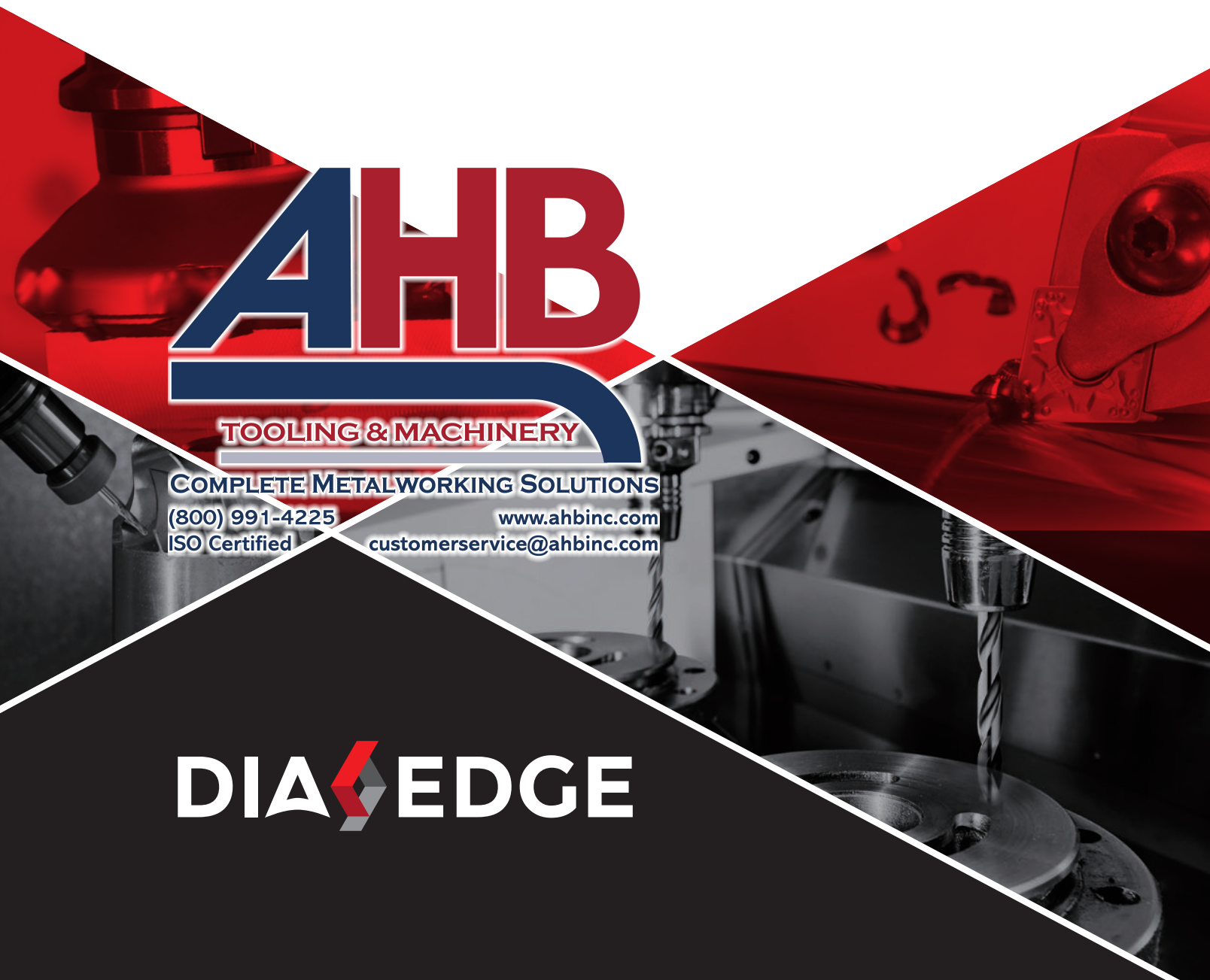
MITSUBISHI MATERIALS

C010A

CUTTING TOOLS 2024

TURNING TOOLS
MILLING TOOLS
DRILLING TOOLS



AHB
TOOLING & MACHINERY
COMPLETE METALWORKING SOLUTIONS
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DIA EDGE

MITSUBISHI MATERIALS

For People, Society and the Earth

We will become the leading business group
committed to creating a sustainable world
through materials innovation, with use of our unique
and distinctive technologies, for People, Society and the Earth.

2024

CONTENTS

	PR, INDEX, NOTES	1
TURNING TOOLS	TURNING INSERTS	A
	CBN & PCD TURNING INSERTS	B
	EXTERNAL TURNING TOOLS	C
	SMALL TOOLS	D
	BORING BARS	E
	GROOVING/CUTTING OFF	F
	THREADING	G
	HSK-T TOOLS	H
ROTATING TOOLS	SOLID END MILLS	I
	EXCHANGEABLE HEAD END MILLS	J
	INDEXABLE MILLING	K
	DRILLING	L
	SPARE PARTS	M
	TECHNICAL DATA	N

DIA EDGE

USING THIS CATALOG

1. This catalog is as of June 2023.

2. Please note that products in this catalog are continuously reviewed and updated. The products therefore may be changed in the future and thus become different from the catalog.

3. Stock status is mentioned for the products in this catalog. However, please note that the products here may be replaced by new grades and products in the future.

   Note 1) Please contact us for dimensions not mentioned in this catalog.
   Note 2) Please contact us regarding order numbers and grades that are not mentioned in this catalog.

4. Stock status indication

● : USA Stock **★ : Stocked in Japan** **□ : Made to Order** **▲ : Inventory maintained To be replaced by new products**

HOW TO USE THIS CATALOG

In this catalog, our company's cutting tools are broadly divided into two types: turning tools and rotating tools, with separate respective sections for each machining method. Please select the search method that matches your requirements when using the catalog.

1. **Search for tool types from the CONTENTS.**

2. **To find the series of products from the index of the inside title**.
   Index of each block are listed on each inside title.

3. **To find the product according to application.**
   The classification page of each block provides the series of products to be selected according to applications and purposes.

4. **Search using the alphabetical index.**
   All tools are listed in the alphabetical index at the front of the catalog.

5. **How to use the block sections.**
   A usage guide for each block is shown on the left of each index (not for all blocks). Refer to this page to know how to read the product information and how the page is organized.

OTHER WAYS TO USE THE CATALOG

The following PR materials are also available in addition to this catalog, for use as necessary.

1. **Catalogs for individual products**
   • Access the following URL and download "Tool News" for the applicable cutting tool.
   Information about tool features and examples of cutting applications are available in greater detail.

http://www.mmus-carbide.com/download/tools_news

2. **Online catalog (electronic catalog with search functions)**
   • Access the following URL to search for applicable cutting tools and view detailed information.
   CAD data, tooling sheets, and other resources are also available for download.

http://www.mitsubishicarbide.net/mmus/enus/

STATEMENT

YOUR GLOBAL CRAFTSMAN STUDIO

Mitsubishi Materials is not just a tool manufacturer

We are committed to responding promptly to customers' challenges and to actively contribute to their success with the dedication of a professional craftsman.

We will strive to become the only tool manufacturer globally offering "your personal craftsman studio", a unique service for our customers.

It is the place where you can:
Find state-of-the-art technologies and products.
Find solutions, anytime, from anywhere in the world.
Share our excitement about the latest technology trends and product innovation.

It is the studio where we think, share, create and develop together with our customers, exciting solutions to meet their specific needs.

YOUR GLOBAL CRAFTSMAN STUDIO
MITSUBISHI MATERIALS

The meaning of our logo
Our logo shows people, standing on a circle, holding hands. The circle represents the earth. Holding hands reflect our commitment to grow and succeed "hand in hand" with our customers and closely work with them to improve performance across the globe. The shape of the logo embodies a variety of ideas. It captures the image of "cutting tools" combined with the dominant letter "M" of the Mitsubishi Materials brand name. It also depicts a flame that symbolises our passion for craftsmanship.

Now available!

A magazine for communication to
encourage excitement about manufacturing

YOUR GLOBAL CRAFTSMAN STUDIO

Access the MMC Magazine here
http://www.mmus-carbide.com/magazine

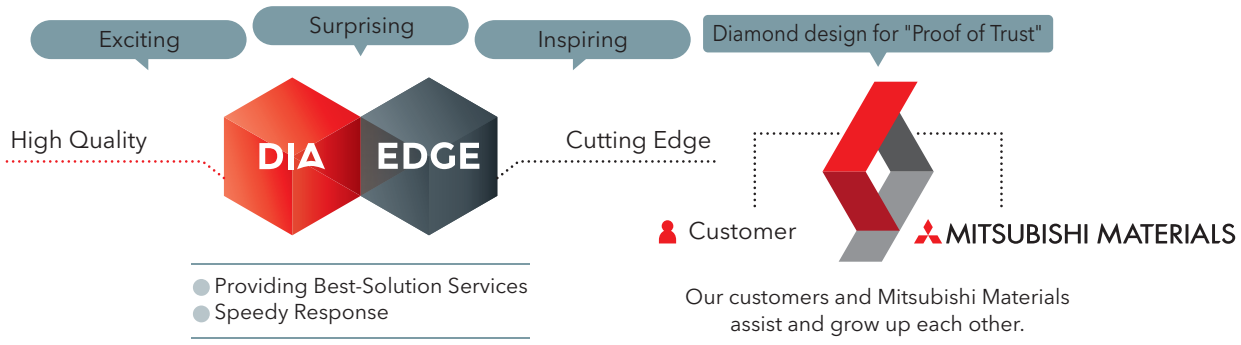
PRODUCT BRAND

With "DIAEDGE," Mitsubishi Materials Metalworking Solutions Company will aim to become the leading company in carbide product business while sharing ideas, creations and feelings with customers through the provision of optimised carbide product solutions and services.

DIAEDGE

Together with our customers, creating a better future

Announcing DIAEDGE, our new brand of tools
that brings together our cutting-edge technologies, exciting all who use them.
Our aim is not only to offer value with our tools,
but to think together with our customers, share inspiration with them,
and continue to take on new challenges.



Tool Solutions

INSERT GRADES

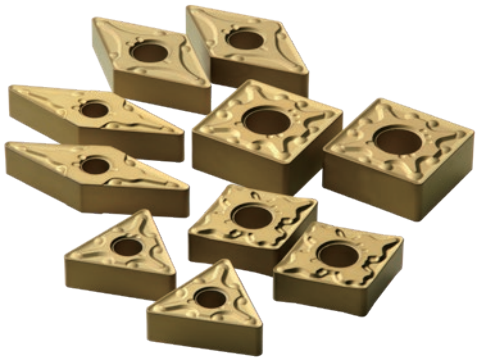
MC6100 Series

» A015
» A020
» A038
» A039

CVD Coated Grade for Steel Turning **P**

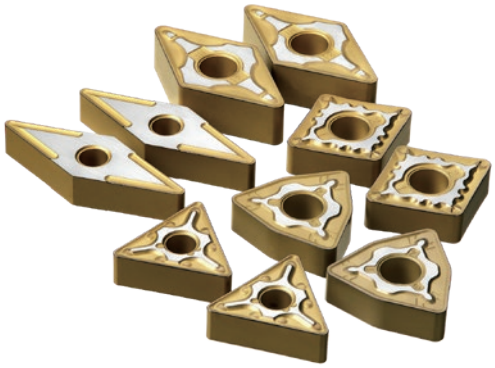
MC6115

Improves high-speed machining and process efficiency with a dramatic increase in resistance to heat and wear



MC6125

First Recommendation for Steel Turning Increases tool life with a stable performance over a wider range of applications



MC5100 Series

» A017
» A023
» A038
» A039

CVD Coated Grades for Cast Iron Turning **K**

MC5105

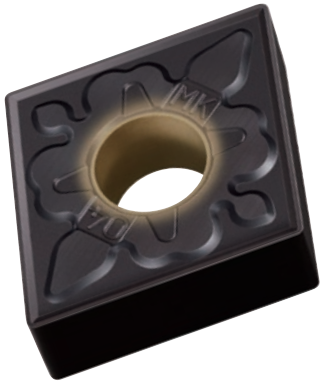
Provides outstanding wear resistance when turning gray cast iron at up to 3280 SFM (1000 m/min) cutting speeds.

MC5115

Prevents abnormal cutting edge damage and displays excellent wear and fracture resistance when machining ductile cast iron.

MC5125

Demonstrates excellent fracture resistance that can withstand heavy interrupted cutting of high strength ductile cast iron.



MS6015/MS7025/MS9025 Series

» D002

PVD Coated Carbide Grade for High Precision and Small Parts Machining

P M S

Greater Enhancement of Turning Inserts for Machining of Small Parts
By selecting the optimum grade for each workpiece material, a stable surface finish and dimensional accuracy are achieved

MS6015

Achieves stable finished surfaces and excellent dimensional accuracy when turning pure iron, carbon steel and free cutting steel

MS7025

Dramatically improved welding and wear resistance in low feed machining with a more precise nano-multilayer coating

MS9025

Effective reduction of notch wear of stainless steel with a balance of wear and fracture resistance

BC8200/MB8100 Series

» B006
» B010

CBN-Series for Hardened Steel Turning

H

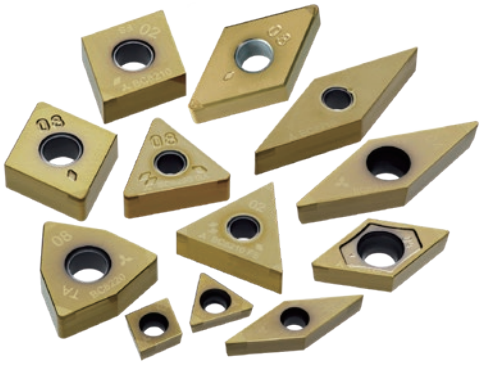
COATED CBN MATERIALS

BC8210 Continuous and Light Interrupted Cutting

Outstanding Tool Life with High-Speed Machining

BC8220 General cutting

Achieves Impressive Tool Life Over a Wide Range of Cutting Conditions



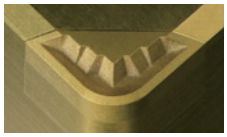
BC8200 Series

CBN Grade (Uncoated)

MB8110 Finish Cutting

MB8120 High Efficiency Machining

MB8130 General cutting



BR Breaker
(BC8220)

BM Breaker

BF Breaker

Tool Solutions

CUTTING OFF AND GROOVING SYSTEM

GY/GW Series

» D004
» F004
» F016
» F218

Holder for High Precision Machining of Small Parts

The new geometry with an extremely high rigidity suppresses vibrations and dimensional changes thereby solving problems during cutting off!

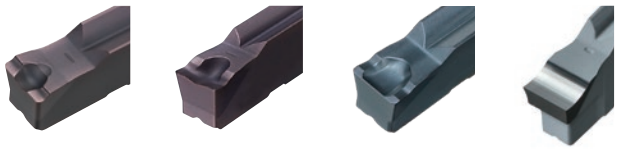
GY series Square type holder

For Cutting Off and Grooving
Maximum Grooving Depth :
1.339 inch (34 mm)

Shank Diameter ; □3/8"□10 mm
Cutting Width : .059 inch (1.5 mm)

A breaker system made for a wide variety of inserts that can be used for machining a huge range of applications

● For Cutting Off and Grooving

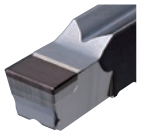


GU Breaker (Gummy Steel)
GS Breaker (Low feeds)
GM Breaker (Medium feeds)
GL Breaker (Aluminum Alloys)

● Cutting Off

R/L05-GM Breaker (Medium feeds)

● Grooving



GFGS Breaker (Hardened Steel)

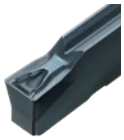
● Copying/ Recessing

BM Breaker (Copying/Recessing)

● For Multifunctional Grooving

MF Breaker (Finish Machining)

MS Breaker (Low feeds)



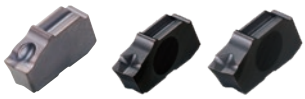
MM Breaker (Medium feeds)

GW series Square type holder

Cutting Off
Maximum Grooving Depth :
2.992 inch (76 mm)

Shank Diameter ; □5/8"□16 mm
Cutting Width : .079 inch (2.0 mm)

A Breaker System Offering Excellent Chip Disposal Properties



GS Breaker (Low feeds)

GM Breaker (Medium feeds)

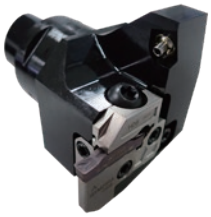
GY Series

» F188
» F010

PSC Holder for Cutting Off and Grooving

The double taper and face contact uses precision machined polygon geometry to provide high clamping rigidity.

00° type holder



90° type holder

Easy exchange between different sizes and types of applications by simply changing the blade.
A breaker system made for a wide variety of inserts that can be used for machining a huge range of applications.

Tool Solutions

MILLING CUTTER

WJX Series

» K308
» K318

Double-Sided Insert Type
High Feed Radius Milling Cutter

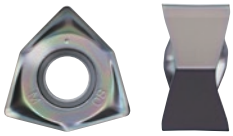
With a low resistance L Breaker and a reinforced cutting edge R Breaker added, the new WJX09 Small Insert Type enables higher feed rates by increasing the number of blades!

WWX Series

» K112
» K120

Double-Sided Insert Type
Shoulder Milling Cutter

The optimized "X-type" insert realizes stable and high-quality machining. This new evolution of the shoulder mill allows for greater stability and high-quality machining!



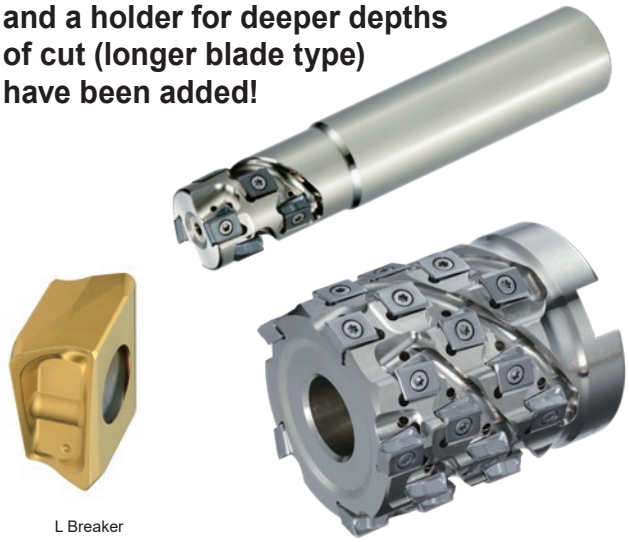
Strong X Geometry

VPX Series

» K182
» K193

Multi-Functional Cutter
for High Efficiency Machining

In order to expand the applications of the VPX300, a low resistance type L breaker and a holder for deeper depths of cut (longer blade type) have been added!



L Breaker

ASPX Series

» K262

For Machining Titanium Alloys

Vibration Control Features + Low Cutting Resistance Equals Extremely Stable, High-Efficiency Cutting!

SOLID END MILLS / EXCHANGEABLE HEAD END MILLS

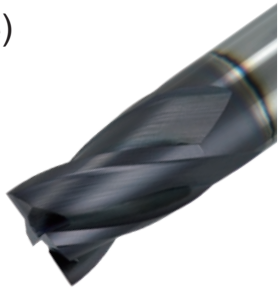
MSplus Series

» I097
» I100
» I103
» D005

End Mill for Swiss Type Automatic Lathes

Enhanced Burr Reduction and Fracture Resistance to Solve Typical Swiss Lathe Machining Problems!

MP2ES (2 Flute)
MP3ES (3 Flute)
MP4EC (4 Flute)



IMPACT MIRACLE REVOLUTION

» I272
» I268

For Machining of Hardened Steels

IMPACT MIRACLE

Revolutionary Machining of Hardened Steel
New coating provides outstanding tool life
Lineup expansion with the addition of a new series!

4 Flute, Precision Corner-Radius End Mill

VFRPSRB

2 Flute, Ball Nose, Long Neck End Mill

VFR2XLB

iMX End Mill Series

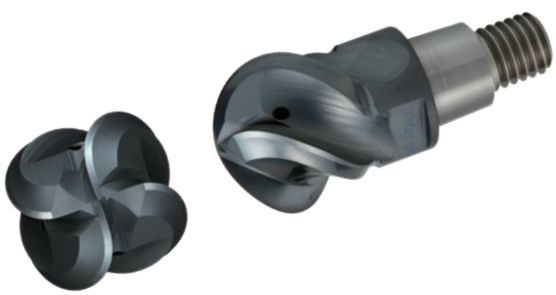
» J070
» J056

Exchangeable Head End Mills

"Carbide"+"Carbide" Double Face Contact Type
(Head) (Holder)

The 4 flute, lollipop head with coolant hole, B4WH-S, and the 4 flute, roughing head with coolant hole, RC4F-C, for machining of titanium alloys have been added to the series!

iMX-B4WH-S



iMX-RC4F-C

SMART MIRACLE Series

» I172 » I164
» I112 » I182
» I114 » I005

Vibration Control End Mills for Machining Difficult-to-Cut Materials

Addition of Lollipop and Radius End Mills to the Series!

Multi-Functional Lollipop End Mill
VQ4WB

Duplex Radius End Mill
VQFDRB

Vibration Control, Corner Radius End Mills
VQHVRB

Long Neck Ball Nose End Mill
VQ2XLB

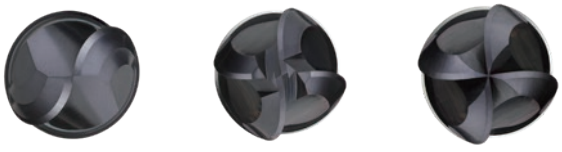
Corner Radius End Mill
for High Efficiency Titanium Alloys Machining
VQT5MVRB (with coolant hole)

SMART MIRACLE Series

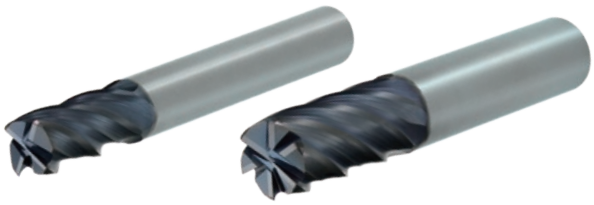
» I187
» I189
» I190
» I192

End Mill for Machining Heat Resistant Super Alloys

2 & 4 Flute, Ball Nose, Medium Cut Length End Mill
VQN2MB/4MB/4MBF



4 & 6 Flute, Corner Radius, Medium Cut Length End Mill (M)
VQN4/6MVRB



Alimaster Series

» I279
» I280
» I277
» I278

High Efficiency Machining of Aluminum Alloys

Highly efficient machining is possible with optimized cutting edge geometry and helical internal coolant holes!

DLC Coating
DLC3SA, DLC3SARB

Uncoated
A3SA, A3SARB

Tool Solutions
DRILLING

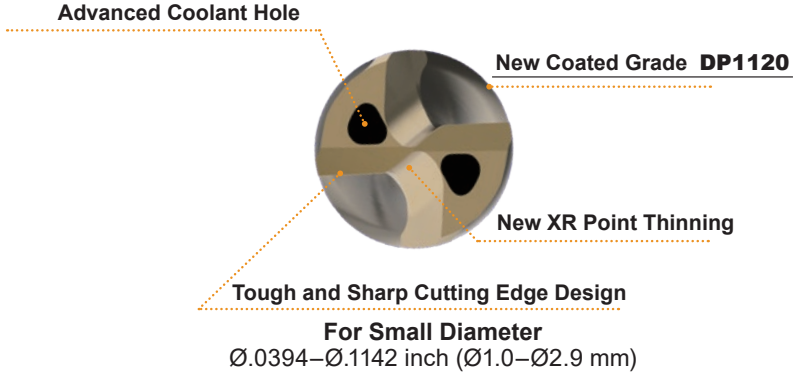
DVAS Series TRISTAR Drill Series

» L008
» D005

Solid Carbide Drills

FAST, RELIABLE and ACCURATE
New standards enabled by the Five Technologies!
~Faster cycle times and higher accuracy~

- Large coolant holes reduce tool damage due to the improved cooling effect thereby greatly improving tool life
- New cutting edge geometry that significantly improves fracture resistance and a new coated grade with excellent wear resistance
- New XR point thinning for high efficiency machining



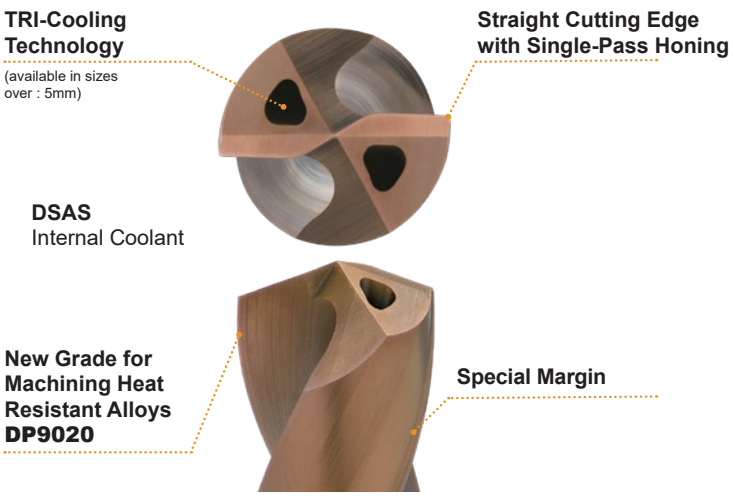
For Small Diameter
Ø.0394–Ø.1142 inch (Ø1.0–Ø2.9 mm)

DSA Series

» L168

Solid Carbide Drill for Machining Heat Resistant Super Alloys

For Long Tool Life when Machining Heat Resistant Super Alloys!
The specially designed margins for machining heat resistant alloys minimize the contact area and prevent work hardening

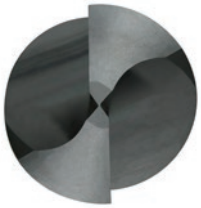


DLE Series

» L192

Solid Drills for Centering and Chamfering

A mini size of ϕ.0394–ϕ.0984 inch (ϕ1.0–ϕ2.5mm) has been added to Solid Carbide DLE Series of drills.



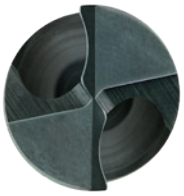
DC : Ø.0394–Ø.6299 inch
(Ø1.0–Ø16.0mm)
SIG : 60°, 90°, 120°, 145°

DWA E Series

» L175
» D005

Carbide Solid Drill Series
for Swiss Type and Small CNC Lathe Machines

Adopts an optimal flute length with a low cutting resistance ideal for Swiss-type automatic and small CNC lathes!



Improved tool rigidity

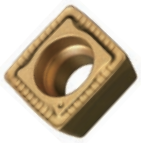
DC : Ø.0394–Ø.5512 inch
(Ø1.0–Ø14.0mm)
L/D : 2, 4

MVX Series

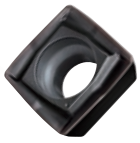
» L199

Indexable Drills

High rigidity body produced by utilizing the latest technology.



UM Breaker



US Breaker

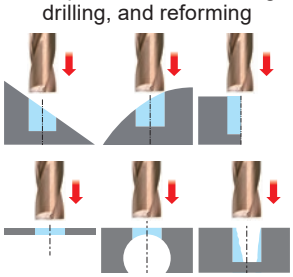
MFE Series

» L183

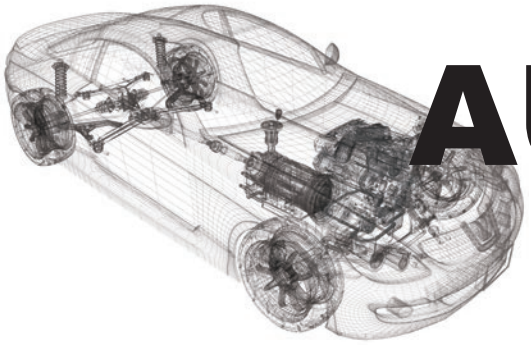
Solid Carbide Flat Bottom Drills

Process shortening with high efficiency drilling in various types of machining
Highly Popular Versatile All-Purpose Drill!

Examples of counter boring, drilling, and reforming



DC : Ø.0295– Ø.7874 inch
(Ø 0.75–Ø20.0mm)
L/D : 2



AUTOMOTIVE

We offer high performance cutting tools that use the latest technology to meet the needs of the automotive industry.

https://www.mitsubishicarbide.com/en/solution/industry/automotive

ENGINE Cylinder Block

❶ **FMAX** » K096

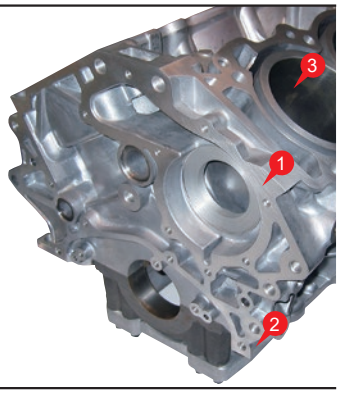
Face Milling Cutter for High Efficiency Finish Cutting of Aluminum Alloys

❷ **VAS** » K144

Exchangeable Inserts Side Cutter Series

❸ **BMR** » K380

Boring Cutter



ENGINE Cylinder Head

❶ **FMAX** » K096

Face Milling Cutter for High Efficiency Finish Cutting of Aluminum Alloys

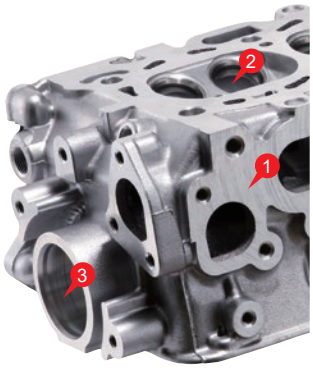
❷ **HVF**

(Special)

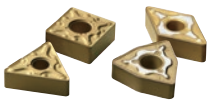
Hydro Clamp Valve Finisher

❸ **Cam Holes Reamer**

High Precision Drilling Reamer with Guide Pad



ENGINE Crank Shaft/ Cam Shaft



❶ **MC6115 / MC6125** » A038

Inserts for Steel Turning

❷ **MC5100 Series** » A038

Insert Series for Machining Ordinary Cast Irons and Ductile Cast Irons

❸ **MFE** » L185

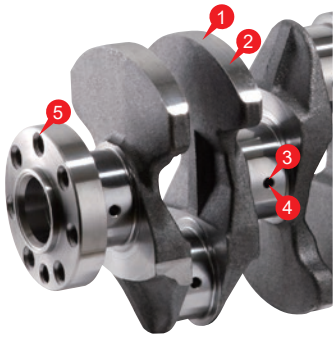
Solid Carbide Flat Bottom Drills

❹ **MVS** » L022

Long Type Drill for Deep Hole Drilling

❺ **DLE** » L192

Solid Carbide Leading Drill for Chamfering



AXLE Steering Knuckle

❶ **VAS** » K144

Exchangeable Inserts Side Cutter Series

❷ **MVS** » L022

Long Type Drill for Deep Hole Drilling

❷ **DLE** » L192

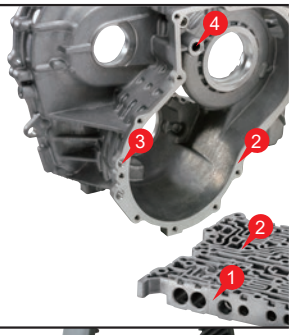
Solid Carbide Leading Drill for Chamfering

TRANSMISSION
Transmission Case / Valve Body

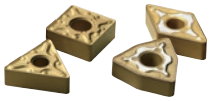
1 FMAX » K096
2 Face Milling Cutter for High Efficiency Finish Cutting of Aluminum Alloys

3 MAS » L150
Solid Carbide Drill for High Efficiency Machining of Aluminum Alloys

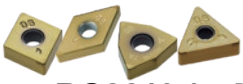
4 Straight Flute Drill
Solid Carbide Drill for High Precision Drilling



TRANSMISSION
Gears / Epicyclic Carriers



1 MC6115 / MC6125 » A038
Inserts for Steel Turning

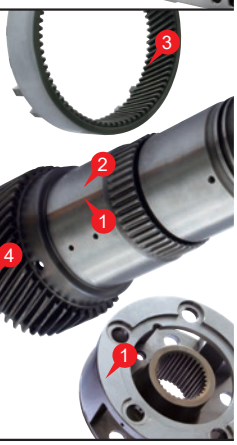


2 BC8210 / BC8220 » B006
Coated CBN Insert for Turning Hardened Steel

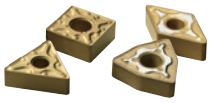
3 Mono Block Helical Broach

4 Hob Cutter

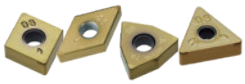
4 Skiving Cutter



TRANSMISSION
Shaft / CVT Pulley

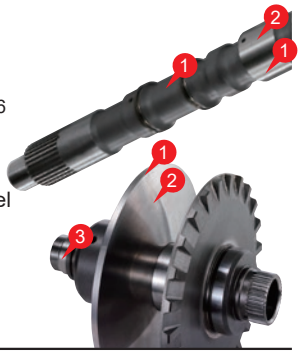


1 MC6115 / MC6125 » A038
Inserts for Steel Turning



2 BC8210 / BC8220 » B006
Coated CBN Insert for Turning Hardened Steel

3 GY » F004
Grooving System



TURBOCHARGER
Wastegate Valve

1 MP9000 Series » A040
Special Chip Breakers for Difficult-to-Cut Materials

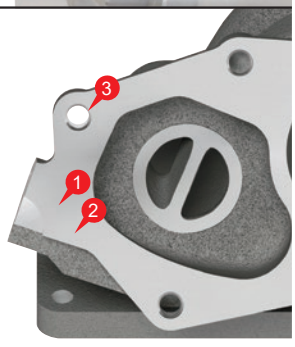
2 DOUBLE CLAMP HOLDER » C002
One Action High Rigidity General Purpose Tool Holder

TURBOCHARGER
Turbine Housing

1 MP9005 / MP9015 / MP9120 / MP9130 » A040 » K024
Insert for Titanium Alloys and Heat Resistant Alloys

2 VPX » K182
Multi-Functional Cutter for High Efficiency Machining

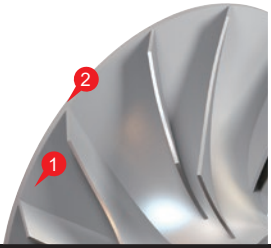
3 MH515 » A039
CVD Coated Carbide Grade



TURBOCHARGER
Compressor Impeller

1 DLC4LATB » I300
Taper Ball End Mill for Aluminum Impellers

2 AZ Breaker » A064
Chip Breakers for Aluminum Alloy Turning



SMALL PARTS

COLLAR/SLEEVE for TURBOCHARGER

1 MMS » L108
Solid Carbide Drill with Internal Coolant Hole

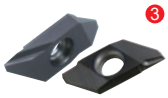
2 MS9025 / MS7025 » A040
FS-P/LS-P Breaker
PVD Coated Carbide Insert for High Precision and Small Parts Machining

3 MICRO-MINI TWIN » E032
Boring and Turning Tool

4 GY / GW » F016 » F224
Cutting Off and Grooving Tool for High Precision and Small Parts Machining

TURBINE IMPELLER SHAFT

1 MP9000 Series » A040
Special Chip Breakers for Difficult-to-Cut Materials



3 BTAT » D018
Tools for External Back Turning

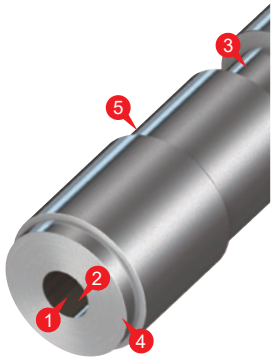
2 GT Series » D024
Tools for External Grooving

4 MMT Series » G021
Threading Tools

SLEEVE for INJECTOR

1 DVAS for Small Diameters » L008
Solid Carbide Drill with Internal Coolant Hole

3 GY Series » F016
Grooving Tool for High Precision and Small Parts Machining



1 MFE for Small Diameters » L183
Solid Carbide Flat Bottom Drills

4 GW Series » F224
Cutting Off Tool for High Precision and Small Parts Machining

1 DLE for Small Diameters » L192
Solid Carbide Leading Drill for Chamfering

5 MS9025 / MS7025 » A040
FS-P/LS-P Breaker
PVD Coated Carbide Insert for High Precision and Small Parts Machining

2 MICRO-MINI TWIN » E032
Boring and Turning Tool

MEDICAL

We provide cutting tools and total applications most suitable for machining of difficult-to-cut materials used in medical parts.

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HIP-SYSTEM
Titanium Alloys
Co-Cr-Mo Alloys

❶ **VQMHVRB / VQMHVRBF** » I148 » I156

Radius End Mills

❷ **MVS** » L022

Solid Carbide Drill with Internal Coolant Hole

❸ **MT9015 / MP9005 / MP9015** » A040 » A043

Special Chip Breakers for Difficult-to-Cut Materials

KNEE-SYSTEM
Titanium Alloys
Co-Cr-Mo Alloys

❶ **VQT6UR** » I184

Barrel End Mills

❶ **VQMHVRB / VQMHVRBF** » I148 » I156

Radius End Mills

❶ **iMX-B6HV / iMX-B4WH-S** » J068 » J070

Exchangeable Head End Mills

BONE PLATES
Titanium Alloys
Stainless Steel

❶ **VQ4WB** » I172

Lollipop End Mill

❷ **VQ4SVB** » I168

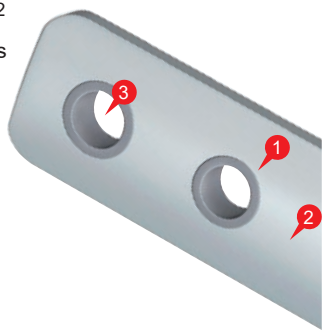
Ball Nose End Mills

❷ **VQFDRB** » I112

Duplex Corner Radius End Mill for High-Speed Cutting

❸ **MFE** » L185

Solid Carbide Flat Bottom Drills



SCREWS
Titanium Alloys
Stainless Steel

❶ **MVS** » L022

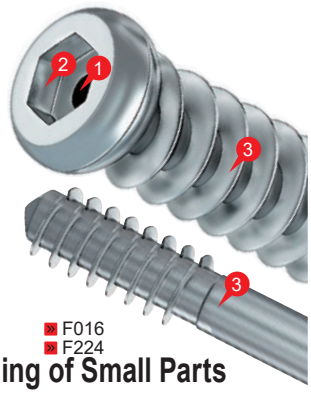
Long Type Drill for Deep Hole Drilling

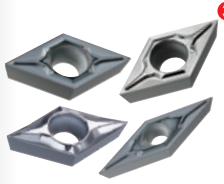
❷ **VQXL** » I194

Long Neck End Mill for Small Diameters

❷ **MPXLRB**

Long Neck Solid Carbide End Mill

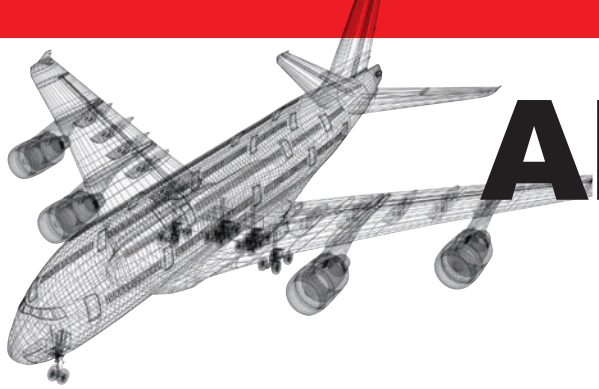




❸ **MP9005 / MP9015 / MS9025 / MT9005 / MT9015** » A040 » A043

ISO Turning Inserts for Difficult-to-Cut Materials

❸ **Holder for High Precision Machining of Small Parts** » F016 » F224



AEROSPACE

We offer the latest cutting tools that enable high efficiency machining of difficult-to-cut parts to meet the needs of the aerospace industry.

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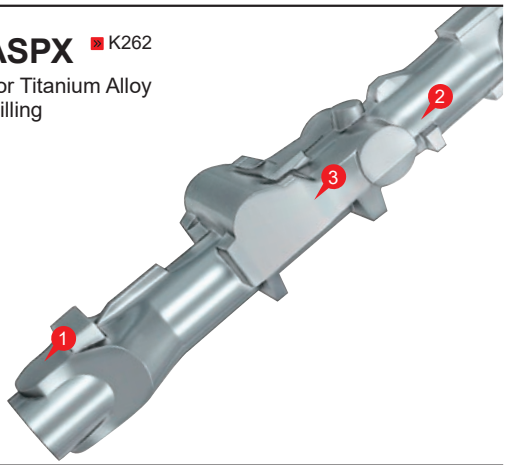
LANDING GEAR
Main Cylinder
Titanium Alloys

❶ **ARP** » K328
Radius Cutter

❸ **ASPX** » K262
For Titanium Alloy Milling

❷ **SMART MIRACLE END MILL SERIES** » I148



ENGINE
Combustion Case
Heat Resistant Super Alloys (HRSA)

❶ **GY** » F004
Grooving System

❸ **VQN** » I187 » I192
End Mill for Machining Heat Resistant Super Alloys

❷ **VPX** » K182

ENGINE
Blisk
Titanium Alloys

❶ **VQT6UR** » I184
Barrel End Mills

❶ **SMART MIRACLE END MILL SERIES** » I168

❶ **iMX** » J056
Exchangeable Head End Mills

ENGINE
Fan Case
Titanium Alloys

❶ **PSC Holder** » F188
Polygon Taper Shank Holder

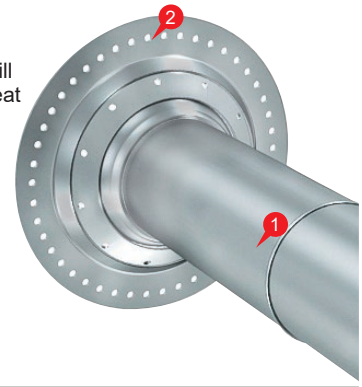
❶ **MT9005 / MT9015** » A043
Insert for Machining Titanium Alloys

ENGINE
Shaft
Heat Resistant Super Alloys (HRSA)
Maraging Steel

1 HSK-T » H004

1 MP9005 / MP9015 / MP9025 » A040
Special Chip Breakers for Difficult-to-Cut Materials

2 DSA » L168
Solid Carbide Drill for Machining Heat Resistant Super Alloys

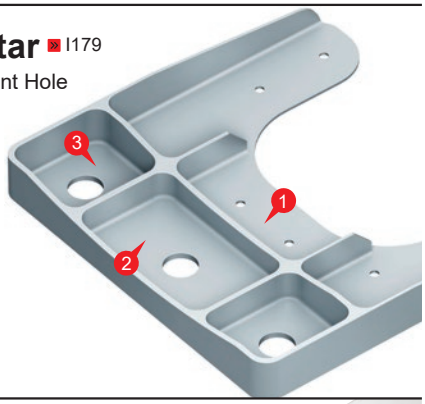


AIR FRAME
Flap Track
Titanium Alloys

1 AJX » K286
High Feed Radius Milling Cutter

2 VQT5MVRB » I182
End Mill for High Efficiency Machining with Internal Coolant Holes

3 CoolStar » I179
Multi-coolant Hole End Mill



AIR FRAME
Hinge
Stainless Steel

1 iMX » J041
Exchangeable Head End Mills

2 VPX » K182

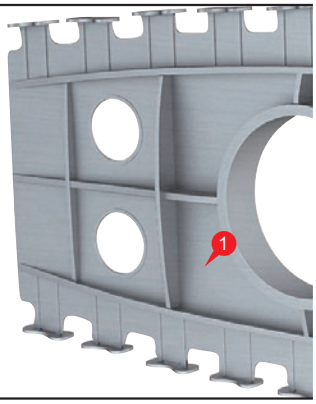
3 MMS » L108
Solid Carbide Drill with Internal Coolant Hole

AIR FRAME
Wing Rib
Aluminum Alloys

1 AXD » K226

1 Alimaster » I279 » I278
End Mill for High Efficiency Machining with Internal Coolant Holes

1 iMX » J020 » J046
Exchangeable Head End Mills

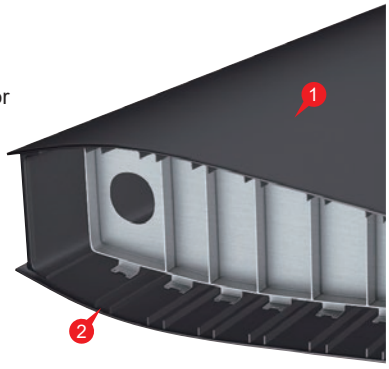


AIR FRAME
CFRP Wing
Carbon Fiber Reinforced Plastics

1 MC Drill Series

2 DFC4JC / DFCJRT » I282 » I283

1 MCCH/ MCAH
Carbon Drill for Hand Tools



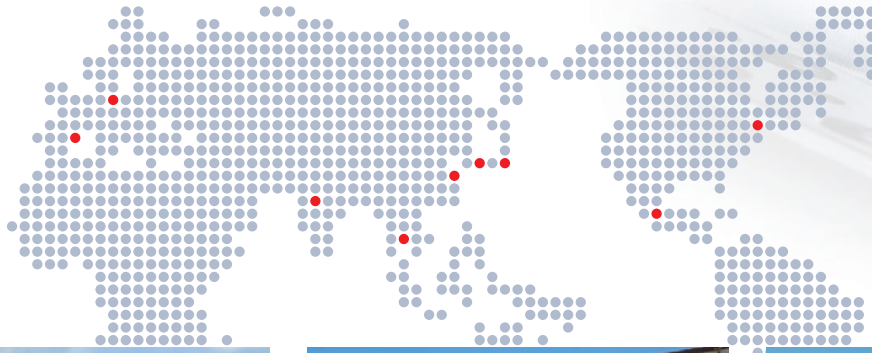
Customer Service

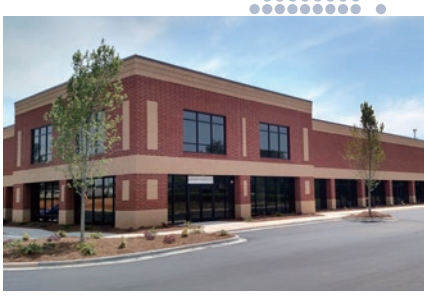
Cutting Solution Service

Machining Technology Center

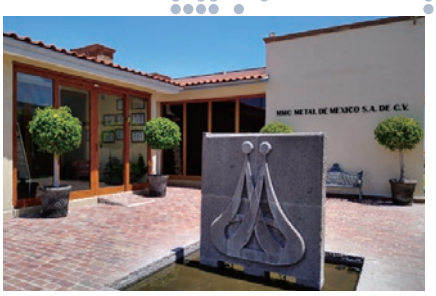
RESPONSIVE, ATTRACTIVE, PROACTIVE

Mitsubishi Materials Corporation, Metalworking Solutions Company, offers a "Comprehensive Craftsman Studio" which addresses the individual needs and requirements of our customers in order to make their business successful. Here the Machining Technology Center is the base at the front lines. It is fully equipped with advanced machines, measuring instruments, extensive cutting data, knowledge, technologies as well as having a team of highly-experienced technical staff members. All of which allows Mitsubishi Materials Corporation to offer the best solution and services for our valued customers.





MTEC North Carolina (USA)



MTEC Querétaro (MEXICO)

MTEC Saitama (East Japan Technical Center)

MTEC Gifu (Central Japan Technical Center)

MTEC TianJin (CHINA)

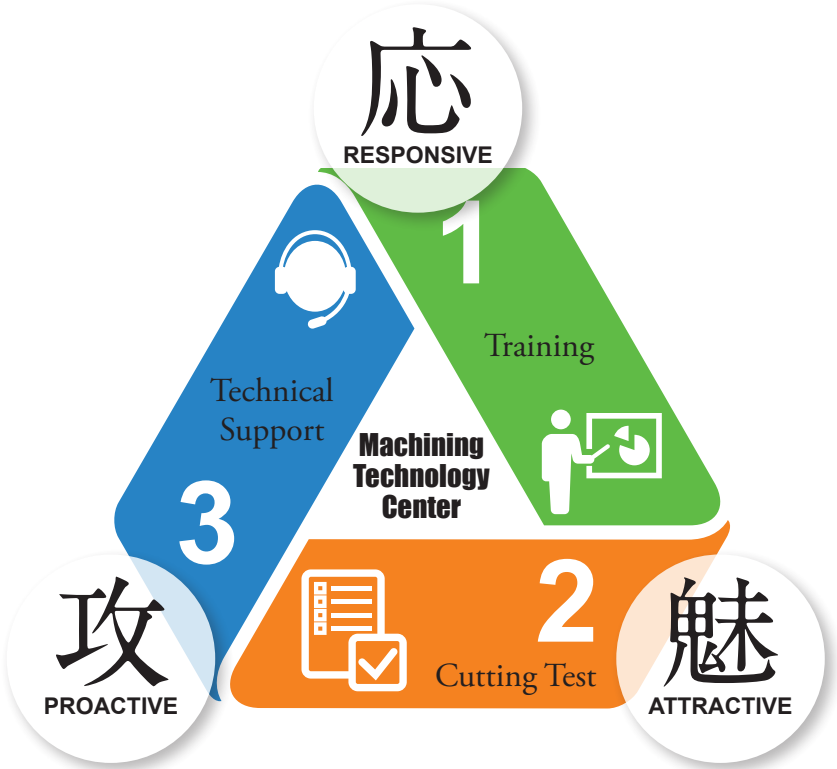
MTEC Valencia (SPAIN)

MTEC Stuttgart (GERMANY)

MTEC Bangkok (THAILAND)

MTEC Pune (India)

We try answering any questions and demands from customers around the world and providing detailed solutions as well as meeting customers' expectations along with a sustainable growth of technical skills and services.



We identify the potential needs of customers and develop innovative tools to cultivate new markets for widening future business possibilities.

Showing and demonstrating, Attractive events and practical seminars present the new possibilities in machining which evoke a feeling of curiosity.

1 TRAINING

Practical "Hands-on" training with real demonstrations

- **Cutting Academy**
- **e-learning**
- Regional seminar
- Requested Seminar

2 CUTTING TEST

Visualizing your machining

- Test Cutting
- Selection of optimal machining conditions
- Improvements in tool life and machining quality
- Predictive tests before line input
- High-speed camera/ Cutting force/ 3D measuring device etc.

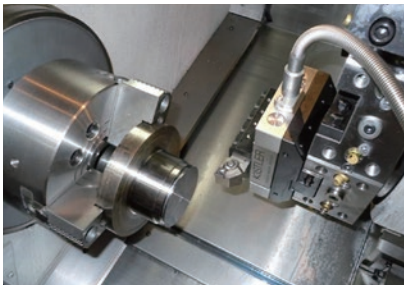
3 TECHNICAL SUPPORT

"RESPONSIVE", with the provision of technical services

- Production line diagnosis/ Process improvement
- Tooling
- Cutting Simulation
- Telephone Technical Counseling

https://www.mitsubishicarbide.com/en/solution/purpose

For details, please contact your nearest sales office. (Refer to "Domestic Sales Offices" at the end of the catalog)

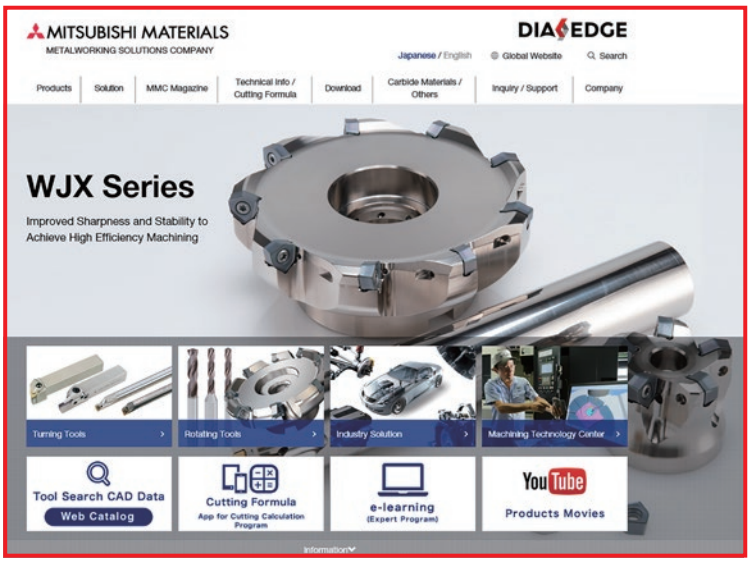


Customer Service

Web Service

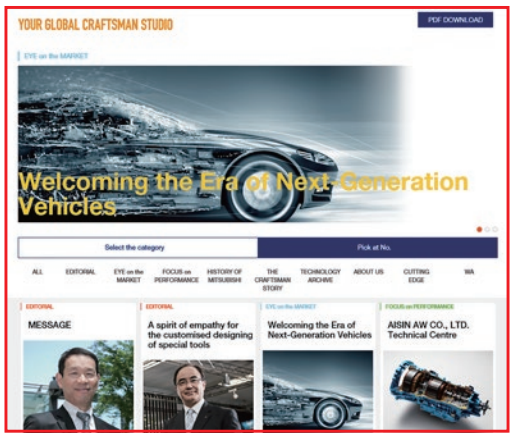
Mitsubishi Materials' Website

- We deliver the latest solution technical information, exhibitions and event information.
- You can view various promotional leaflets as well as the PDF version of the General Catalog on the website.

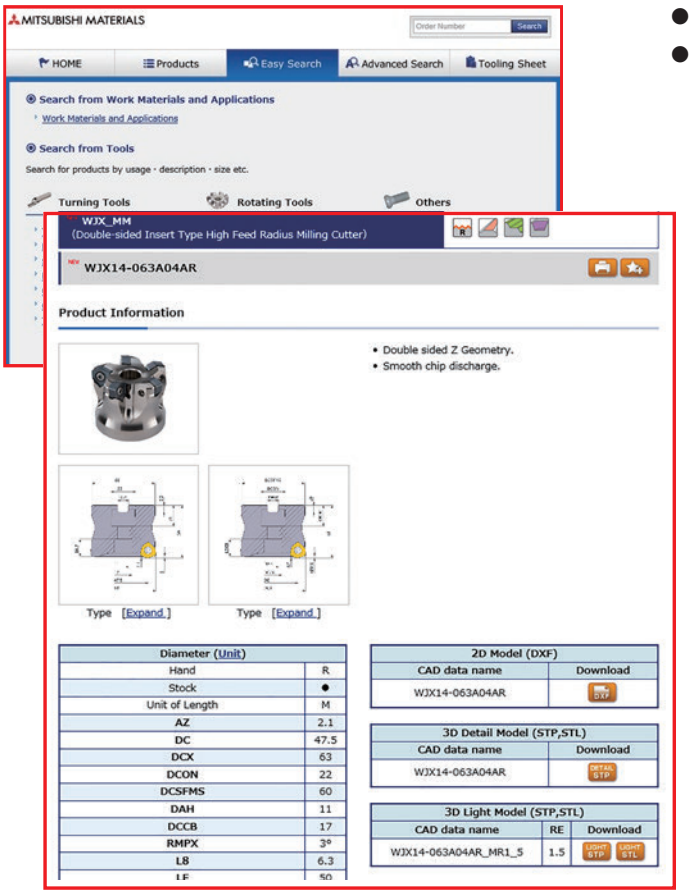


https://www.mitsubishicarbide.com/en/

Access to the website here

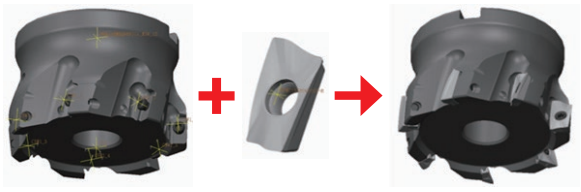


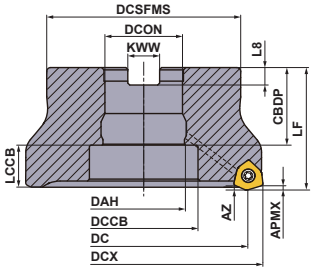
Mitsubishi Materials' Web Catalog



- You can search for materials and cutting applications.
- We are constantly updating various CAD data corresponding to ISO 13399.
  - 2D Model (DXF)
  - 3D Detail Model (STP)
  - 3D Light Model (STP/STL)

3D Detail Model (STP) Example





https://www.mitsubishicarbide.net/mht/enuk/

Access to the web catalog here

INDEX

INDEX FOR TOOL NUMBER

A 2
B 2
C 3
D 4
E 5
F 5
G 5
H 6
I 6
J 7
K 7
L 7
M 7
N 8
O 9
P 9
Q 9
R 9
S 9
T 11
V 12
W 13
X 14
Z 14
NUMBER / OTHERS 14

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
A		
A3SA	Uncoated carbide end mill (Metric type)	I277
A3SARB	Uncoated carbide end mill (Metric type)	I278
AD-BM10	Banjo adapter	F230
AD-G1/8	Adapter	F230
AEMW○○○○○○○ER	Insert (For BAE type end mill)	K386
AHX440S-○○○○○○○R	AHX440S type face mill (Metric type)	K066
AHX440SR○○○○○○○	AHX440S type face mill (Metric type)	K065
AHX440SUR○○○○○○	AHX440S type face mill	K064
AHX475S-○○○○○○○R	AHX475S type face mill (Metric type)	K071
AHX475SR○○○○○○○	AHX475S type face mill (Metric type)	K071
AHX475SUR○○○○○○	AHX475S type face mill	K070
AHX640S-○○○○○○○R	AHX640S type face mill (Metric type)	K077
AHX640SR○○○○○○○	AHX640S type face mill (Metric type)	K076
AHX640SUR/L○○○○○○	AHX640S type face mill	K074,K075
AHX640W-○○○○○○R/L	AHX640W type face mill (Metric type)	K089
AHX640WR/L○○○○○	AHX640W type face mill	K086,K087
AHX640WR/L○○○○○○	AHX640W type face mill (Metric type)	K088
AJS○○○○T○○	Clamp screw	M004
AJX14RA○○○○○E/F	AJX type cutter	K288
AJX○○-○○○A/B/X○○R	AJX type face mill (Metric type)	K294,K295
AJX○○R○○○○○○	AJX type face mill (Metric type)	K294
AJX○○R○○○AM○○○○	AJX type screw-in end mill (Metric type)	K297
AJX○○R○○○SA○○S/SS/L/EL	AJX type end mill (Metric type)	K291,K292
AJXU○○R○○○○	AJX type face mill	K288
AJXU○○R○○○AM○○○○	AJX type screw-in end mill	K290
AJXU○○R○○○○C/E	AJX type face mill	K288
AJXU○○R○○○FA/SA/WA○○S/M/L	AJX type end mill	K286
AMS○	Clamp bridge	M017
AOGT1236○○PEFR-GM	Insert (For APX3000 type cutter)	K161
AOMT1236○○PEER-H/M	Insert (For APX3000 type cutter)	K161
AOMT1848○○PEER-H/M	Insert (For APX4000 type cutter)	K174
AOX445-063A04R	AOX445 type face mill (Metric type)	K095
AOX445R○○○○○○	AOX445 type face mill (Metric type)	K095
AOX445R○○○S32	AOX445 type end mill (Metric type)	K095
APGT○○○○PDFR-G○	Insert (For BAP300/400 type cutter)	K386
APMT○○○○PDER-H○	Insert (For BAP300/400/SRM2 type cutter)	K368,K369,K375,K386
APMT○○○○PDER-M○	Insert (For BAP300/400/SRM2 type cutter)	K368,K369,K375,K386,K387
APX3000-○○○A○○RA	APX3000 type face mill (Metric type)	K158
APX3000R○○○○A/B	APX3000 type face mill	K156
APX3000R○○○○○CA/DA	APX3000 type face mill (Metric type)	K159
APX3000R○○○M○○A○○	APX3000 type screw-in end mill (Metric type)	K160
APX3000R○○○SA○○○A	APX3000 type end mill (Metric type)	K157
APX3000UR○○○AM○○A○○	APX3000 type screw-in end mill	K160
APX3000UR○○○SA/FA○○○○	APX3000 type end mill	K154,K155
APX3K-○○○○○○○○○○RA	APX3000 type end mill (Long cutting edge) (Metric type)	K165
APX3KR○○○○S○○○○○○A	APX3000 type end mill (Long cutting edge) (Metric type)	K165
APX3KUR2.0004AA18A20	APX3000 type end mill (Long cutting edge)	K164
APX3KUR○○○FA/FN○○S○○A○○	APX3000 type end mill (Long cutting edge)	K164
APX4000-○○○A○○RA	APX4000 type face mill (Metric type)	K172
APX4000R○○○○○○A	APX4000 type face mill (Metric type)	K171
APX4000R○○○M○○A○○	APX4000 type screw-in end mill (Metric type)	K173
APX4000R○○○SA○○○A	APX4000 type end mill (Metric type)	K170
APX4000UR○○○○○○	APX4000 type face mill	K169
APX4000UR○○○AM○○A○○	APX4000 type screw-in end mill	K173
APX4000UR○○○SA/FA○○○○	APX4000 type end mill	K168
APX4K-○○○A○○A○○○RA	APX4000 type end mill (Metric type)	K179
APX4KR06316CA056A	APX4000 type end mill (Metric type)	K179
APX4KR○○○○○○A○○○○○○A	APX4000 type end mill (Metric type)	K179
APX4KUR0209A16A	APX4000 type end mill	K178
APX4KUR2516CA22A	APX4000 type end mill	K178
APX4KUR○○○○WA○○○○○A	APX4000 type end mill	K178
AQXR○○○M○○A○○	AQX type screw-in end mill (Metric type)	K279
AQXR○○○SA/SN○○S/L	AQX type end mill (Metric type)	K277,K278
AQXUR○○○SA/WA○○S/L	AQX type end mill	K276
ARP○P-○○○A○○AR	ARP type face mill (Metric type)	K331
ARP○PR○○○○○○A	ARP type face mill (Metric type)	K331
ARP○PR○○○○AM○○○○	ARP type screw-in end mill (Metric type)	K334
ARP○PR○○○○SA○○M/L	ARP type end mill (Metric type)	K333
ARP○UPR○○○○○A	ARP type face mill	K328
ARP○UPR○○○○AM○○○○	ARP type screw-in end mill	K330
ARP○UPR○○○○FA/SA○○M/L	ARP type end mill	K329
ARX○○R○○○M○○A○○	ARX type screw-in end mill (Metric type)	K341
ARX○○R○○○SA○○LW	ARX type end mill (Metric type)	K341
ARX○○R○○○SA○○S	ARX type end mill (Metric type)	K340
ASPX4-○○○○○○○○○○○RA○○	ASPX type end mill (Long cutting edge) (Metric type)	K264
ASPX4R0805H○○○A127SA	ASPX type end mill (Long cutting edge) (Metric type)	K265
ASPX4UR485H○○○A050SA	ASPX type end mill (Long cutting edge)	K263
ASPX4UR○○○○○A○○A○○	ASPX type end mill (Long cutting edge)	K262
ASX400	ASX400 type side cutter (Metric type)	K152,K153
ASX400-○○○○○○○R	ASX400 type face mill (Metric type)	K140
ASX400R○○○○	ASX400 type face mill	K138
ASX400R○○○○○	ASX400 type face mill	K138
ASX400R○○○○○○	ASX400 type face mill (Metric type)	K139
ASX400R○○○AM16○○	ASX400 type screw-in end mill (Metric type)	K139
ASX400R○○○S32	ASX400 type end mill (Metric type)	K140
ASX400R○○○W20	ASX400 type end mill	K141
ASX445-○○○○○○○R	ASX445 type face mill (Metric type)	K058
ASX445R○○○○	ASX445 type face mill	K056
ASX445R○○○○○	ASX445 type face mill	K056,K057
ASX445R○○○S32	ASX445 type end mill (Metric type)	K057
AXD4000A-050A04R○	AXD4000A type face mill (Metric type)	K241
AXD4000AUR2.0004AA○	AXD4000A type face mill	K240
AXD4000-○○○A○○R○	AXD4000 type face mill (Metric type)	K230
AXD4000R○○○○○○A/B	AXD4000 type face mill (Metric type)	K230
AXD4000R○○○AM○○○○○	AXD4000 type screw-in end mill (Metric type)	K232
AXD4000R○○○SA○○○○	AXD4000 type end mill (Metric type)	K229
AXD4000UR○○○○○A/B	AXD4000 type face mill	K227
AXD4000UR○○○SA○○○A/B	AXD4000 type end mill	K226
AXD7000-○○○A/B○○R○	AXD7000 type face mill (Metric type)	K249
AXD7000R○○○○○○○	AXD7000 type face mill (Metric type)	K249
AXD7000R○○○○○A-H63A	AXD7000 type HSK shank end mill (Metric type)	K248
AXD7000R○○○SA○○S○	AXD7000 type end mill (Metric type)	K248
AXD7000UR○○○○○○	AXD7000 type face mill	K247
AXD7000UR○○○SA○○S○	AXD7000 type end mill	K246
B		
BB-G1/8	Banjo bolt	F230
BCP141	Shim pin	M016
BF-CCGT○○○-○○2	Insert (Class G tolerance)	B038
BF-CNGM○○○-○○2	Insert (Class G tolerance)	B024
BF-CNGM○○○-○○WS2	Insert (Class G tolerance)	B024
BF-DCGT○○○-TS2	Insert (Class G tolerance)	B041
BF-DNGM○○○-○○2	Insert (Class G tolerance)	B028
BF-DNGM○○○-○○WS2	Insert (Class G tolerance)	B028

ORDER NUMBER	PRODUCT NAME	PAGE
BLS○○	Clamp screw	M004
BM-CCGT○○○-TA2	Insert (Class G tolerance)	B038
BM-CNGM○○○-TA2	Insert (Class G tolerance)	B024
BM-DCGT○○○-TA2	Insert (Class G tolerance)	B041
BM-DNGM○○○-TA2	Insert (Class G tolerance)	B028
BMR	BMR bore boring cutter	K380
BM-TNGM○○○-TA3	Insert (Class G tolerance)	B031
BOE4S06U	Clamp screw	M009
BR-CNGM○○○-○○2	Insert (Class G tolerance)	B024
BR-DNGM○○○-○○2	Insert (Class G tolerance)	B028
BRP○○○R○○○ELS○○	BRP type end mill	K344
BRP○○○R○○○ELW○○	BRP type end mill	K344
BRP○○○R○○○LW○○	BRP type end mill	K344
BRP○○○R○○○W○○	BRP type end mill	K344
BRP○UPR○○○○	BRP type face mill	K345
BRP○UPR○○○○C/E/X	BRP type face mill	K345
BTAHR/L-○○○	External back turning holder	D018
BTAHR/L○○○○-50	External back turning holder	D021
BTAT603501MR-B	Insert for external back turning	D018,D021
BTAT605000RX	Insert for external back turning	D018,D021
BTAT72350○MR-SMB	Insert for external back turning	D018,D021
BTAT7235V5R-SMB	Insert for external back turning	D018,D021
BTAT○○○○○○R/L-B	Insert for external back turning	D018,D021
BTBT606000R/L	Insert for external back turning	D019,D022
BTBT70550○MR-SMB	Insert for external back turning	D019,D022
BTBT7055V5R-SMB	Insert for external back turning	D019,D022
BTBT○○○○○○MR-B	Insert for external back turning	D019,D022
BTBT○○○○○○R/L-B	Insert for external back turning	D019,D022
BTVHR-○○○	External back turning holder	D020
BTVHR○○○○-75	External back turning holder	D023
BTVHR○○○○-75F	External back turning holder	D023
BTVT○○○○○○R-B	Insert for external back turning	D020,D023
BXD4000-○○○A/B○○RA/RB	BXD4000 type face mill (Metric type)	K260
BXD4000R○○○○	BXD4000 type face mill	K259
BXD4000R○○○○○○○	BXD4000 type face mill (Metric type)	K260
BXD4000R○○○○B	BXD4000 type face mill	K259
BXD4000R○○○SA○○○○	BXD4000 type end mill (Metric type)	K261
BXD4000R○○○SA○○S/SB	BXD4000 type end mill	K258

C

C07KSTUCR06	MICRO-DEX holder (Carbide shank)	E030
C2MHA	Uncoated carbide end mill (Metric type)	I296
C3-GYHR/LCX90-M20R/L	GY type holder (External 90° type)	F178－F187
C4LATB	Uncoated carbide end mill (Metric type)	I298
C6-GYHR/LF00-M25R/L	GY type holder (External 00° type)	F168－F177
CBC4	Chip breaker	M017
CBH○○○○○	Clamp screw	M002
CBR4	Chip breaker	M017
CB○○RS	MICRO-MINI TWIN boring bar	E032
CB○○RS-○○	MICRO-MINI TWIN boring bar	E032
CB○○RS-B	MICRO-MINI TWIN boring bar	E032
CB○○RS-○○B	MICRO-MINI TWIN boring bar	E032
C○-GYHER/LM00-M25R/L	GY PSC type holder (External 00° type)	F188,F190
C○-GYHER/LM50-M25R/L	GY PSC type holder (External 50° type)	F192
C○-GYHR/L○90-M25R/L	GY type holder (External 90° type)	F178－F187
C○-GYHR/L○X00-M○○R/L	GY type holder (External 00° type)	F168－F177
CCET○○○R/LSN	Insert (Class E tolerance)	A160
CCET○○○R/LSR	Insert (Class E tolerance)	A159
CCET○○○R/LWSN	Insert (Class E tolerance)	A160
CCGH○○○○○○MR/L-F	Insert (Class G tolerance)	A154
CCGH○○○R/LF	Insert (Class G tolerance)	A154
CCGT○○○AZ	Insert (Class G tolerance)	A153
CCGT○○○FJ	Insert (Class G tolerance)	A153
CCGT○○○FJ-P	Insert (Class G tolerance)	A153
CCGT○○○○○○L-F	Insert (Class G tolerance)	A153
CCGT○○○MFS	Insert (Class G tolerance)	A152
CCGT○○○MFS-P	Insert (Class G tolerance)	A152
CCGT○○○MJ	Insert (Class G tolerance)	A155
CCGT○○○MJ-P	Insert (Class G tolerance)	A155
CCGT○○○MLS	Insert (Class G tolerance)	A154
CCGT○○○MLS-P	Insert (Class G tolerance)	A155
CCGT○○○○○○MR/L-F	Insert (Class G tolerance)	A153
CCGT○○○MR/LSN	Insert (Class G tolerance)	A159
CCGT○○○MR/LSS	Insert (Class G tolerance)	A156
CCGT○○○MSMG	Insert (Class G tolerance)	A161
CCGT○○○R/LSN	Insert (Class G tolerance)	A159
CCGT○○○R/LSS	Insert (Class G tolerance)	A156
CCGW○○○	Insert (Class G tolerance)	A161
CCGW○○○E	Insert (Class G tolerance)	A161
CCGW○○○V○	Insert (Class G tolerance)	A161
CCMH○○○MV	Insert (Class M tolerance)	A158
CCMH○○○SV	Insert (Class M tolerance)	A155
CCMT○○○	Insert (Class M tolerance)	A158
CCMT○○○FM	Insert (Class M tolerance)	A152
CCMT○○○FP	Insert (Class M tolerance)	A152
CCMT○○○FV	Insert (Class M tolerance)	A152
CCMT○○○LM	Insert (Class M tolerance)	A154
CCMT○○○LP	Insert (Class M tolerance)	A154
CCMT○○○LS	Insert (Class M tolerance)	A154
CCMT○○○MK	Insert (Class M tolerance)	A157
CCMT○○○MM	Insert (Class M tolerance)	A157
CCMT○○○MP	Insert (Class M tolerance)	A157
CCMT○○○MS	Insert (Class M tolerance)	A157
CCMT○○○MW	Insert (Class M tolerance)	A158
CCMT○○○SW	Insert (Class M tolerance)	A155
CCMW○○○	Insert (Class M tolerance)	A161,B053
CCMX○○○○○○ENA/B	Insert (For LER type end mill)	K274
CE4SRB	Ceramic end mill (Metric type)	I294
CE6SRB	Ceramic end mill (Metric type)	I295
CFC/FM○○○○○	Clamp screw	M002
CFSPR○○○W○○	CFSP type end mill	K348
CG○○RS-○○	MICRO-MINI TWIN (For Grooving)	F237
CG○○○○RS-○○	MICRO-MINI TWIN (For Grooving)	F237
CG○○RS-○○B	MICRO-MINI TWIN (For Grooving)	F237
CG○○○○RS-○○B	MICRO-MINI TWIN (For Grooving)	F237
CL○	Clamp bridge	M017
CL○○	Clamp bridge	M017
CNG○○○	Insert (Class G tolerance)	B034
CNGA○○○	CBN insert (Class G tolerance)	B024
CNGG○○○FJ	Insert (Class G tolerance)	A106
CNGG○○○○FJ-P	Insert (Class G tolerance)	A107
CNGG○○○FS	Insert (Class G tolerance)	A106
CNGG○○○LS	Insert (Class G tolerance)	A107
CNGG○○○MJ	Insert (Class G tolerance)	A108
CNMA○○○	Insert (Class M tolerance)	A113,B049
CNMG○○○	Insert (Class M tolerance)	A111
CNMG○○○FP	Insert (Class M tolerance)	A106
CNMG○○○FH	Insert (Class M tolerance)	A106
CNMG○○○FS	Insert (Class M tolerance)	A106
CNMG○○○FY	Insert (Class M tolerance)	A106
CNMG○○○GH	Insert (Class M tolerance)	A112
CNMG○○○GJ	Insert (Class M tolerance)	A112
CNMG○○○GK	Insert (Class M tolerance)	A110

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
CNMG○○○GM	Insert (Class M tolerance)	A110
CNMG○○○LK	Insert (Class M tolerance)	A107
CNMG○○○LM	Insert (Class M tolerance)	A107
CNMG○○○LP	Insert (Class M tolerance)	A107
CNMG○○○LS	Insert (Class M tolerance)	A107
CNMG○○○MA	Insert (Class M tolerance)	A110
CNMG○○○MH	Insert (Class M tolerance)	A110
CNMG○○○MJ	Insert (Class M tolerance)	A108
CNMG○○○MK	Insert (Class M tolerance)	A109
CNMG○○○MM	Insert (Class M tolerance)	A109
CNMG○○○MP	Insert (Class M tolerance)	A108
CNMG○○○MS	Insert (Class M tolerance)	A109
CNMG○○○MW	Insert (Class M tolerance)	A111
CNMG○○○RK	Insert (Class M tolerance)	A111
CNMG○○○RM	Insert (Class M tolerance)	A111
CNMG○○○RP	Insert (Class M tolerance)	A111
CNMG○○○RS	Insert (Class M tolerance)	A112
CNMG○○○SA	Insert (Class M tolerance)	A107
CNMG○○○SH	Insert (Class M tolerance)	A107
CNMG○○○SW	Insert (Class M tolerance)	A108
CNMG○○○SY	Insert (Class M tolerance)	A108
CNMM○○○HL	Insert (Class M tolerance)	A113
CNMM○○○HM	Insert (Class M tolerance)	A113
CNMM○○○HR	Insert (Class M tolerance)	A113
CNMM○○○HV	Insert (Class M tolerance)	A113
CNMM○○○HX	Insert (Class M tolerance)	A112
CNMM○○○HZ	Insert (Class M tolerance)	A113
CNMN○○○	Insert (Class M tolerance)	A149
CNMP○○○	Insert (Class M tolerance)	A109
CPGT○○○	Insert (Class G tolerance)	A162,B053
CPGT○○○R/LF	Insert (Class G tolerance)	A162
CPM○○○○○	Clamp screw	M002
CPMH○○○	Insert (Class M tolerance)	A163
CPMH○○○FV	Insert (Class M tolerance)	A162
CPMH○○○LP	Insert (Class M tolerance)	A163
CPMH○○○MV	Insert (Class M tolerance)	A163
CPMH○○○R/LF	Insert (Class M tolerance)	A162
CPMH○○○SV	Insert (Class M tolerance)	A163
CPMT○○○MQ	Insert (Class M tolerance)	A163
CPMT○○○SQ	Insert (Class M tolerance)	A162
CPMT1205ZPEN-M○	Insert (For PMR type end mill)	K379
CPMX○○○	Insert (Class M tolerance)	A163
C○○○R-BLS	MICRO-MINI boring bar	E031
CR○○RS-○○	MICRO-MINI TWIN boring bar	E033
CR○○RS-○○B	MICRO-MINI TWIN boring bar	E033
CS-1/8-○○○○○	Coolant hose kit	F230
C○○○SCLCR○○	MICRO-DEX holder (Carbide shank)	E029
C-SCLCR/L-○○○	Screw clamp type boring bar (Carbide shank)...	E013
CSC/SD/SP/SR/SS○○○○○	Clamp screw	M002
C-SDQCR/L-○○○	Screw clamp type boring bar (Carbide shank)...	E014
CS○○○○○○T	Clamp screw	M004
C-STUCR/L-○○○	Screw clamp type boring bar (Carbide shank)...	E016
CSVHR/L-○○○	External turning holder	D040
CSVHR/L○○○○	External turning holder	D043
CSVTB○○○R-B	Insert for external back turning	D041,D044
CSVTB○○○R/L	Insert for external back turning	D041,D044
CSVTBXL	Insert for external back turning, copying	D041,D044
CSVTC○○○○R-B	Insert for external cutting off	D041,D044
CSVTC○○○○R/L	Insert for external cutting off	D041,D044
CSVTF○○○R/L	Insert for external front turning	D040,D043
CSVTF○○○R/L-B	Insert for external front turning	D040,D043
CSVTFXL	Insert for external front turning, copying	D040,D043
CSVTG○○○○○R/L	Insert for external grooving	D042,D045
CSVTT60050RR/L	Insert for external threading	D042,D045
C-SWL0502R/LS	Screw clamp type boring bar (Carbide shank)...	E017
C-SWL0504R/L	Screw clamp type boring bar (Carbide shank)...	E017
C-SWL05S3R/LM	Screw clamp type boring bar (Carbide shank)...	E017
C-SWLOR/L-○○○	Screw clamp type boring bar (Carbide shank)...	E019
C○○○SWUBR○○	MICRO-DEX holder (Carbide shank)	E029
CTAHR1010-120S	External cutting off holder	D030
CTAHR/L-○○○	External cutting off holder	D028
CTAHR/L○○○○-120	External cutting off holder	D030
CTAHR-○○○S	External cutting off holder	D028
CTAT○○○○○○○R○-BX	Insert for external cutting off	D029,D031
CTAT○○○○○○○R/L○	Insert for external cutting off	D029,D031
CTAT○○○○○○○R/L○-B	Insert for external cutting off	D029,D031
CTBHR/L-○○○	External back turning, cutting off holder	D019,D032
CTBHR/L○○○○-160	External back turning, cutting off holder	D022,D033
CTBT○○○○○○○R/L○-B	Insert for external cutting off	D032,D033
CTE○○T○○○	Shim	G021,M015
CTI○○T○○○	Shim	G026,M015
CT○○RS-M○	MICRO-MINI TWIN boring bar	G034
CT○○RS-M○○	MICRO-MINI TWIN boring bar	G034
CT○○RS-M○B	MICRO-MINI TWIN boring bar	G034
CT○○RS-M○○B	MICRO-MINI TWIN boring bar	G034

D

DC2SB	Diamond coated end mill (Metric type)	I290
DC2XLB	Diamond coated end mill (Metric type)	I292
DCET○○○R/LSN	Insert (Class E tolerance)	A170
DCET○○○R/LSR	Insert (Class E tolerance)	A169
DCET○○○R/LWSN	Insert (Class E tolerance)	A170
DCGT○○○AZ	Insert (Class G tolerance)	A165
DCGT○○○FJ	Insert (Class G tolerance)	A165
DCGT○○○FJ-P	Insert (Class G tolerance)	A165
DCGT○○○MFS	Insert (Class G tolerance)	A164
DCGT○○○MFS-P	Insert (Class G tolerance)	A164
DCGT○○○MJ	Insert (Class G tolerance)	A166
DCGT○○○MJ-P	Insert (Class G tolerance)	A166
DCGT○○○MLS	Insert (Class G tolerance)	A166
DCGT○○○MLS-P	Insert (Class G tolerance)	A166
DCGT○○○MR/LSN	Insert (Class G tolerance)	A169
DCGT○○○MR/LSS	Insert (Class G tolerance)	A167
DCGT○○○MRSRF	Insert (Class G tolerance)	A165
DCGT○○○MSMG	Insert (Class G tolerance)	A171
DCGT○○○R/LF	Insert (Class G tolerance)	A165
DCGT○○○R/LSN	Insert (Class G tolerance)	A169
DCGT○○○R/LSS	Insert (Class G tolerance)	A167
DCGW○○○	Insert (Class G tolerance)	A171
DCK○○○○	Clamp bridge	M017
DCLNR/L-○○○	Double clamp type holder	C006
DCMT○○○	Insert (Class M tolerance)	A168
DCMT○○○FM	Insert (Class M tolerance)	A164
DCMT○○○FP	Insert (Class M tolerance)	A164
DCMT○○○FV	Insert (Class M tolerance)	A164
DCMT○○○LM	Insert (Class M tolerance)	A165
DCMT○○○LP	Insert (Class M tolerance)	A165
DCMT○○○LS	Insert (Class M tolerance)	A166
DCMT○○○MS	Insert (Class M tolerance)	A168
DCMT○○○MK	Insert (Class M tolerance)	A168
DCMT○○○MM	Insert (Class M tolerance)	A167
DCMT○○○MP	Insert (Class M tolerance)	A167
DCMT○○○MV	Insert (Class M tolerance)	A168

ORDER NUMBER	PRODUCT NAME	PAGE
DCMT○○○SV	Insert (Class M tolerance)	A167
DCMW○○○	Insert (Class M tolerance)	A171,B054
DCRNR/L-○○○	Double clamp type holder	C008
DCS○	Spring	C006—C027
DCSVN32	Shim	M012
DC○○○○T	Clamp screw	M004
DDJNR/L-○○○	Double clamp type holder	C010
DDPNN-164	Double clamp type holder	C011
DDQNR/L-164	Double clamp type holder	C012
DEGX○○○R/L	Insert (Class G tolerance)	A172
DEGX○○○R/LF	Insert (Class G tolerance)	A172,B060
DF2XLB	Diamond coated end mill (Metric type)	I284
DF2XLBF	Diamond coated end mill (Metric type)	I286
DF4JC	Diamond coated end mill (Metric type)	I288
DFC4JC	DFC end mill (Metric type)	I282
DFCJRT	DFC end mill (Metric type)	I283
DLC3SA	DLC end mill (Metric type)	I279
DLC3SARB	DLC end mill (Metric type)	I280
DLC4LATB	DLC end mill (Metric type)	I300
DLE○○○○S○○○P○○○	Leading drills (Metric type)	L192—L194
DNG○○○	Insert (Class G tolerance)	B035
DNGA○○○	Insert (Class G tolerance)	A121,B049
DNGG○○○FJ	Insert (Class G tolerance)	A115
DNGG○○○FS	Insert (Class G tolerance)	A114
DNGG○○○LS	Insert (Class G tolerance)	A115
DNGG○○○R/L	Insert (Class G tolerance)	A119
DNGM○○○MJ	Insert (Class G tolerance)	A117
DNMA○○○	Insert (Class M tolerance)	A121
DNMG○○○	Insert (Class M tolerance)	A119
DNMG○○○FP	Insert (Class M tolerance)	A114
DNMG○○○FH	Insert (Class M tolerance)	A114
DNMG○○○FS	Insert (Class M tolerance)	A114
DNMG○○○FY	Insert (Class M tolerance)	A114
DNMG○○○GH	Insert (Class M tolerance)	A120
DNMG○○○GJ	Insert (Class M tolerance)	A120
DNMG○○○GK	Insert (Class M tolerance)	A118
DNMG○○○GM	Insert (Class M tolerance)	A118
DNMG○○○LK	Insert (Class M tolerance)	A115
DNMG○○○LM	Insert (Class M tolerance)	A115
DNMG○○○LP	Insert (Class M tolerance)	A115
DNMG○○○LS	Insert (Class M tolerance)	A115
DNMG○○○MA	Insert (Class M tolerance)	A118
DNMG○○○MH	Insert (Class M tolerance)	A119
DNMG○○○MJ	Insert (Class M tolerance)	A117
DNMG○○○MK	Insert (Class M tolerance)	A117
DNMG○○○MM	Insert (Class M tolerance)	A117
DNMG○○○MP	Insert (Class M tolerance)	A117
DNMG○○○MS	Insert (Class M tolerance)	A117,A118
DNMG○○○RK	Insert (Class M tolerance)	A120
DNMG○○○RM	Insert (Class M tolerance)	A119
DNMG○○○RP	Insert (Class M tolerance)	A119
DNMG○○○RS	Insert (Class M tolerance)	A120
DNMG○○○SA	Insert (Class M tolerance)	A116
DNMG○○○SH	Insert (Class M tolerance)	A116
DNMG○○○SY	Insert (Class M tolerance)	A116
DNMM○○○HL	Insert (Class M tolerance)	A120
DNMM○○○HZ	Insert (Class M tolerance)	A121
DNMX○○○MW	Insert (Class M tolerance)	A119
DNMX○○○SW	Insert (Class M tolerance)	A116
DRGNR/L-○○○	Double clamp type holder	C013
DSAE○○○○X○○S○○○	DSAE type drill	L168—L173
DSAS○○○○X○○S○○○	DSAS type drill	L168—L174
DSDNN-○○○	Double clamp type holder	C016
DSKNR/L-○○○	Double clamp type holder	C017
DSRNR/L-○○○	Double clamp type holder	C014
DSSNR/L-○○○	Double clamp type holder	C015
DTCNN-○○○	Double clamp type holder	C022
DTFNR/L-○○○	Double clamp type holder	C022
DTGNR/L-○○○	Double clamp type holder	C018
DVAS○○○○X○○S○○○	DVAS type drill (Metric type)	L008—L011
DVJNR/L-○○○	Double clamp type holder	C024
DVPNR/L-○○○	Double clamp type holder	C025
DVVNN-○○○	Double clamp type holder	C025
DWAE○○○○X○○S○○○	DWAE type drill (Metric type)	L176—L180
DWLNR/L-○○○	Double clamp type holder	C027

E

ORDER NUMBER	PRODUCT NAME	PAGE
E○○○-SCLCR/L○	Coolant through carbide	E040
E○○○-SCLPR/L○	Coolant through carbide	E041
E○○○-SDQCR/L○	Coolant through carbide	E042
E○○○-SDUCR/L○	Coolant through carbide	E043
E○○○-STUCR/L○	Coolant through carbide	E044
E○○○-STUPR/L○	Coolant through carbide	E045
E○○○-SVUCR/L○	Coolant through carbide	E046
E○○○-SWLOR/L○	Coolant through carbide	E047

F

ORDER NUMBER	PRODUCT NAME	PAGE
FC400890T	Clamp screw	M004
FMAX-○○○A○○R	FMAX type face mill (Metric type)	K098
FMAXR○○○○○○	FMAX type face mill (Metric type)	K099
FMAXR○○○○○CLW	FMAX type face mill (Metric type)	K097
FMAXUR○○○○○	FMAX type face mill	K096
FSL5○○○R	Grooving and threading boring bar	F234,G031
FSWL108RS/RM	Screw clamp boring bar	E018
FSWL1○○R	Screw clamp boring bar	E018
FSWL208R/LM	Screw clamp boring bar (Carbide shank)	E018
FSWL208RS	Screw clamp boring bar (Carbide shank)	E018
FSWL2○○R/L	Screw clamp boring bar (Carbide shank)	E018

G

ORDER NUMBER	PRODUCT NAME	PAGE
GOER1401ZXFR2	Insert (For FMAX type cutter)	K101
GOER1408PXFR2-8	Insert (For FMAX type cutter)	K101
GOER○○○○PXFR2	Insert (For FMAX type cutter)	K101
GTBHR/L-○○○	External grooving holder	D024
GT○HR/L○○○○-○○	External grooving holder	D026
GT○HR/L○○○○-○○S	External grooving holder	D026
GT○T○○○○○○○R-VT	Insert for external grooving	D025,D027
GT○T○○○○○○○R/L-E	Insert for external grooving	D025,D027
GT○T○○○○○○○R/L-U	Insert for external grooving	D024,D026
GTS○	Clamp screw	M004
GW04005F	Plug screw (For GW blade)	F226
GW1B○○○○○○○○N	Inserts (For GW holder)	F229
GW1M○○○○○○○○N-○○	Inserts (For GW holder)	F229
GW1M○○○○○○○○R/L05-GM	Inserts (For GW holder)	F229
GW1M○○○○○○○○R/L○○-GS	Inserts (For GW holder)	F229
GWB○○NA2-○○○	GW blade	F226
GWCW○	Wedge (For GW blade)	F227,F228
GWSR/L○○○○○00-○○○	GW type holder (External 00° type)	F224
GWSR/L○○○○JX00-○○○	GW type holder (External 00° type)	F224
GWTBN○○○○-B○○	Tool block (For GW holder)	F228
GWTBN○○○○-B○○-C	Tool block (For GW holder)	F228

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
GWTBNUS○○-B○○	Tool block (For GW holder)	F227
GWTBNUS○○-B○○-C	Tool block (For GW holder)	F227
GWW○○○○○	Washer (For GW blade)	F226
GWY39L	Wrench (For GW blade)	F226
GY1G○○○○○○○○N-GFGS	CBN Insert (For GY holder)	B048,F013
GY2G○○○○○○○○N-○○	Insert (For GY holder)	F011,F013
GY2G○○○○○○○○R○○-GS	Insert (For GY holder)	F012
GYAR/L○○○90○-○○○	GY type holder (Internal 90° type)	F160—F167
GYAR/LUS○○○90○-○○○	GY type holder (Internal 90° type)	F152—F159
GY○B○○○○○○○○N	Insert (For GY holder)	F015
GYDR/L○○○90○-M○○R/L	GY type holder (Internal 90° type)	F160—F167
GYDR/LUS○○○90○-M○○R/L	GY type holder (Internal 90° type)	F152—F159
GYHR/L○○○○○00-M○○R/L	GY type holder (External 00° type)	F046—F057,F110—F141
GYHR/L○○○○○50-M○○R/L	GY type holder (External 50° type)	F066
GYHR/L○○○○○90-M○○R/L	GY type holder (External 90° type)	F060—F065,F142—F151
GYHR/LUS○○○00-M○○R/L	GY type holder (External 00° type)	F018—F029,F068—F099
GYHR/LUS○○○50-M○○R/L	GY type holder (External 50° type)	F038
GYHR/LUS○○○90-M○○R/L	GY type holder (External 90° type)	F032—F037,F100—F109
GY○M○○○○○○○○N-○○	Insert (For GY holder)	F011,F013,F014
GY○M○○○○○○○○R/L05-○○	Insert (For GY holder)	F012
GYM○○R/L○-○○○	Modular Blade (For GY holder)	F018—F187
GYPR/L○○○○○00-K25	GY type holder (External 00° type)	F058
GYPR/LUS○○D00-K25	GY type holder (External 00° type)	F030
GYQR/L○○○○○00-○○○	GY type holder (External 00° type)	F046,F050—F057
GYQR/LUS○○○00-○○○	GY type holder (External 00° type)	F018—F029
GY○○○○○S/M	Clamp screw	F018—F192,M004
GYSR/L○○○○○00-○○○	GY type holder (External 00° type)	F040,F042
GYSR/L○○○○JX00-○○○	GY type holder (External 00° type)	F040,F042,F044
GYSR/LUS○○B00-○○○	GY type holder (External 00° type)	F016

H

H100TH-B○○-○○○	HSK boring bar holder	H022
H100TH-EN3232R/L-130	HSK external turning tool holder	H020
H100TH-EV3232R/L-180	HSK external turning tool holder	H019
H63TH-A○○○DCLNR/L12	HSK DCLN type holder	H008
H63TH-B○○-○○	HSK boring bar holder	H021
H63TH-DCLNL-L12-3	HSK DCLN type holder	H008
H63TH-DCLNR/L-DX12	HSK DCLN type holder	H006
H63TH-DCMNN-H/L12	HSK DCMN type holder	H007
H63TH-DDJNL-L15-3	HSK DDJN type holder	H011
H63TH-DDJNR/L-DX15	HSK DDJN type holder	H009
H63TH-DDNNN-H/L15	HSK DDNN type holder	H010
H63TH-EN2525R/L-115	HSK external turning tool holder	H020
H63TH-EV2020R/L-105-3	HSK external turning tool holder	H021
H63TH-EV2525R/L-112	HSK external turning tool holder	H019
H63TH-MGHR/L-DX43○○	HSK MG type holder	H014
H63TH-MMTENR-H/L16	HSK MMT type holder	H016
H63TH-MMTER-DX16	HSK MMT type holder	H016
H63TH-MTHR/L-DX43	HSK MT type holder	H017
H63TH-PCLNR/L-DX12	HSK PCLN type holder	H006
H63TH-PCMNN-H/L12	HSK PCMN type holder	H007
H63TH-PDJNR/L-DX15	HSK PDJN type holder	H009
H63TH-PDNNN-H/L15	HSK PDNN type holder	H010
H63TH-PRDCN-H/L12	HSK PRDC type holder	H012
H63TH-PRGCR/L-DX12	HSK PRGC type holder	H012
H63TH-SVPBR/L-DX16	HSK SVPB type holder	H013
H63TH-SVVBN-H/L16	HSK SVVB type holder	H013
HBH○○○○○	Clamp screw	M002,M008
HDS10031	Clamp screw	M009
HDSU37513	Clamp screw	M009
HFC○○○○○	Shim screw	M002,M015
HFF08043H	Clamp screw	M009
HGJ-PT1/8	Plug	F227,F228
HGM-PT○/○	Plug	H007—H016,M010
HKY○○○	Wrench	M003
HNMX1206EN06-R	Insert (For BMR type cutter)	K381
HNMX1206ER12-R	Insert (For BMR type cutter)	K381
HOSE-1/8-○○○	Coolant hose	F230
HPM/FM○○○○○	Clamp screw	M002
HSC○○○○○	Clamp screw	M002,M010
HSC○○○○○H	Clamp screw	M009
HSCU○○○○○H	Clamp screw	M009
HSCUC○○○○○	Clamp screw	M009
HSCUF○○○○○	Clamp screw	M009
HSCX○○○○○H	Clamp screw	M010
HSCXU○○○○○H	Clamp screw	M010
HSD04004H○○	Coolant nozzle	M018
HSD/SP/SR○○○○○	Clamp screw	M002
HSS○○○○○	Clamp screw	M002
HVS060519	Reamer adjustment screws	M011

I

ICSN○○○	Shim	M012
IDSN○○○	Shim	M012
IMX○○-○○○○○○○○○L○○C	Exchangeable head end mill (Holder) (Inch type)	J078
IMX○○-○○○○○○○L○○○C	Exchangeable head end mill (Holder) (Metric type)	J079
IMX○○-○○○○○○○○○L○○S	Exchangeable head end mill (Holder) (Inch type)	J080
IMX○○-○○○○○○○L○○○S	Exchangeable head end mill (Holder) (Metric type)	J081
IMX○○-○○○○○L○○S	Exchangeable head end mill (Holder) (Inch type)	J080
IMX○○-G○○L○○○S	Exchangeable head end mill (Holder) (Metric type)	J081
IMX○○-S○○L○○○C	Exchangeable head end mill (Holder) (Metric type)	J079
iMX-B3FV	Exchangeable head end mill (Head) (Metric type)	J060
iMX-B4HV-E	Exchangeable head end mill (Head) (Inch type)	J064
iMX-B4HV-E	Exchangeable head end mill (Head) (Metric type)	J065
iMX-B4WH-S	Exchangeable head end mill (Head) (Inch type)	J070
iMX-B4WH-S	Exchangeable head end mill (Head) (Metric type)	J070
iMX-B○HV	Exchangeable head end mill (Head) (Inch type)	J062,J068
iMX-B○HV	Exchangeable head end mill (Head) (Metric type)	J063,J068
iMX-B○S	Exchangeable head end mill (Head) (Metric type)	J058,J059
iMX-C3A	Exchangeable head end mill (Head) (Inch type)	J046
iMX-C3A	Exchangeable head end mill (Head) (Metric type)	J047
iMX-C4FD-C	Exchangeable head end mill (Head) (Inch type)	J041
iMX-C4FD-C	Exchangeable head end mill (Head) (Metric type)	J042
iMX-C4FV	Exchangeable head end mill (Head) (Inch type)	J044
iMX-C4FV	Exchangeable head end mill (Head) (Metric type)	J044
iMX-C4HV-S	Exchangeable head end mill (Head) (Inch type)	J028
iMX-C4HV-S	Exchangeable head end mill (Head) (Metric type)	J029
iMX-C6HV-C	Exchangeable head end mill (Head) (Metric type)	J036
iMX-C8T-C	Exchangeable head end mill (Head) (Metric type)	J050
iMX-CH3L	Exchangeable head end mill (Head) (Inch type)	J072
iMX-CH3L	Exchangeable head end mill (Head) (Metric type)	J073
iMX-CH6V	Exchangeable head end mill (Head) (Inch type)	J076
iMX-CH6V	Exchangeable head end mill (Head) (Metric type)	J076
iMX-C○HV	Exchangeable head end mill (Head) (Inch type)	J024,J038
iMX-C○HV	Exchangeable head end mill (Head) (Metric type)	J025,J039
iMX-C○○HV	Exchangeable head end mill (Head) (Inch type)	J038

ORDER NUMBER	PRODUCT NAME	PAGE
iMX-C○○HV	Exchangeable head end mill (Head) (Metric type)	J039
iMX-C○○T-C	Exchangeable head end mill (Head) (Metric type)	J050
IMX○○-WR	Wrench (For exchangeable head end mill)	M003
iMX-R4F	Exchangeable head end mill (Head) (Inch type)	J052
iMX-R4F	Exchangeable head end mill (Head) (Metric type)	J053
iMX-RC4F-C	Exchangeable head end mill (Head) (Metric type)	J056
iMX-S3A	Exchangeable head end mill (Head) (Inch type)	J020
iMX-S3A	Exchangeable head end mill (Head) (Metric type)	J021
iMX-S4HV-S	Exchangeable head end mill (Head) (Inch type)	J014
iMX-S4HV-S	Exchangeable head end mill (Head) (Metric type)	J014
iMX-S○HV	Exchangeable head end mill (Head) (Inch type)	J008,J012
iMX-S○HV	Exchangeable head end mill (Head) (Metric type)	J008,J013
IRSN○○	Shim	M012
ISSN○○○	Shim	M012
ITSN○○○	Shim	M012
IVSN○○○	Shim	M012
IWSN○○○	Shim	M013

J

JDMT○○○○○○ZDER-JL	Insert (For AJX type cutter)	K300
JDMT○○○○○○ZDSR-JM/ST	Insert (For AJX/PMC type cutter)	300,K377
JDMW○○○○○○ZDSR-FT	Insert (For AJX/PMC type cutter)	K300,K377
JFS○○○○-○○	JUST FIT SLEEVE (JFS) (Metric type)	L217
JFS○○○○○○-○○○	JUST FIT SLEEVE (JFS) (Inch type)	L216
JOMT○○○○○○ZZER-JL	Insert (For AJX type cutter)	K300
JOMT○○○○○○ZZSR-JM	Insert (For AJX/PMC type cutter)	K300,K377
JOMU090512ZZER-○	Insert (For WJX09 type cutter)	K314
JOMU140715ZZER-○	Insert (For WJX14 type cutter)	K322
JOMW○○○○○○ZZSR-FT	Insert (For AJX/PMC type cutter)	K300,K377
JPGX1404○○○PPER-JM	Insert (For ASPX type end mill)	K266
JPMT060204-E	Insert (For milling)	K393
JPMX○○0412-JM	Insert (For SPX type end mill)	K271
JPMX○○0412-WH	Insert (For SPX type end mill)	K271

K

KNUX160405RM1	Insert (Class U tolerance)	A148
KSN3	Micro adjustment nut	M011
KSS2	Large adjustment screw	M011
K-XDGX1750○○PD○R-G○	Insert kit (For AXD4000A type cutter)	K243

L

LER○○○○W○○	LER type end mill	K274
LLCL○○	Clamp lever	M016
LLCL○○○	Clamp lever	M016
LLCS○○○	Clamp screw	M005
LLP○○	Shim pin	M016
LLSCN○○	Shim	M013
LLSCP○○	Shim	M013
LLSDN○○	Shim	M013
LLSDP○○	Shim	M013
LLSRN123	Shim	M013
LLSSN42	Shim	M013
LLSSP42	Shim	M013
LLSTN○○	Shim	M013
LLSTP32	Shim	M013
LLSWN○○	Shim	M013
LLSWP42	Shim	M013
LNGU1308○○PNERL-○	Insert (For VAS400 type side cutter)	K147
LNGU1710○○PNERL-R	Insert (For VAS500 type side cutter)	K150
LOGU○○○○○○PN○R-○	Insert (For VPX200/300 type cutter)	K192,K203
LS0622T	Clamp screw	M005
LS○○T	Clamp screw	M005

M

MAE○○○○MB	MAE type drill (Metric type)	L152—L156
MAS○○○○○MB	MAS type drill (Inch type)	L150
MAS○○○○LB/MB	MAS type drill (Metric type)	L152—L156
MBA○○○○○H	Clamp screw	M010
MBAU100016H	Clamp screw	M010
MBAU75016H	Clamp screw	M010
MCFNR/L-○○○	Multiple clamp holder	C009
MCFNR/L-○○○○	Multiple clamp holder	C009
MCGNR/L-○○○	Multiple clamp holder	C008
MCGNR/L-○○○○	Multiple clamp holder	C008
MCLNR/L-○○○	Multiple clamp holder	C007
MCLNR/L-○○○○	Multiple clamp holder	C007
MCRNR/L-○○○○	Multiple clamp holder	C009
MDJNR/L-○○○	Multiple clamp holder	C010
MDJNR/L-○○○○	Multiple clamp holder	C010
MDPNN-○○○D	Multiple clamp holder	C011
MFE○○○○X02S○○○	MFE type drill	L183—L188
M-FSCLCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E006
M-FSCLPR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E006
M-FSDQCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E008
M-FSDUCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E008
M-FSTUPR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E007
M-FSVJBR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVJCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVPBR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVPCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E010
M-FSVUBR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E009
M-FSVUCR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E009
M-FSWUBR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E009
M-FSWUPR/L-○○○-C	Screw clamp DIMPLE BAR (Heavy metal shank)	E009
MGD○○	Driver (For MICRO-MGS type drill)	L165
MGS○○○○L○○○B	MICRO-MGS type drill (Metric type)	L164
MGTR/L43○○○	Insert (For grooving)	H015
MHS○○○○L○○○B	MHS type drill (Metric type)	L120—L135
MK1KS	Anti seize lubricant	M018
MLG○○○○L	Insert (For FSL5 type boring bar)	F236,G033
MLG○○W○○○L	Insert (For FSL5 type boring bar)	F236,G033
MLT○○○○L	Insert (For FSL5 type boring bar)	F236,G033
MMS○○○○X3D/5D○○○	MMS type drill	L108—L117
MMS○○○○X3DB/5DB	MMS type drill	L108—L117
MMT○○ER○○○○○○○	Insert (For external threading)	G023—G025
MMT○○ER○○○○○○○-S	Insert (For external threading)	G022
MMT○○IR○○○○○○○	Insert (For internal threading)	G028—G030
MMT○○IR○○○○○○○-S	Insert (For internal threading)	G027
MMTER-○○○	Threading holder	G021
MMTER-○○○SM	Threading holder	D037,G021
MMTIR○○○-○○○-○○-C	Threading holder	G026
M-MWLNR/L-○○○-C	Multiple clamp type boring bar (Heavy metal shank)	E027
MNS○○○○LB	MNS type drill (Metric type)	L140—L144
MNS○○○○X10/20/30DB	MNS type drill (Metric type)	L140—L144
MP2ES	MS PLUS end mill (Metric type)	I097
MP2MB	MS PLUS end mill (Metric type)	I080
MP2MB	MS PLUS end mill (Inch type)	I083

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
MP2SB	MS PLUS end mill (Metric type)	I079
MP2SDB	MS PLUS end mill (Metric type)	I086
MP2SSB	MS PLUS end mill (Metric type)	I078
MP2XLB	MS PLUS end mill (Metric type)	I088
MP3C	MS PLUS end mill (Metric type)	I068
MP3ES	MS PLUS end mill (Metric type)	I100
MP3MC	MS PLUS end mill (Inch type)	I070
MP4EC	MS PLUS end mill (Metric type)	I103
MP4JC	MS PLUS end mill (Inch type)	I074
MP4MC	MS PLUS end mill (Inch type)	I072
MP4MRB	MS PLUS end mill (Inch type)	I076
MPMX120412-JM	Insert (For SPX type end mill)	K271
MPMX120412-WH	Insert (For SPX type end mill)	K271
MRGNR/L-○○○	Multiple clamp type holder	C013
MRGNR/L-○○○○	Multiple clamp type holder	C013
MS2ES	MSTAR end mill (Metric type)	I054
MS2JS	MSTAR end mill (Metric type)	I020
MS2LS	MSTAR end mill (Metric type)	I022
MS2MD	MSTAR end mill (Metric type)	I018
MS2MRB	MSTAR end mill (Metric type)	I062
MS2MS	MSTAR end mill (Metric type)	I015
MS2SS	MSTAR end mill (Metric type)	I014
MS2XL	MSTAR end mill (Metric type)	I024
MS2XL	MSTAR end mill (Inch type)	I032
MS2XL6	MSTAR end mill (Metric type)	I028
MS2XLB	MSTAR end mill (Inch type)	I060
MS3ES	MSTAR end mill (Metric type)	I056
MS4EC	MSTAR end mill (Metric type)	I058
MS4JC	MSTAR end mill (Metric type)	I046
MS4MC	MSTAR end mill (Metric type)	I044
MS4MRB	MSTAR end mill (Metric type)	I065
MS4SC	MSTAR end mill (Metric type)	I042
MS4XL	MSTAR end mill (Metric type)	I048
MS4XL	MSTAR end mill (Inch type)	I052
M-SCLCR-○○○	Screw clamp type boring bar (Heavy metal shank)	E012
MSDNN-○○	Multiple clamp type holder	C016
MSDNN-○○○	Multiple clamp type holder	C016
MSE○○○○**SB**	MSE type drill (Metric type)	L158,L159
MSKNR/L-○○	Multiple clamp type holder	C017
MSKNR/L-○○○	Multiple clamp type holder	C017
MSKNR/L-○○○○	Multiple clamp type holder	C017
MSMHD	MSTAR end mill (Metric type)	I035
MSMHZD	MSTAR end mill (Metric type)	I038
MSMHZD	MSTAR end mill (Inch type)	I040
MSP0300SB	MSP starter drill (Metric type)	L162
MSRNR/L-○○	Multiple clamp type holder	C014
MSRNR/L-○○○	Multiple clamp type holder	C014
MSRNR/L-○○○○	Multiple clamp type holder	C014
MSSHD	MSTAR end mill (Metric type)	I034
MSSNR/L-○○	Multiple clamp type holder	C015
MSSNR/L-○○○○	Multiple clamp type holder	C015
M-SWLOR/L-○○○	Screw clamp type boring bar (Heavy metal shank)	E020
M-SWLOR/L-○○○**-C**	Screw clamp type boring bar (Heavy metal shank)	E020
MTANR/L-○○○	Multiple clamp type holder	C020
MTANR/L-○○○**X**	Multiple clamp type holder	C020
MTCNN-○○○	Multiple clamp type holder	C021
MTCNN-○○○**X**	Multiple clamp type holder	C021
MTCNN-○○**X**	Multiple clamp type holder	C021
MTENN-○○	Multiple clamp type holder	C021
MTENN-○○○	Multiple clamp type holder	C021
MTENN-○○○**X**	Multiple clamp type holder	C021
MTFNR/L-○○	Multiple clamp type holder	C023
MTFNR/L-○○○○	Multiple clamp type holder	C023
MTFNR/L-○○○○**X**	Multiple clamp type holder	C023
MTGNR/L-○○○○	Multiple clamp type holder	C019
MTGNR/L-○○○○**X**	Multiple clamp type holder	C019
MTJNR/L-○○○	Multiple clamp type holder	C018
MTJNR/L-○○○**X**	Multiple clamp type holder	C018
MTK1R/L	Clamp bridge	M017
MTRNR/L-123X	Multiple clamp type holder	C020
MTRNR/L-164	Multiple clamp type holder	C020
MTTR/L43○○○○	Insert (For threading)	H018
MVE○○○○**X**○○**S**○○○	MVE type drill	L022—L082
MVJNR/L-○○○○	Multiple clamp type holder	C024
MVLNR/L-○○○○	Multiple clamp type holder	C026
MVS○○○○**X**○○**S**○○○	MVS type drill	L016—L082
MVS○○○○**X**○○**S**○○○**PL**	MVS type drill	L023—L073
MVX○○○○**X**○**C**○○○	MVX type drill (Inch type)	L199—L202
MVX○○○○**X**○**F**○○	MVX type drill (Metric type)	L204—L211
MWLNR/L-○○○○	Multiple clamp type holder	C027
MWS○○○○○**LB/SB/XB**	MWS type drill	L092—L102
MWS○○○○**LB/SB/XB**	MWS type drill	L092—L102
MWS○○○○**X**○○**DB**	MWS type drill	L097—L102

N

ORDER NUMBER	PRODUCT NAME	PAGE
NKY○○○	Wrench	M003
NL○○	Pin	M016
NL○○**L**	Pin	M016
NNMU130508ZEN-M	Insert (For AHX440S type face mill)	K067
NNMU130508ZER-L	Insert (For AHX440S type face mill)	K067
NNMU130532ZEN-○	Insert (For AHX440S/AHX475S type face mill)	K067,K072
NNMU200608ZEN-HK	Insert (For AHX640S/AHX640W type face mill)	K078,K090
NNMU200608ZEN-MK	Insert (For AHX640S/AHX640W type face mill)	K078,K090
NNMU200708ZEN-M	Insert (For AHX640S type face mill)	K078
NNMU200708ZEN-MP	Insert (For AHX640S type face mill)	K078
NNMU200712ZER-L	Insert (For AHX640S type face mill)	K078
NNMU200712ZER-MM	Insert (For AHX640S type face mill)	K078
NP-CCGW○○○**-**○○**2**	CBN insert (Class G tolerance)	B037,B038
NP-CCGW○○○○○○○○	CBN insert (Class G tolerance)	B038
NP-CCGW○○○**-F**○**W**○**2**	CBN insert (Class G tolerance)	B038
NP-CCGW○○○**-G**○**W**○**2**	CBN insert (Class G tolerance)	B038
NP-CCMH○○○	CBN insert (Class M tolerance)	B053
NP-CCMW○○○○○○	CBN insert (Class M tolerance)	B053
NP-CNGA○○○**-**○○**2**	CBN insert (Class G tolerance)	B022,B023
NP-CNGA○○○**-**○○**4**	CBN insert (Class G tolerance)	B022
NP-CNGA○○○**-**○○**WL2**	CBN insert (Class G tolerance)	B023,B024
NP-CNGA○○○**-**○○**WS2**	CBN insert (Class G tolerance)	B023
NP-CNGA○○○**-**○○**WS4**	CBN insert (Class G tolerance)	B022
NP-CNMM○○○**RF**	CBN insert (Class M tolerance)	B049
NP-CPGB○○○**-**○○**2**	CBN insert (Class G tolerance)	B039
NP-CPMH○○○	CBN insert (Class M tolerance)	B053
NP-DCGW○○○**-**○○**2**	CBN insert (Class G tolerance)	B040
NP-DCMT○○○**R/LF**	CBN insert (Class M tolerance)	B054
NP-DNGA○○○**-**○○**2**	CBN insert (Class G tolerance)	B026,B027
NP-DNGA○○○**-**○○**4**	CBN insert (Class G tolerance)	B025,B026
NP-DNGA○○○**-**○○**WS2JR/L**	CBN insert (Class G tolerance)	B028
NP-DNMM○○○**RF**	CBN insert (Class M tolerance)	B049
NP-GOEN○○○○**PXSR05**	Insert (For FMAX type cutter)	K101
NP-SNGA○○○**-**○○**2**	CBN insert (Class G tolerance)	B029
NP-SNMM○○○**RF**	CBN insert (Class M tolerance)	B050

ORDER NUMBER	PRODUCT NAME	PAGE
NP-SPGN○○○-○○2	CBN insert (Class G tolerance)	B047
NP-TCGW○○○-○○3	CBN insert (Class G tolerance)	B042
NP-TNGA○○○-○○3	CBN insert (Class G tolerance)	B030,B031
NP-TNGA○○○-○○6	CBN insert (Class G tolerance)	B030
NP-TNMM○○○RF	CBN insert (Class M tolerance)	B050
NP-TPGB○○○-○○3	CBN insert (Class G tolerance)	B043,B044
NP-TPMH○○○R/LF	CBN insert (Class M tolerance)	B056
NP-TPMX○○○R/LF	CBN insert (Class M tolerance)	B056
NP-VBGT○○○RF	CBN insert (Class G tolerance)	B058
NP-VBGW○○○-○○2	CBN insert (Class G tolerance)	B045
NP-VCGT○○○RF	CBN insert (Class G tolerance)	B058
NP-VCGW○○○-○○2	CBN insert (Class G tolerance)	B046
NP-VNGA○○○-○○2	CBN insert (Class G tolerance)	B032,B033
NP-VNGA○○○-○○4	CBN insert (Class G tolerance)	B032
NP-VNMM○○○RF	CBN insert (Class M tolerance)	B051
NP-WEEW13T3AG○R3C	Wiper CBN insert (For ASX445 type cutter)	K060
NP-WNGA432-○○3	CBN insert (Class G tolerance)	B034
NP-WNGA432-○○6	CBN insert (Class G tolerance)	B034
NP-WNGA432-GSWS3	CBN insert (Class G tolerance)	B034
NS○○○	Clamp screw	M005
NS○○○W	Clamp screw	M005
NZ22042080S	Nozzle	F189,F191,F192

O

OEMX○○○○EER1-JS	Insert (For BOE type cutter)	K387
OEMX○○○○ESR1	Insert (For BOE type cutter)	K387
OEMX○○○○ETR1	Insert (For BOE type cutter)	K387
OEMX○○○○ETR1-JS	Insert (For BOE type cutter)	K387
ORGW○○○N9	O ring	F227,F228

P

PMC○○R○○○AM○○○○	PMC type end mill (Metric type)	K376
PMFA13R	Cartridge (For PMF type cutter)	K378
PMF○○○○○A○○R	PMF type end mill (Metric type)	K378
PMR○○○○○○○R	PMR type end mill	K379
PMR○○○○○○A○○R	PMR type end mill	K379

Q

QOGT○○○○R-G1	Insert (For AQX type end mill)	K280
QOMT○○○○R-M2	Insert (For AQX type end mill)	K280

R

RBH○○○○○A	Holder (For MICRO-DEX/MICRO-MINI)	E034,F238,G035
RBH○○○○N	Holder (For MICRO-DEX/MICRO-MINI)	E034,E036,F238,F239,G035,G036
RCGT○○○○M0-AZ	Insert (Class G tolerance)	A173
RCMT○○○○M0	Insert (Class M tolerance)	A173
RCMX○○○○M0	Insert (Class M tolerance)	A173
RCMX○○○○M0-RR	Insert (Class M tolerance)	A173
RDMW○○○○M0E	Insert (For ARX type cutter)	K342
REMX○○○○○N	Insert (For BOE type cutter)	K387
REMX○○○○○N-JS	Insert (For BOE type cutter)	K387
RGEN2004○N	Insert (For SG20 type cutter)	K391
RNG○○	Insert (Class G tolerance)	B035
RNMG○○	Insert (Class M tolerance)	A122
RPHT○○○○M0E4-○	Insert (For ARP type cutter)	K335
RPMT○○○○M0E4-○	Insert (For ARP type cutter)	K335
RPMT○○○○○○E-JS	Insert (For BRP type cutter)	K345
RPMT○○○○M0E○-○○	Insert (For ARP type cutter)	K335
RPMW○○○○○○E	Insert (For BRP type cutter)	K345
RS○○○○T/TS	Clamp screw	M005
RTG○○A	Insert (Class G tolerance)	A200

S

S○	Clamp screw	M005
S○○	Clamp screw	M005
SBAHR○○○○	Boring holder	D046
SBAT○○○○○○L	Insert (For BAHR type holder)	D046
SBAT○○○○○○L-B	Insert (For BAHR type holder)	D046
SBH○○○○○	Clamp screw	M002
SBH○○○○R	Holder (For MICRO-DEX/MICRO-MINI)	E037,F239,G036
SC○○M○○S○○○S/L	Straight shank arbor (For Screw-in) (Metric type)	K382
SC○○M○○S○○○SW/LW	Straight shank arbor (For Screw-in) (Metric type)	K383
SC○○M○○S○○-HSK63A	HSK shank arbor (For Screw-in) (Metric type)	K384
SC○○M○○S10-BT○○	BT shank arbor (For Screw-in) (Metric type)	K384
SCACR/L○○○○○○○○-SM	External front turning holder	D014
SCACR/L-○○○SM	External front turning holder	D010
SCLCR/L-○○○	Screw clamp type holder	C030
SCLCR/L○○○○○○○○-SM	External front turning holder	D014
SCLCR/L-○○○SM	External front turning holder	D010
SCMT○○○	Insert (Class M tolerance)	A175
SCMT○○○FM	Insert (Class M tolerance)	A174
SCMT○○○FP	Insert (Class M tolerance)	A174
SCMT○○○FV	Insert (Class M tolerance)	A174
SCMT○○○LM	Insert (Class M tolerance)	A174
SCMT○○○LP	Insert (Class M tolerance)	A174
SCMT○○○MK	Insert (Class M tolerance)	A175
SCMT○○○MM	Insert (Class M tolerance)	A175
SCMT○○○MP	Insert (Class M tolerance)	A174
SCMT○○○MS	Insert (Class M tolerance)	A175
SCMW○○○	Insert (Class M tolerance)	A175
SCU○○M○○S○○○S/L	Straight shank arbor (For Screw-in)	K382
SCU○○M○○S○○○SW/LW	Straight shank arbor (For Screw-in)	K383
S-DCLNR/L-○○○-C	DOUBLE CLAMP DIMPLE BAR	E021
S-DDUNR/L-○○○-C	DOUBLE CLAMP DIMPLE BAR	E021
SDEN42AEN	Insert (For Corner Angle 45° type cutter)	K393
SDJCR/L-○○○	Screw clamp type holder	C031
SDJCR/L○○○○○○○○-SM	External front turning holder	D015
SDJCR/L-○○○SM	External front turning holder	D011
SDJER/L-○○○	AL type holder	C041
SDNCN-○○○	Screw clamp type holder	C031
SDNCR/L○○○○○○○○-SM	External front turning holder	D015
SDNCR/L-○○○SM	External front turning holder	D011
S-DSKNR/L-○○○-C	DOUBLE CLAMP DIMPLE BAR	E022
S-DTFNR/L-○○○-C	DOUBLE CLAMP DIMPLE BAR	E022
S-DVUNR/L-○○○-C	DOUBLE CLAMP DIMPLE BAR	E023
S-DWLNR/L-○○○-C	DOUBLE CLAMP DIMPLE BAR	E023
SDXCR/L-○○○	Screw clamp type holder	C032
SECN42AFTN1	Insert (For SE445/545 type face mill)	K390
SEEN42EF○R1	Insert (For SE415 type face mill)	K389
SEEN○○AF○N1	Insert (For SE445/545 type face mill)	K390
SEEN53EFER1	Insert (For SE515 type face mill)	K390
SEER42AF○N-JS	Insert (For SE445 type cutter)	K390
SEER42EFER-JS	Insert (For SE415 type cutter)	K389
SEER53AFEN-JS	Insert (For SE545 type cutter)	K390
SEER43AFEN-JS	Insert (For Corner Angle 45° type cutter)	K393
SEET13T3AGEN-JL	Insert (For ASX445 type cutter)	K059

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
SEGT13T3AGFN-JP	Insert (For ASX445 type cutter)	K059
SEMT13T3AGSN-FT	Insert (For ASX445 type cutter)	K059
SEMT13T3AGSN-JH	Insert (For ASX445 type cutter)	K059
SEMT13T3AGSN-JM	Insert (For ASX445 type cutter)	K059
SETK○○	Clamp bridge	M017
SETS○1	Clamp screw	M005
SFAN42ZFFR/L2	Insert (For BF407 type face mill)	K387
SFC/FM○○○○○	Clamp screw	M002
SFCN42ZFFR2	Insert (For BF407 type face mill)	K387,K394
S-FSCLPR/L-○○○-C	Screw clamp DIMPLE BAR	E006
S-FSTUPR/L-○○○-C	Screw clamp DIMPLE BAR	E007
SH○○○-FSDUCL○○	DIMPLE SLEEVE holder	D038,D039
SL○○○○-90	HSK boring bar sleeve	H022
SLCS105	Clamp screw	M005
SL-ONEN120404ASN	Insert (For AOX445 type cutter)	K095
S-MCLNR/L-○○○	Multiple clamp type holder	E024
S-MDUNR/L-○○○	Multiple clamp type holder	E024
S-MSKNR/L-○○○	Multiple clamp type holder	E025
S-MTFNR/L-○○○	Multiple clamp type holder	E025
S-MTFNR/L-○○○X	Multiple clamp type holder	E025
S-MVUNR/L-○○○	Multiple clamp type holder	E026
S-MWLNR/L-○○○	Multiple clamp type holder	E026
SNG○○○	Insert (Class G tolerance)	A150,B036,B052
SNGA○○○	Insert (Class G tolerance)	A129,B029,B050
SNGG○○○R/L	Insert (Class G tolerance)	A127
SNGU140812AN○○-○	Insert (For WSX445 type cutter)	K050
SNMA○○○	Insert (Class M tolerance)	A129
SNMG○○○	Insert (Class M tolerance)	A127
SNMG○○○FH	Insert (Class M tolerance)	A123
SNMG○○○FP	Insert (Class M tolerance)	A123
SNMG○○○FS	Insert (Class M tolerance)	A123
SNMG○○○GH	Insert (Class M tolerance)	A128
SNMG○○○GK	Insert (Class M tolerance)	A125
SNMG○○○GM	Insert (Class M tolerance)	A126
SNMG○○○LK	Insert (Class M tolerance)	A124
SNMG○○○LM	Insert (Class M tolerance)	A123
SNMG○○○LP	Insert (Class M tolerance)	A123
SNMG○○○MA	Insert (Class M tolerance)	A126
SNMG○○○MH	Insert (Class M tolerance)	A126
SNMG○○○MK	Insert (Class M tolerance)	A125
SNMG○○○MM	Insert (Class M tolerance)	A125
SNMG○○○MP	Insert (Class M tolerance)	A124
SNMG○○○MS	Insert (Class M tolerance)	A125
SNMG○○○RK	Insert (Class M tolerance)	A127
SNMG○○○RM	Insert (Class M tolerance)	A127
SNMG○○○RP	Insert (Class M tolerance)	A127
SNMG○○○RS	Insert (Class M tolerance)	A128
SNMG○○○SA	Insert (Class M tolerance)	A124
SNMG○○○SH	Insert (Class M tolerance)	A124
SNMG○○○SY	Insert (Class M tolerance)	A124
SNMM○○○HL	Insert (Class M tolerance)	A128
SNMM○○○HM	Insert (Class M tolerance)	A129
SNMM○○○HR	Insert (Class M tolerance)	A129
SNMM○○○HV	Insert (Class M tolerance)	A129
SNMM○○○HX	Insert (Class M tolerance)	A128
SNMM○○○HZ	Insert (Class M tolerance)	A129
SNMN○○○	Insert (Class M tolerance)	A150,K393
SNMU1206C05ZNER-M	Insert (For WSF406W type type cutter)	K104
SNMU140812ANE○-○	Insert (For WSX445 type cutter)	K050
SOET12T308PEER-JL	Insert (For ASX400 type cutter)	K142
SOGT12T308PEFR-JP	Insert (For ASX400 type cutter)	K142
SOGX○○○○○○-UN	Insert (For MVX type drill)	L203,L212
SOMT12T308PEER/L-JM	Insert (For ASX400 type cutter)	K142,K153
SOMT12T308PEER-JH	Insert (For ASX400 type cutter)	K142
SOMT12T320PEER-FT	Insert (For ASX400 type cutter)	K142
SOMX○○○○○○-UM	Insert (For MVX type drill)	L203,L212
SOMX○○○○○○-US	Insert (For MVX type drill)	L203,L212
SOMX○○○○○○-UH	Insert (For MVX type drill)	L203,L212
SONX1206PER/L	Insert (For VOX400/VOS400 type cutter)	K109,K148
SPEN42EEER/L1	Insert (For FBP415 type face mill)	K388
SPER42EEER-JS	Insert (For FBP415 type cutter)	K388
SPG○○○	Insert (Class G tolerance)	A201,B062
SPGR321R	Insert (Class G tolerance)	A201
SPGX○○○	Insert (Class G tolerance)	A176,B054
SPGX1204100PPER-JM	Insert (For ASPX type end mill)	K266
SPM○○○○○	Clamp screw	M002
SPMB1204APT	Insert (For BSP type end mill)	K387
SPMM432A	Insert (For TBE1 type end mill)	K391
SPMN○○○	Insert (Class M tolerance)	A201,K393
SPMN○○○T	Insert (For 11° positive type end mill)	K393
SPMR○○○	Insert (Class M tolerance)	A201
SPMT○○○	Insert (Class M tolerance)	A176
SPMW○○○	Insert (For CFSP type end mill)	A176,K349,K388
SPMX120408-JM	Insert (For SPX type end mill)	K271
SPMX120408-WH	Insert (For SPX type end mill)	K271
SPNN42EEER/L1	Insert (For FBP415 type face mill)	K388
SPSCN42	Shim	M013
SPSDN32	Shim	M014
SPSSN42	Shim	M014
SPSTN32	Shim	M014
SPSVN32	Shim	M014
SPX4-○○○A24A058RA	SPX type end mill (Metric type)	K270
SPX4R○○○○○○A058A	SPX type end mill (Metric type)	K270
SPX4R050○○WN○	SPX type end mill	K268
SPX4R32○○CAT50N○	SPX type end mill	K268
SPX4UR○○○○○A22A	SPX type end mill	K269
SRDCN-○○○○M	Screw clamp type holder	C033
SRDPN-1612	Screw clamp type holder	C040
SRDPR/L-1612	Screw clamp type holder	C040
SRFHU○○AM○○○○	SRF screw-in type end mill	K355
SRFH○○AM○○○○	SRF screw-in type end mill (Metric type)	K355,K356
SRFH○○S○○○	SRF type end mill (Metric type)	K352,K353
SRFH○○S○○L○○○	SRF type end mill (Metric type)	K352
SRFH○○S○○E○○○	SRF type end mill (Metric type)	K353
SRFH○○S○○LW/MW/EW	SRF type end mill (Metric type)	K354
SRFT○○	Insert (For SRF type cutter)	K357
SRFT○○○○	Insert (For SRF type cutter)	K357
SRFU○○S○○L/M	SRF type end mill	K350
SRFU○○S○○LW/MW	SRF type end mill	K351
SRG○○C/E	SRM2 type end mill	K369,K375
SRGCR/L-○○○○M	Screw clamp type holder	C033
SRM○○○C/E	Insert (For SRM2 type cutter)	K368
SRM○○○C/E-M	Insert (For SRM2 type cutter)	K368
SRM○○C/E-M	Insert (For SRM2 type end mill)	K369
SRM2○○○AM○○S○○	SRM2 type screw-in end mill	K366
SRM2○○○○AM○○S/L○○	SRM2 type screw-in end mill (Metric type)	K367
SRM2○○SAS2/M2/L2/L4	SRM2 type end mill	K363
SRM2○○○S○M/L/F/LF/LL	SRM2 type end mill (Metric type)	K364,K365
SRM2○○○SNLS/M	SRM2 type end mill	K374
SRM2○○○WNLS/M/L/X	SRM2 type end mill	K374
SRM2500MNLS/M	SRM2 type end mill	K374
SSBCR/L-○○○	Screw clamp type holder	C034
S-SCLCR/L-○○○	Screw clamp type boring bar	E012
S-SDQCR/L-○○○	Screw clamp type boring bar	E013

ORDER NUMBER	PRODUCT NAME	PAGE
S-SDUCR/L-○○○	Screw clamp type boring bar	E014
S-SL5NR○○	Grooving and threading boring bar	F235,G032
SSC/SD/SP/SR/SS○○○○○	Clamp screw	M002
SSSCR/L-○○○	Screw clamp type holder	C034
S-SSKCR/L-○○○	Screw clamp type boring bar	E015
S-STFER/L-○○○	AL type boring bar	E028
S-STUCR/L-○○○	Screw clamp type boring bar	E015
S-SVQCR/L-○○○	Screw clamp type boring bar	E016
S-SVUCR/L-○○○	Screw clamp type boring bar	E017
S-SWUCR/L-○○○	Screw clamp type boring bar	E019
STASX○○○N	Shim	M014
STAW○○00○○	STAW type drill (Inch type)	L219,220
STAW○○○○○○S○○	STAW type drill (Metric type)	L221,222
STAWN○○○○T	Insert (For STAW type drill)	L223,L225
STAWN○○○○TH	Insert (For STAW type drill)	L223—L225
STFCR/L-○○○	Screw clamp type holder	C035
STFER/L-○○○	AL type holder	C042
STGCR/L-○○○	Screw clamp type holder	C035
STGER/L-○○○	AL type holder	C042
SUFT○○R○○	Insert (For SUF type cutter)	K358
SVHBR/L-○○○	Screw clamp type holder	C029
SVJBR/L-○○○	Screw clamp type holder	C028
SVJBR/L○○○○○○○-SM	External front turning holder	D016
SVJBR/L-○○○SM	External front turning holder	D012
SVJCR/L-○○○	Screw clamp type holder	C036
SVJCR/L-○○○B-SM	External front turning holder	D013
SVJCR/L○○○○JX○○-SM	External front turning holder	D017
SVJDR/L-○○○	AL type holder	C043
SVLPR/L○○○○○○○-SM	External front turning holder	D016
SVLPR/L-○○○SM	External front turning holder	D012
SVPCR/L-○○○	Screw clamp type holder	C036
SVPDR/L-○○○	AL type holder	C043
SVPPR/L○○○○○○○-SM	External front turning holder	D017
SVVBN-○○○	Screw clamp type holder	C028
SVVBR/L○○○○○○○-SM	External front turning holder	D017
SVVBR/L-○○○SM	External front turning holder	D013
SWLCR/L-○○○	Screw clamp type holder	C037
SXZCR/L-○○○	Double clamp type holder (Inch type)	C038
SXZCR/L○○○○○15	Double clamp type holder	C038

T

ORDER NUMBER	PRODUCT NAME	PAGE
TAWC12T301-45GM	Insert (For TAW type drill)	K395
TAWLN/MN/SN○○○○	TAW type drill (Inch type)	L228—L233
TAWLN/MN/SN○○○○S○○	TAW type drill (Metric type)	L234,L235
TAWNH○○○○T	Insert (For TAW type drill)	L237,L238
TCGN○○○	Insert (Class G tolerance)	A202
TCGT○○○AZ	Insert (Class G tolerance)	A177
TCGT○○○FJ-P	Insert (Class G tolerance)	A177
TCGT○○○MJ	Insert (Class G tolerance)	A179
TCGT○○○MJ-P	Insert (Class G tolerance)	A179
TCGT○○○MR/LF	Insert (Class G tolerance)	A178
TCGT○○○R/LF	Insert (Class G tolerance)	A178
TCGW○○○	Insert (Class G tolerance)	A180,B055
TCGW○○○E	Insert (Class G tolerance)	A180
TCMT○○○	Insert (Class M tolerance)	A180
TCMT○○○FM	Insert (Class M tolerance)	A177
TCMT○○○FP	Insert (Class M tolerance)	A177
TCMT○○○FV	Insert (Class M tolerance)	A177
TCMT○○○LM	Insert (Class M tolerance)	A178
TCMT○○○LP	Insert (Class M tolerance)	A178
TCMT○○○LS	Insert (Class M tolerance)	A178
TCMT○○○MK	Insert (Class M tolerance)	A179
TCMT○○○MM	Insert (Class M tolerance)	A179
TCMT○○○MP	Insert (Class M tolerance)	A179
TCMT○○○MS	Insert (Class M tolerance)	A179
TCMW○○○	Insert (Class M tolerance)	A180,B055
TECN32PE○R1W	Insert (For NSE300 type face mill)	K388
TECN43PE○R1	Insert (For NSE400 type face mill)	K389
TEEN○○PE○R1	Insert (For NSE300/400 type face mill)	K389
TEER○○PEER-JS	Insert (For NSE300/400 type face mill)	K389
TEGX○○○	Insert (Class G tolerance)	B060
TEGX○○○R/L	Insert (Class G tolerance)	A181,B060
TIP○○○	Torx plus Wrench	M003
TKY○○○	Wrench	M003
TNG○○○	Insert (Class G tolerance)	A151,B036
TNGA○○○	Insert (Class G tolerance)	A137,B031,B050
TNGG○○○FS	Insert (Class G tolerance)	A130
TNGG○○○LS	Insert (Class G tolerance)	A131
TNGG○○○R/L	Insert (Class G tolerance)	A135
TNGG○○○R/LF	Insert (Class G tolerance)	A131
TNGG○○○R/LFS	Insert (Class G tolerance)	A131
TNGG○○○R/LK	Insert (Class G tolerance)	A132
TNMA○○○	Insert (Class M tolerance)	A137
TNMG○○○	Insert (Class M tolerance)	A134,A135
TNMG○○○FH	Insert (Class M tolerance)	A130
TNMG○○○FP	Insert (Class M tolerance)	A130
TNMG○○○FS	Insert (Class M tolerance)	A130
TNMG○○○FY	Insert (Class M tolerance)	A130
TNMG○○○GH	Insert (Class M tolerance)	A137
TNMG○○○GK	Insert (Class M tolerance)	A133
TNMG○○○GM	Insert (Class M tolerance)	A133
TNMG○○○LK	Insert (Class M tolerance)	A131
TNMG○○○LM	Insert (Class M tolerance)	A131
TNMG○○○LP	Insert (Class M tolerance)	A131
TNMG○○○LS	Insert (Class M tolerance)	A131
TNMG○○○MA	Insert (Class M tolerance)	A134
TNMG○○○MH	Insert (Class M tolerance)	A134
TNMG○○○MJ	Insert (Class M tolerance)	A132
TNMG○○○MK	Insert (Class M tolerance)	A133
TNMG○○○MM	Insert (Class M tolerance)	A133
TNMG○○○MP	Insert (Class M tolerance)	A133
TNMG○○○MS	Insert (Class M tolerance)	A133
TNMG○○○R/L2G	Insert (Class M tolerance)	A135
TNMG○○○R/LES	Insert (Class M tolerance)	A135
TNMG○○○RK	Insert (Class M tolerance)	A136
TNMG○○○RM	Insert (Class M tolerance)	A136
TNMG○○○RP	Insert (Class M tolerance)	A136
TNMG○○○RS	Insert (Class M tolerance)	A136
TNMG○○○SA	Insert (Class M tolerance)	A132
TNMG○○○SH	Insert (Class M tolerance)	A131
TNMG○○○SY	Insert (Class M tolerance)	A132
TNMM○○○HL	Insert (Class M tolerance)	A137
TNMM○○○HZ	Insert (Class M tolerance)	A137
TNMN○○○	Insert (Class M tolerance)	A151
TNMX○○○MW	Insert (Class M tolerance)	A135
TNMX○○○SW	Insert (Class M tolerance)	A132
TPEW1303ZPER2	Insert (For PMF type end mill)	K378
TPG○○○	Insert (Class G tolerance)	A204,B062
TPGH○○○R/LFS	Insert (Class G tolerance)	A182
TPGR○○○R/L	Insert (Class G tolerance)	A203
TPGT○○○R/LF	Insert (Class G tolerance)	B056
TPGV○○○R/LF	Insert (Class G tolerance)	B057
TPGX○○○	Insert (Class G tolerance)	A185,B057

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
TPGX○○○R/L	Insert (Class G tolerance)	A183
TPMH○○○FV	Insert (Class M tolerance)	A182
TPMH○○○LP	Insert (Class M tolerance)	A183
TPMH○○○MV	Insert (Class M tolerance)	A184
TPMH○○○SV	Insert (Class M tolerance)	A184
TPMN○○○	Insert (Class M tolerance)	A203,K393
TPMR○○○	Insert (Class M tolerance)	A203
TPMT○○○MQ	Insert (Class M tolerance)	A184
TPMT○○○SQ	Insert (Class M tolerance)	A183
TPMX○○○	Insert (Class M tolerance)	A184
TPMX○○○L	Insert (Class M tolerance)	A183
TPS○○	Clamp screw	M006
TPS○○-○	Clamp screw	M006
TS○	Clamp screw	M007
TS○○	Clamp screw	M007
TS○○○	Clamp screw	M007
TSS04005	Radial screw	M008
TSS04505S	Radial screw	M008
TTAHR/L-○○○	External threading holder	D034
TTAHR/L○○○○	External threading holder	D035
TTAT○○○○○○○R/L○-B	Insert for threading	D034,D035

V

VAS400	VAS400 type side cutter (Metric type)	K146
VAS400UA○○○○○○R/L○○○○	VAS400 type side cutter	K144
VAS400UA○○○○○○N○○○○	VAS400 type side cutter	K145
VAS500	VAS500 type side cutter (Metric type)	K149
VBET○○○R/LSN	Insert (Class E tolerance)	A189
VBET○○○R/LSR	Insert (Class E tolerance)	A189
VBET○○○R/LWSN	Insert (Class E tolerance)	A189
VBGT○○○FJ	Insert (Class G tolerance)	A186
VBGT○○○FJ-P	Insert (Class G tolerance)	A186
VBGT○○○MJ	Insert (Class G tolerance)	A187
VBGT○○○MJ-P	Insert (Class G tolerance)	A187
VBGT○○○R/LF	Insert (Class G tolerance)	A187
VBMT○○○	Insert (Class M tolerance)	A188
VBMT○○○FM	Insert (Class M tolerance)	A186
VBMT○○○FP	Insert (Class M tolerance)	A186
VBMT○○○FV	Insert (Class M tolerance)	A186
VBMT○○○LM	Insert (Class M tolerance)	A187
VBMT○○○LP	Insert (Class M tolerance)	A187
VBMT○○○LS	Insert (Class M tolerance)	A187
VBMT○○○MK	Insert (Class M tolerance)	A188
VBMT○○○MM	Insert (Class M tolerance)	A188
VBMT○○○MP	Insert (Class M tolerance)	A188
VBMT○○○MS	Insert (Class M tolerance)	A188
VBMT○○○MV	Insert (Class M tolerance)	A188
VBMT○○○SV	Insert (Class M tolerance)	A187
VBMW○○○	Insert (Class M tolerance)	A189
VC2C	MIRACLE end mill (Metric type)	I110
VC4JRB	MIRACLE end mill (Metric type)	I108
VCGT○○○AZ	Insert (Class G tolerance)	A190
VCGT○○○R/LF	Insert (Class G tolerance)	A190
VCGT○○○MLS	Insert (Class G tolerance)	A191
VCGT○○○MLS-P	Insert (Class G tolerance)	A191
VCGW○○○	Insert (Class G tolerance)	B058
VCLD	MIRACLE end mill (Metric type)	I106
VCMT○○○	Insert (Class M tolerance)	A192
VCMT○○○FM	Insert (Class M tolerance)	A190
VCMT○○○FP	Insert (Class M tolerance)	A190
VCMT○○○FV	Insert (Class M tolerance)	A190
VCMT○○○LM	Insert (Class M tolerance)	A191
VCMT○○○LP	Insert (Class M tolerance)	A191
VCMT○○○LS	Insert (Class M tolerance)	A191
VCMT○○○MK	Insert (Class M tolerance)	A192
VCMT○○○MM	Insert (Class M tolerance)	A192
VCMT○○○MP	Insert (Class M tolerance)	A191
VCMT○○○MS	Insert (Class M tolerance)	A192
VCMT○○○MV	Insert (Class M tolerance)	A192
VCMT○○○SV	Insert (Class M tolerance)	A191
VCMW○○○	Insert (Class M tolerance)	A192
VDGX○○○R/L	Insert (Class G tolerance)	A193
VDGX○○○R/LF	Insert (Class G tolerance)	B061
VF2MV	IMPACT MIRACLE end mill (Metric type)	I199
VF2SB	IMPACT MIRACLE end mill (Inch type)	I217
VF2WB	IMPACT MIRACLE end mill (Metric type)	I216
VF2XL	IMPACT MIRACLE end mill (Metric type)	I197
VF2XLB	IMPACT MIRACLE end mill (Metric type)	I220
VF2XLB	IMPACT MIRACLE end mill (Inch type)	I226
VF2XLBS	IMPACT MIRACLE end mill (Metric type)	I219
VF3XB	IMPACT MIRACLE end mill (Metric type)	I228
VF4MB	IMPACT MIRACLE end mill (Metric type)	I234
VF4MV	IMPACT MIRACLE end mill (Metric type)	I201
VF6MHV	IMPACT MIRACLE end mill (Metric type)	I203
VF6MHVRB	IMPACT MIRACLE end mill (Metric type)	I256
VF6SVRCH	IMPACT MIRACLE end mill (Metric type)	I213
VF8MHVCH	IMPACT MIRACLE end mill (Metric type)	I204
VF8MHVRBCH	IMPACT MIRACLE end mill (Metric type)	I258
VFFDRB	IMPACT MIRACLE end mill (Metric type)	I236
VFHVRB	IMPACT MIRACLE end mill (Metric type)	I238,I246
VFHVRB	IMPACT MIRACLE end mill (Inch type)	I244
VFMD	IMPACT MIRACLE end mill (Metric type)	I206
VFMD	IMPACT MIRACLE end mill (Inch type)	I208
VFMDRB	IMPACT MIRACLE end mill (Metric type)	I252
VFMFPR	IMPACT MIRACLE end mill (Metric type)	I214
VFMHVRBCH	IMPACT MIRACLE end mill (Metric type)	I254
VFR2SB	IMPACT MIRACLE REVOLUTION end mill (Metric type)	I262
VFR2SSB	IMPACT MIRACLE REVOLUTION end mill (Metric type)	I260
VFR2SBF	IMPACT MIRACLE REVOLUTION end mill (Metric type)	I264
VFR2XLB	IMPACT MIRACLE REVOLUTION end mill (Metric type)	I268
VFR4MB	IMPACT MIRACLE REVOLUTION end mill (Metric type)	I266
VFRPSRB	IMPACT MIRACLE REVOLUTION end mill (Metric type)	I272
VFSD	IMPACT MIRACLE end mill (Metric type)	I205
VFSDRB	IMPACT MIRACLE end mill (Metric type)	I250
VFSFPR	IMPACT MIRACLE end mill (Metric type)	I210
VFSFPRCH	IMPACT MIRACLE end mill (Metric type)	I212
VNGA○○○	Insert (Class G tolerance)	A141,B051
VNGG○○○FJ	Insert (Class G tolerance)	A138
VNGG○○○FS	Insert (Class G tolerance)	A138
VNGG○○○LS	Insert (Class G tolerance)	A139
VNGG○○○R/L	Insert (Class G tolerance)	A141
VNGG○○○R/LF	Insert (Class G tolerance)	A138
VNGM○○○MJ	Insert (Class G tolerance)	A140
VNMA○○○	Insert (Class M tolerance)	A141
VNMG○○○	Insert (Class M tolerance)	A141
VNMG○○○FH	Insert (Class M tolerance)	A138
VNMG○○○FP	Insert (Class M tolerance)	A138

ORDER NUMBER	PRODUCT NAME	PAGE
VNMG○○○FS	Insert (Class M tolerance)	A138
VNMG○○○GK	Insert (Class M tolerance)	A141
VNMG○○○GM	Insert (Class M tolerance)	A141
VNMG○○○LK	Insert (Class M tolerance)	A139
VNMG○○○LM	Insert (Class M tolerance)	A139
VNMG○○○LP	Insert (Class M tolerance)	A139
VNMG○○○LS	Insert (Class M tolerance)	A139
VNMG○○○MA	Insert (Class M tolerance)	A141
VNMG○○○MH	Insert (Class M tolerance)	A141
VNMG○○○MJ	Insert (Class M tolerance)	A139
VNMG○○○MK	Insert (Class M tolerance)	A140
VNMG○○○MM	Insert (Class M tolerance)	A140
VNMG○○○MP	Insert (Class M tolerance)	A140
VNMG○○○MS	Insert (Class M tolerance)	A140
VNMG○○○SA	Insert (Class M tolerance)	A139
VNMG○○○SH	Insert (Class M tolerance)	A139
VOS400	VOS400 type side cutter (Metric type)	K148
VOX400-○○○A○○R	VOX400 type face mill (Metric type)	K108
VOX400R○○○○○○	VOX400 type face mill (Metric type)	K107
VOX400UR○○○○○	VOX400 type face mill	K106
VPET○○○R/LSRF	Insert (Class E tolerance)	A194
VPGT○○○MSMG	Insert (Class G tolerance)	A194
VPX200-○○○A○○AR	VPX200 type face mill (Metric type)	K187
VPX200-○○○A○○A○○○R○○	VPX200 type end mill (Long cutting edge) (Metric type)	K191
VPX200R○○○○AM○○○○	VPX200 type screw-in end mill (Metric type)	K186
VPX200R○○○SA○○S○○○○○	VPX200 type end mill (Long cutting edge) (Metric type)	K190
VPX200R○○○○SA○○S/L	VPX200 type end mill (Metric type)	K185
VPX200UR○○○○○○○○	VPX200 type face mill	K184
VPX200UR○○○○AA○○○○	VPX200 type end mill (Long cutting edge)	K189
VPX200UR○○○○AM○○○○	VPX200 type screw-in end mill	K183
VPX200UR○○○FA○○S○○○○	VPX200 type end mill (Long cutting edge)	K188
VPX200UR○○○○FA/SA○○S	VPX200 type end mill	K182
VPX300-○○○A○○AR	VPX300 type face mill (Metric type)	K198
VPX300-○○○A○○A○○○R○○	VPX300 type end mill (Long cutting edge) (Metric type)	K202
VPX300R08005CA○○○○○	VPX300 type end mill (Long cutting edge) (Metric type)	K202
VPX300R○○○○AM○○○○	VPX300 type screw-in end mill (Metric type)	K197
VPX300R○○○○○CA	VPX300 type face mill (Metric type)	K198
VPX300R○○○SA○○S○○○○○	VPX300 type end mill (Long cutting edge) (Metric type)	K201
VPX300R○○○○SA○○S/L	VPX300 type end mill (Metric type)	K196
VPX300UR○○○○○○○○	VPX300 type face mill	K195
VPX300UR○○○○AA○○○○	VPX300 type end mill (Long cutting edge)	K200
VPX300UR○○○○AM○○○○	VPX300 type screw-in end mill	K194
VPX300UR○○○FA○○S○○○○	VPX300 type end mill (Long cutting edge)	K199
VPX300UR○○○○FA/SA○○○	VPX300 type end mill	K193
VQ2XLB	SMART MIRACLE end mill (Metric type)	I164
VQ4MRB-FB	SMART MIRACLE end mill (Metric type)	I166
VQ4SVB	SMART MIRACLE end mill (Metric type)	I168
VQ4SVB	SMART MIRACLE end mill (Inch type)	I170
VQ4WB	SMART MIRACLE end mill (Metric type)	I172
VQ5MHV	SMART MIRACLE end mill (Inch type)	I175
VQ5MHVRB	SMART MIRACLE end mill (Inch type)	I176
VQ6MHVCH	SMART MIRACLE end mill with coolant hole	I179
VQ6MHVRBCH	SMART MIRACLE end mill with coolant hole	I180
VQFDRB	SMART MIRACLE end mill (Metric type)	I112
VQHVRB	SMART MIRACLE end mill (Metric type)	I114
VQJCS	SMART MIRACLE end mill (Metric type)	I116
VQJHV	SMART MIRACLE end mill (Metric type)	I144
VQJHV	SMART MIRACLE end mill (Inch type)	I146
VQLCS	SMART MIRACLE end mill (Metric type)	I118
VQMHV	SMART MIRACLE end mill (Metric type)	I137
VQMHV	SMART MIRACLE end mill (Inch type)	I141
VQMHVRB	SMART MIRACLE end mill (Metric type)	I148
VQMHVRB	SMART MIRACLE end mill (Inch type)	I153
VQMHVRBF	SMART MIRACLE end mill (Metric type)	I156
VQMHVRBF	SMART MIRACLE end mill (Inch type)	I158
VQMHZV	SMART MIRACLE end mill (Metric type)	I120
VQMHZV	SMART MIRACLE end mill (Inch type)	I126
VQMHZVOH	SMART MIRACLE end mill (Metric type)	I130
VQMHZVOH	SMART MIRACLE end mill (Inch type)	I134
VQN2MB	SMART MIRACLE end mill (Metric type)	I187
VQN4MB	SMART MIRACLE end mill (Metric type)	I189
VQN4MBF	SMART MIRACLE end mill (Metric type)	I190
VQN4MVRB	SMART MIRACLE end mill (Metric type)	I192
VQN6MVRB	SMART MIRACLE end mill (Metric type)	I192
VQT5MVRB	SMART MIRACLE end mill with coolant hole	I182
VQT6UR	SMART MIRACLE BARREL end mill	I184
VQSVR	SMART MIRACLE end mill (Metric type)	I161
VQXL	SMART MIRACLE end mill (Metric type)	I194

W

ORDER NUMBER	PRODUCT NAME	PAGE
WA-M10	Washer	F230
WBGT○○○R/LF	Insert (Class G tolerance)	A195
WBMT○○○R/LMV	Insert (Class M tolerance)	A195
WCGT○○○FJ-P	Insert (Class G tolerance)	A196
WCGT○○○MJ	Insert (Class G tolerance)	A196
WCGT○○○MJ-P	Insert (Class G tolerance)	A196
WCGT○○○R/L	Insert (Class G tolerance)	A196
WCMT○○○	Insert (Class M tolerance)	A197
WCMT○○○MP	Insert (Class M tolerance)	A197
WCMW○○○	Insert (Class M tolerance)	B059
WCS503507H	Shim screw	M008
WEC○○AF○R5C	Wiper insert (For SE445/545 type face mill)	K390,K391
WEC42EF○R5C	Wiper insert (For SE415 type face mill)	K390
WEEW13T3AG○R8C	Wiper insert (For ASX445 type face mill)	K060
WJX09-○○○A/X○○AR	WJX09 type face mill (Metric type)	K311
WJX09R○○○○AM○○○○	WJX09 type screw-in end mill (Metric type)	K313
WJX09R○○○○○BA	WJX09 type face mill (Metric type)	K311
WJX09R○○○○SA○○S/L	WJX09 type end mill (Metric type)	K313
WJX09UR○○○○○○A	WJX09 type face mill	K308
WJX09UR○○○○AM○○○○	WJX09 type screw-in end mill	K310
WJX09UR○○○○○○A○○S/L	WJX09 type end mill	K309
WJX14-○○○A○○AR	WJX14 type face mill (Metric type)	K320
WJX14R○○○○○○○A	WJX14 type face mill (Metric type)	K320
WJX14R○○○○○SA42S/L	WJX14 type end mill (Metric type)	K322
WJX14UR○○○○○○A	WJX14 type face mill	K318
WNEU1305ZEN4C-M	Wiper insert (For AHX440S type face mill)	K067
WNEU2007ZEN7C-M	Wiper insert (For AHX640S type face mill)	K078
WNEU2006ZEN7C-WK	Wiper insert (For AHX640S/AHX640W type face mill)	K078,K090
WNEU2007ZEN7C-WP	Wiper insert (For AHX640S type face mill)	K078
WNGU1206ZNER5C-M	Wiper insert (For WSF406W type cutterl)	K104
WNGU1406ANEN8C-M	Wiper insert (For WSX445 type cutter)	K050
WNMA○○○	Insert (Class M tolerance)	A147
WNMG○○○	Insert (Class M tolerance)	A145
WNMG○○○FH	Insert (Class M tolerance)	A142
WNMG○○○FP	Insert (Class M tolerance)	A142
WNMG○○○FS	Insert (Class M tolerance)	A142
WNMG○○○FY	Insert (Class M tolerance)	A142

INDEX FOR TOOL NUMBER

ORDER NUMBER	PRODUCT NAME	PAGE
WNMG○○○GH	Insert (Class M tolerance)	A147
WNMG○○○GJ	Insert (Class M tolerance)	A147
WNMG○○○GK	Insert (Class M tolerance)	A145
WNMG○○○GM	Insert (Class M tolerance)	A145
WNMG○○○LK	Insert (Class M tolerance)	A143
WNMG○○○LM	Insert (Class M tolerance)	A143
WNMG○○○LP	Insert (Class M tolerance)	A142
WNMG○○○LS	Insert (Class M tolerance)	A143
WNMG○○○MA	Insert (Class M tolerance)	A145
WNMG○○○MH	Insert (Class M tolerance)	A145
WNMG○○○MJ	Insert (Class M tolerance)	A143
WNMG○○○MK	Insert (Class M tolerance)	A144
WNMG○○○MM	Insert (Class M tolerance)	A144
WNMG○○○MP	Insert (Class M tolerance)	A144
WNMG○○○MS	Insert (Class M tolerance)	A144,A145
WNMG○○○MW	Insert (Class M tolerance)	A146
WNMG○○○RK	Insert (Class M tolerance)	A146
WNMG○○○RM	Insert (Class M tolerance)	A146
WNMG○○○RP	Insert (Class M tolerance)	A146
WNMG○○○RS	Insert (Class M tolerance)	A146
WNMG○○○SA	Insert (Class M tolerance)	A143
WNMG○○○SH	Insert (Class M tolerance)	A143
WNMG○○○SW	Insert (Class M tolerance)	A143
WNMG○○○SY	Insert (Class M tolerance)	A143
WOEW12T308PE○R8C	Wiper insert (For ASX400 type cutter)	K142
WOEX1206PER5C	Wiper insert (For VOX400 type cutter)	K109
WPC42EEER/L10C	Wiper insert (For FBP415 type cutter)	K388
WPGT○○○	Insert (Class G tolerance)	B059
WPGT○○○R/LFS	Insert (Class G tolerance)	A198
WPMT○○○MV	Insert (Class M tolerance)	A198
WSF406WR○○○○○○N	WSF406W type face mill (Metric type)	K103
WS○○○○○○○T	Clamp screw	M008
WS○○○○○○○TPS	Internal screw	L226,M008
WS○○LH	Stopper	L226,M018
WSX445-○○○○○○○○	WSX445 type face mill (Metric type)	K046
WSX445L○○○○○○○	WSX445 type face mill (Metric type)	K044
WSX445R○○○○○○○	WSX445 type face mill (Metric type)	K044
WSX445R○○○○SA32M	WSX445 type end mill (Metric type)	K049
WSX445UR○○○○○○	WSX445 type face mill	K042
WSX445UR○○○○FA20M	WSX445 type end mill	K048
WWX200-○○○○○○○R	WWX200 type face mill (Metric type)	K116
WWX200R○○○○○○○	WWX200 type face mill (Metric type)	K115
WWX200R○○○○SA○○S/L	WWX200 type end mill (Metric type)	K118
WWX200UR○○○○○A	WWX200 type face mill	K112
WWX200UR○○○○○A○○○	WWX200 type end mill	K114
WWX400-050○○○○R	WWX400 type face mill (Metric type)	K124
WWX400-○○○○○○○R	WWX400 type face mill (Metric type)	K126
WWX400R○○○○○○○	WWX400 type face mill (Metric type)	K125
WWX400R○○○○SA32M	WWX400 type end mill (Metric type)	K128
WWX400UR2.0○○○AA	WWX400 type face mill	K120
WWX400UR○○○○○○	WWX400 type face mill	K121
WWX400UR○○○○○○20M	WWX400 type end mill	K123

X

XCMT○○○SVX	Insert (Class M tolerance)	A199
XDGT1550PD○R-G○○	Insert (For BXD4000 type cutter)	K258
XDGT1550PD○R-GL○○	Insert (For BXD4000 type cutter)	K258
XDGX1750○○PD○R-GM	Insert (For AXD4000/AXD4000A type cutter)	K234,K242
XDGX1750○○PDFR-GL	Insert (For AXD4000/AXD4000A type cutter)	K234,K242
XDGX2270○○PDER-GLA	Insert (For AXD7000 type cutter)	K251
XDGX2270○○PDFR-GL	Insert (For AXD7000 type cutter)	K251
XNMU1607○○R-○S	Insert (For VFX5 type end mill)	K392
XNMU1909○○R-○S	Insert (For VFX6 type end mill)	K392
XNS○○	Clamp screw	M008
XNS○○○	Clamp screw	M008

Z

ZCMX○○○○○○ERA/B	Insert (For LER type end mill)	K274

NUMBER / OTHERS

2NGU1406ZNER6C-M	Wiper insert (For WWX400 type cutter)	K129
6NGU1409○○○PNER-○	Insert (For WWX400 type cutter)	K129
6NGU1409○○○PNFR-○	Insert (For WWX400 type cutter)	K129
6NMU0906○○○PNER-○	Insert (For WWX200 type cutter)	K119
6NMU1409○○○PNER-○	Insert (For WWX400 type cutter)	K129

Memo

SAFETY OF CUTTING TOOL PRODUCTS

1. Use of Cutting Tool Products

Packages of Mitsubishi products carry a safety warning label. However, tools are not labeled with detailed warning instructions. Please read the "Safety of Cutting Tool Products" in this catalog before handling cutting tool products and cemented carbide materials. Moreover, as a part of your workers' safety education, please notify the contents of the "Safety of Cutting Tool Products" to all workers.

2. Basic Characteristics of Hard Tool Materials

In Terms of "Safety of Cutting Tool Products"

Hard Tool Materials : General term for tool materials like cemented carbide alloy, cermet, ceramics, sintered CBN, sintered diamond, high speed steel and alloy steel, etc.

Physical Characteristics

Appearance : Varies depending on the type of material, e.g. gray, black, gold, etc.

Smell : None

Hardness, Specific Gravity :

Hard Tool Materials	Hardness (HV)	Specific Gravity	Hard Tool Materials	Hardness (HV)	Specific Gravity
High Speed Steel (HSS)	200—1200kg/mm^2	7—9	Sintered CBN	2000—5000kg/mm^2	3—5
Cemented Carbide	500—3000kg/mm^2	9—16	Sintered Diamond	8000—12000kg/mm^2	3—5
Cermet	500—3000kg/mm^2	5—9	Alloy Steel	200—1200kg/mm^2	7—9
Ceramics	1000—4000kg/mm^2	2—7	Diamond Electroforming Product	8000—12000kg/mm^2	3—5

Constituents

Carbide, nitride, carbon nitride, oxide, W, Ti, Al, Si, Ta, B, V and metals such as Fe, Co, Ni, Cr, Mo.

3. Safety of Cutting Tool Products

○Hard tool materials have a large specific gravity. Thus, they require special attention as heavy materials when the size or quantity is large.

○Hard tool materials generates dust and mist during grinding operations or heating. This dust and mist can be harmful to the human body when coming in contact with the eyes or skin, or if substantial quantities are swallowed. When grinding and machining, it is recommended to use local exhaust ventilation and respirators, a dust protective mask, glasses, gloves and so on. If dust makes contact with the hands, thoroughly wash the affected area with soap and water. Don't eat in the exposed area, and wash hands thoroughly before eating. Remove dust from the clothing by a cleaner or washing, but don't shake off.

○Cobalt dust can affect the skin, respiratory organs and heart through repeated or prolonged contact.

○For further information, please refer to **SDS** (Safety Data Sheet).

Home page: http://www.mmus-carbide.com/download/safety/

4. Handling Cutting Tool Products

○Surface conditions affect toughness of cutting tools. Therefore, use a diamond grinding wheel for finishing.

○Hard tool materials are extremely hard and brittle at the same time. Thus, they may be broken by shock and tightening with excess force.

○Hard tool materials and ferrous materials have different thermal expansion ratios. Shrinkage or swell fit products may suffer from cracks when applied temperature is higher or lower than the appropriate temperature for the tool.

○Pay special attention regarding storing hard tool materials. Toughness of hard tool materials is lowered when they corrode due to coolant and other liquid.

○When brazing hard tool materials, if the temperature is too high or too low from the melting point of the brazing material, loosening and breakage may occur.

○After regrinding cutting tools, make sure that there are no cracks.

○Machining hard tool materials on EDM may cause cracks on the surface due to remaining electrons resulting in lowering the toughness. Eliminate cracks by grinding, etc.

SUGGESTIONS ON HOW TO USE CUTTING TOOLS

Products	Hazard	Countermeasure
All Cutting Tools	◎Cutting tools have sharp cutting edges. Handling them with bare hands may cause injuries.	* Take precautions such as wearing gloves especially when handling tools and during installation.
	◎Improper use of tools and application of inappropriate cutting conditions may cause the tool to break and be discharged from the machine providing risk of injury.	* Ensure safety guards and goggles are used. * Refer to handling explanatory notes and catalogs. Use tools under recommended cutting conditions.
	◎Impact load and rapid increase of cutting resistance due to excessive wear may cause the tool to break and be expelled from the machine providing risk of injury.	* Ensure safety guards and goggles are used. * Exchange tools before excessive wear occurs.
	◎Cutting tools and workpieces become extremely hot during cutting. Touching them with bare hands may cause burns.	* Take precautions such as wearing gloves.
	◎Expelled hot chips produced in cutting produces risk of injuries and burns.	* Ensure safety guards and goggles are used. * During swarf removal and machine cleaning ensure the machine is stopped and wear gloves. Please use tools, such as cutting nippers and cutting clippers.
	◎In cutting, sparks, hot chips and heat generation caused by tool breakage provides a risk of igniting a fire.	* Avoid using cutting tools in places where there is a possibility of igniting a fire. * In case of using non-water soluble oil, make sure to have a fire prevention countermeasure.
	◎Using machines, chucks, and tools with poor balance at high revolutions may cause tools to break providing risk of injuries.	* Ensure safety guards and goggles are used. * Check the machine for vibration, chattering, and abnormal noise.
	◎Handling machined parts with burrs using bare hands may cause injuries.	* Wear gloves.
Indexable Inserts Type Tools	◎If inserts and spare parts are not held securely, they may become loose and be ejected producing risk of injuries.	* Clean insert locating seat and spare parts before setting inserts. * Use the tool provided for setting inserts, and ensure the inserts and spare parts are clamped securely. Do not use the tool provided for things other than prescribed inserts and spare parts.
	◎Clamping inserts and spare parts too tightly by using tools such as extension pipes may cause them to break and be scattered.	* Do not use extra tools for more leverage. Only use the tool provided.
	◎When applying high cutting speed, spare parts and inserts may be expelled due to centrifugal force. Pay special attention on each safety guidline.	* Refer to the handling explanatory notes and catalogs. Use tools under recommended cutting conditions.
Cutters and Other Rotating Tools	◎Milling cutters have sharp edges. Handling them with bare hands may cause injuries.	* Take precautions such as wearing gloves.
	◎Poor balance or off center revolving of tools may cause vibration and chattering which could cause the tool to break and be discharged.	* Apply cutting speed within the range of recommended cutting conditions. * Adjust accuracy and balance of spindles and bearings periodically to prevent off center revolving and chattering caused by wear on these parts.
Drilling Tools	◎Through cutting in cases when the workpiece revolves may produce a disk shaped peice with sharp edges when the cutting tool breaks through.	* Ensure safety guards and goggles are used. Also install a cover on the chuck.
	◎Drills with an extremely small diameter have a very sharp point which may puncture the skin if not handled carefully. If the drill breaks during cutting, the broken parts may be scattered.	* Handle with care. Take precautions such as wearing gloves and goggles.
Brazed Tools	◎Weakening of the braze and breakage of inserts may cause injury.	* Before using them, ensure they are brazed securely. * Do not use them under conditions which produce very high temperature.
Others	◎Machine and tools may be damaged if they are used for purposes other than the prescribed application.	* Use them strictly for the prescribed application.

INFORMATION

This catalog completes the basic precautions for safety use of our company's products. For further information, please refer to the guideline, catalogs or contact us. We are not responsible for any accidents caused by modifying tools without our permission.

HOW TO READ THE STANDARD OF TURNING INSERTS

●How this section page is organized

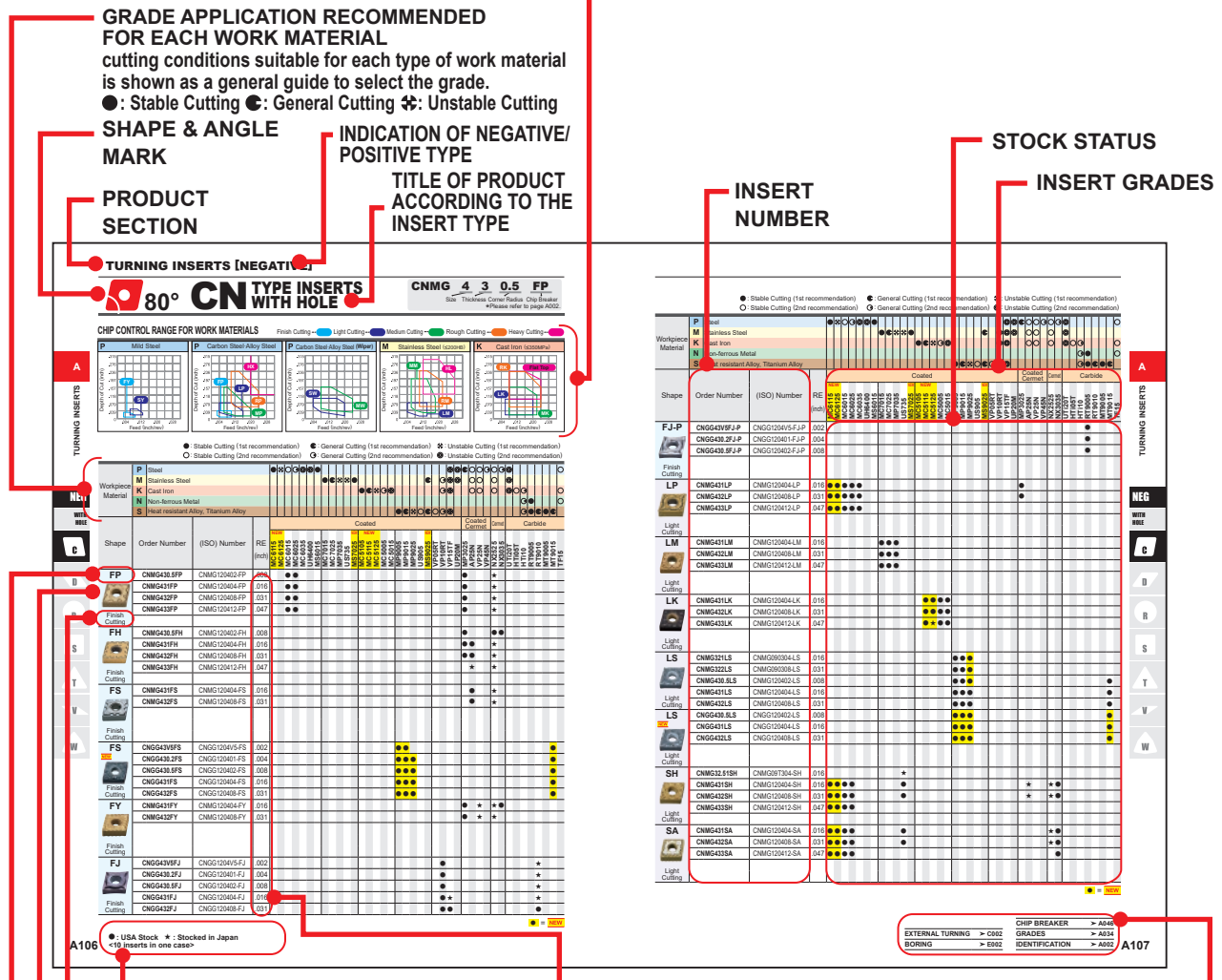
①Organized according to turning insert shape.
(Refer to the index on the next page.)
②Inserts are arranged in order of :
- Negative inserts (with hole→without hole)
- Positive inserts (with hole→without hole)

③Breakers are arranged in order of :
Finish Cutting→Light Cutting→Medium Cutting →Rough Cutting→Heavy Cutting

●Graph of chip control by work material

Shows recommended chip breakers and chip control range according to work material and cutting application.
Graphs are colored according to cutting applications (Finish→Light→Medium→Rough→Heavy) and contain recommended breakers for each application.

Finish Cutting : Light Cutting : Medium Cutting :
Rough Cutting : Heavy Cutting :



●To Order : Please specify insert number and grade.

TURNING TOOLS

INSERT STANDARDS
INSERT GRADES

IDENTIFICATION ····· A002
HOLE GEOMETRY ····· A004
PRECISION BREAKER STANDARD ····· A008
TOOL NAVI ····· A013
OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING ··· A014
PRECISION BREAKER SYSTEM ····· A030
WIPER INSERT ····· A032
GRADES FOR TURNING ····· A034
TURNING APPLICATION RANGE ····· A035
COATED CARBIDE (CVD) ····· A038
COATED CARBIDE (PVD) ····· A040
CERMET ····· A041
COATED CERMET ····· A042
CEMENTED CARBIDE ····· A043
MICRO-GRAIN CEMENTED CARBIDE ····· A044
CLASSIFICATION ····· A046
RECOMMENDED CUTTING CONDITIONS ····· A080

STANDARD OF INSERTS

NEGATIVE INSERTS WITH HOLE

CN○○TYPE···RHOMBIC 80° ····· A106
DN○○TYPE···RHOMBIC 55° ····· A114
RN○○TYPE···ROUND ····· A122
SN○○TYPE···SQUARE 90° ····· A123
TN○○TYPE···TRIANGULAR 60° ····· A130
VN○○TYPE···RHOMBIC 35° ····· A138
WN○○TYPE···TRIGON 80° ····· A142

NEGATIVE INSERTS WITHOUT HOLE

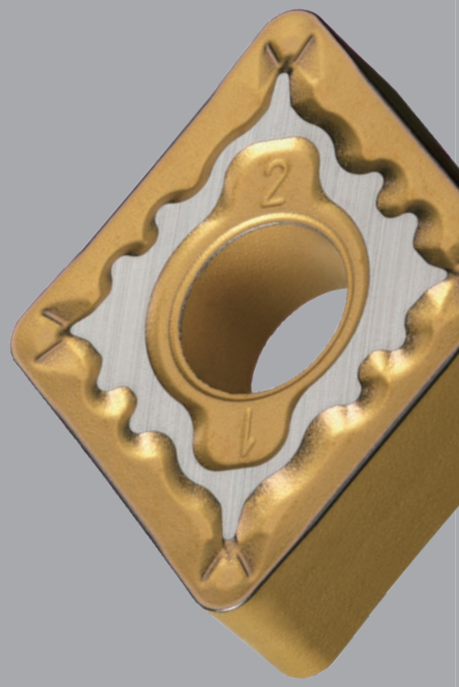
KN○○TYPE···PARALLELOGRAM 55°··· A148
CN○○TYPE···RHOMBIC 80° ····· A149
SN○○TYPE···SQUARE 90° ····· A150
TN○○TYPE···TRIANGULAR 60° ····· A151

POSITIVE INSERTS WITH HOLE

CC○○TYPE···RHOMBIC 80° ····· A152
CP○○TYPE···RHOMBIC 80° ····· A162
DC○○TYPE···RHOMBIC 55° ····· A164
DE○○TYPE···RHOMBIC 55° ····· A172
RC○○TYPE···ROUND ····· A173
SC○○TYPE···SQUARE 90° ····· A174
SP○○TYPE···SQUARE 90° ····· A176
TC○○TYPE···TRIANGULAR 60° ····· A177
TE○○TYPE···TRIANGULAR 60° ····· A181
TP○○TYPE···TRIANGULAR 60° ····· A182
VB○○TYPE···RHOMBIC 35° ····· A186
VC○○TYPE···RHOMBIC 35° ····· A190
VD○○TYPE···RHOMBIC 35° ····· A193
VP○○TYPE···RHOMBIC 35° ····· A194
WB○○TYPE···TRIGON 80° ····· A195
WC○○TYPE···TRIGON 80° ····· A196
WP○○TYPE···TRIGON 80° ····· A198
XC○○TYPE···RHOMBIC 25° ····· A199

POSITIVE INSERTS WITHOUT HOLE

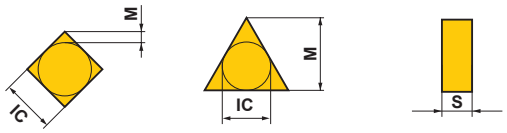
RTG TYPE ····· A200
SP○○TYPE···SQUARE 90° ····· A201
TC○○TYPE···TRIANGULAR 60° ····· A202
TP○○TYPE···TRIANGULAR 60° ····· A203



IDENTIFICATION

Symbol	Insert Shape
H	Hexagonal
O	Octagonal
P	Pentagonal
S	Square
T	Triangular
C	Rhombic 80°
D	Rhombic 55°
E	Rhombic 75°
F	Rhombic 50°
M	Rhombic 86°
V	Rhombic 35°
W	Trigon
L	Rectangular
A	Parallelogram 85°
B	Parallelogram 82°
K	Parallelogram 55°
R	Round
X	Special

① Symbol for Insert Shape



Triangular insert with a facet (Secondary Cutting Edge)

③ Symbol for Tolerance Class

Symbol	Tolerance of Nose Height **M** (inch)	Tolerance of Inscribed Circle **IC** (inch)	Tolerance of Thickness **S** (inch)
A	±.0002	±.001	±.001
F	±.0002	±.0005	±.001
C	±.0005	±.001	±.001
H	±.0005	±.0005	±.001
E	±.001	±.001	±.001
G	±.001	±.001	±.005
J	±.002	±.002	±.005
K*	±.0005	±.002 – ±.006	±.001
L*	±.001	±.002 – ±.006	±.001
M*	±.003 – ±.007	±.002 – ±.006	±.005
N*	±.003 – ±.007	±.002 – ±.006	±.001
U*	±.005 – ±.015	±.003 – ±.01	±.005

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size. For the accuracy of class M, refer to the table on the right.

Detail of M Class Insert Tolerance

●Tolerance of Nose Height **M** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.003	±.003	±.003	±.004	±.0063	–
.375	±.003	±.003	±.003	±.004	±.0063	–
.500	±.005	±.005	±.005	±.006	–	–
.625	±.006	±.006	±.006	±.007	–	–
.750	±.006	±.006	±.006	±.007	–	–
1.000	–	±.007	–	–	–	–
1.250	–	±.008	–	–	–	–

●Tolerance of Inscribed Circle **IC** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.002	±.002	±.002	±.002	±.002	–
.375	±.002	±.002	±.002	±.002	±.002	±.002
.500	±.003	±.003	±.003	±.003	–	±.003
.625	±.004	±.004	±.004	±.004	–	±.004
.750	±.004	±.004	±.004	±.004	–	±.004
1.000	–	±.005	–	–	–	±.005
1.250	–	±.006	–	–	–	±.006

③ Symbol for Tolerance Class

	①		③	
INCH	T	N	M	G
METRIC	T	N	M	G
		②		④

② Symbol for Relief Angle

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other Relief Angle

Major Relief Angle

④ Symbol for Chipbreaker and Clamping System

Inch			Metric									
Figure	I.C. .250" and over	I.C. under .250"	Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
	A	D	W	With Hole	Cylindrical Hole + One Countersink (40—60°)	No		A	With Hole	Cylindrical Hole	No	
	M	P	T	With Hole		One Sided		M	With Hole	Cylindrical Hole	One Sided	
	G	K	Q	With Hole	Cylindrical Hole + Double Countersink (40—60°)	No		G	With Hole	Cylindrical Hole	Double Sided	
	N	E	U	With Hole		Double Sided		N	Without Hole	–	No	
	R	S	B	With Hole	Cylindrical Hole + One Countersink (70—90°)	No		R	Without Hole	–	One Sided	
	F	L	H	With Hole		One Sided		F	Without Hole	–	Double Sided	
Special Design	X	X	C	With Hole	Cylindrical Hole + Double Countersink (70—90°)	No		X	–	–	–	Special Design
			J	With Hole		Double Sided						

Inch		Diameter of Inscribed Circle (inch)	Metric						
I.C. .250" and over	I.C. under .250"		R	W	V	D	C	S	T
	1.2	.156		02		04	03	03	06
	1.5	.187		L3	08	05	04	04	08
	1.8	.219		03	09	06	05	05	09
2		.250		04	11	07	06	06	11
2.5		.313		05	13	09	08	07	13
3		.375	09	06	16	11	09	09	16
4		.500	12	08	22	15	12	12	22
5		.625		10		19	16	15	27
6		.750	19	13		23	19	19	33
7		.875				27	22	22	38
8		1.000	25			31	25	25	44
10		1.250	31			38	32	31	54
		6.00mm	06						
		8.00mm	08						
		10.00mm	10						
		12.00mm	12						
		16.00mm	16						
		20.00mm	20						
		25.00mm	25						
		32.00mm	32						

⑤ Symbol for Insert Size

Thickness is from the bottom of the insert to the top of the cutting edge.

Inch		Thickness (inch)	Metric
I.C. .250" and over	I.C. under .250"		
–	0.9	.055	S1
–	1	.063	01
–	1.1	.070	T0
–	1.2	.078	T1
–	1.5	.094	02
–	1.8	.109	T2
2	–	.125	03
2.5	–	.156	T3
3	–	.187	04
3.5	–	.219	05
4	–	.25	06
5	–	.313	07
6	–	.375	09

⑥ Symbol for Insert Thickness

⑤	⑥				⑩
4	3	2	(E)	(N)	- MP
22	04	08	(E)	(N)	- MP
		⑦	⑧	⑨	

⑦ Symbol for Insert Corner Configuration

Inch	Corner Radius (inch)	Metric
V0	Sharp Nose	00
V3	.0012	V3
V5	.002	V5
0.2	.004	01
0.5	.008	02
1	.016	04
2	.031	08
3	.047	12
4	.063	16
5	.079	20
6	.094	24
7	.110	28
8	.126	32
00	Round Insert	M0

⑧ Symbol for Cutting Edge Condition

Figure	Cutting Edge	Symbol
	Sharp Cutting Edges	F
	Round Cutting Edges	E
	Chamfered Cutting Edges	T
	Chamfered and Rounded Cutting Edges	S
–	(-) Corner R tolerance	M

Mitsubishi Materials omit the honing symbol.

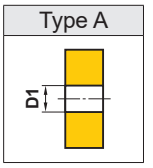
⑨ Symbol for Cutting Direction

Figure	Hand	Symbol
	Right	R
	Left	L
	Neutral	N

⑩ Symbol for Chip Breaker

LP	MP	RP
LM	MM	RM
LK	MK	RK
LS	MS	RS
MA	SW	MW

HOLE GEOMETRY



NEGATIVE

Insert Number		(ISO) Number		Dimension (inch)	Hole Type
				D1	
CNGA CNGG CNMA CNMG CNMM CNMP	32◌	CNGA CNGG CNMA CNMG CNMM CNMP	0903◌◌	.150	A
	32.5◌		09T3◌◌	.150	A
	33◌		0904◌◌	.150	A
	43◌		1204◌◌	.203	A
	54◌		1606◌◌	.250	A
	64◌		1906◌◌	.312	A
	86◌		2509◌◌	.359	A
DNGA DNGG DNGM DNMA DNMG DNMM DNMX	33◌	DNGA DNGG DNGM DNMA DNMG DNMM DNMX	1104◌◌	.150	A
	43◌		1504◌◌	.203	A
	44◌		1506◌◌	.203	A
SNGA SNGG SNMA SNMG SNMM	32◌	SNGA SNGG SNMA SNMG SNMM	0903◌◌	.150	A
	43◌		1204◌◌	.203	A
	54◌		1506◌◌	.250	A
	64◌		1906◌◌	.312	A
	85◌		2507◌◌	.359	A
	86◌		2509◌◌	.359	A
TNGA TNGG TNMA TNMG TNMM TNMX	22◌	TNGA TNGG TNMA TNMG TNMM TNMX	1103◌◌	.089	A
	32◌		1603◌◌	.150	A
	33◌		1604◌◌	.150	A
	43◌		2204◌◌	.203	A
	54◌		2706◌◌	.250	A
	66◌		3309◌◌	.312	A
VNGA VNGG VNGM VNMG VNMM	33◌	VNGA VNGG VNGM VNMG VNMM	1604◌◌	.150	A
WNMA WNMG	32◌	WNMA WNMG	0603◌◌	.150	A
	32.5◌		06T3◌◌	.150	A
	33◌		0604◌◌	.150	A
	43◌		0804◌◌	.203	A
	54◌		1006◌◌	.250	A
RNMG	43	RNMG	120400	.203	A

Type B	Type C	Type D

POSITIVE

Insert Number		(ISO) Number		Dimension (inch)	Hole Type
				D1	
CCET CCGT CCGW	21.5○	CCET CCGT CCGW	0602○○	.110	B
	32.5○		09T3○○	.173	B
	43○		1204○○	.217	B
CCGH CCMH	21.5○	CCGH CCMH	0602○○	.110	B
CCGT	03S1○○	CCGT	03S1○○	.079	B
	04T0○○		04T0○○	.094	B
CCMT	21.5○	CCMT	0602○○	.110	B
	2.52○		0803○○	.134	B
	32.5○		09T3○○	.173	B
	43○		1204○○	.217	B
CCMW	21.5○	CCMW	0602○○	.110	B
	32.5○		09T3○○	.173	B
	43○		1204○○	.217	B
CPGT	2.51.5○	CPGT	0802○○	.134	B
	32○		0903○○	.173	B
CPMH	2.51.5○	CPMH	0802○○	.138	D
	32○		0903○○	.177	D
CPMT	21.5○	CPMT	0602○○	.110	B
	32.5○		09T3○○	.173	B
CPMX	2.51.5○	CPMX	0802○○	.138	D
	32○		0903○○	.181	D
DCET DCGT DCGW	21.5○	DCET DCGT DCGW	0702○○	.110	B
	32.5○		11T3○○	.173	B
DCMT DCMW	21.5○	DCMT DCMW	0702○○	.110	B
	32.5○		11T3○○	.173	B
	43○		1504○○	.217	B
DEGX	43○	DEGX	1504○○	.201	C
RCMX	1003M0	RCMX	1003M0	.142	D
	1204M0		1204M0	.165	D
	1606M0		1606M0	.205	D
	2006M0		2006M0	.256	D
	2507M0		2507M0	.283	D
	3209M0		3209M0	.374	D

HOLE GEOMETRY

Type B	Type C	Type D

POSITIVE

Insert Number		(ISO) Number		Dimension (inch)	Hole Type
				D1	
RCMX	1606M0-○○	RCMX	1606M0-○○	.205	D
	2006M0-○○		2006M0-○○	.256	D
	2507M0-○○		2507M0-○○	.283	D
	3209M0-○○		3209M0-○○	.374	D
RCGT RCMT	0602M0	RCGT RCMT	0602M0	.110	B
	0803M0		0803M0	.134	B
	10T3M0		10T3M0	.173	B
SCMT SCMW	32.5○	SCMT SCMW	09T3○○	.173	B
	43○		1204○○	.217	B
SPGX	32○	SPGX	0903○○	.189	C
	42○		1203○○	.232	C
SPMT	32○	SPMT	0903○○	.173	B
	42○		1203○○	.217	B
SPMW	32○	SPMW	0903○○	.181	B
	42○		1203○○	.224	B
TCGT	1.21○	TCGT	0601○○	.091	B
	21.5○		1102○○	.110	B
	32.5○		16T3○○	.173	B
TCMT	1.51.5○	TCMT	0802○○	.091	B
	1.81.5○		0902○○	.098	B
	21.5○		1102○○	.110	B
	2.52○		1303○○	.134	B
	32.5○		16T3○○	.173	B
TCMW	21.5○	TCMW	1102○○	.110	B
	2.52○		1303○○	.134	B
	32.5○		16T3○○	.173	B
TEGX	32○	TEGX	1603○○	.169	D
TPGH	1.51.5○	TPGH	0802○○	.094	D
	1.81.5○		0902○○	.114	D
	22○		1103○○	.134	D
	32○		1603○○	.173	D
TPGX	1.51.5○	TPGX	0802○○	.098	C
	1.81.5○		0902○○	.118	C
	22○		1103○○	.138	C
	32○		1603○○	.189	D

Type B	Type C	Type D

POSITIVE

Insert Number		(ISO) Number		Dimension (inch)	Hole Type
				D1	
TPMH	1.51.5○	TPMH	0802○○	.098	D
	1.81.5○		0902○○	.114	D
	22○		1103○○	.134	D
	32○		1603○○	.173	B
TPMT	1.81.5○	TPMT	0902○○	.098	B
	21.5○		1102○○	.110	B
	32.5○		16T3○○	.173	B
TPMX	1.81.5○L	TPMX	0902○○L	.126	C
	22○L		1103○○L	.146	C
	22○		1103○○	.138	C
VBET	22○	VBET	1103○○	.115	B
VBGT	22○	VBGT	1103○○	.115	B
	33○		1604○○	.178	B
VBMT	22○	VBMT	1103○○	.115	B
	33○		1604○○	.173	B
VCGT	1.51.5○	VCGT	0802○○	.097	B
	22○		1103○○	.115	B
	2.520○		1303○○	.134	B
	33○		1604○○	.173	B
VCMT	1.51.5○	VCMT	0802○○	.097	B
	22○		1103○○	.110	B
	33○		1604○○	.173	B
VCMW	22○	VCMW	1103○○	.110	B
	33○		1604○○	.173	B
VDGX	32○	VDGX	1603○○	.177	D
WBGT	1.21○○	WBGT	0201○○	.091	B
	1.51.5○○		L302○○	.091	B
WCGT	1.21○○	WCGT	0201○○	.091	B
	1.51.5○○		L302○○	.091	B
	21.5○		0402○○	.110	B
	32.5○		06T3○○	.173	B
WCMT	1.21○○	WCMT	0201○○	.091	B
	1.51.5○○		L302○○	.091	B
	21.5○○		0402○○	.110	B
	32.5○○		06T3○○	.173	B
WPGT WPMT	21.5○	WPGT WPMT	0402○○	.110	B
	32○		0603○○	.173	B
XCMT	22○	XCMT	1503○○	.110	B

PRECISION BREAKER STANDARD

STANDARD FOR LEFT AND RIGHT HAND INSERTS

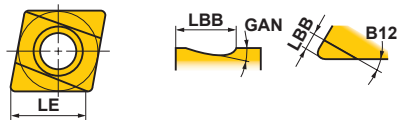
● NEGATIVE INSERTS

Unit : inch

Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
Right hand insert shown.	**DNGG431R/L**	DNGG150404R/L	.110	.587	15°	–
	DNGG432R/L	DNGG150408R/L	.110	.563	15°	–
	DNGG441R/L	DNGG150604R/L	.110	.587	15°	–
	DNGG442R/L	DNGG150608R/L	.110	.563	15°	–
Right hand insert shown.	**SNGG321R/L**	SNGG090304R/L	.071	.063	15°	–
	SNGG322R/L	SNGG090308R/L	.071	.063	15°	–
	SNGG431R/L	SNGG120404R/L	.091	.146	15°	–
	SNGG432R/L	SNGG120408R/L	.091	.146	15°	–
Right hand insert shown.	**TNGG220.5R/L**	TNGG110302R/L	.051	.126	15°	–
	TNGG221R/L	TNGG110304R/L	.051	.118	15°	–
	TNGG222R/L	TNGG110308R/L	.051	.106	15°	–
	TNGG321R/L	TNGG160304R/L	.091	.213	15°	–
	TNGG330.5R/L	TNGG160402R/L	.051	.343	15°	–
	TNGG331R/L	TNGG160404R/L	.091	.213	15°	–
	TNGG332R/L	TNGG160408R/L	.091	.201	15°	–
	TNGG431R/L	TNGG220404R/L	.110	.370	15°	–
	TNGG432R/L	TNGG220408R/L	.110	.358	15°	–

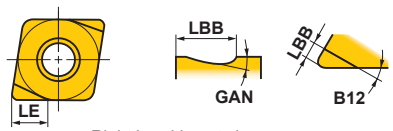
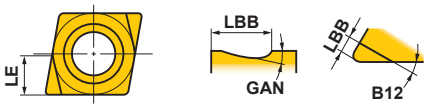
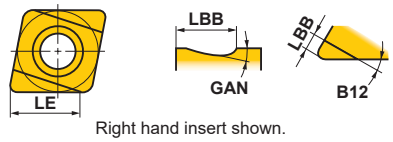
● POSITIVE INSERTS

Unit : inch

Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**CCET21.5V3R/LSR**	CCET0602V3R/L-SR	.087	.252	30°	20°
	CCET21.50.2R/LSR	CCET060201R/L-SR	.087	.248	30°	20°
	CCET21.50.5R/LSR	CCET060202R/L-SR	.087	.244	30°	20°
	CCET21.51R/LSR	CCET060204R/L-SR	.087	.236	30°	20°
	CCET32.5V3R/LSR	CCET09T3V3R/L-SR	.126	.378	30°	20°
	CCET32.50.2R/LSR	CCET09T301R/L-SR	.126	.374	30°	20°
	CCET32.50.5R/LSR	CCET09T302R/L-SR	.126	.370	30°	20°
	CCET32.51R/LSR	CCET09T304R/L-SR	.126	.362	30°	20°
Right hand insert shown.	**CCET21.5V0R/LSN**	CCET060200R/L-SN	.039	.252	20°	–
	CCET21.5V3R/LSN	CCET0602V3R/L-SN	.039	.252	20°	–
	CCET21.50.2R/LSN	CCET060201R/L-SN	.039	.248	20°	–
	CCET21.50.5R/LSN	CCET060202R/L-SN	.039	.244	20°	–
	CCET21.51R/LSN	CCET060204R/L-SN	.039	.236	20°	–
	CCET32.5V0R/LSN	CCET09T300R/L-SN	.059	.378	20°	–
	CCET32.5V3R/LSN	CCET09T3V3R/L-SN	.059	.378	20°	–
	CCET32.50.2R/LSN	CCET09T301R/L-SN	.059	.374	20°	–
	CCET32.50.5R/LSN	CCET09T302R/L-SN	.059	.370	20°	–
	CCET32.51R/LSN	CCET09T304R/L-SN	.059	.362	20°	–

● POSITIVE INSERTS

Unit : inch

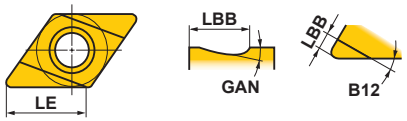
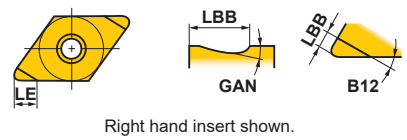
Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
Right hand insert shown.	**CCET21.5V3R/LWSN**	CCET0602V3R/LW-SN	.039	.252	20°	–
	CCET32.5V3R/LWSN	CCET09T3V3R/LW-SN	.059	.378	20°	–
 Right hand insert shown.	**CCGH21.50.5(M)R/LF**	CCGH060202(M)R/L-F	.047	.142	15°	20°
	CCGH21.51(M)R/LF	CCGH060204(M)R/L-F	.055	.173	15°	20°
Right hand insert shown.	**CCGT21.5V3RSN**	CCGT0602V3R-SN	.039	.118	20°	–
	CCGT21.50.2(M)R/LSN	CCGT060201(M)R/L-SN	.039	.118	20°	–
	CCGT21.50.5(M)R/LSN	CCGT060202(M)R/L-SN	.039	.118	20°	–
	CCGT32.5V3R/LSN	CCGT09T3V3R/L-SN	.059	.197	20°	–
	CCGT32.50.2(M)R/LSN	CCGT09T301(M)R/L-SN	.059	.197	20°	–
	CCGT32.50.5(M)R/LSN	CCGT09T302(M)R/L-SN	.059	.197	20°	–
	CCGT32.51(M)R/LSN	CCGT09T304(M)R/L-SN	.059	.197	20°	–
 Left hand insert only.	**CCGT03S1V3L-F**	CCGT03S1V3L-F	.031	.055	17°	35°
	CCGT03S101(M)R/L-F	CCGT03S101(M)R/L-F	.031	.055	17°	35°
	CCGT03S102(M)R/L-F	CCGT03S102(M)R/L-F	.031	.059	17°	35°
	CCGT03S104(M)R/L-F	CCGT03S104(M)R/L-F	.031	.063	17°	35°
	CCGT04T0V3L-F	CCGT04T0V3L-F	.039	.067	17°	35°
	CCGT04T001(M)R/L-F	CCGT04T001(M)R/L-F	.039	.071	17°	35°
	CCGT04T002(M)R/L-F	CCGT04T002(M)R/L-F	.039	.071	17°	35°
	CCGT04T004(M)R/L-F	CCGT04T004(M)R/L-F	.039	.079	17°	35°
Right hand insert shown.	**CCGT21.5V3R/LSS**	CCGT0602V3R/L-SS	.039	.118	14°	–
	CCGT21.50.2(M)R/LSS	CCGT060201(M)R/L-SS	.039	.118	14°	–
	CCGT21.50.5(M)R/LSS	CCGT060202(M)R/L-SS	.039	.118	14°	–
	CCGT32.5V3R/LSS	CCGT09T3V3R/L-SS	.039	.197	14°	–
	CCGT32.50.2(M)R/LSS	CCGT09T301(M)R/L-SS	.039	.197	14°	–
	CCGT32.50.5(M)R/LSS	CCGT09T302(M)R/L-SS	.039	.197	14°	–
	CCGT32.51MR/L-SS	CCGT09T304MR/L-SS	.039	.197	14°	–
 Right hand insert shown.	**CPGT2.51.51R/LF**	CPGT080204R/L-F	.071	.217	15°	20°
	CPGT320.5R/LF	CPGT090302R/L-F	.071	.213	15°	20°
	CPGT321R/LF	CPGT090304R/L-F	.071	.217	15°	20°

PRECISION BREAKER STANDARD

STANDARD FOR LEFT AND RIGHT HAND INSERTS

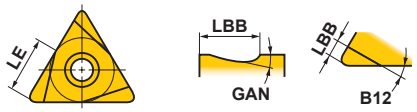
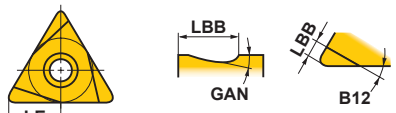
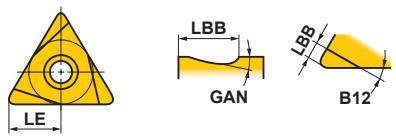
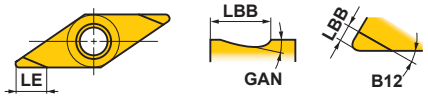
● POSITIVE INSERTS

Unit : inch

Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**DCET21.5V3R/LSR**	DCET0702V3R/L-SR	.098	.303	30°	20°
	DCET21.50.2R/LSR	DCET070201R/L-SR	.098	.299	30°	20°
	DCET21.50.5R/LSR	DCET070202R/L-SR	.098	.291	30°	20°
	DCET21.51R/LSR	DCET070204R/L-SR	.098	.280	30°	20°
	DCET32.5V3R/LSR	DCET11T3V3R/L-SR	.146	.457	30°	20°
	DCET32.50.2R/LSR	DCET11T301R/L-SR	.146	.449	30°	20°
	DCET32.50.5R/LSR	DCET11T302R/L-SR	.146	.445	30°	20°
	DCET32.51R/LSR	DCET11T304R/L-SR	.146	.433	30°	20°
Right hand insert shown.	**DCET21.5V0R/LSN**	DCET070200R/L-SN	.039	.303	20°	–
	DCET21.5V3R/LSN	DCET0702V3R/L-SN	.039	.303	20°	–
	DCET21.50.2R/LSN	DCET070201R/L-SN	.039	.299	20°	–
	DCET21.50.5R/LSN	DCET070202R/L-SN	.039	.291	20°	–
	DCET21.51R/LSN	DCET070204R/L-SN	.039	.280	20°	–
	DCET32.5V0R/LSN	DCET11T300R/L-SN	.059	.457	20°	–
	DCET32.5V3R/LSN	DCET11T3V3R/L-SN	.059	.457	20°	–
	DCET32.50.2R/LSN	DCET11T301R/L-SN	.059	.449	20°	–
	DCET32.50.5R/LSN	DCET11T302R/L-SN	.059	.445	20°	–
	DCET32.51R/LSN	DCET11T304RL-SN	.059	.433	20°	–
Right hand insert shown.	**DCET21.5V3R/LWSN**	DCET0702V3R/LW-SN	.039	.303	20°	–
	DCET32.5V3R/LWSN	DCET11T3V3R/LW-SN	.059	.457	20°	–
Right hand insert shown.	**DCGT21.5V3RSN**	DCGT0702V3R-SN	.039	.138	20°	–
	DCGT21.50.2(M)R/LSN	DCGT070201(M)R/L-SN	.039	.138	20°	–
	DCGT21.50.5(M)R/LSN	DCGT070202(M)R/L-SN	.039	.138	20°	–
	DCGT32.5V3R/LSN	DCGT11T3V3R/L-SN	.059	.256	20°	–
	DCGT32.50.2(M)R/LSN	DCGT11T301(M)R/L-SN	.059	.256	20°	–
	DCGT32.50.5(M)R/LSN	DCGT11T302(M)R/L-SN	.059	.256	20°	–
	DCGT32.51(M)R/LSN	DCGT11T304(M)R/L-SN	.059	.256	20°	–
 Right hand insert shown.	**DCGT21.50.5R/LF**	DCGT070202R/L-F	.039	.118	17°	20°
	DCGT21.51R/LF	DCGT070204R/L-F	.039	.126	17°	20°
	DCGT32.50.5R/LF	DCGT11T302R/L-F	.039	.118	14°	20°
	DCGT32.51R/LF	DCGT11T304R/L-F	.039	.126	14°	20°
Right hand insert shown.	**DCGT21.5V3R/LSS**	DCGT0702V3R/L-SS	.039	.138	14°	–
	DCGT21.50.2R/LSS	DCGT070201R/L-SS	.039	.138	14°	–
	DCGT21.50.5(M)R/LSS	DCGT070202(M)R/L-SS	.039	.138	14°	–
	DCGT32.5V3RSS	DCGT11T3V3R-SS	.039	.256	14°	–
	DCGT32.50.2(M)R/LSS	DCGT11T301(M)R/L-SS	.039	.256	14°	–
	DCGT32.50.5(M)R/LSS	DCGT11T302(M)R/L-SS	.039	.256	14°	–
	DCGT32.51MR/LSS	DCGT11T304MR/L-SS	.039	.256	14°	–

● POSITIVE INSERTS

Unit : inch

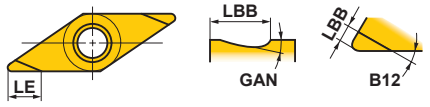
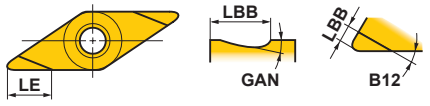
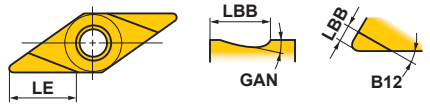
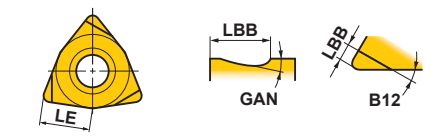
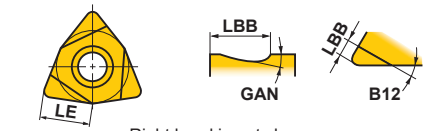
Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
Right hand insert shown.	**DEGX430.5R/L**	DEGX150402R/L	.110	.598	20°	–
	DEGX431R/L	DEGX150404R/L	.110	.587	20°	–
	DEGX432R/L	DEGX150408R/L	.110	.576	20°	–
 Left hand insert only.	**TCGT1.21V3LF**	TCGT0601V3L-F	.039	.114	14°	20°
	TCGT1.210.2LF	TCGT060101L-F	.039	.118	14°	20°
	TCGT1.210.5R/LF	TCGT060102R/L-F	.039	.118	14°	20°
	TCGT1.211R/LF	TCGT060104R/L-F	.039	.126	14°	20°
Right hand insert shown.	**TEGX320.5R/L**	TEGX160302R/L	.079	.236	20°	–
	TEGX321R/L	TEGX160304R/L	.079	.236	20°	–
 Right hand insert shown.	**TPGH1.51.50.5R/LFS**	TPGH080202R/L-FS	.035	.106	15°	20°
	TPGH1.51.51R/LFS	TPGH080204R/L-FS	.035	.114	15°	20°
	TPGH1.81.50.5R/LFS	TPGH090202R/L-FS	.039	.118	15°	20°
	TPGH1.81.51R/LFS	TPGH090204R/L-FS	.039	.126	15°	20°
	TPGH220.5R/LFS	TPGH110302R/L-FS	.055	.165	15°	20°
	TPGH221R/LFS	TPGH110304R/L-FS	.055	.173	15°	20°
	TPGH321R/LFS	TPGH160304R/L-FS	.079	.240	14°	20°
	TPGH322R/LFS	TPGH160308R/L-FS	.079	.256	14°	20°
 Right hand insert shown.	**TPGX1.51.50.5R/L**	TPGX080202R/L	.051	.154	10°	20°
	TPGX1.51.51R/L	TPGX080204R/L	.051	.161	10°	20°
	TPGX1.81.50.5R/L	TPGX090202R/L	.063	.189	10°	20°
	TPGX1.81.51R/L	TPGX090204R/L	.063	.197	10°	20°
	TPGX1.81.52R/L	TPGX090208R/L	.055	.185	10°	20°
	TPGX220.5L	TPGX110302L	.071	.213	10°	20°
	TPGX221R/L	TPGX110304R/L	.071	.217	10°	20°
	TPGX222R/L	TPGX110308R/L	.071	.232	10°	20°
 Right hand insert shown.	**VCGT1.51.50.5R/LF**	VCGT080202R/L-F	.031	.098	13°	20°
	VCGT1.51.51R/LF	VCGT080204R/L-F	.031	.102	13°	20°

PRECISION BREAKER STANDARD

STANDARD FOR LEFT AND RIGHT HAND INSERTS

● POSITIVE INSERTS

Unit : inch

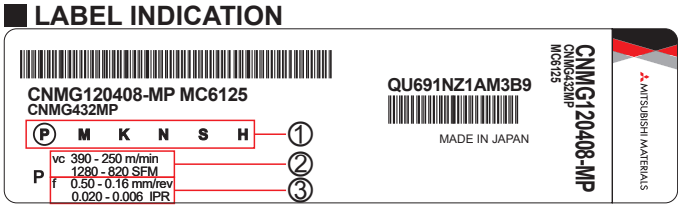
Geometry	Insert Number	(ISO) Number	LBB	LE	GAN	B12
 Right hand insert shown.	**VDGX320.5R/L**	VDGX160302R/L	.079	.236	25°	20°
	VDGX321R/L	VDGX160304R/L	.079	.240	25°	20°
 Right hand insert shown.	**VBGT220.5R/LF**	VBGT110302R/L-F	.039	.118	13°	20°
	VBGT221R/LF	VBGT110304R/L-F	.039	.126	13°	20°
	VBGT330.5R/LF	VBGT160402R/L-F	.059	.177	13°	20°
	VBGT331R/LF	VBGT160404R/L-F	.059	.185	13°	20°
 Right hand insert shown.	**VBET22V3R/LSR**	VBET1103V3R/L-SR	.098	.287	30°	20°
	VBET220.2R/LSR	VBET110301R/L-SR	.098	.287	30°	20°
	VBET220.5R/LSR	VBET110302R/L-SR	.098	.291	30°	20°
	VBET221R/LSR	VBET110304R/L-SR	.098	.299	30°	20°
Right hand insert shown.	**VBET22V0R/LSN**	VBET110300R/L-SN	.039	.433	20°	—
	VBET22V3R/LSN	VBET1103V3R/L-SN	.039	.433	20°	—
	VBET220.2R/LSN	VBET110301R/L-SN	.039	.425	20°	—
	VBET220.5R/LSN	VBET110302R/L-SN	.039	.413	20°	—
	VBET221R/LSN	VBET110304R/L-SN	.039	.433	20°	—
Right hand insert shown.	**VBET22V3R/LWSN**	VBET1103V3R/LW-SN	.039	.433	20°	—
 Left hand insert shown.	**WBGT1.21V3LF**	WBGT0201V3L-F	.039	.079	13°	30°
	WBGT1.210.2LF	WBGT020101L-F	.039	.079	13°	30°
	WBGT1.210.5LF	WBGT020102L-F	.039	.083	13°	30°
	WBGT1.211LF	WBGT020104L-F	.039	.087	13°	30°
	WBGT1.51.5V3LF	WBGTL302V3L-F	.039	.079	13°	30°
	WBGT1.51.50.2LF	WBGTL30201L-F	.039	.079	13°	30°
	WBGT1.51.50.5R/LF	WBGTL30202R/L-F	.039	.083	13°	30°
	WBGT1.51.51R/LF	WBGTL30204R/L-F	.039	.087	13°	30°
 Right hand insert shown.	**WCGT1.210.5R/L**	WCGT020102R/L	.039	.083	15°	30°
	WCGT1.211R/L	WCGT020104R/L	.039	.087	15°	30°
	WCGT1.51.50.5L	WCGTL30202L	.039	.083	15°	30°
	WCGT1.51.51L	WCGTL30204L	.039	.087	15°	30°

TOOL NAVI

OUTLINE

TOOL NAVI supports our customers with information and supplies suitable cutting conditions for each work material by selecting optimal indexable insert together with the optional tool.

LABEL INDICATION



*1. The above is an example. There may be inserts recommended for multiple work materials.
*2. Please contact us for recommended cutting conditions using coefficient values other than the above.

①Work materials

P : Steel (Material reference : Carbon steel, alloy steel 180HB)
M : Stainless steel (Material reference : Austenitic stainless steel 180HB)
K : Cast iron (Material reference : Gray cast iron, ductile cast iron 180HB)
N : Aluminum alloy, Non-ferrous metal
S : Material reference : Titanium alloy 320HB, Ni, Co-based alloy 400HB
H : Hardened steel 60HRC

②Cutting speed standards

Work Material	Tool Life		Work Material	Hardness
	Life	Performance		
P	90min.	15min.	Carbon steel, alloy steel	180HB
M	90min.	15min.	Stainless steel	180HB
K	90min.	15min.	Cast iron	180HB
S	25min.	5min.	Titanium alloy	320HB
			Ni, Co-based alloy	400HB
H	80min.	10min.	Hardened steel	60HRC

③Feed rate

Minimum and maximum feed rate settings are based on the chip control range of the chip breaker.

*3. N : Life based on each grade. For stable conditions choose the performance cutting speed and for unstable choose the tool life feed rate.
*4. The tool life is based on the following (VB wear). Some materials include elements other than this.
PMKS • • • VB=0.3 mm
H • • • VB=0.1 mm

TOOL LIFE

Cutting speed has a large affect on tool life. **TOOL NAVI** is based on Taylor's equation (relationship vc x Tn=C between tool grade, cutting conditions, and tool life). Therefore, performance speed and tool life is found for each work material. When the customer requires different tool life, obtain coefficient values of the grade you use from the charts below. Multiply the coefficient values by the cutting speed to calculate the new cutting speed.

● P Grade (Steel) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
MC6115	1.00	0.82	0.72	0.67	0.59
MC6125	1.00	0.83	0.75	0.69	0.62
MP3025	1.00	0.85	0.77	0.72	0.65
NX2525	1.00	0.87	0.80	0.76	0.70

● K Grade (Cast Iron) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
MC5115	1.00	0.79	0.69	0.62	0.54
MC5125	1.00	0.76	0.65	0.58	0.50

(ex.) Medium cutting of steel
The 1st recommendation : MC6125
Indexable inserts : CNMG432MA
Recommended cutting speed : vc = 1280 SFM
(Tool life : 15min.)

↓

Tool life required by the customer : 30min.
1280×0.83≒1062 SFM

● M Grade (Stainless Steel) cutting speed coefficient values.

Grade \ Tool life	15min	30min	45min	60min	90min
MC7015	1.00	0.83	0.75	0.70	0.63
MC7025	1.00	0.90	0.84	0.80	0.75
MP7035	1.00	0.84	0.76	0.71	0.62
US735	1.00	0.78	0.68	0.61	0.53

HARDNESS OF WORKPIECE

Hardness of the work material also affects tool life. Mitsubishi's **TOOL NAVI** suggests cutting speed variations when hardness of the work material differs. Obtain the suitable coefficient value for each work material from the chart below. Multiply the coefficient value by the recommended cutting speed of the grade you use to calculate the new cutting speed.

Work Material	Soft ← (Hardness of work material) → Hard											
	120HB	140HB	160HB	180HB	200HB	220HB	240HB	260HB	280HB	300HB	320HB	340HB
P	1.34	1.19	1.08	1.00	0.92	0.85	0.80	0.75	0.71	0.68	0.64	0.61
M	1.41	1.23	1.10	1.00	0.91	0.85	0.78	0.72	0.68	0.64	0.61	0.58
K	1.27	1.19	1.09	1.00	0.97	0.91	0.88	0.85	0.81	0.78	0.75	0.72

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING

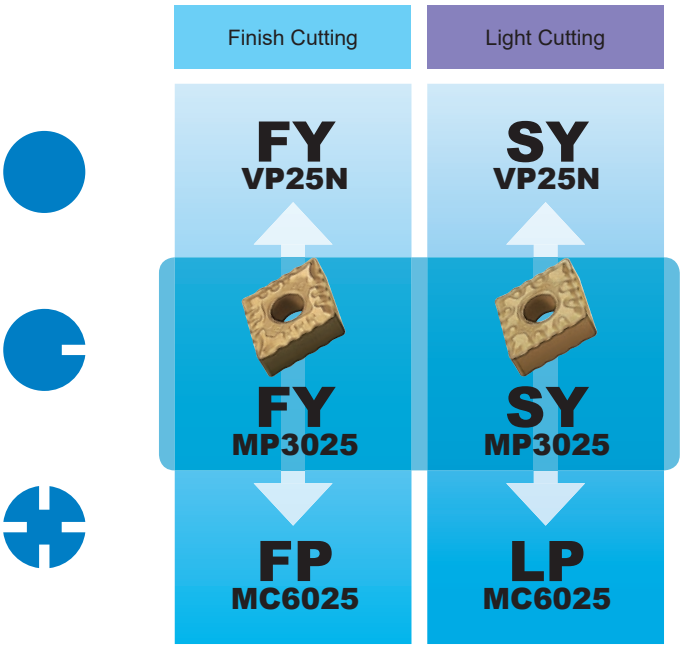
● Selection of optimum inserts for turning
The following diagrams show for each work material, the optimal combination of suitable grades and chip breakers for each application area in turning.

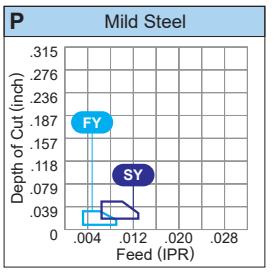
■ CUTTING CONDITIONS

● Stable Cutting	Continuous Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component
◕ General Cutting	
✚ Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity

■ CUTTING AREA

F	Finish Cutting
L	Light Cutting
M	Medium Cutting
R	Rough Cutting
H	Heavy Cutting



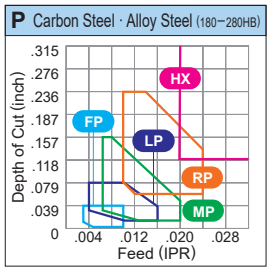


P Mild Steel (EX. : ASTM A283, AISI 1010)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
● Stable Cutting	F	**FY**	**VP25N**	935—1475	.004—.009	.008—.031
	L	**SY**	**VP25N**	850—1345	.006—.013	.020—.047
◕ General Cutting	F	**FY**	**MP3025**	900—1395	.004—.009	.008—.031
	L	**SY**	**MP3025**	835—1260	.006—.013	.020—.047
✚ Unstable Cutting	F	**FY**	**MC6025**	1030—1670	.003—.010	.004—.040
	L	**SY**	**MC6025**	935—1580	.004—.016	.012—.079



Stable Cutting
General Cutting
Unstable Cutting

F Finish Cutting
L Light Cutting
M Medium Cutting
R Rough Cutting
H Heavy Cutting

Finish Cutting	Light Cutting	Medium Cutting	Rough Cutting	Heavy Cutting
FP NX2525	LP MC6115	MP MC6115	RP MC6115	HX MC6025
FP MP3025	LP MC6115	MP MC6125	RP MC6125	HX MC6025
FP MC6025	LP MC6125	MP MC6125	RP MC6025	HX MC6035

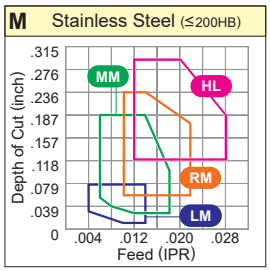
P Carbon Steel • Alloy Steel (EX. : AISI 1045, AISI 4140)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

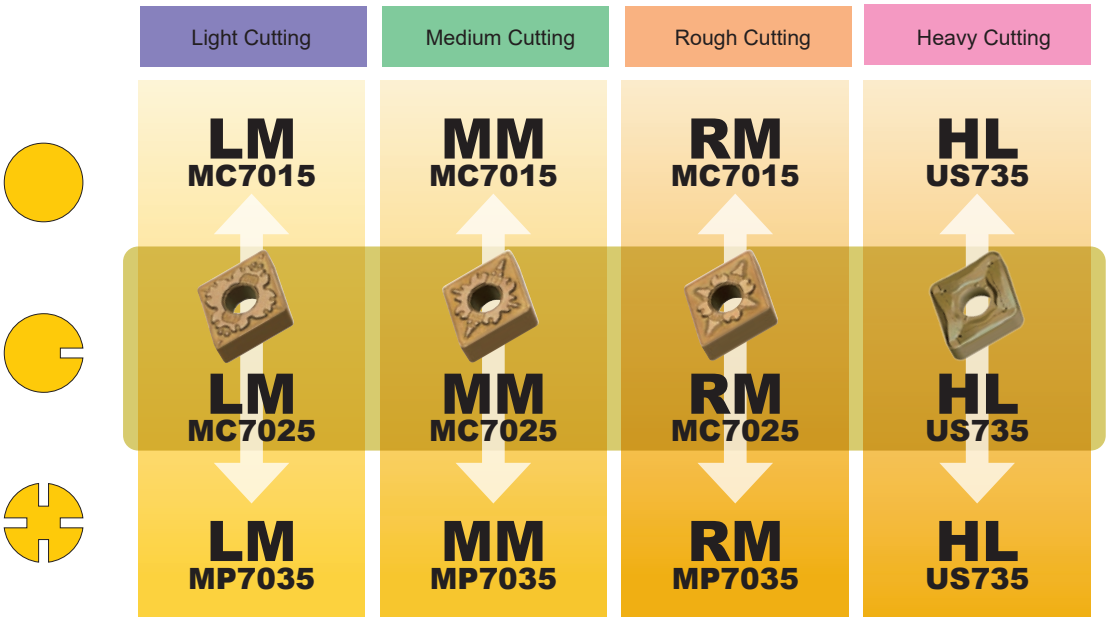
	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FP	NX2525	690—985	.003—.010	.004—.039
	L	LP	MC6115	820—1575	.004—.016	.012—.079
	M	MP	MC6115	755—1445	.006—.020	.012—.157
	R	RP	MC6115	705—1360	.010—.024	.059—.236
	H	HX	MC6025	540—870	.020—.050	.119—.434
General Cutting	F	FP	MP3025	705—1080	.003—.010	.004—.039
	L	LP	MC6115	820—1575	.004—.016	.012—.079
	M	MP	MC6125	820—1280	.006—.020	.012—.157
	R	RP	MC6125	770—1215	.010—.024	.059—.236
	H	HX	MC6025	540—870	.020—.050	.119—.434
Unstable Cutting	F	FP	MC6025	755—1230	.004—.010	.004—.040
	L	LP	MC6125	900—1395	.004—.016	.012—.079
	M	MP	MC6125	820—1280	.006—.020	.012—.157
	R	RP	MC6025	605—970	.010—.024	.060—.237
	H	HX	MC6035	460—655	.020—.050	.119—.434

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



- Stable Cutting
- General Cutting
- Unstable Cutting

- L Light Cutting
- M Medium Cutting
- R Rough Cutting
- H Heavy Cutting

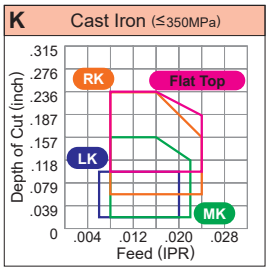


M Stainless Steel (EX. : AISI 304, AISI 316)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	L	LM	MC7015	590—935	.004—.014	.012—.079
	M	MM	MC7015	540—850	.006—.018	.028—.197
	R	RM	MC7015	510—805	.010—.022	.059—.236
	H	HL	US735	245—460	.012—.028	.118—.295
General Cutting	L	LM	MC7025	540—720	.004—.014	.012—.079
	M	MM	MC7025	490—655	.006—.018	.028—.197
	R	RM	MC7025	460—620	.010—.022	.059—.236
	H	HL	US735	245—460	.012—.028	.118—.295
Unstable Cutting	L	LM	MP7035	310—510	.004—.014	.012—.079
	M	MM	MP7035	295—475	.006—.018	.028—.197
	R	RM	MP7035	280—440	.010—.022	.059—.236
	H	HL	US735	245—460	.012—.028	.118—.295



- Stable Cutting
- General Cutting
- Unstable Cutting

- L Light Cutting
- M Medium Cutting
- R Rough Cutting
- H Heavy Cutting

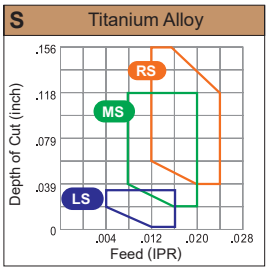
K Cast Iron • Ductile Cast Iron (EX. : AISI No 45 B)

NEGATIVE INSERTS

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	L	LK	MC5005	755—1200	.004—.016	.012—.079
	M	MK	MC5105	690—2100	.008—.022	.020—.157
	R	RK	MC5105	640—1985	.008—.024	.059—.236
	H	Flat Top	MC5105	640—1985	.008—.024	.098—.236
General Cutting	L	LK	MC5015	670—1100	.004—.016	.012—.079
	M	MK	MC5105	690—2100	.008—.022	.020—.157
	R	RK	MC5105	640—1985	.008—.024	.059—.236
	H	Flat Top	MC5105	640—1985	.008—.024	.098—.236
Unstable Cutting	L	LK	MC5115	670—1260	.004—.020	.020—.098
	M	MK	MC5115	620—1150	.008—.022	.020—.157
	R	RK	MC5115	590—1080	.008—.024	.059—.236
	H	Flat Top	MC5115	590—1080	.008—.024	.098—.236

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



- Stable Cutting
- General Cutting
- Unstable Cutting

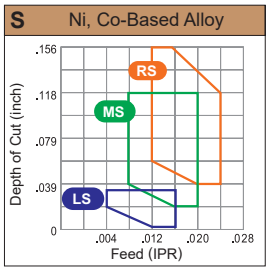
- F Finish Cutting
- L Light Cutting
- M Medium Cutting
- R Rough Cutting

S Titanium Alloy (EX. : Ti-6Al-4V)

NEGATIVE INSERTS

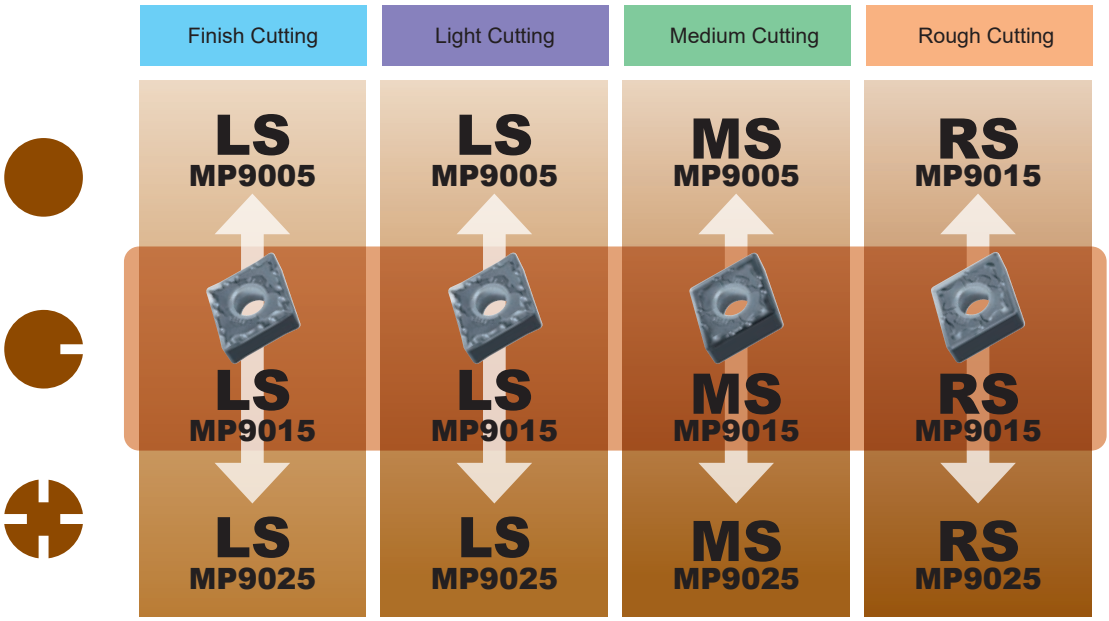
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	LS	MT9015	130—280	.004—.010	.008—.031
	L	LS	MT9015	130—280	.004—.010	.008—.031
	M	MS	MT9015	130—260	.006—.012	.020—.118
	R	RS	MT9015	115—245	.008—.014	.039—.157
General Cutting	F	LS	MT9015	130—280	.004—.010	.008—.031
	L	LS	MT9015	130—280	.004—.010	.008—.031
	M	MS	MT9015	130—260	.006—.012	.020—.118
	R	RS	MT9015	115—245	.008—.014	.039—.157
Unstable Cutting	F	LS	MT9015	130—280	.004—.010	.008—.031
	L	LS	MT9015	130—280	.004—.010	.008—.031
	M	MS	MT9015	130—260	.006—.012	.020—.118
	R	RS	MT9015	115—245	.008—.014	.039—.157



Stable Cutting
General Cutting
Unstable Cutting

F Finish Cutting
L Light Cutting
M Medium Cutting
R Rough Cutting



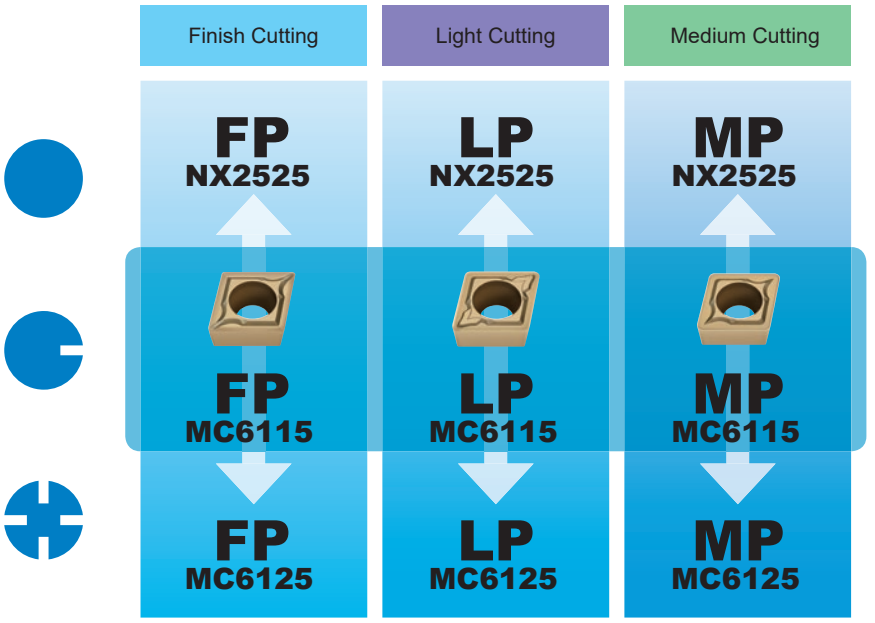
S Ni, Co-Based Alloy (EX. : Inconel718)

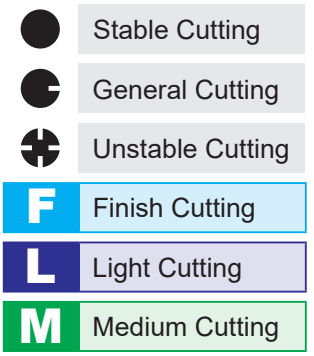
NEGATIVE INSERTS

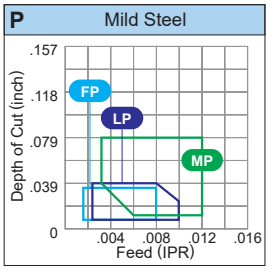
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	LS	MP9005	180—360	.004—.010	.008—.031
	L	LS	MP9005	180—360	.004—.010	.008—.031
	M	MS	MP9005	165—330	.006—.012	.020—.118
	R	RS	MP9015	115—245	.008—.014	.039—.157
General Cutting	F	LS	MP9015	130—280	.004—.010	.008—.031
	L	LS	MP9015	130—280	.004—.010	.008—.031
	M	MS	MP9015	130—260	.006—.012	.020—.118
	R	RS	MP9015	115—245	.008—.014	.039—.157
Unstable Cutting	F	LS	MP9025	100—150	.004—.010	.008—.031
	L	LS	MP9025	100—150	.004—.010	.008—.031
	M	MS	MP9025	100—150	.006—.012	.020—.118
	R	RS	MP9025	80—130	.008—.014	.039—.157

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING





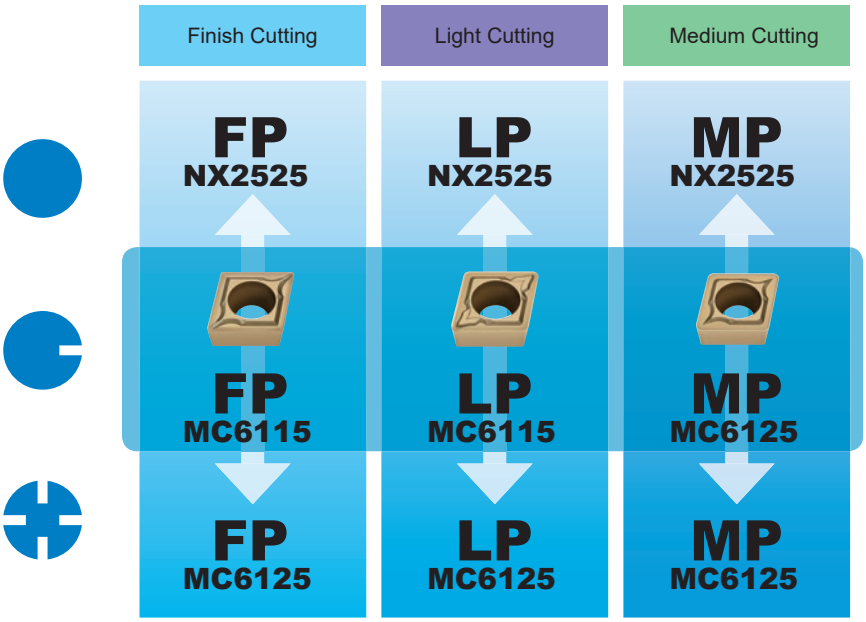


P Mild Steel (EX. : ASTM A283, AISI 1010)

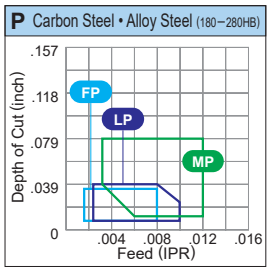
7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FP	NX2525	740—1050	.002—.008	.008—.035
	L	LP	NX2525	740—1050	.002—.010	.008—.039
	M	MP	NX2525	605—885	.003—.012	.012—.079
General Cutting	F	FP	MC6115	970—1870	.002—.008	.008—.035
	L	LP	MC6115	970—1870	.002—.010	.008—.039
	M	MP	MC6115	805—1560	.003—.012	.012—.079
Unstable Cutting	F	FP	MC6125	1050—1655	.002—.008	.008—.035
	L	LP	MC6125	1050—1655	.002—.010	.008—.039
	M	MP	MC6125	885—1380	.003—.012	.012—.079



- Stable Cutting
- General Cutting
- Unstable Cutting
- **F** Finish Cutting
- **L** Light Cutting
- **M** Medium Cutting



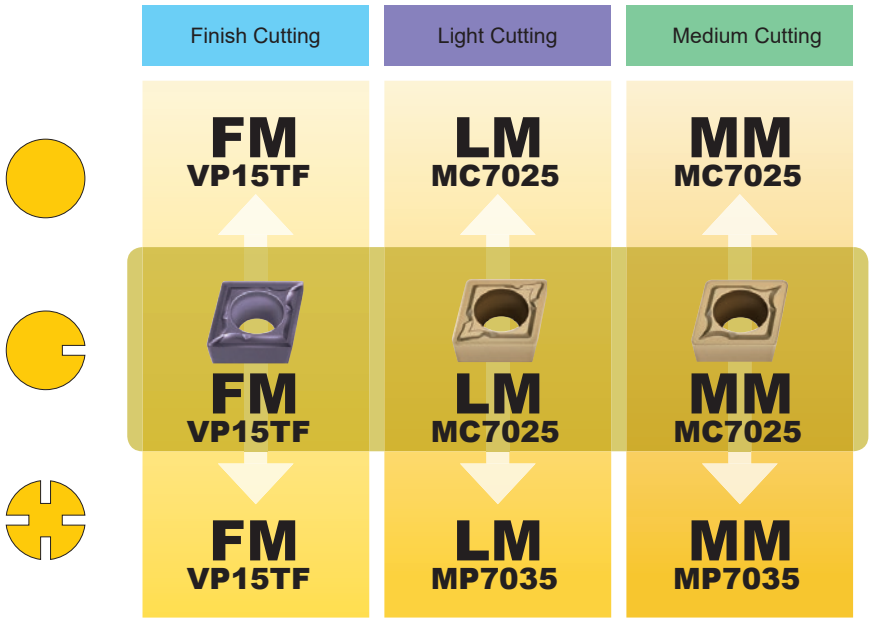
P Carbon Steel • Alloy Steel (EX. : AISI 1045, AISI 4140)

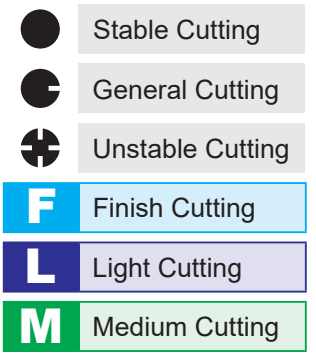
7° POSITIVE INSERTS WITH HOLE

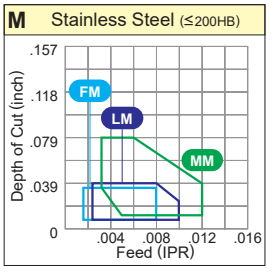
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FP	NX2525	540—785	.002—.008	.008—.035
	L	LP	NX2525	540—785	.002—.010	.008—.039
	M	MP	NX2525	460—655	.003—.012	.012—.079
General Cutting	F	FP	MC6115	720—1380	.002—.008	.008—.035
	L	LP	MC6115	720—1380	.002—.010	.008—.039
	M	MP	MC6125	655—1015	.003—.012	.012—.079
Unstable Cutting	F	FP	MC6125	785—1215	.002—.008	.008—.035
	L	LP	MC6125	785—1215	.002—.010	.008—.039
	M	MP	MC6125	655—1015	.003—.012	.012—.079

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING





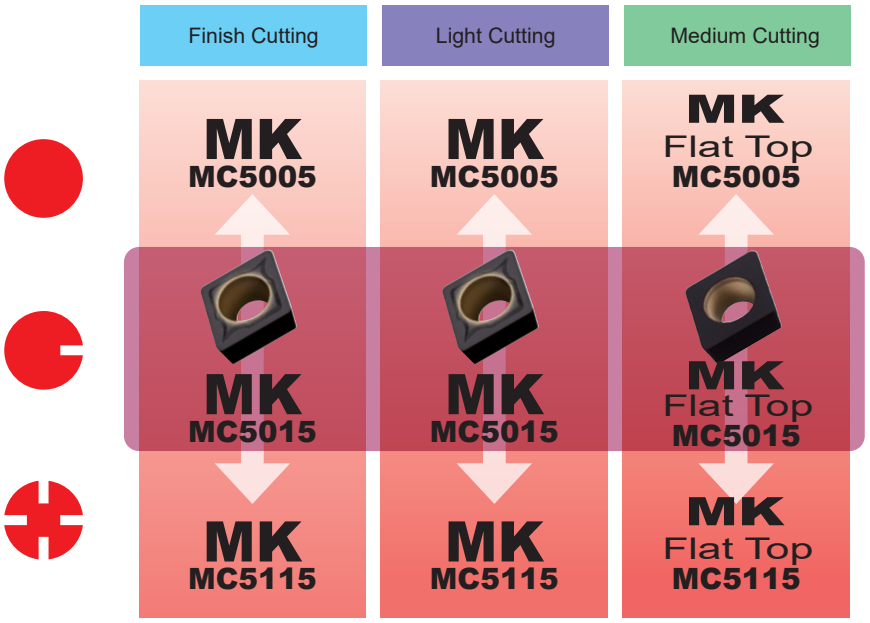


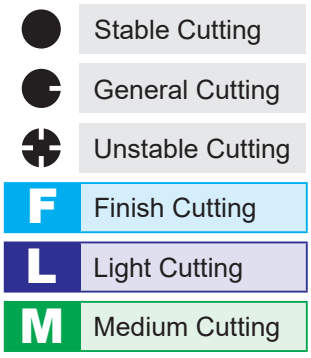
M Stainless Steel (EX. : AISI 304, AISI 316)

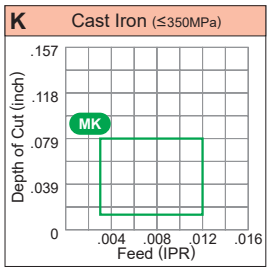
7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FM	VP15TF	245—410	.002—.008	.008—.035
	L	LM	MC7025	460—620	.002—.010	.008—.039
	M	MM	MC7025	395—525	.003—.012	.012—.079
General Cutting	F	FM	VP15TF	245—410	.002—.008	.008—.035
	L	LM	MC7025	460—620	.002—.010	.008—.039
	M	MM	MC7025	395—525	.003—.012	.012—.079
Unstable Cutting	F	FM	VP15TF	245—410	.002—.008	.008—.035
	L	LM	MP7035	280—440	.002—.010	.008—.039
	M	MM	MP7035	230—375	.003—.012	.012—.079







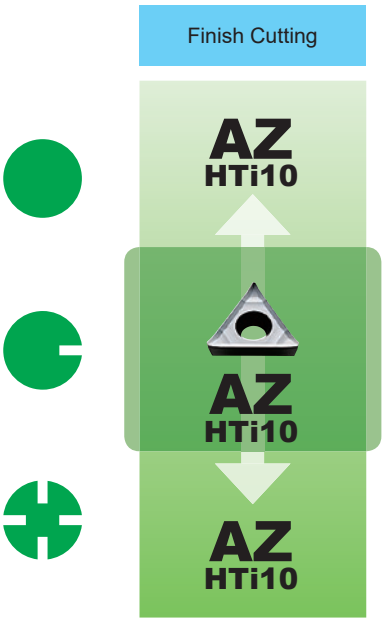
K Cast Iron • Ductile Cast Iron (EX. : AISI No 45 B)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	MK	MC5005	540—870	.004—.012	.012—.079
	L	MK	MC5005	540—870	.004—.012	.012—.079
	M	MK, Flat Top	MC5005	540—870	.004—.012	.012—.079
General Cutting	F	MK	MC5015	490—745	.004—.012	.012—.079
	L	MK	MC5015	490—745	.004—.012	.012—.079
	M	MK, Flat Top	MC5015	490—745	.004—.012	.012—.079
Unstable Cutting	F	MK	MC5115	590—1100	.002—.010	.008—.039
	L	MK	MC5115	590—1100	.002—.010	.008—.039
	M	MK, Flat Top	MC5115	490—920	.003—.012	.012—.079

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



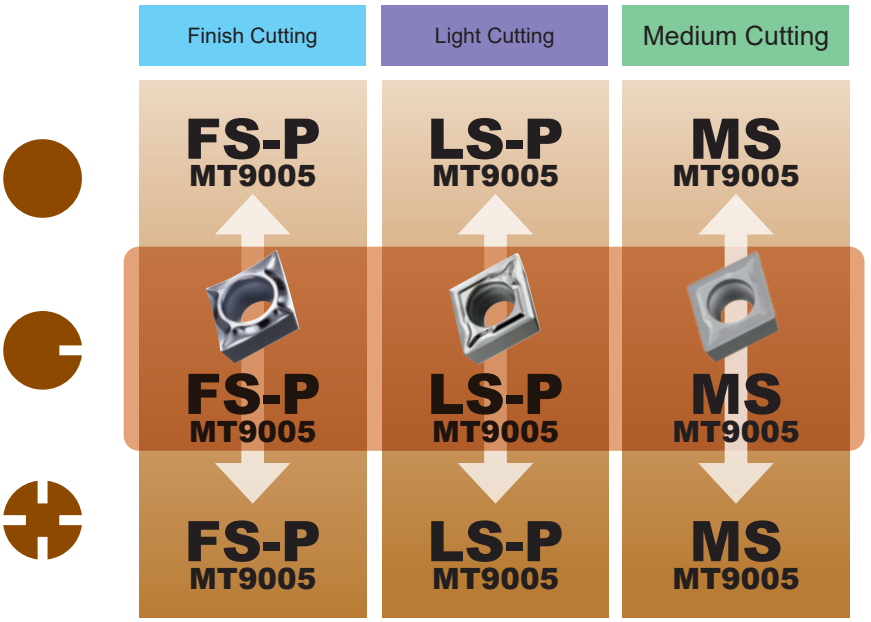
- Stable Cutting
- General Cutting
- Unstable Cutting
- F Finish Cutting

N Aluminum Alloy (EX. : A6061, A7075)

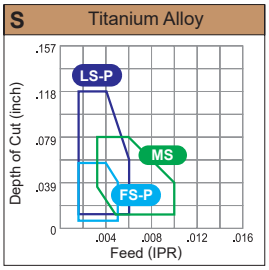
7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	**AZ**	**HTi10**	985—2295	.004—.016	.008—.118
General Cutting	F	**AZ**	**HTi10**	985—2295	.004—.016	.008—.118
Unstable Cutting	F	**AZ**	**HTi10**	985—2295	.004—.016	.008—.118



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting



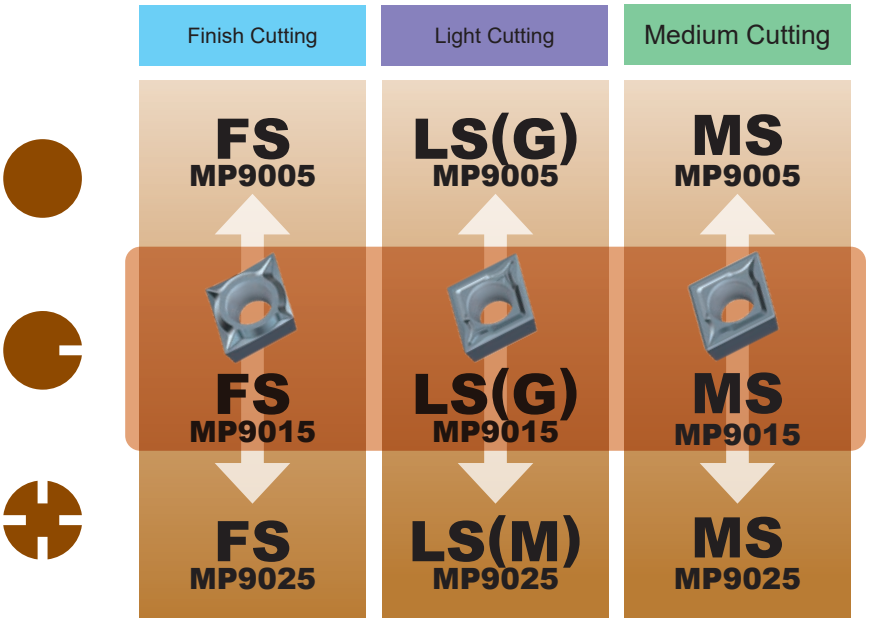
S Titanium Alloy (EX. : Ti-6Al-4V)

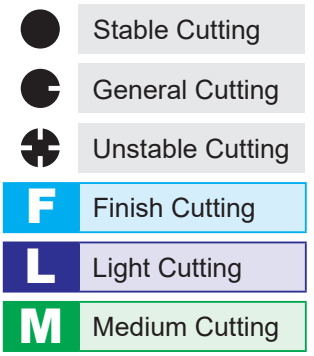
7° POSITIVE INSERTS WITH HOLE

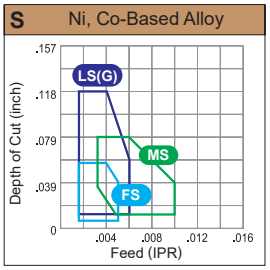
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FS-P	MT9005	130—260	.002—.005	.008—.055
	L	LS-P	MT9005	130—260	.002—.006	.012—.118
	M	MS	MT9005	115—210	.003—.010	.012—.079
General Cutting	F	FS-P	MT9005	130—260	.002—.005	.008—.055
	L	LS-P	MT9005	130—260	.002—.006	.012—.118
	M	MS	MT9005	115—210	.003—.010	.012—.079
Unstable Cutting	F	FS-P	MT9005	130—260	.002—.005	.008—.055
	L	LS-P	MT9005	130—260	.002—.006	.012—.118
	M	MS	MT9005	115—210	.003—.010	.012—.079

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING







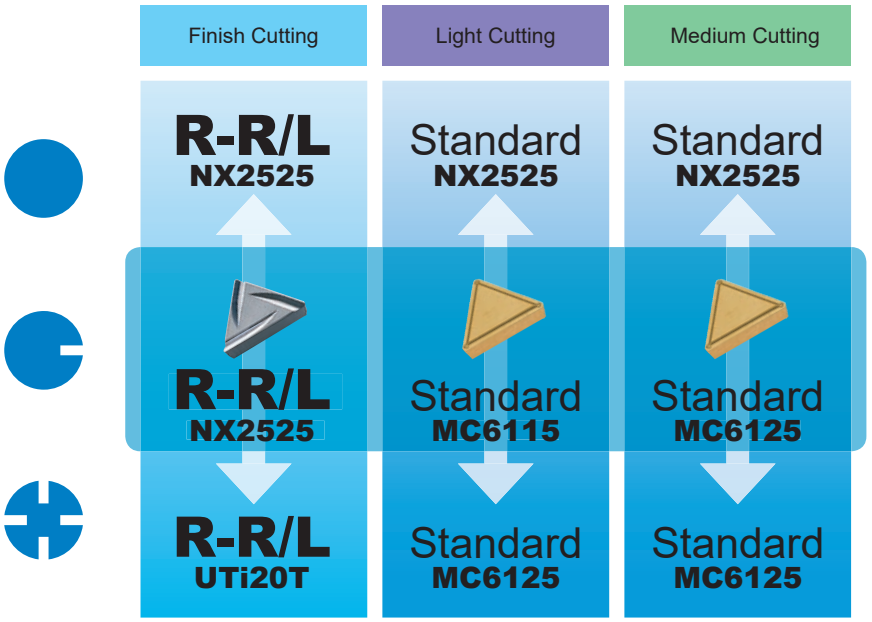
S Ni, Co-Based Alloy (EX. : Inconel718)

7° POSITIVE INSERTS WITH HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	1st Recommendation Grade	vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	FS	MP9005	150—310	.002—.005	.008—.055
	L	LS(G)	MP9005	150—310	.002—.006	.012—.118
	M	MS	MP9005	130—260	.003—.010	.012—.079
General Cutting	F	FS	MP9015	115—245	.002—.005	.008—.055
	L	LS(G)	MP9015	115—245	.002—.006	.012—.118
	M	MS	MP9015	100—195	.003—.010	.012—.079
Unstable Cutting	F	FS	MP9025	80—130	.002—.005	.008—.055
	L	LS(M)	MP9025	80—130	.002—.008	.008—.039
	M	MS	MP9025	65—115	.003—.010	.012—.079

CLASSIFICATION ➤ A064



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting

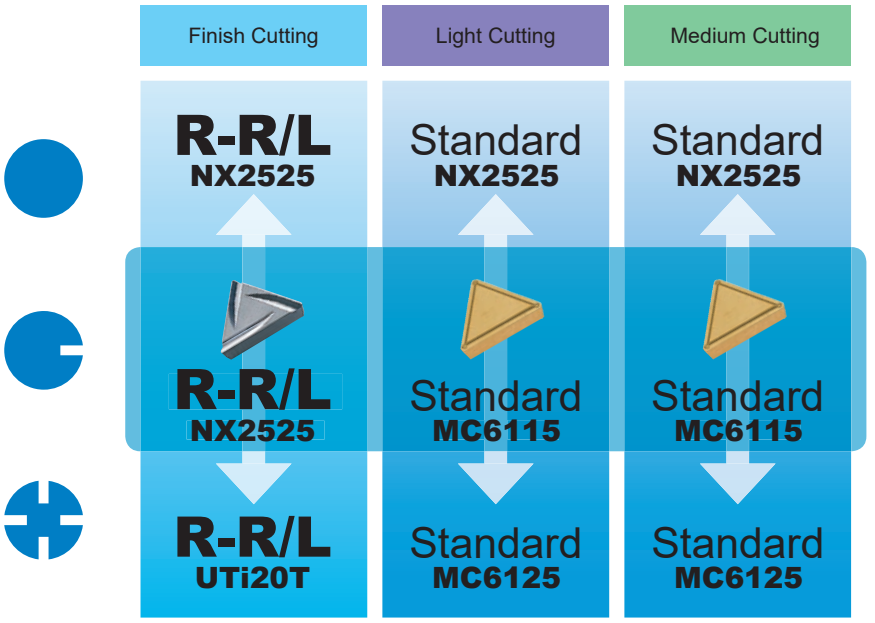
P Mild Steel (EX. : AISI ASTM A283, AISI 1010)

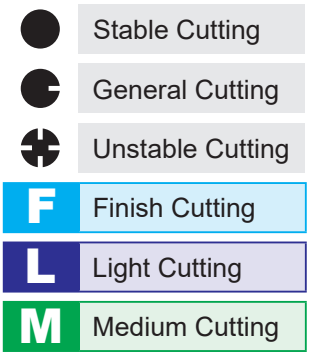
11° POSITIVE INSERTS WITHOUT HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	**R-R/L**	**NX2525**	740—1050	.002—.010	.012—.059
	L	**Standard**	**NX2525**	605—885	.003—.012	.012—.079
	M	**Standard**	**NX2525**	605—885	.003—.012	.012—.079
General Cutting	F	**R-R/L**	**NX2525**	740—1050	.002—.010	.012—.059
	L	**Standard**	**MC6115**	805—1560	.003—.012	.012—.079
	M	**Standard**	**MC6125**	885—1380	.003—.012	.012—.079
Unstable Cutting	F	**R-R/L**	**UTi20T**	375—540	.002—.010	.012—.059
	L	**Standard**	**MC6125**	885—1380	.003—.012	.012—.079
	M	**Standard**	**MC6125**	885—1380	.003—.012	.012—.079

OPTIMUM GRADES AND CHIP BREAKERS FOR EXTERNAL TURNING



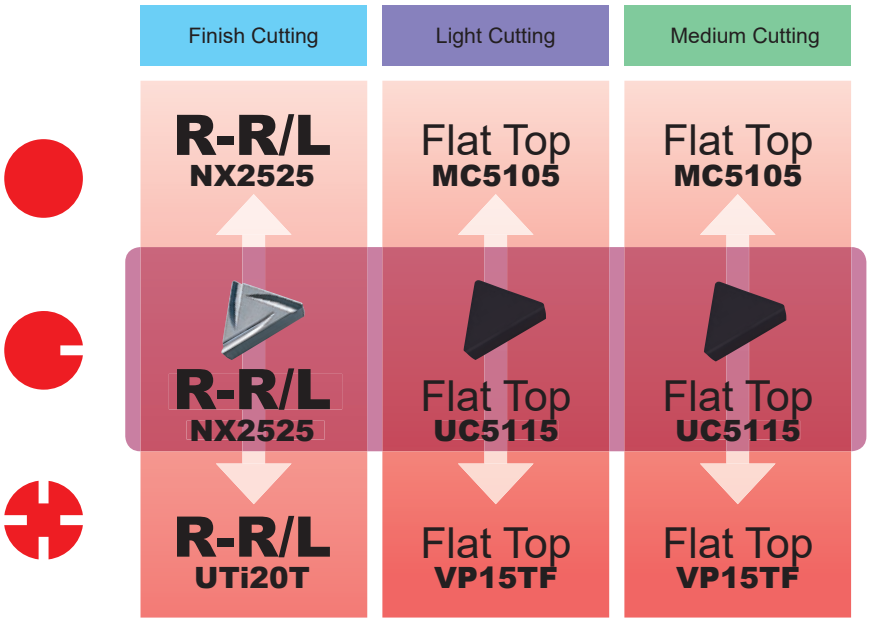


P Carbon Steel • Alloy Steel (EX. : AISI 1045, AISI 4140)

11° POSITIVE INSERTS WITHOUT HOLE

vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	**R-R/L**	**NX2525**	540—785	.002—.010	.012—.059
	L	**Standard**	**NX2525**	460—655	.003—.012	.012—.079
	M	**Standard**	**NX2525**	460—655	.003—.012	.012—.079
General Cutting	F	**R-R/L**	**NX2525**	540—785	.002—.010	.012—.059
	L	**Standard**	**MC6115**	590—1150	.003—.012	.012—.079
	M	**Standard**	**MC6115**	590—1150	.003—.012	.012—.079
Unstable Cutting	F	**R-R/L**	**UTi20T**	280—395	.002—.010	.012—.059
	L	**Standard**	**MC6125**	655—1015	.003—.012	.012—.079
	M	**Standard**	**MC6125**	655—1015	.003—.012	.012—.079



Stable Cutting
General Cutting
Unstable Cutting
F Finish Cutting
L Light Cutting
M Medium Cutting

K Cast Iron • Ductile Cast Iron (EX. : AISI No 45 B)

11° POSITIVE INSERTS WITHOUT HOLE

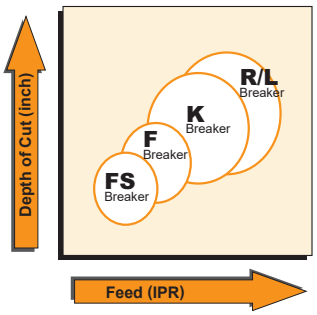
vc : Cutting speed
f : Feed
ap : Depth of cut.

	Cutting Area	Chip Breaker	Grade	1st Recommendation vc (SFM)	f (IPR)	ap (inch)
Stable Cutting	F	**R-R/L**	**NX2525**	475—655	.002—.010	.012—.059
	L	**Flat Top**	**MC5105**	540—1670	.003—.012	.012—.079
	M	**Flat Top**	**MC5105**	540—1670	.003—.012	.012—.079
General Cutting	F	**R-R/L**	**NX2525**	475—655	.002—.010	.012—.059
	L	**Flat Top**	**UC5115**	425—785	.004—.012	.012—.079
	M	**Flat Top**	**UC5115**	425—785	.004—.012	.012—.079
Unstable Cutting	F	**R-R/L**	**UTi20T**	230—345	.002—.010	.012—.059
	L	**Flat Top**	**VP15TF**	375—525	.004—.012	.012—.079
	M	**Flat Top**	**VP15TF**	375—525	.004—.012	.012—.079

PRECISION BREAKER SYSTEM

ANGULAR AND PARALLEL CHIP BREAKERS (NEGATIVE INSERTS)

■CHIP CONTROL RANGE

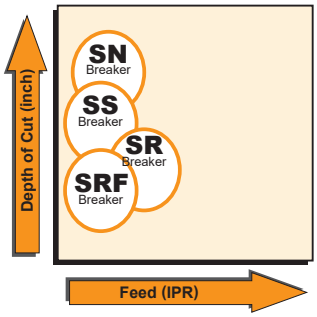


■FEATURES OF CHIP BREAKER

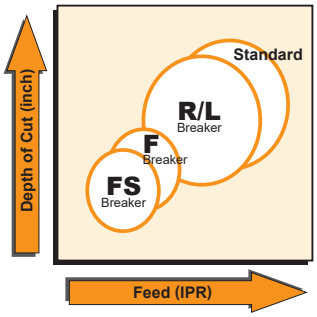
Breaker	Features	DNGG Type	SNGG Type	TNGG Type	VNGG Type
FS	● For precision finishing. ● Small width lead breaker for good chip control. ● Sharp cutting edge gives a good surface finish.	—	—		—
F	● For finish cutting. ● Lead breaker controls chip flow. ● Sharp cutting edge gives a good surface finish.	—	—		—
K	● Parallel breaker for light cutting. ● Excellent chip control for low to medium feed rates.	—	—		—
R/L	● Parallel breaker for medium cutting. ● Good chip control for medium feed rates.				

ANGULAR AND PARALLEL CHIP BREAKERS (POSITIVE INSERTS)

■For turning small, high precision parts



■For general turning



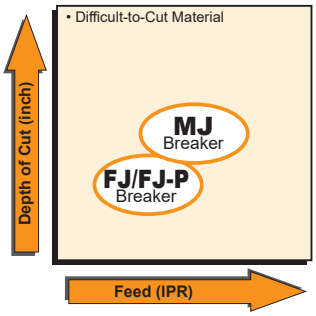
■FEATURES OF CHIP BREAKER

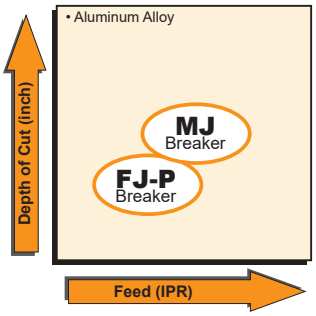
Breaker	Features	CCET Type	CCGT Type	DCET Type	DCGT Type	VBET Type
SRF	● The wide lead breaker for medium cutting is suitable for automatic lathe machining. ● The insert design for low resistance controls chip flow.	—	—	—		
SR	● The wide lead breaker for medium cutting is suitable for automatic lathe machining. ● The insert design for low resistance controls chip flow.		—		—	
SS	● The parallel breaker for light cutting is suitable for automatic lathe machining. ● Excellent chip control at low feed rates.	—		—		—
SN	● The parallel breaker for general purpose is suitable for automatic lathe machining. ● Excellent chip control for low to medium feed rates.					

Breaker	Features	CCGH/CCGT Type	CPGT Type	DCGT Type	TPGH Type	TCGT Type	VBGT/VCGT Type	WBGT Type	WCGT Type	WPGT Type
FS	● For precision finishing. ● Small width lead breaker for excellent chip control. ● Sharp cutting edge gives a good surface finish.	—	—	—		—	—	—	—	
F	● For finish cutting. ● Lead breaker controls chip flow. ● Sharp cutting edge gives a good surface finish.				—				—	—
R/L	● Lead breaker for light cutting. ● Good chip control for low to medium feed rates.	—	—	—	—	—	—	—		—
Standard	● For light cutting. ● Good chip control for low to medium feed rates.	—		—	—	—	—	—	—	—

3D MOLDED CHIP BREAKERS (NEGATIVE INSERTS)

■CHIP CONTROL RANGE



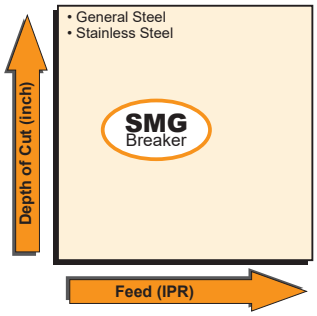


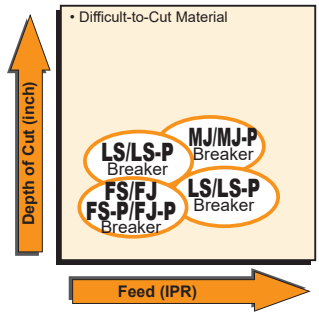
■FEATURES OF CHIP BREAKER

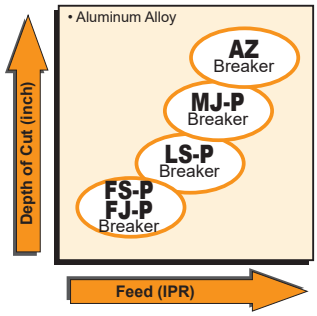
Breaker	Features	CNGG Type	DNGG/DNGM Type	VNGG/VNGM Type
FJ	● Ideal for heat-resistant alloy. ● The sharp edge produces good cutting surface.			
FJ-P	● Ideal for aluminum and copper. ● The sharp edge produces excellent surface finishes.		—	—
MJ	● Ideal for heat-resistant alloy and titanium alloy. ● The sharp edge produces excellent surface finishes.			

3D MOLDED CHIP BREAKERS (POSITIVE INSERTS)

■CHIP CONTROL RANGE







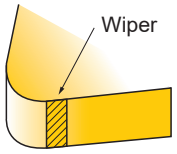
■FEATURES OF CHIP BREAKER

Breaker	Features	CCGT Type	DCGT Type	TCGT Type	VCGT Type	WCGT/RCGT Type
FS	● Ideal for heat-resistant alloys, titanium alloys, and cobalt chrome alloys. ● Sharp cutting edges provide excellent surface precision and finish.			—	—	—
FS-P	● Ideal for titanium alloys and copper alloys. ● Sharp cutting edges provide excellent surface precision and finish.			—	—	—
FJ	● The curved cutting edges support changes in cutting depth-smooth chip discharge and disposal. ● The large rake angle highly suitable for finishing difficult-to-cut materials.			—	—	—
FJ-P	● Ideal for aluminum and copper. ● The sharp edge produces excellent surface finishes.				—	
LS	● Ideal for heat-resistant alloy and titanium alloy and cobalt chrome alloy. ● Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.			—		—
LS-P	● Ideal for aluminum and copper. ● The polished insert face prevents built up edge.			—		—
MJ	● The curved cutting edges support changes in cutting depth-smooth chip discharge and disposal. ● Large rake angle highly suitable for finish- light cutting difficult-to-cut materials.				—	
MJ-P	● Ideal for aluminum and copper. ● The sharp edge produces excellent surface finishes.				—	
SMG	● For medium cutting. ● 3D molded chipbreaker provides good chip control.Breaker geometry appropriate for copying and back turning.			—	—	—
AZ	● The high rake angle and 3D curved cutting edge provides sharpness at the cutting point. ● Additionally the 3D shape of the rake face enables excellent chip control.					

WIPER INSERT

What is a Wiper Insert?

- The wiper insert is designed with a wiper edge that is situated where the straight edge meets the corner radius.
- In comparison to conventional breakers, the surface finish does not deteriorate even if the feed rate is doubled.
- Machining at high feed rates improves cutting efficiency.



●Improving Surface Finish
Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the work material can be improved.

●Improving Efficiency
High feed rates not only shortened machining times but also make it possible to combine roughing and finishing operations.

●Increased Tool Life
When a change to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

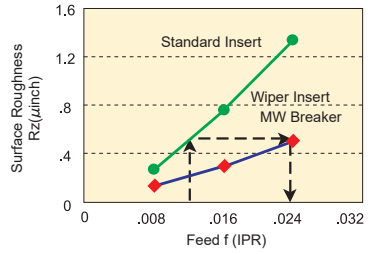
●Improving Chip Control
Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

Wiper insert + High feed (The feed rate is doubled.)

Finished surface Same surface roughness =

Standard insert + The conventional feed condition

*Please use a wiper insert at high feed rate.



<Cutting Condition>
Work material : AISI 1045
Insert : CNMG432□□
Cutting Speed=655 SFM
Depth of Cut=.059 inch
Feed rate=.008—.024 IPR
with flood coolant

<Ex>The surface roughness does not deteriorate even if the feed rate is doubled (.012"→.024")!

■A wiper insert + machining at high feed rate
- Reduced machining time (per work material)
- Increased number of work material (per definitive time period)
- Improving chip control

■A wiper insert + machining at conventional feed rate
- Eliminating the finishing step by roughing and finishing together (Separate roughing and finishing steps → Single-step machining)

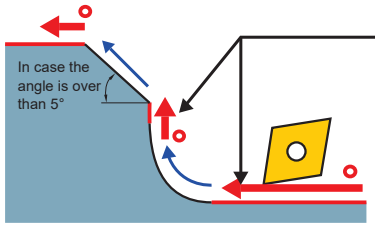
- Reducing cycle times
- Increased productivity
- Avoiding Line-Stoppage

<The Realization of Reduced Costs!!>

■ The estimate of finished surface roughness when using a wiper insert

The effects of wiper inserts on external machining, boring and facing.

*The surface roughness when machining at corner R or taper angle over 5°, is the same as machining with standard inserts.



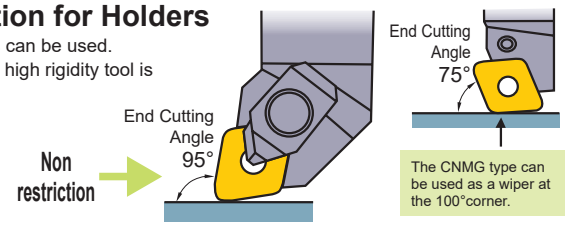
Rz(W)=Rz×0.5

Rz(W) = Finished surface roughness when using a wiper insert.
Rz : Finished surface roughness from conventional conditions. (When using a standard insert)

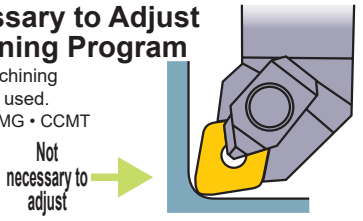
Effective uses of a wiper insert
Non effective uses of a wiper insert

■ Special attention is not necessary when using CNMG • WNMG • CCMT types

●No Restriction for Holders
A standard holders can be used.
(*A double clamp, high rigidity tool is recommended.)



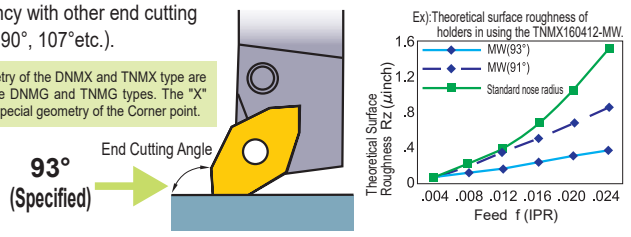
●Not Necessary to Adjust the Machining Program
Conventional machining programs can be used.
(The CNMG • WNMG • CCMT types are based on the ISO/ANSI.)



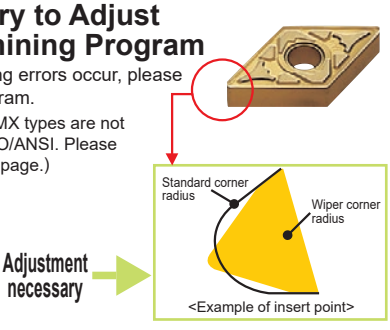
■ Special attention is necessary when using the DNMX • TNMX types due to the special top face geometry

●Restriction for Holders
Use a holder with end cutting angle 93° for improving wiper efficiency. A holder with end cutting angle 91° can improve wiper efficiency (see the following figure), however, there is no wiper efficiency with other end cutting angles (60°, 90°, 107°etc.).

The hole geometry of the DNMX and TNMX type are the same as the DNMG and TNMG types. The "X" represents the special geometry of the Corner point.



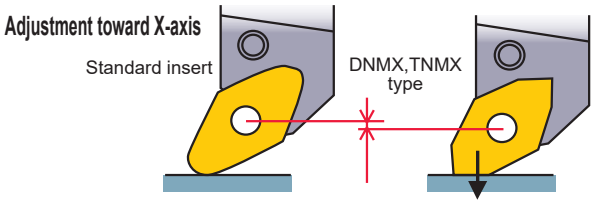
●Necessary to Adjust the Machining Program
When machining errors occur, please adjust the program.
(The DNMX•TNMX types are not based on the ISO/ANSI. Please refer to the next page.)



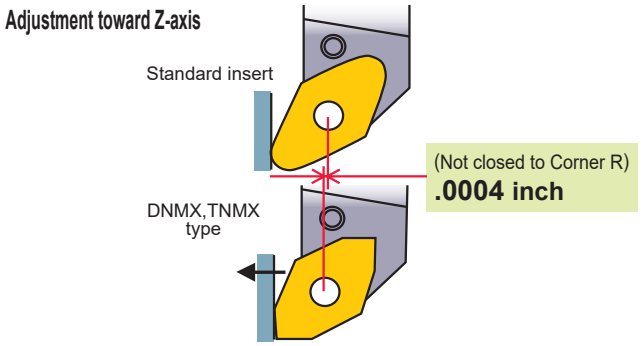
■Adjustment of machining programs for DNMX • TNMX types

Basic Process) Adjusting Toward X-axis and Z-axis

Adjusting the differential between a standard insert and Z-axis / X-axis.



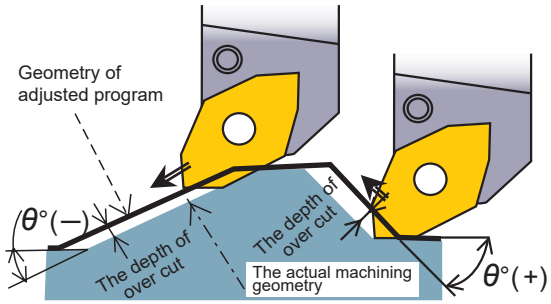
Corner radius .016",.031" : **.0016 inch**
Corner radius .047" : **.0020 inch**



A) Adjusting a Taper ⁎Necessary to maintain a correct taper.

Adjust the relief angle toward the normal line.

Note1) Adjust the angle toward the normal line in the case where the adjustment number is minus (θ =60°—70°) and is not machined completely.



Classification

Nose Radius	Taper Angle θ°															
	-25—-15	-10	-5	**0**	5	10	15	20—35	40	45	50	55	60—65	70	75—85	**90**
.047	.0016	.0012	.0004	**0**	.0008	.0012	.0016	.0020	.0016	.0016	.0008	.0004	-.0004	0	.0004	**0**
.031	.0012	.0008	.0004	**0**	.0004	.0008	.0012	.0016	.0012	.0012	.0008	0	-.0004	0	.0004	**0**
.016	.0008	.0004	.0004	**0**	.0004	.0004	.0008	.0008	.0008	.0004	.0004	0	-.0004	-.0004	0	**0**

Values→+numbers:adjustment of relief angle, -numbers:adjustment of plunge in angle (inch)

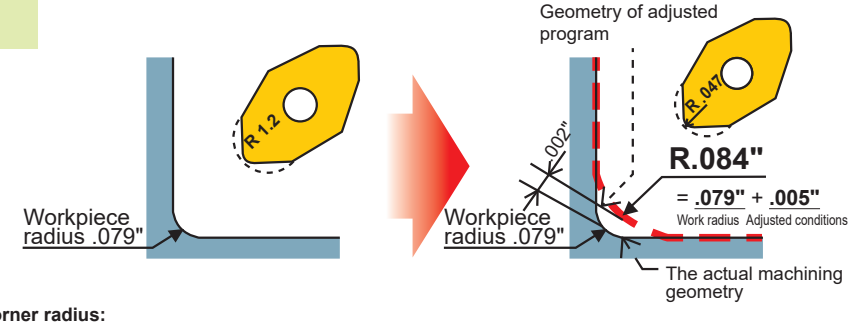
B) Adjusting a Corner R ⁎Necessary to maintain a correct corner radius.

Adjust the work diameter same as the taper to prevent over-cut.

The value of adjustment to work R
= Work R + the adjustment value
⁎No adjusting the corner radius in this case.

The corner radius of the insert	The adjustment amount on the workpiece radius.
Corner Radius .016" →	Work Radius**+.0020"**
Corner Radius .031" →	Work Radius**+.0043"**
Corner Radius .047" →	Work Radius**+.0055"**

Ex) : In case of machining R .079" when using a corner R .047" type insert.



The Easy-to-correct Method

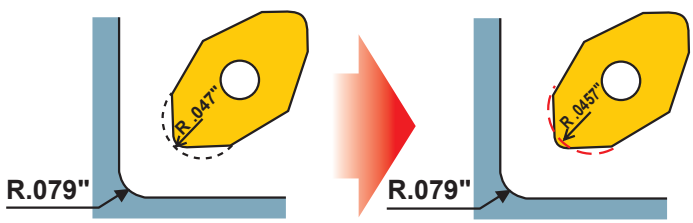
In correcting corner radius:
It is not necessary to adjust the machining program, however, machining errors can occur within max. ± .0012" due to correcting by an approximate number.

Corner Radius Correction Input the correction number of each corner radius.

The value of corrected corner radius
= approximation
⁎No adjustment required in machining program.

The corner radius of a insert	The value of corrected corner radius = approximation
Corner Radius .016" →	**R.0142"**
Corner Radius .031" →	**R.0299"**
Corner Radius .047" →	**R.0457"**

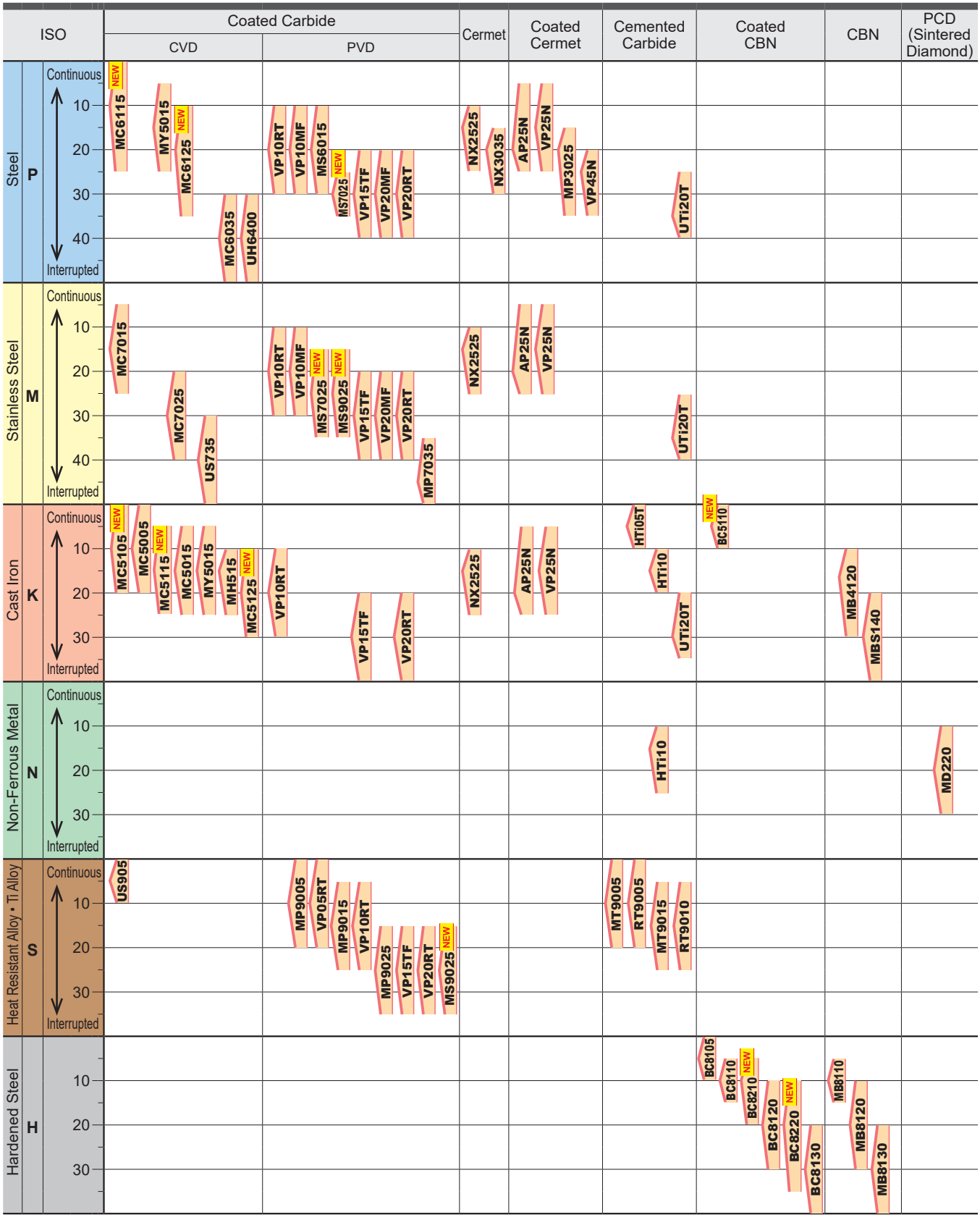
Ex):In the case of machining a corner with a radius R .079" when using an insert with a corner radius R .047".



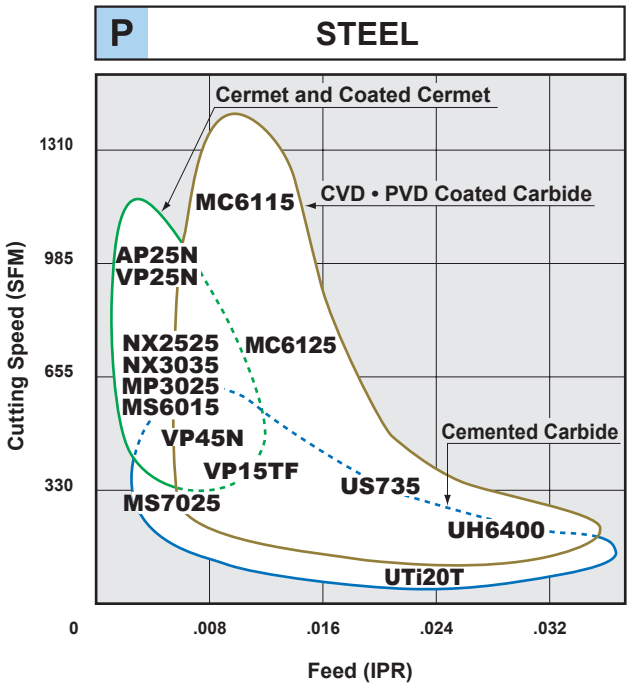
Others) The value of correction is same for both DNMX and TNMX. Discriminate them by the size of corner radius.

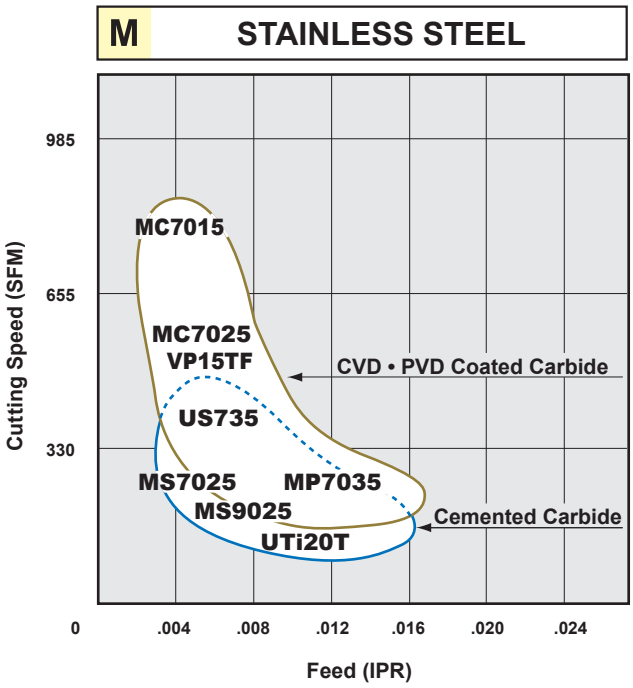
GRADES FOR TURNING

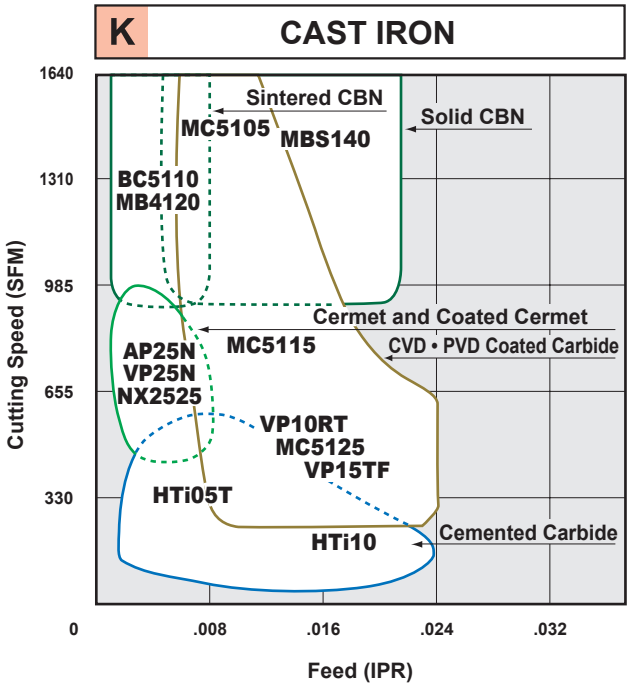
●INDEXABLE INSERT GRADES FOR TURNING

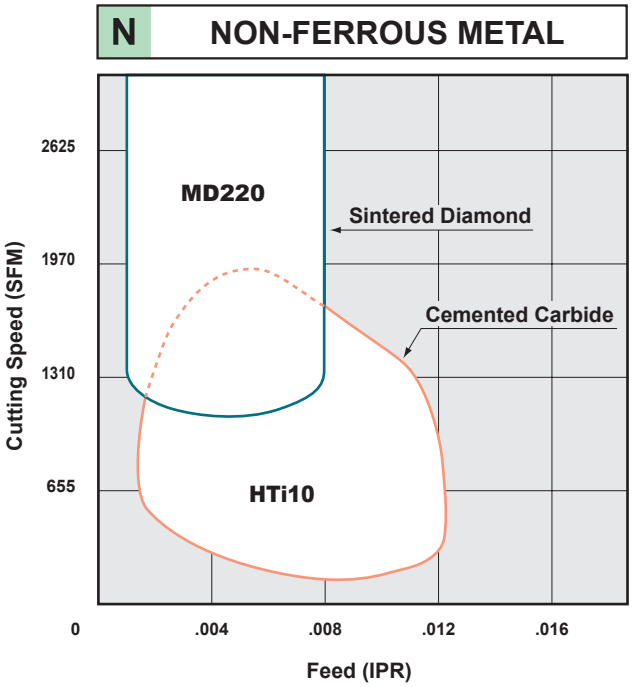


TURNING APPLICATION RANGE





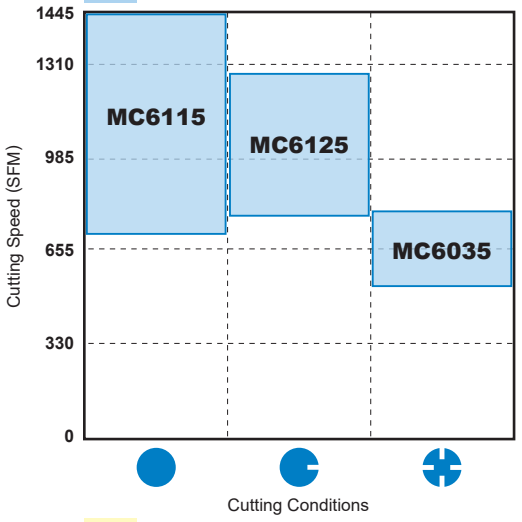




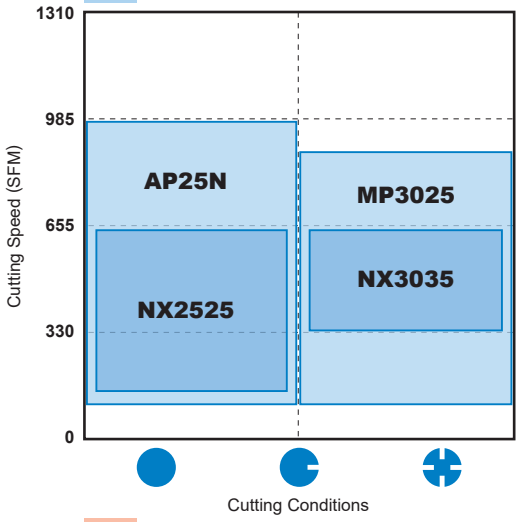
TURNING APPLICATION RANGE

●Recommendation of the insert grade based on cutting speed and conditions for each work material.

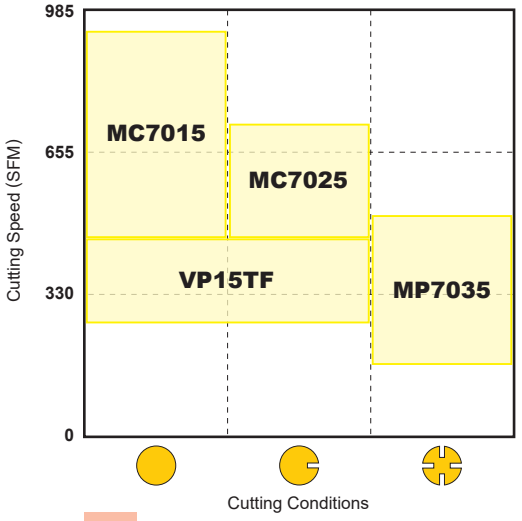
P STEEL (Medium-Rough Cutting)



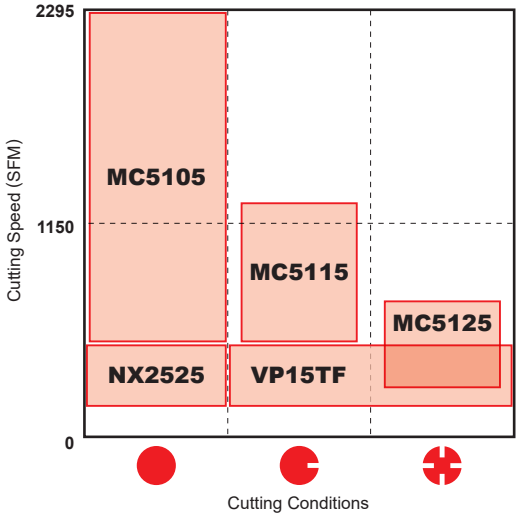
P STEEL (Finish Cutting)



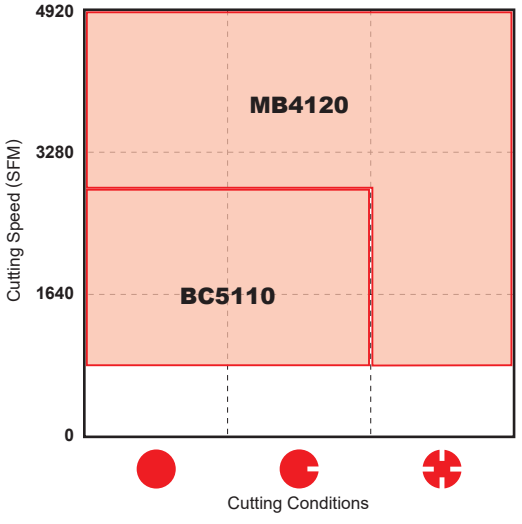
M STAINLESS STEEL



K CAST IRON



K CAST IRON (CBN)



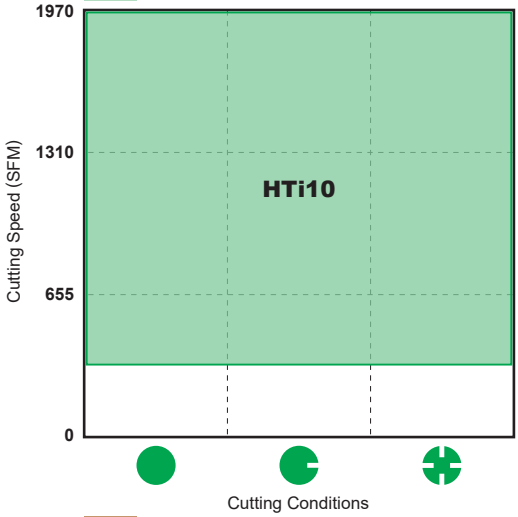
CUTTING CONDITIONS

Stable Cutting — Continuous Cutting, Constant Depth of Cut, Pre-Machined, Securely Clamped Component

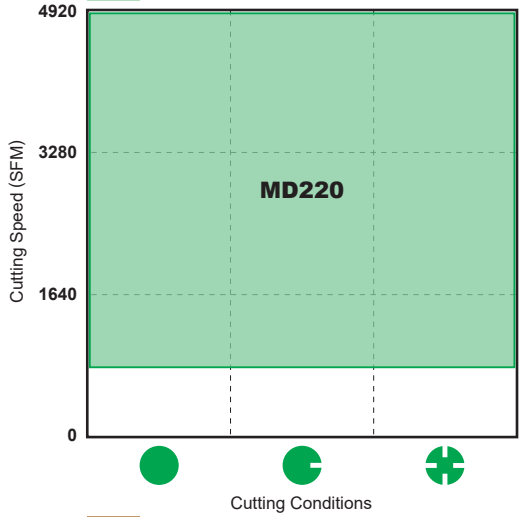
Unstable Cutting — Heavy Interrupted Cutting, Irregular Depth of Cut, Low Clamping Rigidity

General Cutting

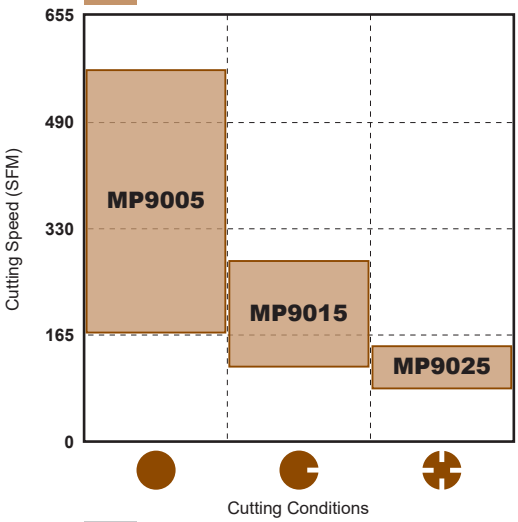
N NON-FERROUS METAL



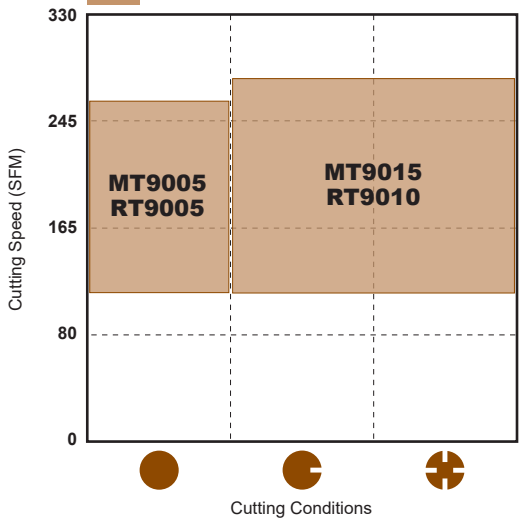
N NON-FERROUS METAL (PCD)



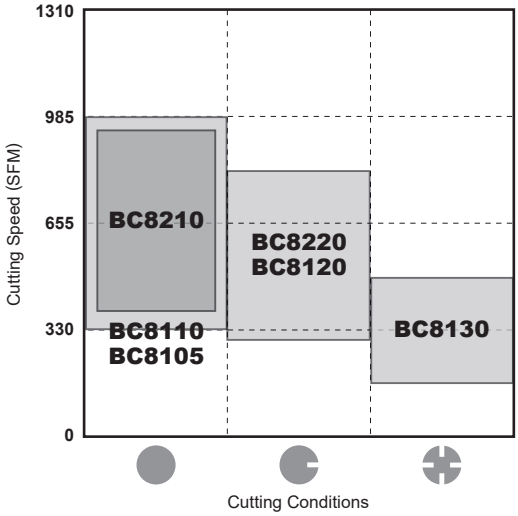
S HEAT RESISTANT ALLOY



S TITANIUM ALLOY



H HARDENED MATERIALS (CBN)



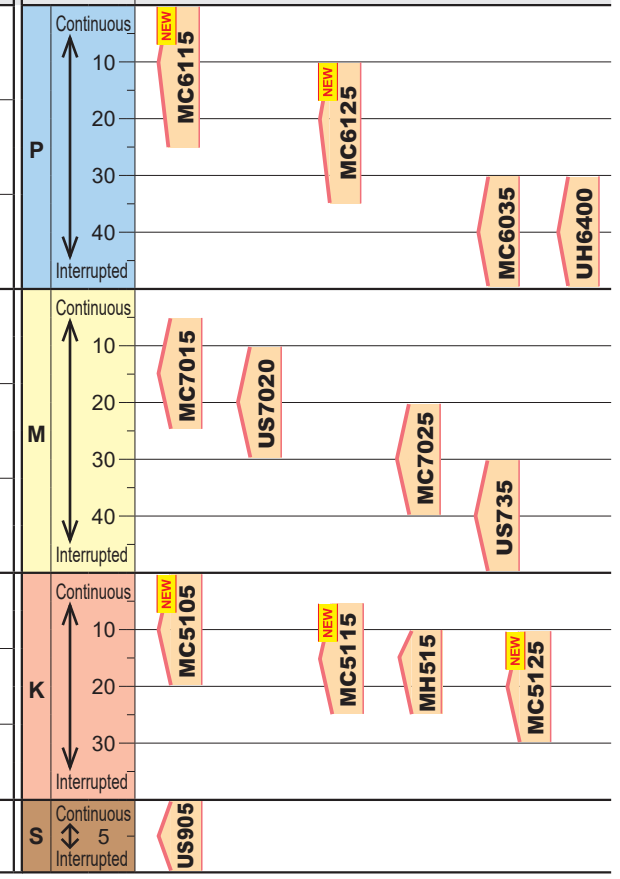
COATED CARBIDE (CVD)

- Special tough fibrous structure improves wear and fracture resistance.
- It covers a wide application range and thus reduces the number of tools required.

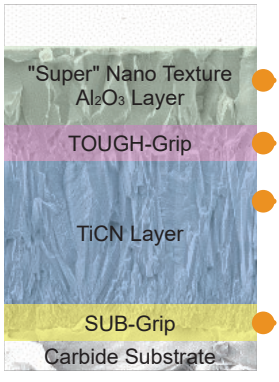
■ SELECTION STANDARD

●TURNING

	Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (SFM)
P	Steel	Continuous Cutting	NEW MC6115	1115 (705 — 1575)
			NEW MC6125	1080 (690 — 1525)
		Interrupted Cutting	MC6035	490 (260 — 665)
M	Stainless Steel	Continuous Cutting	MC7015	720 (510 — 935)
			MC7025	590 (460 — 720)
		Continuous and Interrupted Cutting	US735	425 (245 — 605)
K	Cast Iron Ductile Cast Iron	Continuous Cutting	NEW MC5105	1418 (540 — 2295)
			NEW MC5115	875 (490 — 1260)
		Interrupted Cutting	NEW MC5125	490 (260 — 720)
S	Heat Resistant Alloy	Continuous and Interrupted Cutting	US905	70 (45 — 95)



MC5115



- Al_2O_3 layer with excellent wear resistance
- Intermediate layer with microstructure suitable for ductile cast iron
- Thick TiCN layer suitable for coping with the hardness of ductile cast iron
- New adhesion layer with an enhanced resistance to peeling

Tough and Sub Grip Layers for Ductile Cast Iron Grades

The extra strength of the adhesion between the coating layers (1.3 times stronger) suppresses peeling during machining of ductile cast iron.

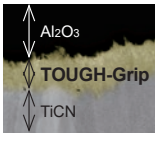
Adhesion is 1.3 Times* Greater!

MC5115

*Compared with a conventional Mitsubishi product.

TOUGH-Grip

The interface between the layers is controlled at the nano level, allowing the TOUGH-Grip layer extremely high levels of adhesion to prevent delamination.



SUB-Grip

By increasing the degree of adhesion between the carbide substrate and the coating layer, a coating layer has been developed that is resistant to peeling even during strong intermittent machining.

By Image

■ GRADE CHARACTERISTICS

Workpiece Material		Grade	Substrate	Coating Layer	
			Hardness (HRA)	Composition	Thickness
P	Steel	NEW **MC6115**	90.8	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
		NEW **MC6125**	90.0	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
		UH6400	89.5	Accumulated TiCN-Al_2O_3-Ti Compound	Thick
M	Stainless Steel	**MC7015**	90.7	TiCN-Al_2O_3-TiN	Thin
		US7020	90.5	TiCN-Al_2O_3-TiN	Thin
		MC7025	89.4	TiCN-Al_2O_3-TiN	Thin
		US735	89.0	Ti Compound	Thin
K	Cast Iron Ductile Cast Iron	NEW **MC5105**	91.0	TiCN-Al_2O_3	Thick
		NEW **MC5115**	91.0	TiCN-Al_2O_3	Thick
		NEW **MC5125**	91.0	TiCN-Al_2O_3	Thick
	Heat Resistant Cast Steel	**MH515**	91.0	TiCN-Al_2O_3	Thick
S	Heat Resistant Alloy	**US905**	92.2	TiCN-Al_2O_3-TiN	Thin

Note 1) Hardness shows representative value of the substrate.

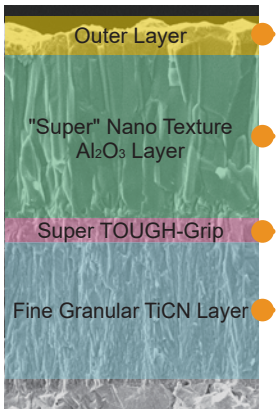
■ Super Nano Texture Technology

The standard Nano Texture Technology has been improved and developed to be an industry leading standard for crystal growth of Al_2O_3 coatings. This Super Nano Texture Technology increases tool life and wear resistance due to the fine, dense crystal growth process.

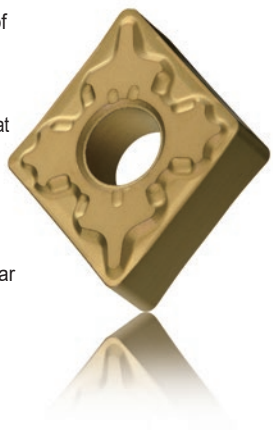
■ Super TOUGH-Grip

The Super TOUGH-Grip layer has finer crystal grains that enhance the strength of the adhesion between the coating layers.

MC6115



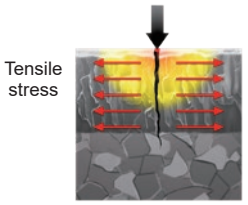
- Outer Layer: Gold color assists easy identification of edge use.
- "Super" Nano Texture Al_2O_3 Layer: Outstanding wear resistance especially at high temperatures.
- Super TOUGH-Grip: Strong adhesion between the tough coating layers.
- Fine Granular TiCN Layer: Coating for high wear resistance.



Reducing the effect of severe fracturing

Cracks that occur during unstable machining are prevented due to the relaxing of the tensile stress in the coating. MC6100 series has an 80% reduction in coating tensile stress compared to conventional CVD inserts.

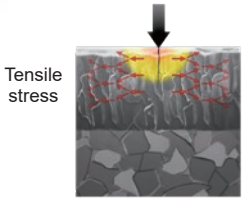
Impact stress when interrupted cutting



Conventional CVD Inserts

Cracks are generated in the surface of coatings during machining. They propagate through the coating into the substrate due to the large tensile stress in the coating structure. This creates one of the main causes of sudden insert breakage.

Impact stress when interrupted cutting



MC6100 Series

Relaxing of the Tensile Stress

MC6100 series has a much lower level of stress than conventional CVD coatings due to the surface treatment. This divides the force of impacts during machining and protects from sudden fracturing.

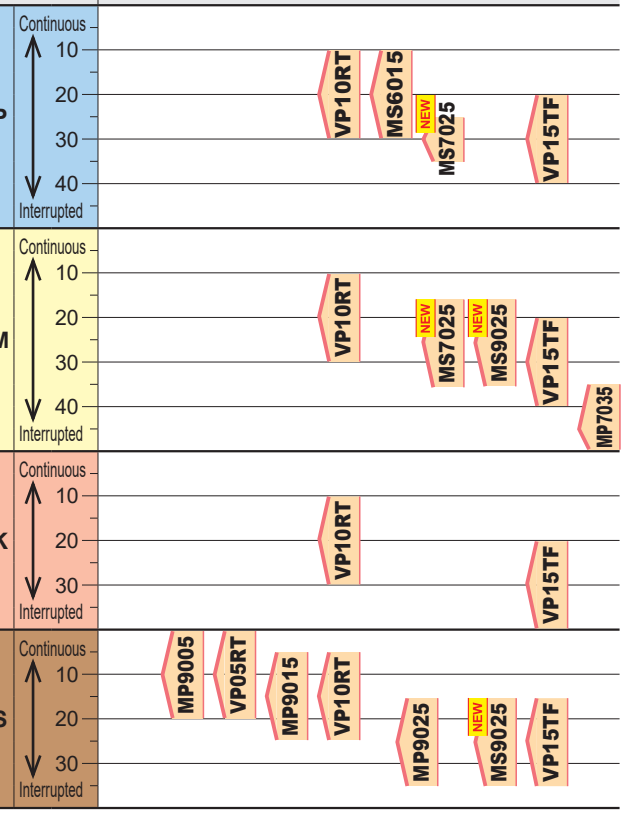
COATED CARBIDE (PVD)

- PVD coating prolongs tool life under the same cutting conditions compared to uncoated carbide.
- Coating of tools with sharp edges is possible without softening or changing the edge quality of the substrate.

■ SELECTION STANDARD

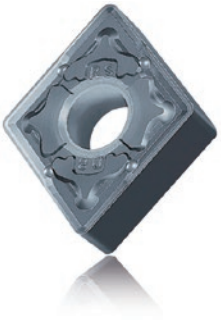
●TURNING

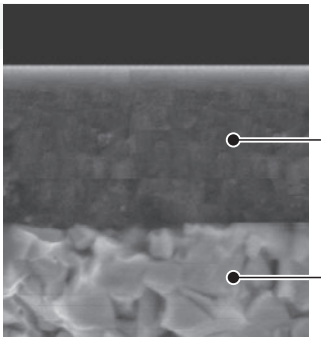
	Work Material	Recommended Grade	Recommended Cutting Speed (SFM)
P	Steel	**VP10RT**	395 (330 — 490)
		VP15TF	330 (165 — 490)
M	Stainless Steel	**VP10RT**	395 (330 — 490)
		VP15TF	330 (260 — 440)
		MP7035	395 (280 — 510)
K	Cast Iron	**VP10RT**	395 (330 — 490)
		VP15TF	395 (330 — 490)
S	Heat Resistant Alloy	**MP9005**	260 (165 — 360)
		MP9015	195 (115 — 280)
		MP9025	100 (80 — 150)



ISO Turning Inserts for Difficult to Cut Materials

MP9005/MP9015/MP9025





ISO Grade	Grade	Concept	Application
S01	**MP9005**	Top-quality grade focusing on wear resistance	Heat Resistant Alloy Finish-Medium Cutting
S10	**MP9015**	First recommendation for general applications	Heat Resistant Alloy Medium-Rough Cutting
S30	**MP9025**	Prevents severe damage for increased stability	Heat Resistant Alloy Interrupted • Light-Rough Cutting

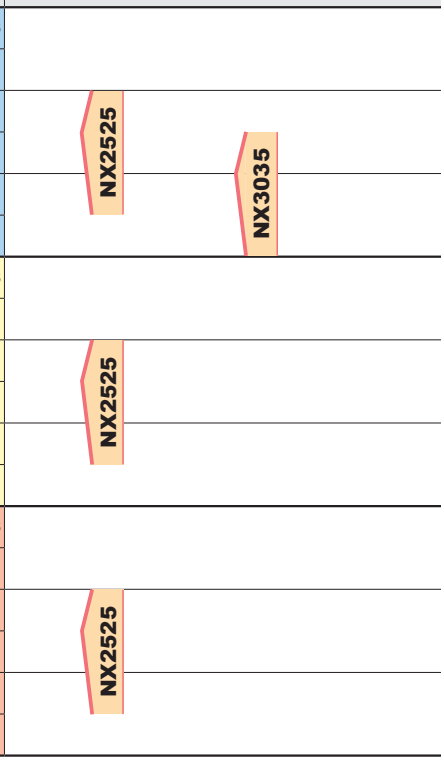
CERMET

- The optimized alloy structure and special alloy binder improves both wear and fracture resistance.
- It covers a wide application range and reduces the number of tools required.
- NX3035 for wet cutting.
- NX2525 for dry cutting.

■SELECTION STANDARD

●TURNING

	Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	Continuous Cutting	**NX2525**	755 (575 — 985)	P	NX2525
		Interrupted Cutting	**NX3035**	720 (560 — 935)		NX3035
M	Stainless Steel	Continuous Cutting	**NX2525**	330 (210 — 440)	M	NX2525
K	Cast Iron Ductile Cast Iron	Finishing	**NX2525**	560 (425 — 690)	K	NX2525



■GRADE CHARACTERISTICS

Grade	Hardness (HRA)
NX2525	92.2
NX3035	91.5

Note 1) Hardness shows representative value of the substrate.

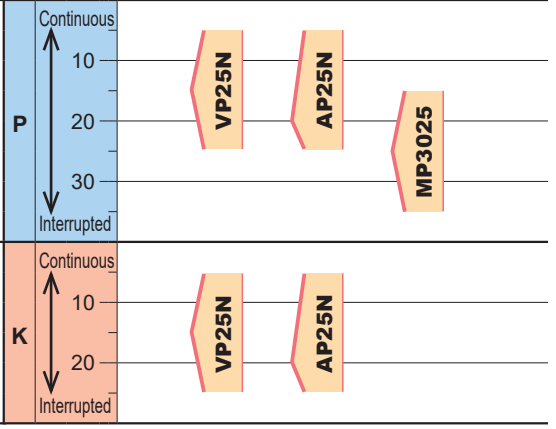
COATED CERMET

●Coated cermet (PVD coating) has superior wear and fracture resistance, and therefore provides a stable cutting performance.

■SELECTION STANDARD

●TURNING

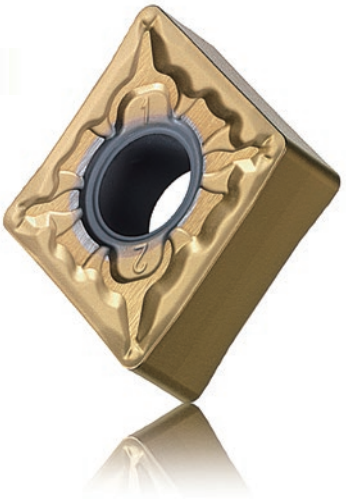
	Work Material	Cutting Mode	Recommended Grade	Recommended Cutting Speed (SFM)
P	Steel	Continuous Cutting	**VP25N AP25N**	885 (655 — 1130)
		Interrupted Cutting	**MP3025**	820 (590 — 1080)
K	Cast Iron Ductile Cast Iron	Finishing	**VP25N AP25N**	620 (510 — 740)

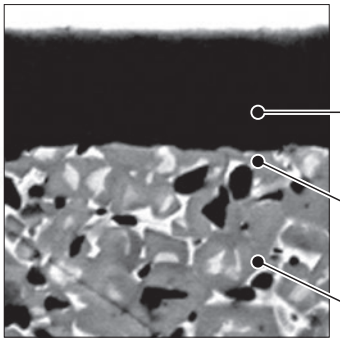


Effective for production of small parts.

MP3025

MP3025 provides improved adhesion for coating layer due to the newly-developed special substrate. Uniform flank wear allows prolonged machining that maintains excellent surface finish.





Ti-compound PVD coating provides excellent wear and welding resistance.

Substrate surface provides excellent adhesion strength for coating layer.

Substrate with superior fracture resistance and thermal shock resistance.

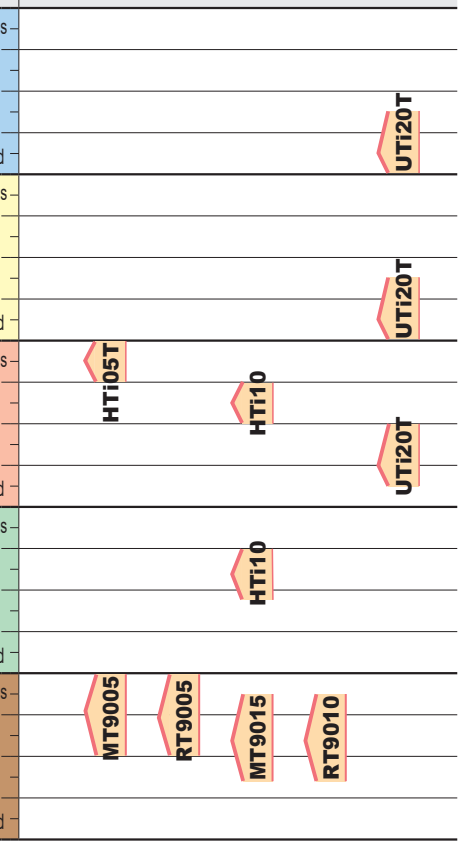
CEMENTED CARBIDE

●UTi grades are available for steel and cast iron. HTi grades are available for non-ferrous and non-metal materials and are also suitable for cast iron.

■SELECTION STANDARD

●TURNING

Work Material		Recommended Grade	Recommended Cutting Speed (SFM)	ISO	Application Range
P	Steel	**UTi20T**	360 (295 — 425)	P	UTi20T
M	Stainless Steel	**UTi20T**	330 (260 — 375)	M	UTi20T
K	Cast Iron	**HTi05T**	395 (260 — 540)	K	HTi05T
		HTi10	330 (245 — 440)		HTi10
		UTi20T	260 (195 — 360)		UTi20T
N	Non-Ferrous Metal	**HTi10**	1640 (985 — 2295)	N	HTi10
S	Heat Resistant Alloy Ti Alloy	**MT9005 RT9005**	165 (115 — 260)	S	MT9005 RT9005 MT9015 RT9010
		MT9015 RT9010	195 (115 — 280)		



■MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Work Material
P M	WC-TiC-TaC-Co	Heat / deformation resistance.	Carbon steel, alloy steel, stainless steel and cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, non-ferrous metals, and non-metal
S	WC-Co	High heat resistance and wear resistance.	Heat resistant alloy, Ti alloy

■GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)
P M	**UTi20T**	90.5
K N	**HTi05T**	92.5
	HTi10	92.0
S	**MT9005/RT9005**	92.2
	MT9015/RT9010	92.0

Note 1) Hardness shows representative value of the substrate.

MICRO-GRAIN CEMENTED CARBIDE

● Compared to general cemented carbide, micro-grain alloy has higher wear resistance and higher toughness.

SELECTION STANDARD

Cutting Tool	Recommended Grade	Work Material
Turning Inserts Milling Inserts Carbide Drills	**TF15**	Steel Cast Iron

GRADE CHARACTERISTICS

Grade	Grade Characteristics *		ISO	Wear Resistance	Fracture Resistance	Corrosion Resistance
	Hardness (HRA)	T.R.S (Gpa)				
TF15	91.0	4.0	K20	◎	○	◎

* After HIP

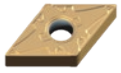
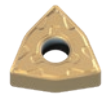
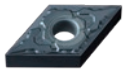
Note 1) Hardness shows representative value of the substrate.

Memo

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	FP	**First recommendation for finishing carbon steel and alloy steel** Controls chip clogging during high-feed cutting and prevents chips of soft workpiece materials from running onto their surfaces. Large rake angle suppress chatter vibration and deformation in machining of low rigidity workpiece material.	Carbon Steel·Alloy Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner 20° Flank 20° CNMG432FP
		FH	**First recommendation for finishing carbon steel and alloy steel** Stable chip control even at small depths of cut.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Corner 12° Flank 12° CNMG432FH
		FS	**Alternative chip breaker for finishing mild steel** Stable chip control even at small depths of cut. Sharp edge gives best performance.	Mild Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Corner 16° Flank 8° CNMG432FS
	G Class	NEW FS	**Recommendation for finishing difficult-to-cut materials** Excellent chip breaking even at very small depths of cut. The large rake angle and precision grade enables excellent sharpness.	Difficult-to-Cut Materials ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) .009" Corner 25° .017" Flank 25° CNGG432FS
	M Class	FY	**First recommendation for finishing mild steel** Effectively controls adhesive chips. Suitable for mild steel finishing.	Difficult-to-Cut Materials ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Corner 15° Flank .008" 15° CNMG432FY
	G Class	FJ	**Alternative breaker for finishing difficult-to-cut materials** Ideal for heat resistant alloys and titanium alloys. The sharp edge produces good cutting surface. The curved edge allows smooth chip discharge.	Titanium alloy ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Corner 14° Flank 9° CNGG431FJ
		FJ-P	**Recommendation for finishing titanium alloy** Double sided chipbreaker. Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Corner 14° Flank 9° CNGG431FJ-P
		R/L FS	**Chip breaker for precise finishing** A narrow lead chip breaker for good chip control. The sharp edge produces a good surface finish.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Flank 14° TNGG331RFS
		R/L F	**Chip breaker for finishing** Lead chip breaker controls chip flow. The sharp edge produces a good surface finish.	Carbon Steel·Alloy Steel ap (inch) .118 .079 .039 0 .004 .008 .012 .016 f (IPR) Flank 14° TNGG331RF

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_FP A106	DNMG_FP  A114	SNMG_FP A123	TNMG_FP A130	VNMG_FP A138	WNMG_FP  A142	
	CNMG_FH A106	DNMG_FH A114	SNMG_FH A123	TNMG_FH A130	VNMG_FH A138	WNMG_FH A142	
	CNMG_FS A106	DNMG_FS A114	SNMG_FS A123	TNMG_FS A130	VNMG_FS A138	WNMG_FS A142	
	CNGG_FS NEW A106	DNGG_FS NEW  A114		TNGG_FS NEW A130	VNGG_FS NEW A138		
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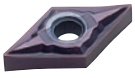
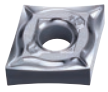
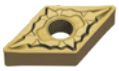
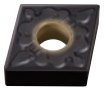
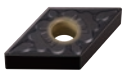
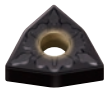
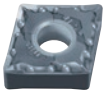
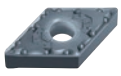
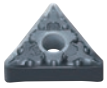
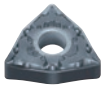
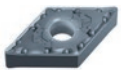
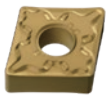
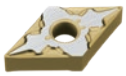
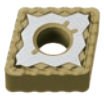
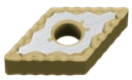
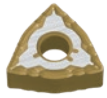
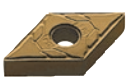
	CNGG_FJ A106	DNGG_FJ  A115			VNGG_FJ A138		
	CNGG_FJ-P  A107						
				TNGG_R/L FS A131			
				TNGG_R/L-F A131	VNGG_R/L-F A138		

CLASSIFICATION

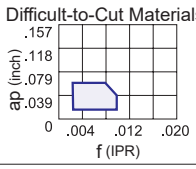
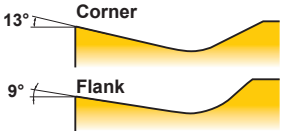
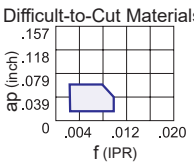
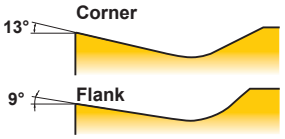
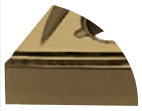
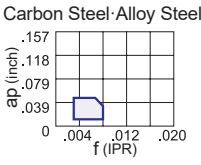
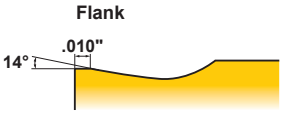
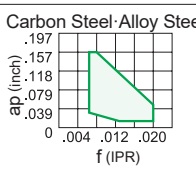
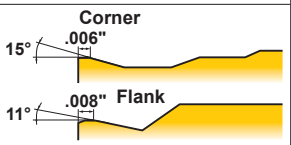
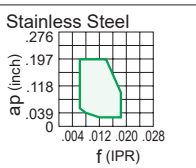
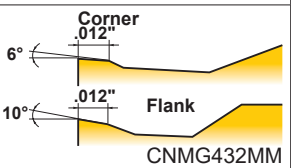
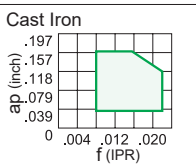
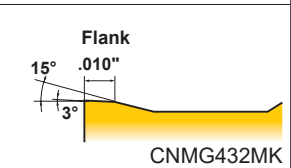
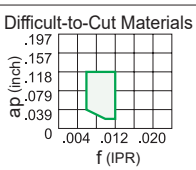
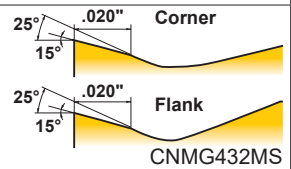
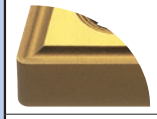
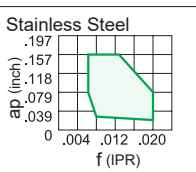
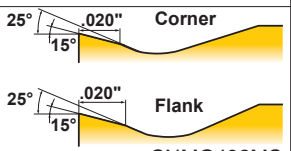
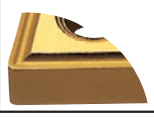
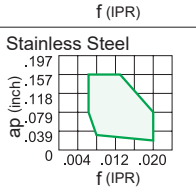
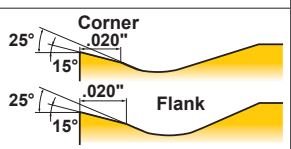
NEGATIVE INSERTS WITH HOLE

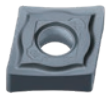
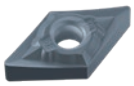
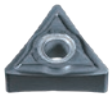
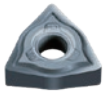
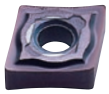
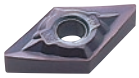
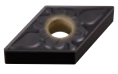
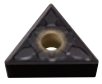
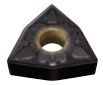
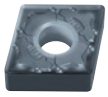
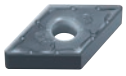
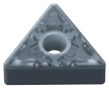
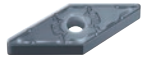
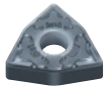
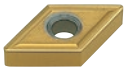
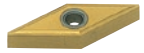
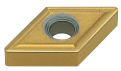
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	LP	**First recommendation for light cutting of carbon steel and alloy steel** Stable chip control at light cutting range. The curved edge allows smooth chip discharge.	Carbon Steel·Alloy Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner .004" 15° Flank .008" 11° CNMG432LP
		LM	**First recommendation for light cutting of stainless steel** Stable chip control at light cutting range. Breaker with high rake angle provides excellent burr control.	Stainless Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner .020" 15° Flank 20° CNMG432LM
		LK	**First recommendation for light cutting of cast iron** Narrow positive land provides low cutting resistance and excellent finish.	Cast Iron ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Flank .006" 15° 6° CNMG432LK
		LS	**First recommendation for light cutting of difficult-to-cut materials** **Alternative chip breaker for light cutting of stainless steel** Enhanced chip disposal for depths of cut smaller than the corner R.	Difficult-to-Cut Materials ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) .016" Corner 20° .024" Flank 20° CNMG432LS
	G Class	NEW LS	**Recommendation for light cutting of difficult-to-cut materials** Enhanced chip disposal for depths of cut smaller than the corner R. Precision grade with excellent sharpness.	Difficult-to-Cut Materials ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) .016" Corner 20° .024" Flank 20° CNGG432LS
	M Class	SH	**Alternative chip breaker for light cutting of carbon steel and alloy steel** Can be used at low depths of cut and high feed rates. The curved edge allows smooth chip discharge. Recommended for workpieces in the 160—250HB range.	Carbon Steel·Alloy Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner 15° .008" Flank 15° CNMG432SH
		SA	**Alternative chip breaker for light cutting of carbon steel and alloy steel** Superior chip control at small depths of cut. Covers copying and back turning with wavy edge. Recommended for workpieces in the 200—300HB range.	Carbon Steel·Alloy Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner .012" 25° 10° .013" Flank 25° 8° CNMG432SA
		SW	**Wiper insert for light cutting of carbon steel, alloy steel, stainless steel and cast iron** In comparison to conventional chip breakers, the surface finish is maintained even if the feed per revolution is doubled. Wiper design for increased productivity and improved surface finish.	Carbon Steel·Alloy Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner .006" 18° 7° .006" Flank 18° 7° CNMG432SW
		SY	**First recommendation for light cutting of mild steel** Effectively controls adhesive chips. Suitable for mild steel light cutting.	Mild Steel ap (inch) .157 .118 .079 .039 0 .004 .012 .020 f (IPR) Corner 10° .008" Flank 10° CNMG432SY

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_LP A107	DNMG_LP  A115	SNMG_LP A123	TNMG_LP A131	VNMG_LP A139	WNMG_LP A142	
	CNMG_LM A107	DNMG_LM A115	SNMG_LM A123	TNMG_LM A131	VNMG_LM A139	WNMG_LM A143	
	CNMG_LK  A107	DNMG_LK  A115	SNMG_LK A124	TNMG_LK A131	VNMG_LK A139	WNMG_LK  A143	
	CNMG_LS  A107	DNMG_LS  A115		TNMG_LS  A131	VNMG_LS A139	WNMG_LS  A143	
	CNGG_LS NEW A107	DNGG_LS NEW  A115		TNGG_LS NEW A131	VNGG_LS NEW A139		
	CNMG_SH  A107	DNMG_SH  A116	SNMG_SH A124	TNMG_SH A131	VNMG_SH A139	WNMG_SH A143	
	CNMG_SA  A107	DNMG_SA  A116	SNMG_SA A124	TNMG_SA A132	VNMG_SA A139	WNMG_SA  A143	
	CNMG_SW A108	DNMX_SW  A116		TNMX_SW A132		WNMG_SW A143	
	CNMG_SY A108	DNMG_SY A116	SNMG_SY A124	TNMG_SY A132		WNMG_SY A143	

CLASSIFICATION

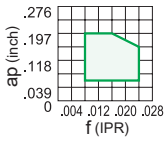
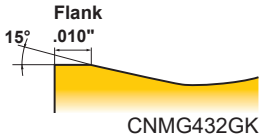
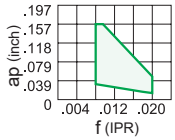
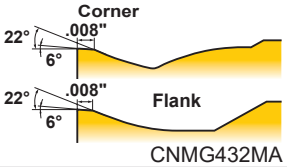
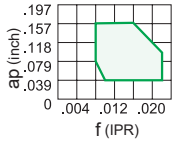
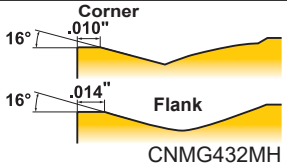
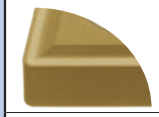
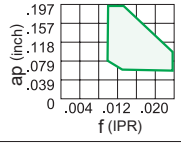
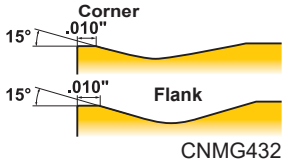
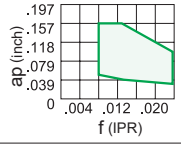
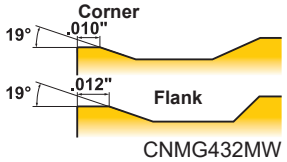
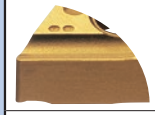
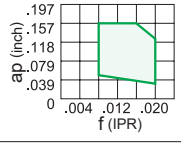
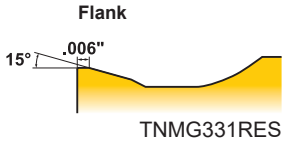
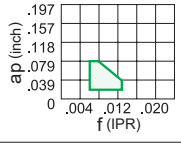
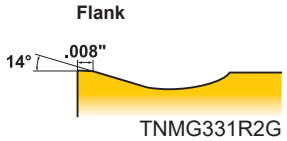
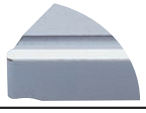
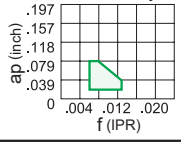
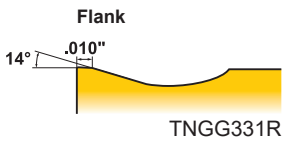
NEGATIVE INSERTS WITH HOLE

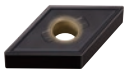
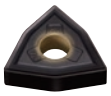
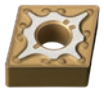
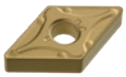
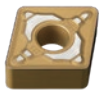
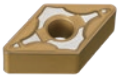
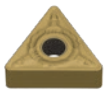
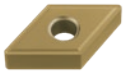
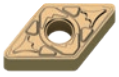
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	**MJ**	**Alternative chip breaker for light cutting of difficult-to-cut materials** Ideal for heat resistant alloys and titanium alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Excellent notch wear resistance for light to medium cutting.	 
Light Cutting	G Class	**MJ**	**Alternative chip breaker for light cutting of difficult-to-cut materials** Double-sided chip breaker, Single sided chip breaker (D type, V type). The sharp edge produces a good surface finish. Ideal for heat resistant alloys and titanium alloys. The curved edge allows smooth chip discharge.	 
Light Cutting	G Class	**R/L-K** 	**Chip breaker for Light cutting** Parallel chip breaker. Excellent chip control at low to medium feed rates.	 
Medium Cutting	M Class	**MP**	**First recommendation for medium cutting of carbon steel and alloy steel** Suitable for medium to light cutting. Breaker geometry appropriate for copying and back turning. Cutting edge geometry for an optimum balance of sharpness and fracture resistance.	 
Medium Cutting	M Class	**MM**	**First recommendation for medium cutting of stainless steel** Optimised land geometry by simulation analysis technology controls the plastic deformation of the corner and achieves the long tool life.	 
Medium Cutting	M Class	**MK**	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	 
Medium Cutting	M Class	**MS**	**First recommendation for medium cutting of difficult-to-cut materials,** **Alternative chip breaker for medium cutting of stainless steel.** A large two-step rake corner creates chips without squeezing and entangled shapes. Applicable to MP9005, MP9015, MP9025, MT9015	 
Medium Cutting	M Class	**MS** 	**Alternative chip breaker for medium cutting of stainless steel and difficult-to-cut materials** The sharp edge gives best performance. Flat top breaker shape offers high edge strength. Applicable to grades other than MP9005, MP9015, MP9025, MT9015	 
Medium Cutting	M Class	**GM** 	**Alternative chip breaker for light to medium cutting of stainless steel** Alternative chip breaker of main chip breaker LM and MM. Excellent notch wear resistance for light to medium cutting.	 

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_MJ  A108	DNMG_MJ  A117		TNMG_MJ  A132	VNMG_MJ A139	WNMG_MJ  A143	
	CNGG_MJ  A108	DNGM_MJ  A117			VNGM_MJ A140		
				TNGG_R/L K A132			
	CNMG_MP A108	DNMG_MP A117	SNMG_MP A124	TNMG_MP A133	VNMG_MP A140	WNMG_MP A144	
	CNMG_MM A109	DNMG_MM A117	SNMG_MM A125	TNMG_MM A133	VNMG_MM A140	WNMG_MM A144	
	CNMG_MK A109	DNMG_MK  A117	SNMG_MK A125	TNMG_MK  A133	VNMG_MK A140	WNMG_MK  A144	
	CNMG_MS  A109	DNMG_MS  A117	SNMG_MS A125	TNMG_MS  A133	VNMG_MS  A140	WNMG_MS  A144	
	CNMG_MS A109	DNMG_MS  A118	SNMG_MS A125	TNMG_MS A133	VNMG_MS  A140	WNMG_MS A145	
	CNMG_GM A110	DNMG_GM  A118	SNMG_GM A126	TNMG_GM A133	VNMG_GM A141	WNMG_GM A145	

CLASSIFICATION

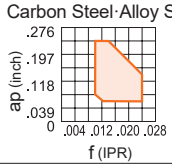
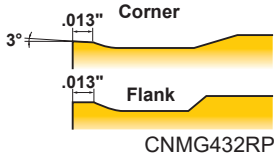
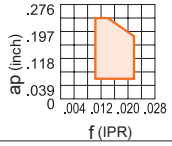
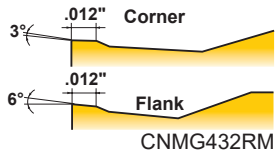
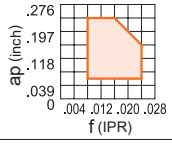
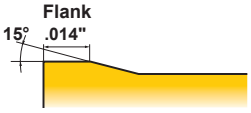
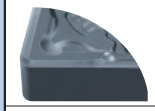
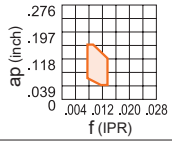
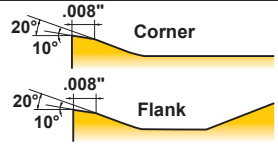
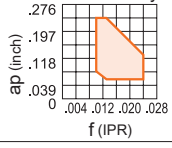
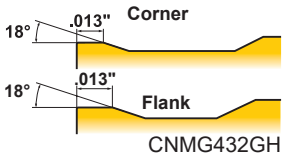
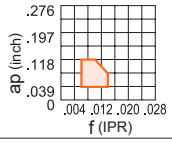
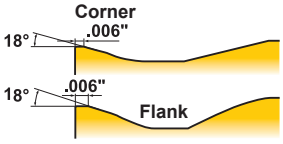
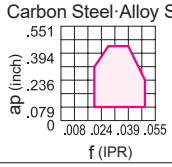
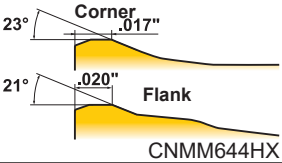
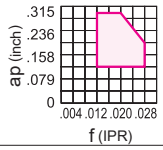
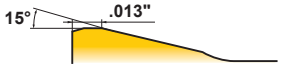
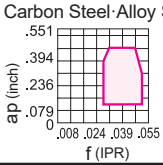
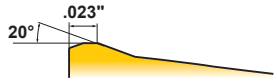
NEGATIVE INSERTS WITH HOLE

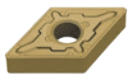
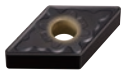
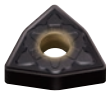
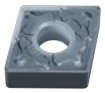
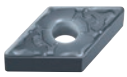
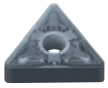
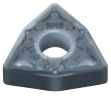
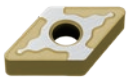
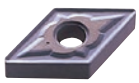
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**GK**	**Alternative chip breaker for medium cutting for cast iron** Breakers are suitable for a wide range of applications. Maintenance of high stability by the flat-land.	Cast Iron   CNMG432GK
		MA	**Multi-assist chip breaker** Ideal for general cutting applications. Positive land provides sharp cutting action.	Carbon Steel·Alloy Steel   CNMG432MA
		MH	**Alternative chip breaker for medium cutting of carbon steel and alloy steel** Flat land offers high edge strength. Good chip control with suitable chip pocket.	Carbon Steel·Alloy Steel   CNMG432MH
		Standard 	**Alternative chip breaker for medium cutting of carbon steel and alloy steel** Flat land offers high edge strength. Flat top breaker shape offers high edge strength.	Carbon Steel·Alloy Steel   CNMG432
		MW	**Wiper insert for medium cutting carbon steel, alloy steel, stainless steel and cast iron** The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel·Alloy Steel   CNMG432MW
		R/L-ES 	**Alternative chip breaker for medium cutting of stainless steel** Good balance of edge strength and sharpness. Right- or left-hand breaker for unidirectional chip control.	Stainless Steel   TNMG331RES
		R/L-2G	**Alternative chip breaker for medium cutting of carbon steel and alloy steel** Good balance of edge strength and sharpness. Right- or left-hand breaker for unidirectional chip control. Precision chip breaker.	Carbon Steel·Alloy Steel   TNMG331R2G
	G Class	**R/L** 	**Medium cutting** Parallel chip breaker. Good chip control for medium feed rates.	Carbon Steel·Alloy Steel   TNGG331R

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_GK A110	DNMG_GK  A118	SNMG_GK A125	TNMG_GK A133	VNMG_GK A141	WNMG_GK  A145	
	CNMG_MA  A110	DNMG_MA  A118	SNMG_MA A126	TNMG_MA A134	VNMG_MA A141	WNMG_MA A145	
	CNMG_MH  A110	DNMG_MH  A119	SNMG_MH A126	TNMG_MH  A134	VNMG_MH A141	WNMG_MH A145	
	CNMG A111	DNMG  A119	SNMG A127	TNMG A134	VNMG A141	WNMG A145	RNMG A122
	CNMG_MW A111	DNMX_MW  A119		TNMX_MW A135		WNMG_MW A146	
				TNMG_R/L ES A135			
				TNMG_R/L 2G A135			
		DNGG_R/L A119	SNGG_R/L A127	TNGG_R/L A135	VNGG_R/L A141		

CLASSIFICATION

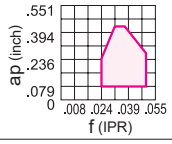
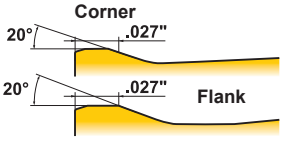
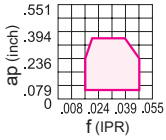
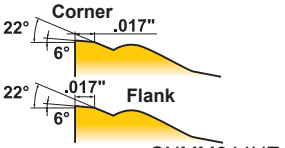
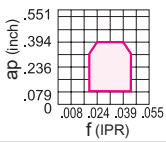
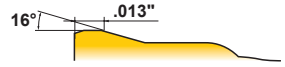
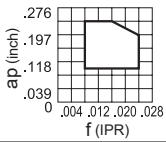
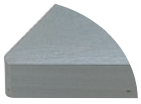
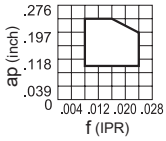
NEGATIVE INSERTS WITH HOLE

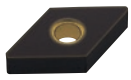
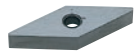
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Rough Cutting	M Class	**RP**	**First recommendation for rough cutting of carbon steel and alloy steel** For interrupted cuts and removing scale. Good balance of cutting edge strength and low cutting resistance because of suitable rake angle.	Carbon Steel·Alloy Steel   CNMG432RP
		RM	**First recommendation for rough cutting of stainless steel** Excellent fracture resistance at interrupted cutting due to the optimum land angle and honing geometry.	Stainless Steel   CNMG432RM
		RK	**First recommendation for rough cutting of cast iron** Seating surface and wide land 3 or more times that of conventional products and provides high cutting stability for interrupted machining and scale removal.	Cast Iron   CNMG432RK
		RS 	**First recommendation for rough cutting of difficult-to-cut materials** **Alternative chip breaker for rough cutting of stainless steels** Positive land increases welding resistance and suppresses chip welding and abrasion at low speed cutting.	Difficult-to-Cut Materials   CNMG432RS
		GH	**Alternative chip breaker for rough cutting of carbon steel, alloy steel and cast iron** For interrupted cuts and removing scale. A combination of wide land and a large chip pocket allows high feed rates.	Carbon Steel·Alloy Steel   CNMG432GH
		GJ	**Alternative chip breaker for rough cutting of difficult-to-cut materials** Excellent balance of edge sharpness and strength. Edge geometry with high face wear resistance.	Difficult-to-Cut Materials   CNMG432GJ
Heavy Cutting	M Class	**HX**	**First recommendation for heavy cutting of carbon steel and alloy steel** Covers the medium range of the heavy cutting region. Owing to the straight edge and chamfer, it gives a balance of sharpness and strength. Variable land and a wavy chip breaker for good chip control.	Carbon Steel·Alloy Steel   CNMM644HX
		HL	**First recommendation for heavy cutting of stainless steel** **Alternative chip breaker for heavy cutting of carbon steel and alloy steel** Low resistance due to narrow flat land. Achieves high chip breaking ability.	Mild Steel   CNMM644HL
		HR	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel** High cutting edge strength. Excellent chip discharge even with high feed and high depth of cut.	Carbon Steel·Alloy Steel   CNMM866HR

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMG_RP A111	DNMG_RP  A119	SNMG_RP A127	TNMG_RP A136		WNMG_RP A146	
	CNMG_RM A111	DNMG_RM A119	SNMG_RM A127	TNMG_RM A136		WNMG_RM A146	
	CNMG_RK A111	DNMG_RK  A120	SNMG_RK A127	TNMG_RK A136		WNMG_RK  A146	
	CNMG_RS  A112	DNMG_RS  A120	SNMG_RS A128	TNMG_RS  A136		WNMG_RS  A146	
	CNMG_GH A112	DNMG_GH  A120	SNMG_GH A128	TNMG_GH A137		WNMG_GH A147	
	CNMG_GJ A112	DNMG_GJ  A120				WNMG_GJ A147	
	CNMM_HX A112		SNMM_HX A128				
	CNMM_HL A113	DNMM_HL A120	SNMM_HL A128	TNMM_HL A137			
	CNMM_HR A113		SNMM_HR A129				

CLASSIFICATION

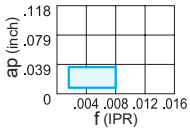
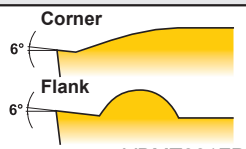
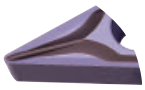
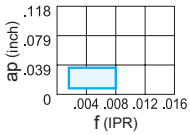
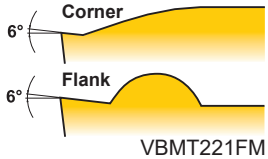
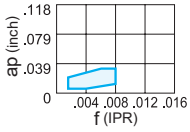
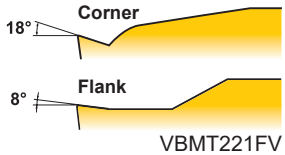
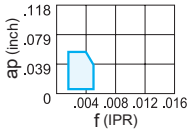
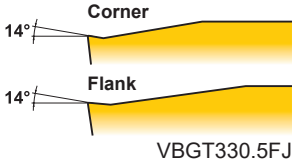
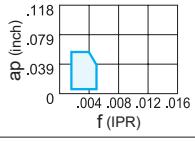
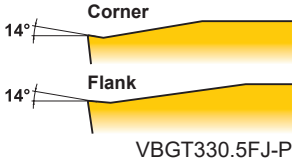
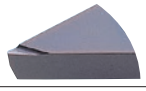
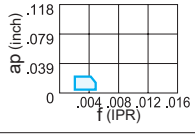
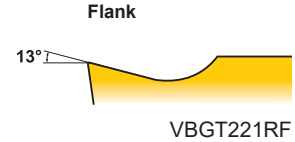
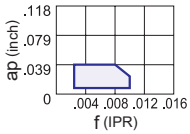
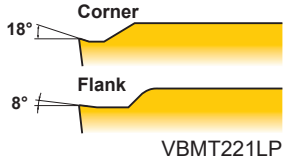
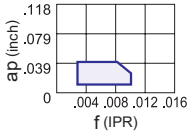
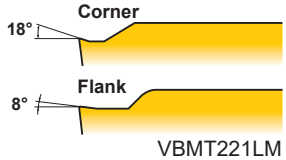
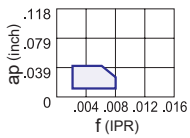
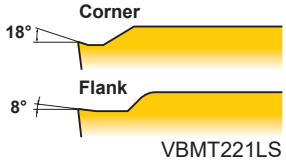
NEGATIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Heavy Cutting	M Class	**HV**	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel** Covers the upper end of the heavy cutting region. Wide land and large chamfer offer high edge strength. A wide chip breaker prevents chip jamming.	Carbon Steel·Alloy Steel   CNMM644HV
		HZ	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel** Covers the lower end of the heavy cutting region. Low cutting resistance due to positive land and curved edge. Teardrop dots improve chip control without increasing cutting resistance.	Mild Steel   CNMM644HZ
		HM	**Alternative chip breaker for heavy cutting of carbon steel and alloy steel and stainless steel** Flat land provides outstanding balance between cutting edge strength and sharpness.	Mild Steel   CNMM644HM
For Cast Iron	M Class	**Flat Top**	**First recommendation for heavy cutting of cast iron** Flat Top. Most effective for unstable machining due to its high edge strength.	Cast Iron  CNMA432
	G Class	**Flat Top** 	**For heavy cutting of cast iron** Flat Top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron  DNGA432

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CNMM_HV A113		SNMM_HV A129				
	CNMM_HZ A113	DNMM_HZ A121	SNMM_HZ A129	TNMM_HZ A137			
	CNMM_HM A113		SNMM_HM A129				
	CNMA A113	DNMA  A121	SNMA A129	TNMA A137	VNMA A141	WNMA A147	
		DNGA A121	SNGA A129	TNGA A137	VNGA  A141		

CLASSIFICATION

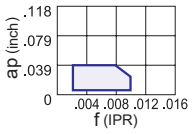
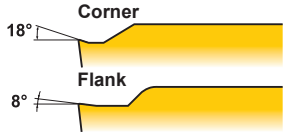
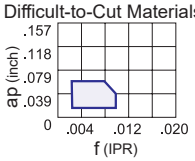
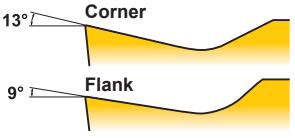
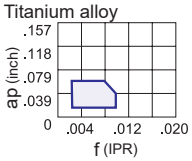
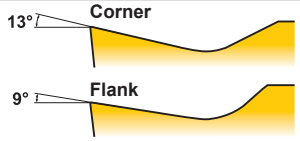
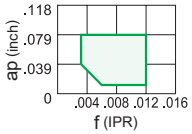
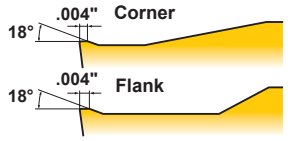
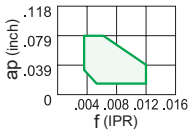
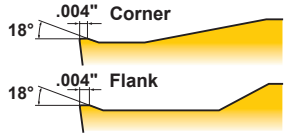
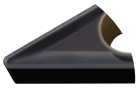
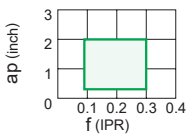
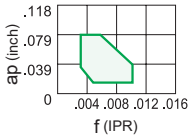
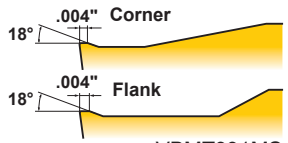
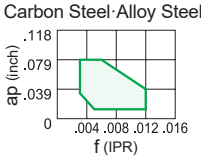
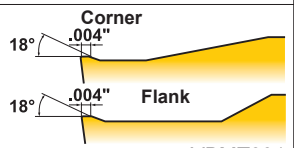
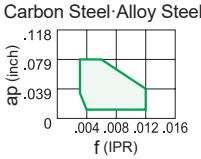
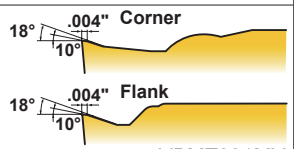
5° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FP**	**First recommendation for finishing carbon steel, alloy steel and mild steel** Breaker protrusion at the corner tip controls chips even at small depths of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel·Alloy Steel   VBMT221FP
		FM 	**First recommendation for finishing stainless steel** Breaker protrusion at the corner tip controls chips even at small depths of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel   VBMT221FM
		FV	**Alternative chip breaker for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel·Alloy Steel   VBMT221FV
	G Class	**FJ**	**Finishing difficult-to-cut materials** The curved cutting edges support changes in cutting depth, smooth chip discharge and disposal. The high rake angle is highly suitable for finishing difficult-to-cut materials.	Difficult-to-Cut Materials   VBGT330.5FJ
		FJ-P	**Finishing titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy   VBGT330.5FJ-P
		R/L F 	**Finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel   VBGT221RF
Light Cutting	M Class	**LP**	**First recommendation for light cutting of carbon steel, alloy steel and mild steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Carbon Steel·Alloy Steel   VBMT221LP
		LM	**First recommendation for light cutting of stainless steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Stainless Steel   VBMT221LM
		LS	**First recommendation for light cutting of difficult-to-cut materials** Prevents welding of the insert and controls white turbidity of the surface finish.	Difficult-to-Cut Materials   VBMT221LS

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VBMT_FP A186		
					VBMT_FM A186		
					VBMT_FV A186		
					VBGT_FJ A186		
					VBGT_FJ-P A186		
					VBGT_R/L F A187	WBGT_R/L F A195	
					VBMT_LP A187		
					VBMT_LM A187		
					VBMT_LS A187		

CLASSIFICATION

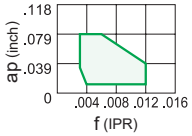
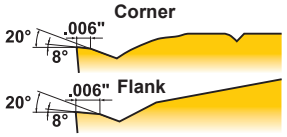
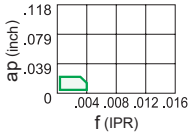
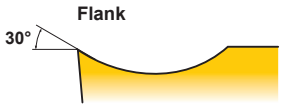
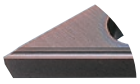
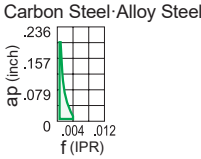
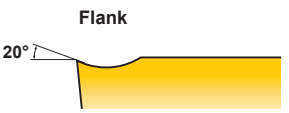
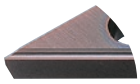
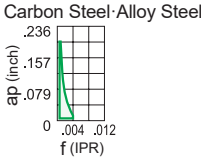
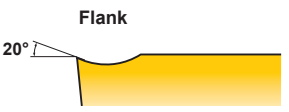
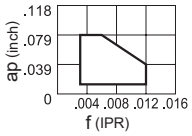
5° POSITIVE INSERTS WITH HOLE

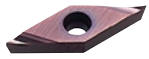
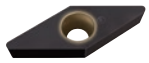
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	**SV**	**Alternative chip breaker for carbon steel, alloy steel and stainless steel** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel·Alloy Steel   VBMT221SV
Light Cutting	G Class	**MJ**	**Light cutting of difficult-to-cut materials Ideal for heat-resistant alloy and titanium alloy** The curved cutting edges support changes in cutting depth, smooth chip discharge and disposal. The high rake angle is highly suitable for finish-light cutting difficult-to-cut materials.	Difficult-to-Cut Materials   VBGT331MJ
		MJ-P	**Light cutting for titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy   VBGT331MJ-P
Medium Cutting	M Class	**MP**	**First recommendation for medium cutting of carbon steel, alloy steel and mild steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Carbon Steel·Alloy Steel   VBMT331MP
		MM	**First recommendation for medium cutting of stainless steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Stainless Steel   VBMT331MM
		MK 	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron  VBMT331MK
		MS	**First recommendation for medium cutting of difficult-to-cut materials** A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Difficult-to-Cut Materials   VBMT331MS
		Standard	**Alternative chip breaker for medium cutting of carbon steel, alloy steel and stainless steel** Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	Carbon Steel·Alloy Steel   VBMT331
		MV	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive insert with a large rake angle achieves sharp cutting edge performance. The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	Carbon Steel·Alloy Steel   VBMT331MV

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VBMT_SV A187		
					VBGT_MJ A187		
					VBGT_MJ-P A187		
					VBMT_MP A188		
					VBMT_MM A188		
					VBMT_MK A188		
					VBMT_MS A188		
					VBMT A188		
					VBMT_MV A188		

CLASSIFICATION

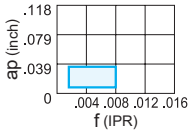
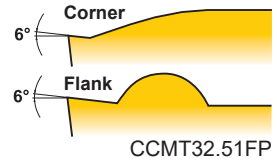
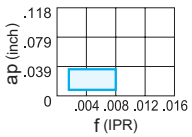
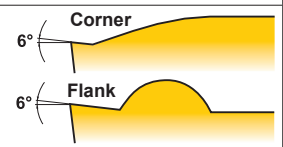
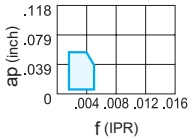
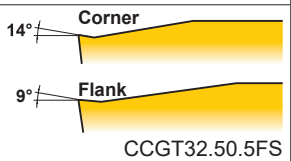
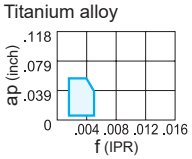
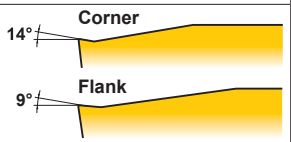
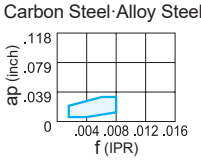
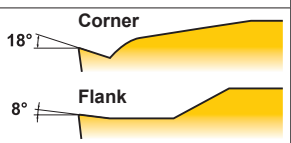
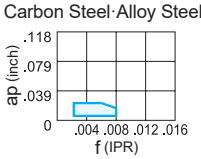
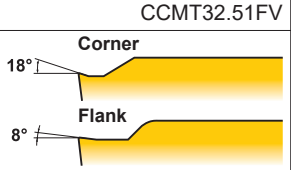
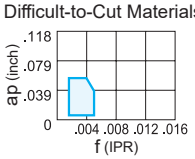
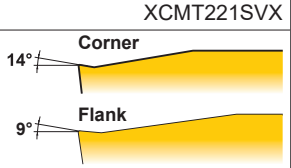
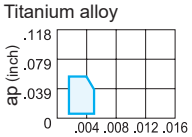
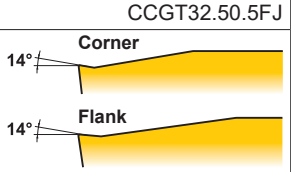
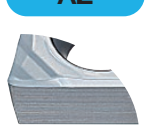
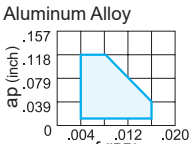
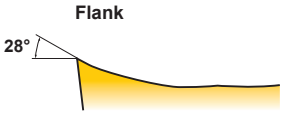
5° POSITIVE INSERTS WITH HOLE

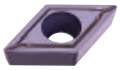
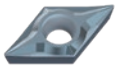
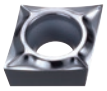
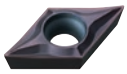
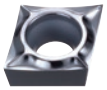
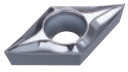
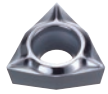
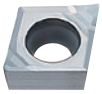
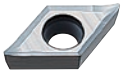
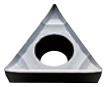
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**R/L-MV**	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive insert with a large rake angle achieves sharp cutting edge performance. The double breakers and round-shaped dots in the rake face achieve a wide range of chip discharge.	Carbon Steel·Alloy Steel   WBMT1.51.51RMV
Medium Cutting	E Class	**R/L SR**	**Chip breaker for medium cutting of automatic lathe machining** A wide lead chip breaker. Insert designed for low resistance chip control.	Carbon Steel·Alloy Steel   VBET22V3RSR
Medium Cutting	E Class	**R/L SN** 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control for low to medium feed rates.	Carbon Steel·Alloy Steel   VBET22V3RSN
Medium Cutting	E Class	**R/LW SN** 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control for low to medium feed rates. The wiper produces good cutting surface.	Carbon Steel·Alloy Steel   VBET22V3RWSN
For Cast Iron	M Class	**Flat Top**	**Chip breaker for Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron  VBMW332

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
						WBMT_R/L MV A195	
					VBET_R/L SR  A189		
					VBET_R/L SN A189		
					VBET_R/LW SN A189		
					VBMW  A189		

CLASSIFICATION

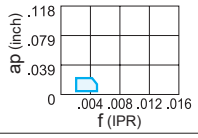
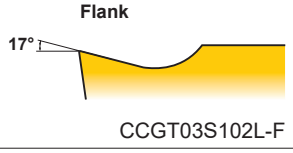
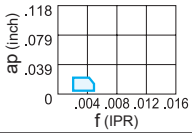
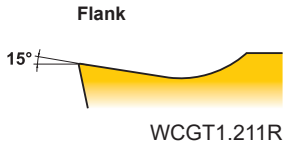
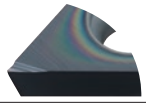
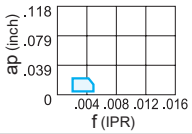
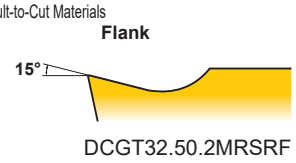
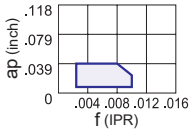
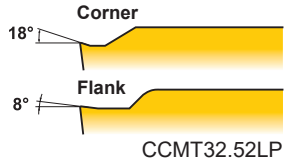
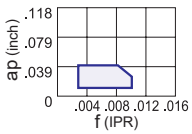
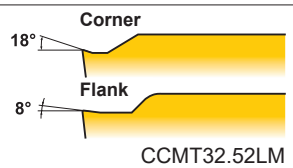
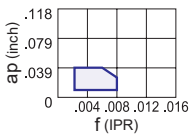
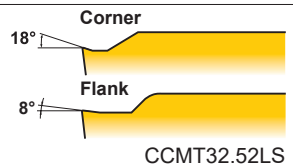
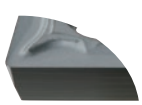
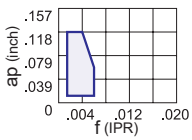
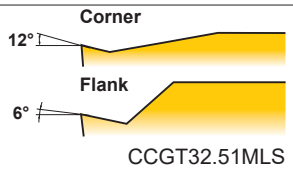
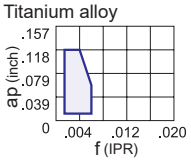
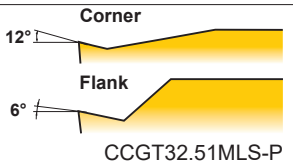
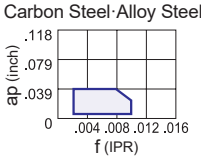
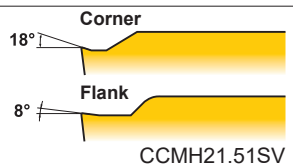
7° POSITIVE INSERTS WITH HOLE

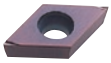
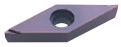
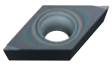
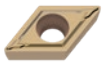
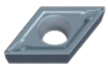
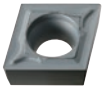
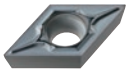
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FP**	**First recommendation for finishing carbon steel, alloy steel and mild steel** Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Carbon Steel·Alloy Steel   CCMT32.51FP
		FM	**First recommendation for finishing stainless steel** Breaker protrusion at the corner tip controls chips even at small depth of cut. Maintains the edge strength at the corner and prevents sudden fractures.	Stainless Steel   CCMT32.51FM
	G Class	**FS**	**First recommendation for finishing difficult-to-cut materials** Ideal for heat resistant alloys, titanium alloy and Cobalt chromium alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials   CCGT32.50.5FS
		FS-P	**First recommendation for finishing titanium alloys** Ideal for titanium alloys and Copper alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloy   CCGT32.50.5FS-P
	M Class	**FV**	**Alternative chip breaker for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel·Alloy Steel   CCMT32.51FV
		SVX	**Alternative chip breaker for light cutting of carbon steel and alloy steel** Chip control is improved by having a chip breaker geometry suitable for copying.	Carbon Steel·Alloy Steel   XCMT221SVX
	G Class	**FJ**	**Alternative chip breaker for finishing difficult-to-cut materials** Ideal for heat resistant alloys and titanium alloys. The sharp edge produces a good surface finish. The curved edge allows smooth chip discharge.	Difficult-to-Cut Materials   CCGT32.50.5FJ
		FJ-P	**Finishing titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy   CCGT32.50.5FJ-P
		AZ 	**Chip breaker for for aluminium alloy** The high rake angle and 3D curved cutting edge provides sharpness at the cutting point. Additionally the 3D shape of the rake face enables excellent chip control. Lapping of the top surface gives a mirror finish for improved welding resistance.	Aluminum Alloy   DCGT32.50.5AZ

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round
	CCMT_FP A152	DCMT_FP A164	SCMT_FP A174	TCMT_FP A177	VCMT_FP A190			
	CCMT_FM A152	DCMT_FM  A164	SCMT_FM A174	TCMT_FM A177	VCMT_FM A190			
	CCGT_FS A152	DCGT_FS  A164						
	CCGT_FS-P  A152	DCGT_FS-P A164						
	CCMT_FV A152	DCMT_FV A164	SCMT_FV A174	TCMT_FV A177	VCMT_FV A190			
							XCMT_SVX A199	
	CCGT_FJ A153	DCGT_FJ  A165						
	CCGT_FJ-P  A153	DCGT_FJ-P  A165		TCGT_FJ-P A177		WCGT_FJ-P  A196		
	CCGT_AZ  A153	DCGT_AZ  A165		TCGT_AZ  A177	VCGT_AZ A190			RCGT-AZ A173

CLASSIFICATION

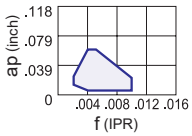
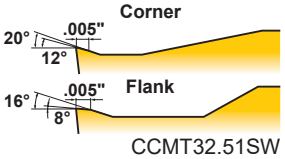
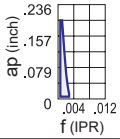
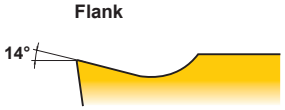
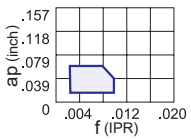
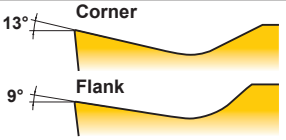
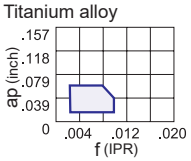
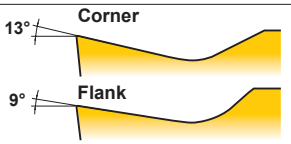
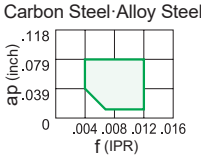
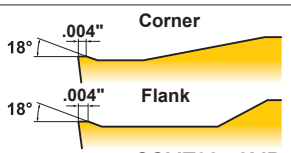
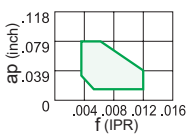
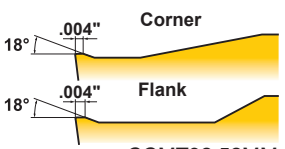
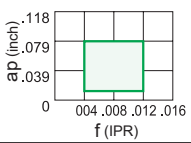
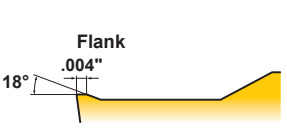
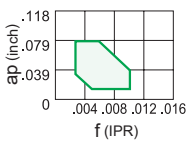
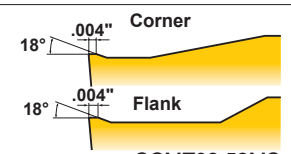
7° POSITIVE INSERTS WITH HOLE

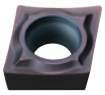
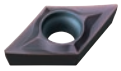
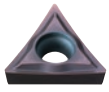
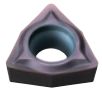
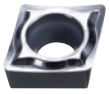
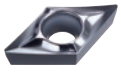
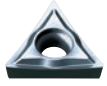
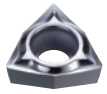
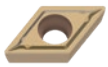
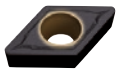
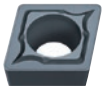
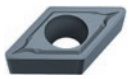
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G Class	R/L-F	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel  
		R/L	**Chip breaker for finishing** Lead chip breaker. Excellent chip control at low feed rates.	Carbon Steel·Alloy Steel  
		NEW R-SRF 	**Chip breaker for finishing** Lead chip breaker controls chip flow. The sharp edge produces a good surface finish.	Carbon Steel • Alloy Steel, Stainless Steel, Difficult-to-Cut Materials  
Light Cutting	M Class	LP	**First recommendation for light cutting of carbon steel, alloy steel and mild steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Carbon Steel·Alloy Steel  
		LM	**First recommendation for light cutting of stainless steel** Sharp cutting edge due to a large rake angle. Prevents welding of the insert and controls white turbidity of the surface finish. Breaker protrusion suitable for depth of cut area achieves a wide range of chip control.	Stainless Steel  
		LS	**First recommendation for light cutting of difficult-to-cut materials** Prevents welding of the insert and controls cloudy surface of the surface finish.	Difficult-to-Cut Materials  
	G Class	LS 	**First recommendation for light cutting of difficult-to-cut materials** Ideal for heat resistant alloys, titanium alloys and Cobalt chromium alloys. Parallel cutting edge. Achieves stable chip control in a wide range of areas from low to medium depths of cut.	Difficult-to-Cut Materials  
		LS-P	**First recommendation for light cutting of titanium alloys** Ideal for titanium alloys and Copper alloys. Parallel cutting edge. Achieves stable chip control in a wide range of areas from low to medium depths of cut. Lapping of the top surface gives a mirror finish for improved welding resistance.	Titanium alloy  
	M Class	SV	**Alternative chip breaker for light cutting of carbon steel, alloy steel, mild steel and stainless steel** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	Carbon Steel·Alloy Steel  

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round
	CCGT_R/L F CCGH_R/L F A153, A154	DCGT_R/L F  A165		TCGT_R/L F A178	VCGT_R/L F  A190			
						WCGT_R/L A196		
		DCGT_R SRF NEW  A165						
	CCMT_LP A154	DCMT_LP A165	SCMT_LP A174	TCMT_LP A178	VCMT_LP A191			
	CCMT_LM A154	DCMT_LM  A165	SCMT_LM A174	TCMT_LM A178	VCMT_LM A191			
	CCMT_LS A154	DCMT_LS  A166		TCMT_LS A178	VCMT_LS A191			
	CCGT_LS  A154	DCGT_LS  A166			VCGT_LS A191			
	CCGT_LS-P A155	DCGT_LS-P A166			VCGT_LS-P A191			
	CCMH_SV A155	DCMT_SV A167			VCMT_SV A191			

CLASSIFICATION

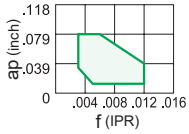
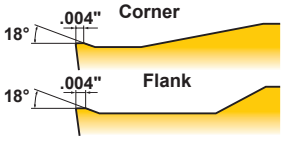
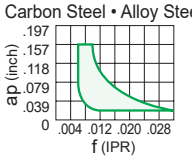
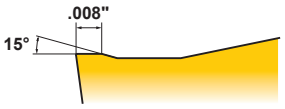
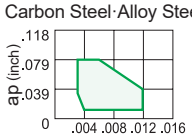
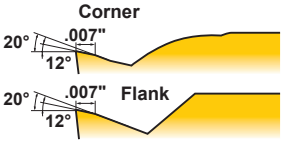
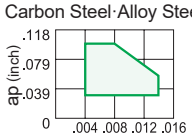
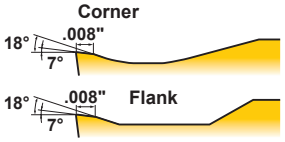
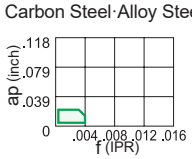
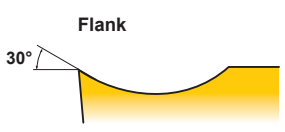
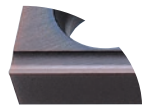
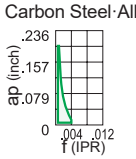
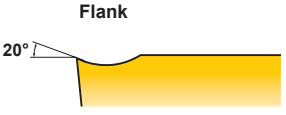
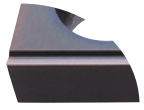
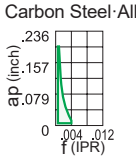
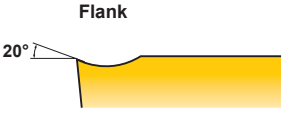
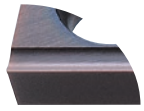
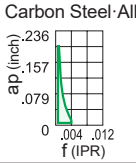
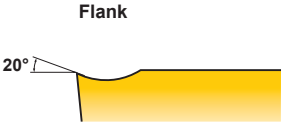
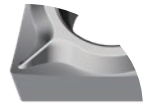
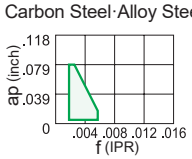
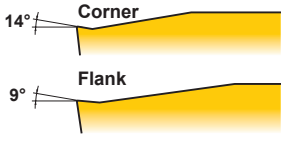
7° POSITIVE INSERTS WITH HOLE

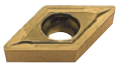
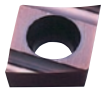
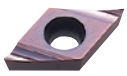
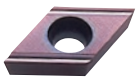
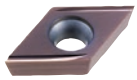
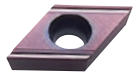
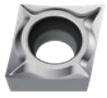
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Light Cutting	M Class	**SW**	**Wiper insert for light cutting of carbon steel, alloy steel, mild steel and stainless steel** In comparison to conventional chip breakers, the surface finish is maintained even if the feed per revolution is doubled. Positive land improves sharpness.	Carbon Steel·Alloy Steel   CCMT32.51SW
Light Cutting	G Class	**R/L-SS**	**Chip breaker for light cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low feed rates.	Carbon Steel·Alloy Steel   CCGT32.50.5RSS
Light Cutting	G Class	**MJ**	**Light cutting of difficult-to-cut materials Ideal for heat-resistant alloy and titanium alloy** The curved cutting edges support changes in cutting depth-smooth chip discharge and disposal. The high rake angle is highly suitable for finish- light cutting difficult-to-cut materials.	Difficult-to-Cut Materials   CCGT21.51MJ
Light Cutting	G Class	**MJ-P**	**Light cutting for titanium alloy** Ideal for aluminum and copper. The sharp edge produces excellent surface finishes. The curved edge allows smooth chip discharge. The polished insert face prevents built up edge.	Titanium alloy   CCGT21.51MJP
Medium Cutting	M Class	**MP**	**First recommendation for medium cutting of carbon steel, alloy steel and mild steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Carbon Steel·Alloy Steel   CCMT32.52MP
Medium Cutting	M Class	**MM**	**First recommendation for medium cutting of stainless steel** Good balance of wear resistance and fracture resistance because of the flat land cutting edge. A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Stainless Steel   CCMT32.52MM
Medium Cutting	M Class	**MK**	**First recommendation for medium cutting of cast iron** Optimum balance between sharpness and high edge strength for general use.	Cast Iron   CCMT32.52MK
Medium Cutting	M Class	**MS**	**First recommendation for medium cutting of difficult-to-cut materials** A wide chip pocket controls increasing of the cutting resistance and reduces vibration and chip jamming even at large depths of cut.	Difficult-to-Cut Materials   CCMT32.52MS

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Rhombic 25°	Round
	CCMT_SW A155							
	CCGT_R/L SS A156	DCGT_R/L SS A167						
	CCGT_MJ  A155	DCGT_MJ  A166		TCGT_MJ  A179		WCGT_MJ  A196		
	CCGT_MJ-P  A155	DCGT_MJ-P  A166		TCGT_MJ-P  A179		WCGT_MJ-P  A196		
	CCMT_MP A157	DCMT_MP A167	SCMT_MP A174	TCMT_MP A179	VCMT_MP A191	WCMT_MP NEW A197		
	CCMT_MM A157	DCMT_MM  A167	SCMT_MM A175	TCMT_MM A179	VCMT_MM A192			
	CCMT_MK A157	DCMT_MK  A168	SCMT_MK A175	TCMT_MK A179	VCMT_MK A192			
	CCMT_MS  A157	DCMT_MS  A168	SCMT_MS A175	TCMT_MS A179	VCMT_MS A192			

CLASSIFICATION

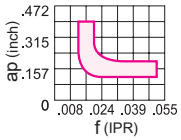
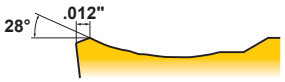
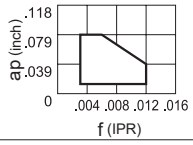
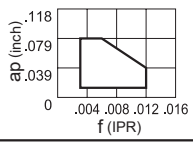
7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**Standard**	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** Balance of edge strength and sharpness due to a combination of a flat land and large rake angle.	Carbon Steel·Alloy Steel   CCMT32.52
				Carbon Steel • Alloy Steel   RCMX1204M0
		MV	**Alternative chip breaker for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** A positive insert and the large rake angle achieve sharp cutting edge performance. The double breakers and round shape in the rake face achieve a wide range of chip discharge.	Carbon Steel·Alloy Steel   CCMH21.51MV
		MW	**Wiper insert for medium cutting of carbon steel, alloy steel, mild steel and stainless steel** The wiper allows up to two times higher feed. A wide chip pocket prevents chip jamming.	Carbon Steel·Alloy Steel   CCMT32.52MW
	E Class	**R/L SR**	**Chip breaker for medium cutting of automatic lathe machining** A wide lead chip breaker. Insert designed for low resistance chip control.	Carbon Steel·Alloy Steel   CCET32.5V3RSR
		R/L SN 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low to medium feed rates.	Carbon Steel·Alloy Steel   CCET32.5V3RSN
	G Class	**R/L SN** 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low to medium feed rates. Suitable for precise machining with E class tolerance.	Carbon Steel·Alloy Steel   CCGT32.5V3RSN
	E Class	**R/LW SN** 	**Chip breaker for medium cutting of automatic lathe machining** A parallel chip breaker. Excellent chip control at low to medium feed rates. The wiper produces a good surface finish.	Carbon Steel·Alloy Steel   CCET31.5V3RWSN
	G Class	**SNG** 	**Chip breaker for medium cutting of automatic lathe machining** 3D molded chip breaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	Carbon Steel·Alloy Steel   CCGT32.51MSMG

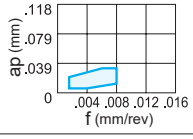
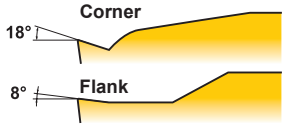
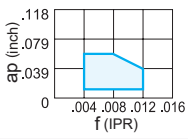
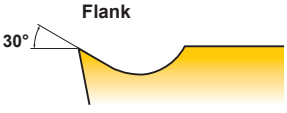
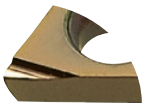
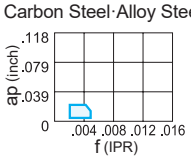
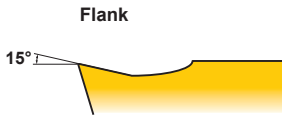
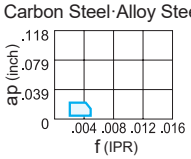
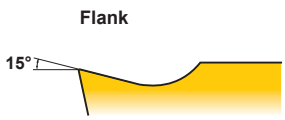
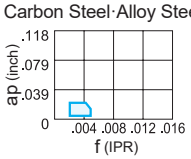
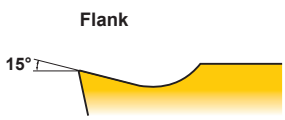
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CCMT A158	**DCMT**  A168	**SCMT** A175	**TCMT** A180	**VCMT** A192	**WCMT** A197	**RCMT** A173
							RCMX A173
	CCMH_MV A158	**DCMT_MV** A168			**VCMT_MV** A192		
	CCMT_MW A158						
	CCET_R/L SR  A159	**DCET_R/L SR**  A169					
	CCET_R/L SN A160	**DCET_R/L SN**  A170					
	CCGT_R/L SN A159	**DCGT_R/L SN**  A169					
	CCET_R/LW SN A160	**DCET_R/LW SN**  A170					
	CCGT_SMG  A161	**DCGT_SMG** A171					

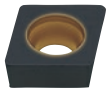
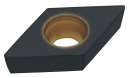
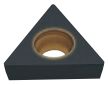
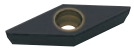
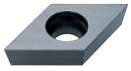
CLASSIFICATION

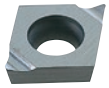
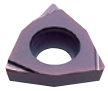
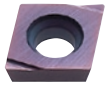
7° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Heavy Cutting	M Class	**RR**	**Chip breaker for heavy cutting of carbon steel and alloy steel** A wide groove chip breaker prevents chips from jamming at large depths of cut. Small dimples improve chip control at small depths of cut.	Carbon Steel·Alloy Steel   RCMX2006M0-RR
For Cast Iron	M Class	**Flat Top**	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron  CCMW32.52
For Cast Iron	G Class	**Flat Top**	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron  CCGW32.5V0

11° POSITIVE INSERTS WITH HOLE

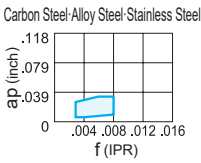
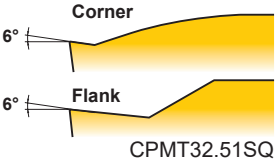
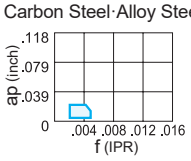
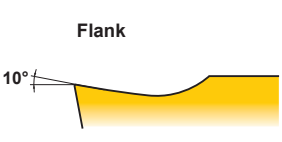
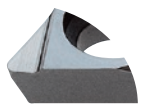
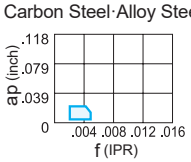
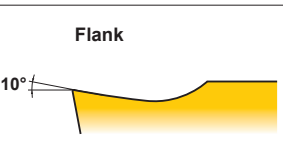
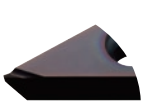
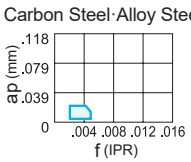
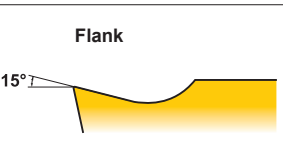
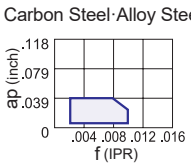
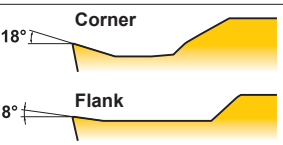
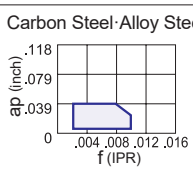
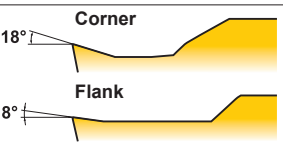
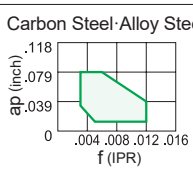
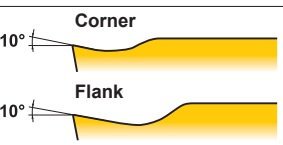
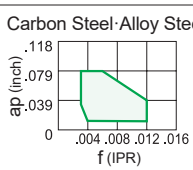
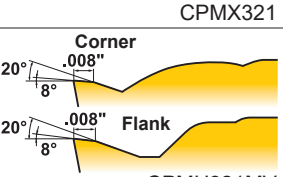
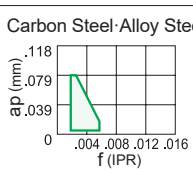
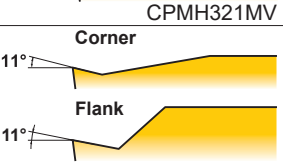
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**FV**	**First recommendation for finishing carbon steel, alloy steel, mild steel and stainless steel** Suitable for low depths of cut and low feed rates. Sharp cutting edge and low resistance design achieves excellent cutting performance.	Carbon Steel·Alloy Steel   CPMH321FV
Finish Cutting	G Class	**Standard**	**Chip breaker for finishing** Lead chip breaker controls chip flow. Good chip control for low to medium feed rates.	Aluminum Alloy   CPGT321
Finish Cutting	G Class	**R/L FS** 	**Chip breaker for finishing carbon steel, alloy steel, stainless steel, cast iron and aluminium alloy** Small wide lead chip breaker. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel   TPGH1.81.51RFS
Finish Cutting	M Class	**R/L F**	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel   CPMT321RF
Finish Cutting	G Class	**R/L F**	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	Carbon Steel·Alloy Steel   CPGT321RF

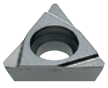
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
							RCMX_RR A173
	CCMW  A161	DCMW  A171	SCMW A175	TCMW  A180	VCMW  A192		
	CCGW A161	DCGW  A171		TCGW A180			

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CPMH_FV A162			TPMH_FV A182			
	CPGT  A162						
				TPGH_R/L FS A182		WPGT_R/L FS  A198	
	CPMH_R/L F  A162						
	CPGT_R/L F A162						

CLASSIFICATION

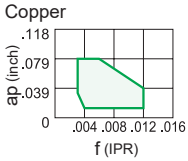
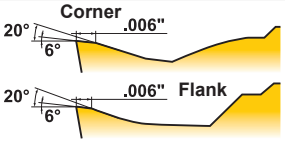
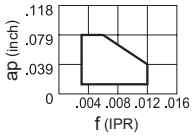
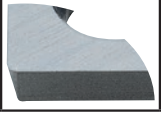
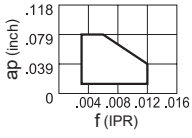
11° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	M Class	**SQ**	**Finishing carbon steel, alloy steel and stainless steel** For small depth of cut and low feed.	  CPMT32.51SQ
	G Class	**R/L**	**Chip breaker for finishing** Lead chip breaker controls chip flow. Good chip control for low to medium feed rates.	  TPGX1.81.51R
	M Class	**L** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Good chip control for low to medium feed rates.	  TPMX1.81.51L
	E Class	**SRF** 	**Chip breaker for finishing** Lead chip breaker controls chip flow. Sharp cutting edge gives a good surface finish.	  VPET1.51.50.2RSRF
Light Cutting	M Class	NEW **LP**	**First recommendation for light cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	  CPMH32.51SV
		SV	**First recommendation for light cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** Large rake angle provides sharp cutting action. A peninsular dot ensures chip control at depths of cut under 1mm.	  CPMH32.51SV
Medium Cutting	M Class	**Standard**	**Alternative chip breaker for medium cutting of carbon steel, alloy steel and stainless steel** Standard, general purpose chip breaker.	  CPMX321
		MV	**First recommendation for medium cutting of carbon steel, alloy steel, mild steel, stainless steel and cast iron** A positive insert and large rake angle achieves sharp cutting edge performance. Double breakers in the rake face achieve a wide range of chip discharge.	  CPMH321MV
	G Class	**SMG**	**Chip breaker for medium cutting of automatic lathe machining** 3D molded chip breaker provides good chip control. G class insert gives sharp cutting action, allowing high precision machining. Breaker geometry appropriate for copying and back turning.	  VPGT1.51.50.2MSMG

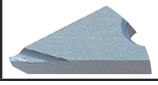
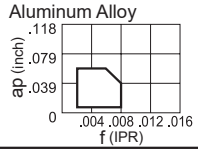
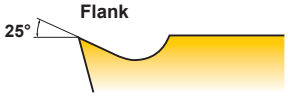
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CPMT_SQ A162			TPMT_SQ A183			
				TPGX_R/L A183			
				TPMX_L  A183			
					VPET_R/L SRF A194		
	CPMH_LP NEW A163			TPMH_LP NEW A183			
	CPMH_SV A163			TPMH_SV A184			
	CPMX NEW CPMH A163		SPMT A176	TPMX A184			
	CPMH_MV A163			TPMH_MV A184		WPMT_MV A198	
					VPGT_SMG A194		

CLASSIFICATION

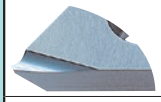
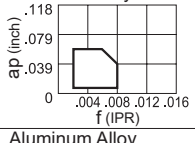
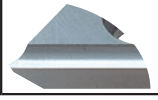
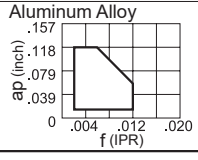
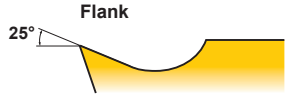
11° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**MQ**	**Medium cutting of carbon steel, alloy steel and stainless steel** Can be used under a wide range of cutting conditions.	Copper   CPMT32.51MQ
For Cast Iron	M Class	**Flat Top**	**Chip breaker for Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength.	Cast Iron  SPMW432
	G Class	**Flat Top** 	**Chip breaker for Heavy cutting of cast iron** Flat top. Most effective for unstable machining due to its high edge strength. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	Cast Iron  SPGX432

15° POSITIVE INSERTS WITH HOLE

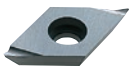
Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminum Alloy	G Class	**R/L** 	**Chip breaker for aluminium alloy cutting** Lead chip breaker. Sharp cutting edge gives a good surface finish.	Aluminum Alloy   VDGX320.5R

20° POSITIVE INSERTS WITH HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Aluminum Alloy	G Class	**R/L F** 	**Chip breaker for aluminium alloy cutting** Lead chip breaker. Sharp cutting edge gives a good surface finish.	Aluminum Alloy  DEGX431RF
		R/L 	**Chip breaker for aluminium alloy cutting** A parallel chip breaker. Sharp cutting edge gives a good surface finish. Good chip control for medium feed rates.	Aluminum Alloy   DEGX431R

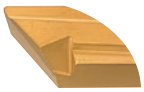
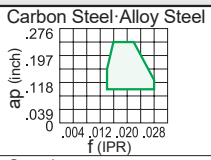
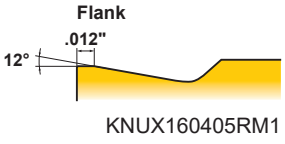
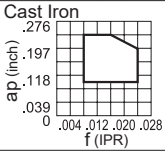
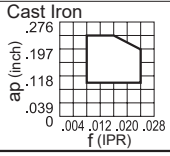
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
	CPMT_MQ A163			**TPMT_MQ** A184			
			SPMW A176				
			SPGX A176	**TPGX** A185			

	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
					VDGX_R/L A193		

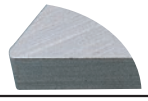
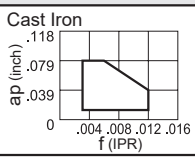
	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°	Round
		DEGX_R/L F  A172					
		DEGX_R/L A172		**TEGX_R/L** A181			

CLASSIFICATION

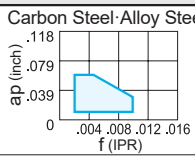
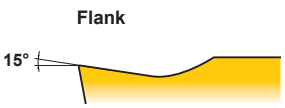
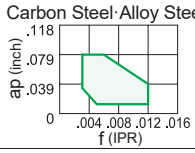
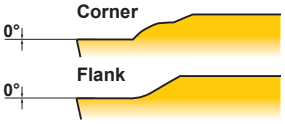
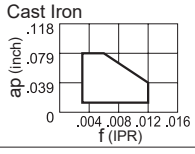
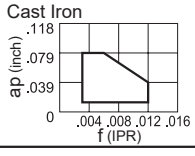
NEGATIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Medium Cutting	M Class	**M1** 	**Medium cutting of carbon steel and alloy steel** Single sided chipbreaker. Can be used for copying. An angled chipbreaker for controlling chip flow. (M1)	  KNUX160405RM1
For Cast Iron	M Class	**Flat Top**	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping.	 SNMN432
For Cast Iron	G Class	**Flat Top**	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	 SNGN432

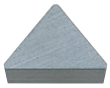
7° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
For Cast Iron	G Class	**Flat Top** 	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	 TCGN1.81.51

11° POSITIVE INSERTS WITHOUT HOLE

Application	Tolerance	Breaker Name and Picture	Features	Cross Section Geometry
Finish Cutting	G Class	**R/L**	**Chip breaker for finishing** A parallel chip breaker. Good chip control for low to medium feed rates.	  SPGR321R
Light to Medium Cutting	M Class	**Standard**	**Chip breaker for light to medium cutting of carbon steel, alloy steel and stainless steel** Standard, general purpose chip breaker.	  SPMR322
For Cast Iron	M Class	**Flat Top**	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping.	 SPMN322
For Cast Iron	G Class	**Flat Top**	**Chip breaker for heavy cutting of cast iron** Flat top. Most effective for unstable machining due to high edge strength and stable insert clamping. Can be used on workpieces requiring close tolerances due to G class insert tolerance.	 SPGN322

	Rhombic 80°	Square 90°	Triangular 60°	Parallelogram 55°
				KNUX_M1 A148
	CNMN A149	SNMN A150	TNMN A151	
		SNG A150	TNG A151	

	Triangular 60°
	TCGN  A202

SPECIAL PURPOSE INSERTS

	Square 90°	Triangular 60°
	SPGR_R A201	TPGR_R/L A203
	SPMR A201	TPMR A203
	SPMN A201	TPMN A203
	SPG A201	TPG A204

Application	Tolerance	Tool Holder Type	Inserts
Special	G Class	TL Type	RTG A200

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Mild Steel (ANSI ASTM A283, AISI 1010)	≤180HB	●	F	1	FY	VP25N	935—1475	.004—.009	.008—.031
		●	F	2	FY	NX2525	885—1260	.004—.009	.008—.031
		●	F	3	FS	NX2525	885—1260	.004—.009	.008—.028
		●	L	1	SY	VP25N	850—1345	.006—.013	.020—.047
		●	L	2	SY	NX2525	805—1150	.006—.013	.020—.047
		◐	F	1	FY	MP3025	900—1395	.004—.009	.008—.031
		◐	F	2	FY	NX3035	850—1215	.004—.009	.008—.031
		◐	F	3	FS	NX2525	885—1260	.004—.009	.008—.028
		◐	L	1	SY	MP3025	835—1260	.006—.013	.020—.047
		◐	L	2	SY	NX3035	785—1115	.006—.013	.020—.047
		✣	F	1	FY	MC6125	1260—1985	.004—.009	.008—.031
		✣	L	1	SY	MC6125	1150—1805	.006—.013	.020—.047
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	●	F	1	FP	NX2525	690—985	.003—.010	.004—.039
		●	F	2	FH	AP25N	720—1130	.003—.008	.008—.039
		●	F	3	FH	NX2525	690—985	.003—.008	.008—.039
		●	F	4	R/L-F	MP3025	705—1080	.002—.006	.004—.020
		●	L	1	LP	MC6115	820—1575	.004—.016	.012—.079
		●	L	2	LP	MC6125	900—1395	.004—.016	.012—.079
		●	L	3	SH	MC6115	820—1575	.004—.016	.012—.079
		●	M	1	MP	MC6115	755—1445	.006—.020	.012—.157
		●	M	2	MP	MC6125	820—1280	.006—.020	.012—.157
		●	M	3	MP	MP3025	590—900	.006—.020	.012—.157
		●	R	1	RP	MC6115	705—1360	.010—.024	.059—.236
		●	R	2	RP	MC6125	770—1215	.010—.024	.059—.236
		●	R	3	GH	MC6115	705—1360	.010—.024	.059—.236

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 — 280HB		**H**	1	**HX**	**MC6125**	690—1080	.020—.050	.118—.039
			F	1	**FP**	**MP3025**	705—1080	.003—.010	.004—.039
			F	2	**FH**	**MP3025**	705—1080	.003—.008	.008—.039
			F	3	**FH**	**NX3035**	655—935	.003—.008	.008—.039
			L	1	**LP**	**MC6115**	820—1575	.004—.016	.012—.079
			L	2	**LP**	**MC6125**	900—1395	.004—.016	.012—.079
			L	3	**SH**	**MC6115**	820—1575	.004—.016	.012—.079
			L	4	**SH**	**MC6125**	900—1395	.004—.016	.012—.079
			M	1	**MP**	**MC6125**	820—1280	.006—.020	.012—.157
			M	2	**MP**	**MC6115**	755—1445	.006—.020	.012—.157
			M	3	**MA**	**MC6125**	820—1280	.008—.020	.012—.157
			M	4	**MA**	**MC6115**	755—1445	.008—.020	.012—.157
			R	1	**RP**	**MC6125**	770—1215	.010—.024	.059—.236
			R	2	**RP**	**MC6115**	705—1360	.010—.024	.059—.236
			R	3	**GH**	**MC6125**	770—1215	.010—.024	.059—.236
			H	2	**HX**	**MC6125**	690—1080	.020—.050	.118—.039
			F	1	**FP**	**MC6125**	985—1525	.003—.010	.004—.039
			L	1	**LP**	**MC6125**	900—1395	.004—.016	.012—.079
			L	2	**SH**	**MC6125**	900—1395	.004—.016	.012—.079
			M	1	**MP**	**MC6125**	820—1280	.006—.020	.012—.157
			M	2	**MA**	**MC6125**	820—1280	.008—.020	.012—.157
			R	1	**RP**	**MC6035**	525—740	.010—.024	.059—.236
			R	2	**GH**	**MC6125**	770—1215	.010—.024	.059—.236
			H	1	**HX**	**MC6035**	460—655	.020—.050	.118—.433
			H	2	**HX**	**UH6400**	460—640	.020—.050	.118—.039
			H	3	**HV**	**UH6400**	375—525	.023—.050	.157—.079

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Austenitic Stainless Steel (AISI 304, AISI 316)	≤200HB	●	L	1	LM	MC7015	590—935	.004—.014	.012—.079
		●	L	2	SH	US735	310—605	.004—.016	.012—.079
		●	L	3	SH	NX2525	210—440	.004—.016	.012—.079
		●	M	1	MM	MC7015	540—850	.006—.018	.028—.197
		●	M	2	GM	MC7015	540—850	.006—.020	.020—.157
		●	R	1	RM	MC7015	510—805	.010—.022	.059—.236
		●	H	1	HL	US735	245—460	.012—.028	.118—.295
		●	H	2	HL	US735	245—460	.012—.028	.118—.295
		◐	L	1	LM	MC7025	540—720	.004—.014	.012—.079
		◐	L	2	SH	US735	310—605	.004—.016	.012—.079
		◐	M	1	MM	MC7025	490—655	.006—.018	.028—.197
		◐	M	2	GM	MC7025	490—655	.006—.020	.020—.157
		◐	M	3	MA	MC7025	490—655	.008—.020	.012—.157
		◐	M	4	MS	US735	295—560	.006—.020	.020—.157
		◐	M	5	MA	US735	295—560	.008—.020	.012—.157
		◐	R	1	RM	MC7025	460—620	.010—.022	.059—.236
		◐	R	2	GH	US735	280—525	.010—.024	.059—.236
		◐	H	1	HL	US735	245—460	.012—.028	.118—.295
		◐	H	2	HM	US735	245—460	.020—.043	.079—.394
		✣	L	1	LM	MP7035	310—510	.004—.014	.012—.079
		✣	L	2	SH	US735	310—605	.004—.016	.012—.079
		✣	M	1	MM	MP7035	295—475	.006—.018	.028—.197
		✣	M	2	GM	MP7035	295—475	.006—.020	.020—.157
		✣	M	3	MA	MP7035	295—475	.008—.020	.012—.157
		✣	M	4	MS	US735	295—560	.006—.020	.020—.157
		✣	M	5	MS	VP15TF	260—440	.006—.020	.020—.157
		✣	R	1	RM	MP7035	280—440	.010—.022	.059—.236
		✣	R	2	GH	US735	280—525	.010—.024	.059—.236
		✣	H	1	HL	US735	245—460	.012—.028	.118—.295
		✣	H	2	HM	US735	245—460	.020—.043	.079—.394

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Austenitic Stainless Steel (AISI 304LN, AISI 316LN)	>200HB	●	L	1	LM	MC7015	490—785	.004—.014	.012—.079
		●	L	2	SH	US735	260—510	.004—.016	.012—.079
		●	L	3	SH	NX2525	180—375	.004—.016	.012—.079
		●	M	1	MM	MC7015	440—705	.006—.018	.028—.197
		●	M	2	GM	MC7015	440—705	.006—.020	.020—.157
		●	R	1	RM	MC7015	425—670	.010—.022	.059—.236
		●	H	1	HL	US735	195—395	.012—.028	.118—.295
		●	H	2	HM	US735	195—395	.020—.043	.079—.394
		◐	L	1	LM	MC7025	440—590	.004—.014	.012—.079
		◐	L	2	SH	US735	260—510	.004—.016	.012—.079
		◐	M	1	MM	MC7025	410—540	.006—.018	.028—.197
		◐	M	2	GM	MC7025	410—540	.006—.020	.020—.157
		◐	M	3	MA	MC7025	410—540	.008—.020	.012—.157
		◐	M	4	MS	US735	245—460	.006—.020	.020—.157
		◐	M	5	MA	US735	245—460	.008—.020	.012—.157
		◐	R	1	RM	MC7025	375—510	.010—.022	.059—.236
		◐	R	2	GH	US735	230—440	.010—.024	.059—.236
		◐	H	1	HL	US735	195—395	.012—.028	.118—.295
		◐	H	2	HM	US735	195—395	.020—.043	.079—.394
		✣	L	1	LM	MP7035	260—425	.004—.014	.012—.079
		✣	L	2	SH	US735	260—510	.004—.016	.012—.079
		✣	M	1	MM	MP7035	245—395	.006—.018	.028—.197
		✣	M	2	GM	MP7035	245—395	.006—.020	.020—.157
		✣	M	3	MA	MP7035	245—395	.008—.020	.012—.157
		✣	M	4	MS	US735	245—460	.006—.020	.020—.157
		✣	M	5	MS	VP15TF	210—360	.006—.020	.020—.157
		✣	R	1	RM	MP7035	230—375	.010—.022	.059—.236
		✣	R	2	GH	US735	230—440	.010—.024	.059—.236
		✣	H	1	HL	US735	195—395	.012—.028	.118—.295
		✣	H	2	HM	US735	195—395	.020—.043	.079—.394

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Two-phase Stainless Steel (AISI 329)	≤280HB	●	L	1	LM	MC7015	395—620	.004—.014	.012—.079
		●	L	2	SH	US735	210—410	.004—.016	.012—.079
		●	L	3	SH	NX2525	130—295	.004—.016	.012—.079
		●	M	1	MM	MC7015	360—575	.006—.018	.028—.197
		●	M	2	GM	MC7015	360—575	.006—.020	.020—.157
		●	R	1	RM	MC7015	345—540	.010—.022	.059—.236
		●	H	1	HL	US735	165—310	.012—.028	.118—.295
		●	H	2	HM	US735	165—310	.020—.043	.079—.394
		◐	L	1	LM	MC7025	360—475	.004—.014	.012—.079
		◐	L	2	SH	US735	210—410	.004—.016	.012—.079
		◐	M	1	MM	MC7025	330—440	.006—.018	.028—.197
		◐	M	2	GM	MC7025	330—440	.006—.020	.020—.157
		◐	M	3	MA	MC7025	330—440	.008—.020	.012—.157
		◐	M	4	MS	US735	195—375	.006—.020	.020—.157
		◐	M	5	MA	US735	195—375	.008—.020	.012—.157
		◐	R	1	RM	MC7025	310—410	.010—.022	.059—.236
		◐	R	2	GH	US735	180—345	.010—.024	.059—.236
		◐	H	1	HL	US735	165—310	.012—.028	.118—.295
		◐	H	2	HM	US735	165—310	.020—.043	.079—.394
		✣	L	1	LM	MP7035	210—345	.004—.014	.012—.079
		✣	L	2	SH	US735	210—410	.004—.016	.012—.079
		✣	M	1	MM	MP7035	195—310	.006—.018	.028—.197
		✣	M	2	GM	MP7035	195—310	.006—.020	.020—.157
		✣	M	3	MA	MP7035	195—310	.008—.020	.012—.157
		✣	M	4	MS	US735	195—375	.006—.020	.020—.157
		✣	M	5	MS	VP15TF	165—295	.006—.020	.020—.157
		✣	R	1	RM	MP7035	180—295	.010—.022	.059—.236
		✣	R	2	GH	US735	180—345	.010—.024	.059—.236
		✣	H	1	HL	US735	165—310	.012—.028	.118—.295
		✣	H	2	HM	US735	165—310	.020—.043	.079—.394

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430)	≤200HB	●	L	1	LM	MC7015	590—935	.004—.014	.012—.079
		●	L	2	SH	US735	310—605	.004—.016	.012—.079
		●	L	3	SH	NX2525	210—440	.004—.016	.012—.079
		●	M	1	MM	MC7015	540—850	.006—.018	.028—.197
		●	M	2	GM	MC7015	540—850	.006—.020	.020—.157
		●	R	1	RM	MC7015	510—805	.010—.022	.059—.236
		●	H	1	HL	US735	245—460	.012—.028	.118—.295
		●	H	2	HM	US735	245—460	.020—.043	.079—.394
		◐	L	1	LM	MC7025	540—720	.004—.014	.012—.079
		◐	L	2	SH	US735	310—605	.004—.016	.012—.079
		◐	M	1	MM	MC7025	490—655	.006—.018	.028—.197
		◐	M	2	GM	MC7025	490—655	.006—.020	.020—.157
		◐	M	3	MA	MC7025	490—655	.008—.020	.012—.157
		◐	M	4	MA	US735	295—560	.008—.020	.012—.157
		◐	M	5	MS	US735	295—560	.006—.020	.020—.157
		◐	R	1	RM	MC7025	460—620	.010—.022	.059—.236
		◐	R	2	GH	US735	280—525	.010—.024	.059—.236
		◐	H	1	HL	US735	245—460	.012—.028	.118—.295
		◐	H	2	HM	US735	245—460	.020—.043	.079—.394
		✣	L	1	LM	MP7035	310—510	.004—.014	.012—.079
		✣	L	2	SH	US735	310—605	.004—.016	.012—.079
		✣	M	1	MM	MP7035	295—475	.006—.018	.028—.197
		✣	M	2	GM	MP7035	295—475	.006—.020	.020—.157
		✣	M	3	MA	MP7035	295—475	.008—.020	.012—.157
		✣	M	4	MS	US735	295—560	.006—.020	.020—.157
		✣	M	5	MS	VP15TF	260—440	.006—.020	.020—.157
		✣	R	1	RM	MP7035	280—440	.010—.022	.059—.236
		✣	R	2	GH	US735	280—525	.010—.024	.059—.236
		✣	H	1	HL	US735	245—460	.012—.028	.118—.295
		✣	H	2	HM	US735	245—460	.020—.043	.079—.394

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420)	>200HB	●	L	1	LM	MC7015	490—785	.004—.014	.012—.079
		●	L	2	SH	US735	260—510	.004—.016	.012—.079
		●	L	3	SH	NX2525	180—375	.004—.016	.012—.079
		●	M	1	MM	MC7015	440—705	.006—.018	.028—.197
		●	M	2	GM	MC7015	440—705	.006—.020	.020—.157
		●	R	1	RM	MC7015	425—670	.010—.022	.059—.236
		●	H	1	HL	US735	195—395	.012—.028	.118—.295
		●	H	2	HM	US735	195—395	.020—.043	.079—.394
		◐	L	1	LM	MC7025	440—590	.004—.014	.012—.079
		◐	L	2	SH	US735	260—510	.004—.016	.012—.079
		◐	M	1	MM	MC7025	410—540	.006—.018	.028—.197
		◐	M	2	MA	MC7025	410—540	.008—.020	.012—.157
		◐	M	3	MA	US735	245—460	.008—.020	.012—.157
		◐	M	4	MS	US735	245—460	.006—.020	.020—.157
		◐	R	1	RM	MC7025	375—510	.010—.022	.059—.236
		◐	R	2	GH	US735	230—440	.010—.024	.059—.236
		◐	H	1	HL	US735	195—395	.012—.028	.118—.295
		◐	H	2	HM	US735	195—395	.020—.043	.079—.394
		✣	L	1	LM	MP7035	260—425	.004—.014	.012—.079
		✣	L	2	SH	US735	260—510	.004—.016	.012—.079
		✣	M	1	MM	MP7035	245—395	.006—.018	.028—.197
		✣	M	2	GM	MP7035	245—395	.006—.020	.020—.157
		✣	M	3	MA	MP7035	245—395	.008—.020	.012—.157
		✣	M	4	MS	US735	245—460	.006—.020	.020—.157
		✣	M	5	MS	VP15TF	210—360	.006—.020	.020—.157
		✣	R	1	RM	MP7035	230—375	.010—.022	.059—.236
		✣	R	2	GH	US735	230—440	.010—.024	.059—.236
		✣	H	1	HL	US735	195—395	.012—.028	.118—.295
		✣	H	2	HM	US735	195—395	.020—.043	.079—.394

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Hardened Stainless Steel (AISI 630, AISI 631)	<450HB	●	L	1	LM	MC7015	310–425	.004–.014	.012–.079
		●	L	2	LS(M)	MP9005	410–575	.004–.010	.008–.031
		●	L	3	SH	US735	180–330	.004–.016	.012–.079
		●	L	4	SH	NX2525	115–245	.004–.016	.012–.079
		●	M	1	MM	MC7015	295–395	.006–.018	.028–.197
		●	M	2	GM	MC7015	295–395	.006–.020	.020–.157
		●	M	3	MS	MP9005	375–525	.006–.012	.020–.118
		●	R	1	RM	MC7015	280–360	.010–.022	.059–.236
		●	H	1	HL	US735	130–260	.016–.039	.059–.315
		●	H	2	HM	US735	130–260	.020–.043	.079–.394
		◐	L	1	LM	MC7025	280–360	.004–.014	.012–.079
		◐	L	2	SH	US735	180–330	.004–.016	.012–.079
		◐	L	3	LS(M)	MP9015	395–540	.004–.010	.008–.031
		◐	M	1	MM	MC7025	260–330	.006–.018	.028–.197
		◐	M	2	GM	MC7025	260–330	.006–.020	.020–.157
		◐	M	3	MA	MC7025	260–330	.004–.012	.020–.118
		◐	M	4	MS	US735	165–310	.006–.020	.020–.157
		◐	M	5	MA	US735	165–310	.004–.012	.020–.118
		◐	R	1	RM	MC7025	245–310	.010–.022	.059–.236
		◐	R	2	GH	US735	150–295	.010–.024	.059–.236
		◐	R	3	RS	MP9015	330–460	.008–.014	.039–.157
		◐	H	1	HL	US735	130–260	.016–.039	.059–.315
		◐	H	2	HM	US735	130–260	.020–.043	.079–.394
		✣	L	1	LM	MP7035	180–280	.004–.014	.012–.079
		✣	L	2	SH	US735	180–330	.004–.016	.012–.079
		✣	L	3	LS(M)	MP9025	260–310	.004–.010	.008–.031
		✣	M	1	MM	MP7035	165–260	.006–.018	.028–.197
		✣	M	2	GM	MP7035	165–260	.006–.020	.020–.157
		✣	M	3	MA	MP7035	165–260	.004–.012	.020–.118
		✣	M	4	MS	US735	165–310	.006–.020	.020–.157
		✣	M	5	MS	VP15TF	150–245	.006–.020	.020–.157
		✣	R	1	RM	MP7035	150–245	.010–.022	.059–.236
		✣	R	2	GH	US735	150–295	.010–.024	.059–.236
		✣	R	3	RS	MP9025	230–280	.008–.014	.039–.157
		✣	H	1	HL	US735	130–260	.016–.039	.059–.315
		✣	H	2	HM	US735	130–260	.020–.043	.079–.394

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron (AISI No 45 B)	≤350MPa	●	L	1	LK	MC5105	755－2295	.004－.020	.020－.098
		●	L	2	LK	MC5115	670－1260	.004－.020	.020－.098
		●	L	3	MA	MC5105	690－2100	.008－.020	.012－.157
		●	L	4	MA	MC5115	620－1150	.008－.020	.012－.157
		●	M	1	MK	MC5105	690－2100	.008－.022	.020－.157
		●	M	2	MK	MC5115	620－1150	.008－.022	.020－.157
		●	M	3	GK	MC5105	690－2100	.008－.024	.059－.197
		●	M	4	GK	MC5115	620－1150	.008－.024	.059－.197
		●	R	1	RK	MC5105	640－1985	.008－.024	.059－.236
		●	R	2	RK	MC5115	590－1080	.008－.024	.059－.236
		●	R	3	Flat	MC5105	640－1985	.008－.024	.098－.236
		●	R	4	Flat	MC5115	590－1080	.008－.024	.098－.236
		●	H	1	Flat	MC5105	640－1985	.008－.024	.098－.236
		●	H	2	Flat	MC5115	590－1080	.008－.024	.098－.236
		◐	L	1	LK	MC5105	755－2295	.004－.020	.020－.098
		◐	L	2	LK	MC5115	670－1260	.004－.020	.020－.098
		◐	L	3	MA	MC5105	690－2100	.008－.020	.012－.157
		◐	L	4	MA	MC5115	620－1150	.008－.020	.012－.157
		◐	M	1	MK	MC5105	690－2100	.008－.022	.020－.157
		◐	M	2	MK	MC5115	620－1150	.008－.022	.020－.157
		◐	M	3	GK	MC5105	690－2100	.008－.024	.059－.197
		◐	M	4	GK	MC5115	620－1150	.008－.024	.059－.197
		◐	R	1	RK	MC5105	640－1985	.008－.024	.059－.236
		◐	R	2	RK	MC5115	590－1080	.008－.024	.059－.236
		◐	R	3	Flat	MC5105	640－1985	.008－.024	.098－.236
		◐	R	4	Flat	MC5115	590－1080	.008－.024	.098－.236
		◐	H	1	Flat	MC5105	640－1985	.008－.024	.098－.236
		◐	H	2	Flat	MC5115	590－1080	.008－.024	.098－.236
		✣	L	1	LK	MC5115	670－1260	.004－.020	.020－.098
		✣	L	2	LK	MC5125	360－720	.004－.020	.020－.098
		✣	L	3	MA	MC5115	620－1150	.008－.020	.012－.157
		✣	L	4	MA	MC5125	330－655	.008－.020	.012－.157
		✣	M	1	MK	MC5115	620－1150	.008－.022	.020－.157
		✣	M	2	MK	MC5125	330－655	.008－.022	.020－.157
		✣	M	3	GK	MC5115	620－1150	.008－.024	.059－.197
		✣	M	4	GK	MC5125	330－655	.008－.024	.059－.197
		✣	R	1	RK	MC5115	590－1080	.008－.024	.059－.236
		✣	R	2	RK	MC5125	310－620	.008－.024	.059－.236
		✣	R	3	Flat	MC5115	590－1080	.008－.024	.098－.236
		✣	R	4	Flat	MC5125	310－620	.008－.024	.098－.236
		✣	H	1	Flat	MC5115	590－1080	.008－.024	.098－.236
		✣	H	2	Flat	MC5125	310－620	.008－.024	.098－.236

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤450MPa	●	**L**	1	**LK**	**MC5115**	640—1200	.004—.020	.020—.098
		●	**L**	2	**LK**	**MC5105**	705—2180	.004—.020	.020—.098
		●	**L**	3	**MA**	**MC5115**	590—1080	.008—.020	.012—.157
		●	**L**	4	**MA**	**MC5115**	590—1080	.008—.020	.012—.157
		●	**M**	1	**MK**	**MC5115**	590—1080	.008—.022	.020—.157
		●	**M**	2	**MK**	**MC5105**	640—1985	.008—.022	.020—.157
		●	**M**	3	**GK**	**MC5115**	590—1080	.008—.024	.059—.197
		●	**M**	4	**GK**	**MC5105**	640—1985	.008—.024	.059—.197
		●	**R**	1	**RK**	**MC5115**	560—1030	.008—.024	.059—.236
		●	**R**	2	**RK**	**MC5105**	605—1885	.008—.024	.059—.236
		●	**R**	3	**Flat**	**MC5115**	560—1030	.008—.024	.098—.236
		●	**R**	4	**Flat**	**MC5105**	605—1885	.008—.024	.098—.236
		●	**H**	1	**Flat**	**MC5115**	560—1030	.008—.024	.098—.236
		◐	**L**	1	**LK**	**MC5115**	640—1200	.004—.020	.020—.098
		◐	**L**	2	**MA**	**MC5115**	590—1080	.008—.020	.012—.157
		◐	**M**	1	**MK**	**MC5115**	590—1080	.008—.022	.020—.157
		◐	**M**	2	**GK**	**MC5115**	590—1080	.008—.024	.059—.197
		◐	**R**	1	**RK**	**MC5115**	560—1030	.008—.024	.059—.236
		◐	**R**	2	**Flat**	**MC5115**	560—1030	.008—.024	.098—.236
		◐	**R**	3	**GH**	**MC5115**	560—1030	.010—.024	.059—.236
		◐	**H**	1	**Flat**	**MC5115**	560—1030	.008—.024	.098—.236
		✣	**L**	1	**LK**	**MC5125**	330—670	.004—.020	.020—.098
		✣	**L**	2	**LK**	**MC5115**	640—1200	.004—.020	.020—.098
		✣	**L**	3	**MA**	**MC5125**	310—620	.008—.020	.012—.157
		✣	**L**	4	**MA**	**MC5115**	590—1080	.008—.020	.012—.157
		✣	**M**	1	**MK**	**MC5125**	310—620	.008—.022	.020—.157
		✣	**M**	2	**MK**	**MC5115**	590—1080	.008—.022	.020—.157
		✣	**M**	3	**GK**	**MC5125**	310—620	.008—.024	.059—.197
		✣	**M**	4	**GK**	**MC5115**	590—1080	.008—.024	.059—.197
		✣	**R**	1	**RK**	**MC5125**	295—590	.008—.024	.059—.236
		✣	**R**	2	**RK**	**MC5115**	560—1030	.008—.024	.059—.236
		✣	**R**	3	**Flat**	**MC5125**	295—590	.008—.024	.098—.236
		✣	**R**	4	**Flat**	**MC5115**	560—1030	.008—.024	.098—.236
		✣	**H**	1	**Flat**	**MC5125**	295—590	.008—.024	.098—.236
		✣	**H**	2	**Flat**	**MC5115**	560—1030	.008—.024	.098—.236
	≤800MPa	●	**L**	1	**LK**	**MC5115**	575—1065	.004—.020	.020—.098
		●	**L**	2	**LK**	**MC5105**	640—1950	.004—.020	.020—.098
		●	**L**	3	**MA**	**MC5115**	525—970	.008—.020	.012—.157
		●	**L**	4	**MA**	**MC5105**	575—1770	.008—.020	.012—.157
		●	**M**	1	**MK**	**MC5115**	525—970	.008—.022	.020—.157
		●	**M**	2	**MK**	**MC5105**	575—1770	.008—.022	.020—.157
		●	**M**	3	**GK**	**MC5115**	525—970	.008—.024	.059—.197
		●	**M**	4	**GK**	**MC5105**	575—1770	.008—.024	.059—.197

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤800MPa	●	R	1	RK	MC5115	490—920	.008—.024	.059—.236
		●	R	2	RK	MC5105	540—1690	.008—.024	.059—.236
		●	R	3	Flat	MC5115	490—920	.008—.024	.098—.236
		●	R	4	Flat	MC5105	540—1690	.008—.024	.098—.236
		●	H	1	Flat	MC5115	490—920	.008—.024	.098—.236
		●	H	2	Flat	MC5105	540—1690	.008—.024	.098—.236
		◐	L	1	LK	MC5115	575—1065	.004—.020	.020—.098
		◐	L	2	LK	MC5105	640—1950	.004—.020	.020—.098
		◐	L	3	MA	MC5115	525—970	.008—.020	.012—.157
		◐	L	4	MA	MC5105	575—1770	.008—.020	.012—.157
		◐	M	1	MK	MC5115	525—970	.008—.022	.020—.157
		◐	M	2	MK	MC5105	575—1770	.008—.022	.020—.157
		◐	M	3	GK	MC5115	525—970	.008—.024	.059—.197
		◐	M	4	GK	MC5105	575—1770	.008—.024	.059—.197
		◐	R	1	RK	MC5115	490—920	.008—.024	.059—.236
		◐	R	2	RK	MC5105	540—1690	.008—.024	.059—.236
		◐	R	3	Flat	MC5115	490—920	.008—.024	.098—.236
		◐	R	4	Flat	MC5105	540—1690	.008—.024	.098—.236
		◐	H	1	Flat	MC5115	490—920	.008—.024	.098—.236
		◐	H	2	Flat	MC5105	540—1690	.008—.024	.098—.236
		✣	L	1	LK	MC5125	295—605	.004—.020	.020—.098
		✣	L	2	LK	MC5115	575—1065	.004—.020	.020—.098
		✣	L	3	MA	MC5125	280—560	.008—.020	.012—.157
		✣	L	4	MA	MC5115	525—970	.008—.020	.012—.157
		✣	M	1	MK	MC5125	280—560	.008—.022	.020—.157
		✣	M	2	MK	MC5115	525—970	.008—.022	.020—.157
		✣	M	3	GK	MC5125	280—560	.008—.024	.059—.197
		✣	M	4	GK	MC5115	525—970	.008—.024	.059—.197
		✣	R	1	RK	MC5125	260—525	.008—.024	.059—.236
		✣	R	2	RK	MC5115	490—920	.008—.024	.059—.236
		✣	R	3	Flat	MC5125	260—525	.008—.024	.098—.236
		✣	R	4	Flat	MC5115	490—920	.008—.024	.098—.236
		✣	H	1	Flat	MC5125	260—525	.008—.024	.098—.236
		✣	H	2	Flat	MC5115	490—920	.008—.024	.098—.236

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
S									
Titanium Alloy (Ti-6Al-4V)	–	●	F	1	LS(M)	MT9015	130–280	.004–.010	.008–.031
		●	F	2	FJ	RT9010	150–310	.003–.008	.004–.039
		●	L	1	LS(M)	MT9015	130–280	.004–.010	.008–.031
		●	L	2	MJ(M)	RT9010	130–280	.003–.010	.016–.059
		●	M	1	MS	MT9015	130–260	.006–.012	.020–.118
		●	M	2	MS	RT9010	130–260	.006–.020	.020–.157
		●	R	1	RS	MT9015	115–245	.008–.014	.039–.157
		●	R	2	GJ	RT9010	115–245	.006–.014	.039–.118
		◐	F	1	LS(M)	MT9015	130–280	.004–.010	.008–.031
		◐	F	2	FJ	RT9010	150–310	.003–.008	.004–.039
		◐	L	1	LS(M)	MT9015	130–280	.004–.010	.008–.031
		◐	L	2	MJ(M)	RT9010	130–280	.003–.010	.016–.059
		◐	L	3	MJ(G)	RT9010	130–280	.003–.010	.016–.059
		◐	M	1	MS	MT9015	130–260	.006–.012	.020–.118
		◐	M	2	MS	RT9010	130–260	.006–.020	.020–.157
		◐	R	1	RS	MT9015	115–245	.008–.014	.039–.157
		◐	R	2	GJ	RT9010	115–245	.006–.014	.039–.118
		✣	F	1	LS(M)	MT9015	130–280	.004–.010	.008–.031
		✣	F	2	FJ	RT9010	150–310	.003–.008	.004–.039
		✣	L	1	LS(M)	MT9015	130–280	.004–.010	.008–.031
		✣	L	2	MJ(M)	RT9010	130–280	.003–.010	.016–.059
		✣	L	3	MJ(G)	RT9010	130–280	.003–.010	.016–.059
		✣	M	1	MS	MT9015	130–260	.006–.012	.020–.118
		✣	R	1	RS	MT9015	115–245	.008–.014	.039–.157
		✣	R	2	GJ	RT9010	115–245	.006–.014	.039–.118

RECOMMENDED CUTTING CONDITIONS

NEGATIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
S									
Heat Resistant Alloy (Inconel718)	–	●	F	1	LS(M)	MP9005	180—360	.004—.010	.008—.031
		●	F	2	FJ	VP10RT	100—195	.003—.008	.004—.039
		●	L	1	LS(M)	MP9005	180—360	.004—.010	.008—.031
		●	L	2	MJ(M)	MP9005	180—360	.003—.010	.016—.059
		●	L	3	MJ(M)	VP05RT	100—210	.003—.010	.016—.059
		●	L	4	MJ(M)	US905	180—310	.003—.010	.016—.059
		●	M	1	MS	MP9005	165—330	.006—.012	.020—.118
		●	M	2	MS	VP05RT	100—195	.006—.020	.020—.157
		●	M	3	MS	US905	165—295	.006—.020	.020—.157
		●	R	1	RS	MP9015	115—245	.008—.014	.039—.157
		●	R	2	GJ	VP10RT	65—150	.006—.014	.039—.118
		●	R	3	GJ	US905	150—280	.006—.014	.039—.118
		◐	F	1	LS(M)	MP9015	130—280	.004—.010	.008—.031
		◐	F	2	FJ	VP10RT	100—195	.003—.008	.004—.039
		◐	L	1	LS(M)	MP9015	130—280	.004—.010	.008—.031
		◐	L	2	MJ(M)	MP9015	130—260	.003—.010	.016—.059
		◐	L	3	MJ(M)	VP10RT	80—180	.003—.010	.016—.059
		◐	M	1	MS	MP9015	130—260	.006—.012	.020—.118
		◐	M	2	MA	MP9015	130—260	.004—.012	.020—.118
		◐	M	3	MS	VP10RT	80—165	.006—.020	.020—.157
		◐	R	1	RS	MP9015	115—245	.008—.014	.039—.157
		◐	R	2	GJ	VP10RT	65—150	.006—.014	.039—.118
		✣	F	1	LS(M)	MP9025	100—150	.004—.010	.008—.031
		✣	F	2	FJ	VP15TF	65—130	.003—.008	.004—.039
		✣	L	1	LS(M)	MP9025	100—150	.004—.010	.008—.031
		✣	L	2	MJ(G)	VP15TF	65—115	.003—.010	.016—.059
		✣	M	1	MS	MP9025	100—150	.006—.012	.020—.118
		✣	M	2	MA	MP9025	100—150	.004—.012	.020—.118
		✣	M	3	MS	VP15TF	65—115	.006—.020	.020—.157
		✣	R	1	RS	MP9025	80—130	.008—.014	.039—.157
		✣	R	2	GJ	VP15TF	50—100	.006—.014	.039—.118

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Mild Steel (AISI ASTM A283, AISI 1010)	≤180HB	●	F	1	FP	NX2525	740—1050	.002—.008	.008—.035
		●	F	2	FV	NX2525	740—1050	.002—.008	.008—.035
		●	F	3	R/L-F	MP3025	755—1165	.002—.005	.004—.020
		●	L	1	LP	NX2525	740—1050	.002—.010	.008—.039
		●	L	2	MV	MP3025	620—970	.003—.012	.012—.079
		●	L	3	Std	MP3025	620—970	.003—.012	.012—.079
		●	M	1	MP	NX2525	605—885	.003—.012	.012—.079
		◐	F	1	FP	MC6115	970—1870	.002—.008	.008—.035
		◐	F	2	FP	MP3025	755—1165	.002—.008	.008—.035
		◐	F	3	FV	MC6115	970—1870	.002—.008	.008—.035
		◐	F	4	FV	MP3025	755—1165	.002—.008	.008—.035
		◐	F	5	FV	NX3035	720—1015	.002—.008	.008—.035
		◐	L	1	LP	MC6115	970—1870	.002—.010	.008—.039
		◐	L	2	LP	MP3025	755—1165	.002—.010	.008—.039
		◐	L	3	SW	MC6115	970—1870	.002—.009	.008—.059
		◐	L	4	SW	MP3025	755—1165	.002—.009	.008—.059
		◐	M	1	MP	MC6115	805—1560	.003—.012	.012—.079
		◐	M	2	MP	MP3025	620—970	.003—.012	.012—.079
		◐	M	3	MV	MC6115	805—1560	.003—.012	.012—.079
		◐	M	4	MW	MC6115	805—1560	.004—.014	.031—.098
		✣	F	1	FP	MC6125	1050—1655	.002—.008	.008—.035
		✣	F	2	FV	MC6125	1050—1655	.002—.008	.008—.035
		✣	L	1	LP	MC6125	1050—1655	.002—.010	.008—.039
		✣	L	2	SV	MC6125	1050—1655	.002—.010	.008—.039
		✣	L	3	SW	MC6125	1050—1655	.002—.009	.008—.059
		✣	M	1	MP	MC6125	885—1380	.003—.012	.012—.079
		✣	M	2	MV	MC6125	885—1380	.003—.012	.012—.079
		✣	M	3	MW	MC6125	885—1380	.004—.014	.031—.098
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	●	F	1	FP	NX2525	540—785	.002—.008	.008—.035
		●	F	2	FV	NX2525	540—785	.002—.008	.008—.035
		●	F	3	R/L-F	MP3025	560—850	.002—.005	.004—.020
		●	L	1	LP	NX2525	540—785	.002—.010	.008—.039
		●	L	2	MV	MP3025	460—720	.003—.012	.012—.079
		●	L	3	Std	MP3025	460—720	.003—.012	.012—.079
		●	L	4	SV	MP3025	560—850	.002—.010	.008—.039
		●	L	5	SW	MP3025	560—850	.002—.009	.008—.059
		●	M	1	MP	NX2525	460—655	.003—.012	.012—.079
		●	M	2	MW	MP3025	460—720	.004—.014	.031—.098
		◐	F	1	FP	MC6115	720—1380	.002—.008	.008—.035
		◐	F	2	FP	MP3025	560—850	.002—.008	.008—.035
		◐	F	3	FV	MC6115	720—1380	.002—.008	.008—.035
		◐	F	4	FV	MP3025	560—850	.002—.008	.008—.035
		◐	F	5	FV	NX3035	525—755	.002—.008	.008—.035

RECOMMENDED CUTTING CONDITIONS

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	◔	L	1	LP	MC6115	720—1380	.002—.010	.008—.039
		◔	L	2	LP	MP3025	560—850	.002—.010	.008—.039
		◔	L	3	SW	MC6115	720—1380	.002—.009	.008—.059
		◔	L	4	SW	MP3025	560—850	.002—.009	.008—.059
		◔	M	1	MP	MC6125	655—1015	.003—.012	.012—.079
		◔	M	2	MP	MC6115	590—1150	.003—.012	.012—.079
		◔	M	3	MP	MP3025	460—720	.003—.012	.012—.079
		◔	M	4	MV	MC6125	655—1015	.003—.012	.012—.079
		◔	M	5	MV	MC6115	590—1150	.003—.012	.012—.079
		◔	M	6	MW	MC6115	590—1150	.004—.014	.031—.098
		✣	F	1	FP	MC6125	785—1215	.002—.008	.008—.035
		✣	F	2	FV	MC6125	785—1215	.002—.008	.008—.035
		✣	L	1	LP	MC6125	785—1215	.002—.010	.008—.039
		✣	L	2	SV	MC6125	785—1215	.002—.010	.008—.039
		✣	L	3	SW	MC6125	785—1215	.002—.009	.008—.059
		✣	M	1	MP	MC6125	655—1015	.003—.012	.012—.079
		✣	M	2	MV	MC6125	655—1015	.003—.012	.012—.079
		✣	M	3	MW	MC6125	655—1015	.004—.014	.031—.098
Carbon Steel • Alloy Steel (AISI 4340)	280 | 350HB	●	F	1	FP	NX2525	375—560	.002—.008	.008—.035
		●	L	1	LP	NX2525	375—560	.002—.010	.008—.039
		●	M	1	MP	NX2525	310—460	.003—.012	.012—.079
		◔	F	1	FP	MC6115	510—970	.002—.008	.008—.035
		◔	F	2	FV	MC6115	510—970	.002—.008	.008—.035
		◔	L	1	LP	MC6115	510—970	.002—.010	.008—.039
		◔	M	1	MP	MC6115	425—805	.003—.012	.012—.079
		◔	M	2	MP	MP3025	330—510	.003—.012	.012—.079
		◔	M	3	MV	MC6115	425—805	.003—.012	.012—.079
		✣	F	1	FP	MC6125	560—870	.002—.008	.008—.035
		✣	F	2	FV	MC6125	560—870	.002—.008	.008—.035
		✣	L	1	LP	MC6125	560—870	.002—.010	.008—.039
		✣	M	1	MP	MC6125	460—720	.003—.012	.012—.079
		✣	M	2	MV	MC6125	460—720	.003—.012	.012—.079

CUTTING CONDITIONS : ● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Austenitic Stainless Steel (AISI 304, AISI 316)	≤200HB	●	**F**	1	**FM**	**VP15TF**	245—410	.002—.008	.008—.035
		●	**F**	2	**Std**	**US735**	230—440	.003—.012	.012—.079
		●	**L**	1	**LM**	**MC7025**	460—620	.002—.010	.008—.039
		●	**L**	2	**Std**	**US735**	230—440	.003—.012	.012—.079
		●	**M**	1	**MM**	**MC7025**	395—525	.003—.012	.012—.079
		◐	**F**	1	**FM**	**VP15TF**	245—410	.002—.008	.008—.035
		◐	**F**	2	**Std**	**US735**	230—440	.003—.012	.012—.079
		◐	**L**	1	**LM**	**MC7025**	460—620	.002—.010	.008—.039
		◐	**L**	2	**Std**	**US735**	230—440	.003—.012	.012—.079
		◐	**M**	1	**MM**	**MC7025**	395—525	.003—.012	.012—.079
		✣	**F**	1	**FM**	**VP15TF**	245—410	.002—.008	.008—.035
		✣	**F**	2	**Std**	**US735**	230—440	.003—.012	.012—.079
		✣	**L**	1	**LM**	**MP7035**	280—440	.002—.010	.008—.039
		✣	**L**	2	**LM**	**VP15TF**	245—410	.002—.010	.008—.039
		✣	**L**	3	**Std**	**US735**	230—440	.003—.012	.012—.079
		✣	**M**	1	**MM**	**MP7035**	230—375	.003—.012	.012—.079
		✣	**M**	2	**MM**	**VP15TF**	195—345	.003—.012	.012—.079
Austenitic Stainless Steel (AISI 304LN, AISI 316LN)	>200HB	●	**F**	1	**FM**	**VP15TF**	195—345	.002—.008	.008—.035
		●	**F**	2	**Std**	**US735**	195—360	.003—.012	.012—.079
		●	**L**	1	**LM**	**MC7025**	395—525	.002—.010	.008—.039
		●	**L**	2	**Std**	**US735**	195—360	.003—.012	.012—.079
		●	**M**	1	**MM**	**MC7025**	330—425	.003—.012	.012—.079
		◐	**F**	1	**FM**	**VP15TF**	195—345	.002—.008	.008—.035
		◐	**F**	2	**Std**	**US735**	195—360	.003—.012	.012—.079
		◐	**L**	1	**LM**	**MC7025**	395—525	.002—.010	.008—.039
		◐	**L**	2	**Std**	**US735**	195—360	.003—.012	.012—.079
		◐	**M**	1	**MM**	**MC7025**	330—425	.003—.012	.012—.079
		✣	**F**	1	**FM**	**VP15TF**	195—345	.002—.008	.008—.035
		✣	**F**	2	**Std**	**US735**	195—360	.003—.012	.012—.079
		✣	**L**	1	**LM**	**MP7035**	230—375	.002—.010	.008—.039
		✣	**L**	2	**LM**	**VP15TF**	195—345	.002—.010	.008—.039
		✣	**L**	3	**Std**	**US735**	195—360	.003—.012	.012—.079
		✣	**M**	1	**MM**	**MP7035**	195—310	.003—.012	.012—.079
		✣	**M**	2	**MM**	**VP15TF**	165—295	.003—.012	.012—.079

RECOMMENDED CUTTING CONDITIONS

■ 7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Two-phase Stainless Steel (AISI 329)	≤280HB	●	F	1	FM	VP15TF	165－280	.002－.008	.008－.035
		●	F	2	Std	US735	150－295	.003－.012	.012－.079
		●	L	1	LM	MC7025	310－425	.002－.010	.008－.039
		●	L	2	Std	US735	150－295	.003－.012	.012－.079
		●	M	1	MM	MC7025	260－345	.003－.012	.012－.079
		◐	F	1	FM	VP15TF	165－280	.002－.008	.008－.035
		◐	F	2	Std	US735	150－295	.003－.012	.012－.079
		◐	L	1	LM	MC7025	310－425	.002－.010	.008－.039
		◐	L	2	Std	US735	150－295	.003－.012	.012－.079
		◐	M	1	MM	MC7025	260－345	.003－.012	.012－.079
		✣	F	1	FM	VP15TF	165－280	.002－.008	.008－.035
		✣	F	2	Std	US735	150－295	.003－.012	.012－.079
		✣	L	1	LM	MP7035	180－295	.002－.010	.008－.039
		✣	L	2	LM	VP15TF	165－280	.002－.010	.008－.039
		✣	L	3	Std	US735	150－295	.003－.012	.012－.079
		✣	M	1	MM	MP7035	150－245	.003－.012	.012－.079
		✣	M	2	MM	VP15TF	130－230	.003－.012	.012－.079
Ferritic and Martensitic Stainless Steel (AISI 410, AISI 430)	≤200HB	●	F	1	FM	VP15TF	245－410	.002－.008	.008－.035
		●	F	2	Std	US735	230－440	.003－.012	.012－.079
		●	L	1	LM	MC7025	460－620	.002－.010	.008－.039
		●	L	2	Std	US735	230－440	.003－.012	.012－.079
		●	M	1	MM	MC7025	395－525	.003－.012	.012－.079
		◐	F	1	FM	VP15TF	245－410	.002－.008	.008－.035
		◐	F	2	Std	US735	230－440	.003－.012	.012－.079
		◐	L	1	LM	MC7025	460－620	.002－.010	.008－.039
		◐	L	2	Std	US735	230－440	.003－.012	.012－.079
		◐	M	1	MM	MC7025	395－525	.003－.012	.012－.079
		✣	F	1	FM	VP15TF	245－410	.002－.008	.008－.035
		✣	F	2	Std	US735	230－440	.003－.012	.012－.079
		✣	L	1	LM	MP7035	280－440	.002－.010	.008－.039
		✣	L	2	LM	VP15TF	245－410	.002－.010	.008－.039
		✣	L	3	Std	US735	230－440	.003－.012	.012－.079
		✣	M	1	MM	MP7035	230－375	.003－.012	.012－.079
		✣	M	2	MM	VP15TF	195－345	.003－.012	.012－.079
Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420)	>200HB	●	F	1	FM	VP15TF	195－345	.002－.008	.008－.035
		●	F	2	Std	US735	195－360	.003－.012	.012－.079
		●	L	1	LM	MC7025	395－525	.002－.010	.008－.039
		●	L	2	Std	US735	195－360	.003－.012	.012－.079
		●	M	1	MM	MC7025	330－425	.003－.012	.012－.079
		◐	F	1	FM	VP15TF	195－345	.002－.008	.008－.035
		◐	F	2	Std	US735	195－360	.003－.012	.012－.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
M									
Ferritic and Martensitic Stainless Steel (AISI 431, AISI 420)	>200HB		**L**	1	**LM**	**MC7025**	395−525	.002−.010	.008−.039
			L	2	**Std**	**US735**	195−360	.003−.012	.012−.079
			M	1	**MM**	**MC7025**	330−425	.003−.012	.012−.079
			F	1	**FM**	**VP15TF**	195−345	.002−.008	.008−.035
			F	2	**Std**	**US735**	195−360	.003−.012	.012−.079
			L	1	**LM**	**MP7035**	230−375	.002−.010	.008−.039
			L	2	**LM**	**VP15TF**	195−345	.002−.010	.008−.039
			L	3	**Std**	**US735**	195−360	.003−.012	.012−.079
			M	1	**MM**	**MP7035**	195−310	.003−.012	.012−.079
			M	2	**MM**	**VP15TF**	165−295	.003−.012	.012−.079
Hardened Stainless Steel (AISI 630, AISI 631)	<450HB		**F**	1	**FM**	**VP15TF**	130−230	.002−.008	.008−.035
			F	2	**FS**	**MP9005**	360−490	.002−.005	.008−.055
			F	3	**Std**	**US735**	130−245	.003−.010	.012−.079
			L	1	**LM**	**MC7025**	245−310	.002−.008	.008−.039
			L	2	**LS(G)**	**MP9015**	345−460	.002−.006	.012−.118
			L	3	**LS(M)**	**MP9015**	345−460	.002−.008	.008−.039
			L	4	**Std**	**US735**	130−245	.003−.010	.012−.079
			M	1	**MM**	**MC7025**	195−260	.003−.010	.012−.079
			M	2	**MS**	**MP9015**	280−395	.003−.010	.012−.079
			M	3	**RCMT**	**MP9015**	280−395	.010−.018	.059−.118
			F	1	**FM**	**VP15TF**	130−230	.002−.008	.008−.035
			F	3	**FS**	**MP9015**	345−460	.002−.005	.008−.055
			F	3	**Std**	**US735**	130−245	.003−.010	.012−.079
			L	1	**LM**	**MC7025**	245−310	.002−.008	.008−.039
			L	2	**LS(G)**	**MP9015**	345−460	.002−.006	.012−.118
			L	3	**LS(M)**	**MP9015**	345−460	.002−.008	.008−.039
			L	4	**Std**	**US735**	130−245	.003−.010	.012−.079
			M	1	**MM**	**MC7025**	195−260	.003−.010	.012−.079
			M	2	**MS**	**MP9015**	280−395	.003−.010	.012−.079
			M	3	**RCMT**	**MP9015**	280−395	.010−.018	.059−.118
			F	1	**FM**	**VP15TF**	130−230	.002−.008	.008−.035
			F	2	**FS**	**MP9025**	230−280	.002−.005	.008−.055
			F	3	**Std**	**US735**	130−245	.003−.010	.012−.079
			L	1	**LM**	**MP7035**	150−245	.002−.008	.008−.039
			L	2	**LS(M)**	**MP9025**	230−280	.002−.008	.008−.039
			L	3	**LM**	**VP15TF**	130−230	.002−.008	.008−.039
			L	4	**LS(G)**	**MP9025**	230−280	.002−.006	.012−.118
			L	5	**Std**	**US735**	130−245	.003−.010	.012−.079
			M	1	**MM**	**MP7035**	130−195	.003−.010	.012−.079
			M	2	**MS**	**MP9025**	195−230	.003−.010	.012−.079
			M	3	**MM**	**VP15TF**	115−195	.003−.010	.012−.079
			M	4	**RCMT**	**MP9025**	195−230	.010−.018	.059−.118

RECOMMENDED CUTTING CONDITIONS

7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron (AISI No 45 B)	≤350MPa	●	F	1	LK	MC5105	655—2000	.002—.010	.008—.039
		●	F	2	LK	MC5115	590—1100	.002—.010	.008—.039
		●	L	1	LK	MC5105	655—2000	.002—.010	.008—.039
		●	L	2	LK	MC5115	590—1100	.002—.010	.008—.039
		●	M	1	MK	MC5105	540—1670	.003—.012	.012—.079
		●	M	2	MK	MC5115	490—920	.003—.012	.012—.079
		◐	F	1	LK	MC5105	655—2000	.002—.010	.008—.039
		◐	F	2	LK	MC5115	590—1100	.002—.010	.008—.039
		◐	L	1	LK	MC5105	655—2000	.002—.010	.008—.039
		◐	L	2	LK	MC5115	590—1100	.002—.010	.008—.039
		◐	L	3	SW	MC5115	590—1100	.002—.009	.008—.059
		◐	M	1	MK	MC5105	540—1670	.003—.012	.012—.079
		◐	M	2	MK	MC5115	490—920	.003—.012	.012—.079
		◐	M	3	Flat	MC5105	540—1670	.003—.012	.012—.079
		◐	M	4	Flat	MC5115	490—920	.003—.012	.012—.079
		◐	M	5	MV	MC5115	590—1100	.003—.012	.012—.079
		◐	M	6	MW	MC5115	490—920	.004—.014	.031—.098
		✣	F	1	LK	MC5115	590—1100	.002—.010	.008—.039
		✣	F	2	LK	MC5105	655—2000	.002—.010	.008—.039
		✣	L	1	LK	MC5115	590—1100	.002—.010	.008—.039
		✣	L	2	LK	MC5105	655—2000	.002—.010	.008—.039
		✣	M	1	MK	MC5115	490—920	.003—.012	.012—.079
		✣	M	2	MK	MC5105	540—1670	.003—.012	.012—.079
		✣	M	3	Flat	MC5115	490—920	.003—.012	.012—.079
		✣	M	4	Flat	MC5105	540—1670	.003—.012	.012—.079
Ductile Cast Iron	≤450MPa	●	F	1	LK	MC5115	560—1030	.002—.010	.008—.039
		●	F	2	LK	MC5105	620—1900	.002—.010	.008—.039
		●	L	1	LK	MC5115	560—1030	.002—.010	.008—.039
		●	L	2	LK	MC5105	620—1900	.002—.010	.008—.039
		●	M	1	MK	MC5115	460—870	.003—.012	.012—.079
		●	M	2	MK	MC5105	510—1590	.003—.012	.012—.079
		◐	F	1	LK	MC5115	560—1030	.002—.010	.008—.039
		◐	F	2	LK	MC5125	295—590	.002—.010	.008—.039
		◐	F	3	LK	MC5105	620—1900	.002—.010	.008—.039
		◐	L	1	LK	MC5115	560—1030	.002—.010	.008—.039
		◐	L	2	LK	MC5125	295—590	.002—.010	.008—.039
		◐	L	3	LK	MC5105	620—1900	.002—.010	.008—.039
		◐	L	4	MK	MC5115	460—870	.003—.012	.012—.079
		◐	L	5	MK	MC5125	245—490	.003—.012	.012—.079
		◐	L	6	MK	MC5105	510—1590	.003—.012	.012—.079
		◐	L	7	SW	MC5115	560—1030	.002—.009	.008—.059

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤450MPa		**M**	1	**MK**	**MC5115**	460－870	.003－.012	.012－.079
			M	2	**MK**	**MC5105**	510－1590	.003－.012	.012－.079
			M	3	**Flat**	**MC5115**	460－870	.003－.012	.012－.079
			M	4	**Flat**	**MC5125**	245－490	.003－.012	.012－.079
			M	5	**Flat**	**MC5105**	510－1590	.003－.012	.012－.079
			M	6	**MV**	**MC5115**	560－1030	.003－.012	.012－.079
			M	7	**MW**	**MC5115**	460－870	.004－.014	.031－.098
			F	1	**LK**	**MC5125**	295－590	.002－.010	.008－.039
			F	2	**LK**	**MC5115**	560－1030	.002－.010	.008－.039
			L	1	**LK**	**MC5125**	295－590	.002－.010	.008－.039
			L	2	**LK**	**MC5115**	560－1030	.002－.010	.008－.039
			M	1	**MK**	**MC5125**	245－490	.003－.012	.012－.079
			M	2	**MK**	**MC5115**	460－870	.003－.012	.012－.079
			M	3	**Flat**	**MC5125**	245－490	.003－.012	.012－.079
	≤800MPa		**F**	1	**LK**	**MC5115**	510－935	.002－.010	.008－.039
			F	2	**LK**	**MC5105**	560－1705	.002－.010	.008－.039
			L	1	**LK**	**MC5115**	510－935	.002－.010	.008－.039
			L	2	**LK**	**MC5105**	560－1705	.002－.010	.008－.039
			M	1	**MK**	**MC5115**	410－770	.003－.012	.012－.079
			M	2	**MK**	**MC5105**	460－1425	.003－.012	.012－.079
			F	1	**LK**	**MC5115**	510－935	.002－.010	.008－.039
			F	2	**LK**	**MC5125**	260－525	.002－.010	.008－.039
			F	3	**LK**	**MC5105**	560－1705	.002－.010	.008－.039
			L	1	**LK**	**MC5115**	510－935	.002－.010	.008－.039
			L	2	**LK**	**MC5125**	260－525	.002－.010	.008－.039
			L	3	**LK**	**MC5105**	560－1705	.002－.010	.008－.039
			L	4	**SW**	**MC5115**	510－935	.002－.009	.008－.059
			M	1	**MK**	**MC5115**	410－770	.003－.012	.012－.079
			M	2	**MK**	**MC5125**	210－440	.003－.012	.012－.079
			M	3	**MK**	**MC5105**	460－1425	.003－.012	.012－.079
			M	4	**MV**	**MC5115**	510－935	.003－.012	.012－.079
			M	5	**MW**	**MC5115**	410－770	.004－.014	.031－.098
			F	1	**LK**	**MC5125**	260－525	.002－.010	.008－.039
			F	2	**LK**	**MC5115**	510－935	.002－.010	.008－.039
			L	1	**LK**	**MC5125**	260－525	.002－.010	.008－.039
			L	2	**LK**	**MC5115**	510－935	.002－.010	.008－.039
			M	1	**MK**	**MC5125**	210－440	.003－.012	.012－.079
			M	2	**MK**	**MC5115**	410－770	.003－.012	.012－.079

RECOMMENDED CUTTING CONDITIONS

■ 7° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
N									
Aluminum Alloy (A6061, A7075)	Si<5%	●	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
		◐	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
		✣	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
Aluminum Alloy (AC4B)	5%≤Si≤10%	●	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
		◐	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
		✣	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
Aluminum Alloy (ADC12, A390)	Si>10%	●	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
		◐	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118
		✣	**F**	1	**AZ**	**HTi10**	985－2295	.004－.016	.008－.118

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
S									
Titanium Alloy (Ti-6Al-4V)	–	●	F	1	FS-P	MT9005	130－260	.002－.005	.008－.055
		●	F	2	FJ	RT9010	115－245	.002－.005	.008－.055
		●	L	1	LS-P	MT9005	130－260	.002－.006	.012－.118
		●	L	2	LS(M)	MT9005	130－260	.002－.008	.008－.039
		●	M	1	MS	MT9005	115－210	.003－.010	.012－.079
		●	M	2	RCMT	MT9005	115－210	.010－.018	.059－.118
		◐	F	1	FS-P	MT9005	130－260	.002－.005	.008－.055
		◐	F	2	FJ	RT9010	115－245	.002－.005	.008－.055
		◐	L	1	LS-P	MT9005	130－260	.002－.006	.012－.118
		◐	L	2	LS(M)	MT9005	130－260	.002－.008	.008－.039
		◐	M	1	MS	MT9005	115－210	.003－.010	.012－.079
		◐	M	2	RCMT	MT9005	115－210	.010－.018	.059－.118
		✣	F	1	FS-P	MT9005	130－260	.002－.005	.008－.055
		✣	F	2	FJ	RT9010	115－245	.002－.005	.008－.055
		✣	L	1	LS-P	MT9005	130－260	.002－.006	.012－.118
		✣	L	2	LS(M)	MT9005	130－260	.002－.008	.008－.039
		✣	M	1	MS	MT9005	115－210	.003－.010	.012－.079
		✣	M	2	RCMT	MT9015	100－195	.010－.018	.059－.118
Heat Resistant Alloy (Inconel718)		●	F	1	FS	MP9005	150－310	.002－.005	.008－.055
		●	F	2	FJ	VP10RT	65－150	.002－.005	.008－.055
		●	L	1	LS(G)	MP9005	150－310	.002－.006	.012－.118
		●	L	2	LS(M)	MP9005	150－310	.002－.008	.008－.039
		●	M	1	MS	MP9005	130－260	.003－.010	.012－.079
		●	M	2	RCMT	MP9005	130－260	.010－.018	.059－.118
		◐	F	1	FS	MP9015	115－245	.002－.005	.008－.055
		◐	F	2	FJ	VP10RT	65－150	.002－.005	.008－.055
		◐	L	1	LS(G)	MP9015	115－245	.002－.006	.012－.118
		◐	L	2	LS(M)	MP9015	115－245	.002－.008	.008－.039
		◐	M	1	MS	MP9015	100－195	.003－.010	.012－.079
		◐	M	2	RCMT	MP9015	100－195	.010－.018	.059－.118
		✣	F	1	FS	MP9025	80－130	.002－.005	.008－.055
		✣	F	2	FJ	VP10RT	65－150	.002－.005	.008－.055
		✣	L	1	LS(M)	MP9025	80－130	.002－.008	.008－.039
		✣	L	2	LS(G)	MP9025	80－130	.002－.006	.012－.118
		✣	M	1	MS	MP9025	65－115	.003－.010	.012－.079
		✣	M	2	RCMT	MP9025	65－115	.010－.018	.059－.118

RECOMMENDED CUTTING CONDITIONS

11° POSITIVE INSERT TYPE

Breaker : **Std :** Standard **Flat :** Flat Top

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P									
Mild Steel (AISI ASTM A283, AISI 1010)	≤180HB	●	F	1	R-R/L	NX2525	740－1050	.002－.010	.012－.059
		●	L	1	R-Std	NX2525	605－885	.003－.012	.012－.079
		●	M	1	R-Std	NX2525	605－885	.003－.012	.012－.079
		◐	F	1	FV	MC6125	1050－1655	.002－.008	.008－.035
		◐	F	2	R-R/L	NX2525	740－1050	.002－.010	.012－.059
		◐	L	1	LP	MC6125	1050－1655	.002－.010	.008－.039
		◐	L	2	R-Std	MC6115	805－1560	.003－.012	.012－.079
		◐	L	3	R-Std	MP3025	620－970	.003－.012	.012－.079
		◐	L	4	R-Std	NX3035	590－835	.003－.012	.012－.079
		◐	M	1	MV	MC6125	885－1380	.003－.012	.012－.079
		◐	M	2	MV	MC6115	805－1560	.003－.012	.012－.079
		◐	M	3	R-Std	MC6125	885－1380	.003－.012	.012－.079
		◐	M	4	R-Std	MP3025	620－970	.003－.012	.012－.079
		◐	M	5	R-Std	NX3035	590－835	.003－.012	.012－.079
		✣	F	1	R-R/L	UTi20T	375－540	.002－.010	.012－.059
		✣	L	1	LP	MC6125	1050－1655	.002－.010	.008－.039
		✣	L	2	R-Std	MC6125	885－1380	.003－.012	.012－.079
		✣	L	3	N-Flat	UP20M	345－525	.003－.012	.012－.079
		✣	M	1	MV	MC6125	885－1380	.003－.012	.012－.079
		✣	M	2	R-Std	MC6125	885－1380	.003－.012	.012－.079
		✣	M	3	N-Flat	UP20M	345－525	.003－.012	.012－.079
Carbon Steel • Alloy Steel (AISI 1045, AISI 4140)	180 | 280HB	●	F	1	R-R/L	NX2525	540－785	.002－.010	.012－.059
		●	L	1	R-Std	NX2525	460－655	.003－.012	.012－.079
		●	M	1	R-Std	NX2525	460－655	.003－.012	.012－.079
		◐	F	1	FV	MC6125	785－1215	.002－.008	.008－.035
		◐	F	2	R-R/L	NX2525	540－785	.002－.010	.012－.059
		◐	L	1	LP	MC6125	785－1215	.002－.010	.008－.039
		◐	L	2	R-Std	MC6115	590－1150	.003－.012	.012－.079
		◐	L	3	R-Std	MC6125	655－1015	.003－.012	.012－.079
		◐	L	4	R-Std	MP3025	460－720	.003－.012	.012－.079
		◐	L	5	R-Std	NX3035	440－620	.003－.012	.012－.079
		◐	M	1	MV	MC6125	655－1015	.003－.012	.012－.079
		◐	M	2	R-Std	MC6115	590－1150	.003－.012	.012－.079
		◐	M	3	R-Std	MC6125	655－1015	.003－.012	.012－.079
		◐	M	4	R-Std	MP3025	460－720	.003－.012	.012－.079
		◐	M	5	R-Std	NX3035	440－620	.003－.012	.012－.079
		✣	F	1	R-R/L	UTi20T	280－395	.002－.010	.012－.059
		✣	L	1	LP	MC6125	785－1215	.002－.010	.008－.039
		✣	L	2	R-Std	MC6125	655－1015	.003－.012	.012－.079
		✣	L	3	N-Flat	UP20M	260－395	.003－.012	.012－.079
		✣	M	1	MV	MC6125	655－1015	.003－.012	.012－.079
		✣	M	2	R-Std	MC6125	655－1015	.003－.012	.012－.079
		✣	M	3	N-Flat	UP20M	260－395	.003－.012	.012－.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Gray Cast Iron (AISI No 45 B)	≤350MPa	●	F	1	R-R/L	NX2525	475−655	.002−.010	.012−.059
		●	L	1	N-Flat	MC5105	540−1670	.003−.012	.012−.079
		●	L	2	N-Flat	MC5115	490−920	.003−.012	.012−.079
		●	L	3	N-Flat	NX2525	395−540	.003−.012	.012−.079
		●	L	4	R-Std	NX2525	395−540	.003−.012	.012−.079
		●	M	1	N-Flat	MC5105	540−1670	.003−.012	.012−.079
		●	M	2	N-Flat	MC5115	490−920	.003−.012	.012−.079
		●	M	3	N-Flat	NX2525	395−540	.003−.012	.012−.079
		●	M	4	R-Std	NX2525	395−540	.003−.012	.012−.079
		◐	F	1	R-R/L	NX2525	475−655	.002−.010	.012−.059
		◐	F	2	R-R/L	HTi10	295−410	.002−.010	.012−.059
		◐	L	1	N-Flat	MC5115	490−920	.003−.012	.012−.079
		◐	L	2	N-Flat	MC5105	540−1670	.003−.012	.012−.079
		◐	M	1	N-Flat	MC5115	490−920	.003−.012	.012−.079
		◐	M	2	N-Flat	MC5105	540−1670	.003−.012	.012−.079
		◐	M	3	MV	MC5115	590−1100	.003−.012	.012−.079
		✣	F	1	R-R/L	UTi20T	230−345	.002−.010	.012−.059
		✣	L	1	N-Flat	MC5125	260−525	.003−.012	.012−.079
		✣	L	2	N-Flat	MC5115	490−920	.003−.012	.012−.079
		✣	L	3	N-Flat	VP15TF	375−525	.003−.012	.012−.079
		✣	M	1	N-Flat	MC5125	260−525	.003−.012	.012−.079
		✣	M	2	N-Flat	MC5115	490−920	.003−.012	.012−.079
		✣	M	3	N-Flat	VP15TF	375−525	.003−.012	.012−.079
Ductile Cast Iron	≤450MPa	●	F	1	R-R/L	NX2525	460−620	.002−.010	.012−.059
		●	L	1	N-Flat	MC5115	460−870	.003−.012	.012−.079
		●	L	2	N-Flat	MC5105	510−1590	.003−.012	.012−.079
		●	L	3	N-Flat	NX2525	375−510	.003−.012	.012−.079
		●	L	4	R-Std	NX2525	375−510	.003−.012	.012−.079
		●	M	1	N-Flat	MC5115	460−870	.003−.012	.012−.079
		●	M	2	N-Flat	MC5105	510−1590	.003−.012	.012−.079
		●	M	3	N-Flat	NX2525	375−510	.003−.012	.012−.079
		●	M	4	R-Std	NX2525	375−510	.003−.012	.012−.079
		◐	F	1	R-R/L	NX2525	460−620	.002−.010	.012−.059
		◐	F	2	R-R/L	HTi10	280−395	.002−.010	.012−.059
		◐	L	1	N-Flat	MC5115	460−870	.003−.012	.012−.079
		◐	L	2	N-Flat	MC5125	245−490	.003−.012	.012−.079
		◐	L	3	N-Flat	MC5105	510−1590	.003−.012	.012−.079
		◐	M	1	N-Flat	MC5115	460−870	.003−.012	.012−.079
		◐	M	2	N-Flat	MC5125	245−490	.003−.012	.012−.079
		◐	M	3	N-Flat	MC5105	510−1590	.003−.012	.012−.079
		◐	M	4	MV	MC5115	560−1030	.003−.012	.012−.079
		✣	F	1	R-R/L	UTi20T	210−330	.002−.010	.012−.059
		✣	L	1	N-Flat	MC5125	245−490	.003−.012	.012−.079
		✣	L	2	N-Flat	MC5115	460−870	.003−.012	.012−.079
		✣	L	3	N-Flat	VP15TF	360−490	.003−.012	.012−.079
		✣	M	1	N-Flat	MC5125	245−490	.003−.012	.012−.079
		✣	M	2	N-Flat	MC5115	460−870	.003−.012	.012−.079
		✣	M	3	N-Flat	VP15TF	360−490	.003−.012	.012−.079

Work Material	Hardness	Cutting Mode		Priority	Breaker	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
K									
Ductile Cast Iron	≤800MPa	●	**F**	1	**R-R/L**	**NX2525**	410－560	.002－.010	.012－.059
		●	**L**	1	**N-Flat**	**MC5115**	410－770	.003－.012	.012－.079
		●	**L**	2	**N-Flat**	**MC5105**	460－1425	.003－.012	.012－.079
		●	**L**	3	**N-Flat**	**NX2525**	345－460	.003－.012	.012－.079
		●	**L**	4	**R-Std**	**NX2525**	345－460	.003－.012	.012－.079
		●	**M**	1	**N-Flat**	**MC5115**	410－770	.003－.012	.012－.079
		●	**M**	2	**N-Flat**	**MC5105**	460－1425	.003－.012	.012－.079
		●	**M**	3	**N-Flat**	**NX2525**	345－460	.003－.012	.012－.079
		●	**M**	4	**R-Std**	**NX2525**	345－460	.003－.012	.012－.079
		◐	**F**	1	**R-R/L**	**NX2525**	410－560	.002－.010	.012－.059
		◐	**F**	2	**R-R/L**	**HTi10**	245－360	.002－.010	.012－.059
		◐	**L**	1	**N-Flat**	**MC5115**	410－770	.003－.012	.012－.079
		◐	**L**	2	**N-Flat**	**MC5125**	210－440	.003－.012	.012－.079
		◐	**L**	3	**N-Flat**	**MC5105**	460－1425	.003－.012	.012－.079
		◐	**M**	1	**N-Flat**	**MC5115**	410－770	.003－.012	.012－.079
		◐	**M**	2	**N-Flat**	**MC5125**	210－440	.003－.012	.012－.079
		◐	**M**	3	**N-Flat**	**MC5105**	460－1425	.003－.012	.012－.079
		◐	**M**	4	**MV**	**MC5115**	510－935	.003－.012	.012－.079
		✣	**F**	1	**R-R/L**	**UTi20T**	195－280	.002－.010	.012－.059
		✣	**L**	1	**N-Flat**	**MC5125**	210－440	.003－.012	.012－.079
		✣	**L**	2	**N-Flat**	**MC5115**	410－770	.003－.012	.012－.079
		✣	**L**	3	**N-Flat**	**VP15TF**	310－440	.003－.012	.012－.079
		✣	**M**	1	**N-Flat**	**MC5125**	210－440	.003－.012	.012－.079
		✣	**M**	2	**N-Flat**	**MC5115**	410－770	.003－.012	.012－.079
		✣	**M**	3	**N-Flat**	**VP15TF**	310－440	.003－.012	.012－.079

CUTTING CONDITIONS : ● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
CUTTING AREA : **F** : Finish Cutting **L** : Light Cutting **M** : Medium Cutting **R** : Rough Cutting **H** : Heavy Cutting

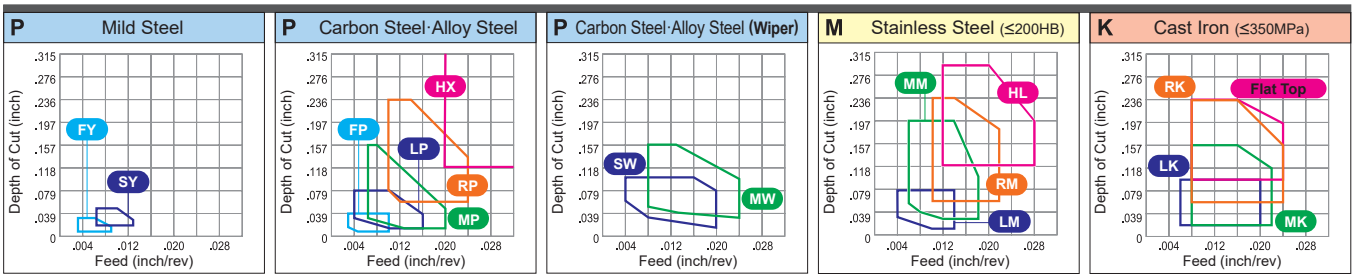
Memo

80° CN TYPE INSERTS WITH HOLE

CNMG 4 3 0.5 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◐●✠✠●○◐◔○◔✠✠○◐○◔○◔✠○
M	Stainless Steel	●◐●✠✠●◐◔✠✠○○○✠✠
K	Cast Iron	●◐●✠◔✠◔✠✠○○○✠○◔●○
N	Non-ferrous Metal	◔●
S	Heat resistant Alloy, Titanium Alloy	●◐●✠○◐○◔✠◔●◐●◐●

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP	**CNMG430.5FP**	CNMG120402-FP	.008			●	●																						●				★									
	CNMG431FP	CNMG120404-FP	.016			●	●																						●				★									
	CNMG432FP	CNMG120408-FP	.031			●	●																						●				★									
	CNMG433FP	CNMG120412-FP	.047			●	●																						●				★									
Finish Cutting																																											
FH	**CNMG430.5FH**	CNMG120402-FH	.008																										●				●●									
	CNMG431FH	CNMG120404-FH	.016																										●●				★									
	CNMG432FH	CNMG120408-FH	.031																										●●				★									
	CNMG433FH	CNMG120412-FH	.047																										★				★									
Finish Cutting																																											
FS	**CNMG431FS**	CNMG120404-FS	.016																										●				★									
	CNMG432FS	CNMG120408-FS	.031																										●				★									
Finish Cutting																																											
FS	**CNGG43V5FS**	CNGG1204V5-FS	.002																		●●																					●	
NEW	**CNGG430.2FS**	CNGG120401-FS	.004																		●●●																					●	
Finish Cutting	**CNGG430.5FS**	CNGG120402-FS	.008																		●●●																					●	
	CNGG431FS	CNGG120404-FS	.016																		●●●																					●	
	CNGG432FS	CNGG120408-FS	.031																		●●●																					●	
FY	**CNMG431FY**	CNMG120404-FY	.016																										●	★			★●									
	CNMG432FY	CNMG120408-FY	.031																										●	★			★									
Finish Cutting																																											
FJ	**CNGG43V5FJ**	CNGG1204V5-FJ	.002																								●													★			
	CNGG430.2FJ	CNGG120401-FJ	.004																								●													★			
	CNGG430.5FJ	CNGG120402-FJ	.008																								●													★			
	CNGG431FJ	CNGG120404-FJ	.016																								●★													★			
Finish Cutting	**CNGG432FJ**	CNGG120408-FJ	.031																								●●													●			

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	● ✣ ○ ◔ ❁ ❁ ● ◐ ✣ ✣ ● ○ ◐ ✣ ○ ◔ ❁ ❁ ◐ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	● ◐ ✣ ✣ ● ◐ ❁ ❁ ◐ ○ ○ ○ ❁ ○
K	Cast Iron	● ◐ ✣ ◔ ❁ ◐ ❁ ❁ ○ ○ ○ ❁ ○ ○ ◔ ○
N	Non-ferrous Metal	◔ ● ◐ ◐ ◐ ◐ ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◔ ● ◐ ◐ ◐ ◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW									NEW		NEW						NEW																					
				MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FJ-P	**CNGG43V5FJ-P**	CNGG1204V5-FJ-P	.002																																		●				
	CNGG430.2FJ-P	CNGG120401-FJ-P	.004																																		●				
	CNGG430.5FJ-P	CNGG120402-FJ-P	.008																																		●				
Finish Cutting																																									
LP	**CNMG431LP**	CNMG120404-LP	.016	●	●	●	●	●																						●											
	CNMG432LP	CNMG120408-LP	.031	●	●	●	●	●																						●											
	CNMG433LP	CNMG120412-LP	.047	●	●	●	●	●																																		
Light Cutting																																									
LM	**CNMG431LM**	CNMG120404-LM	.016								●	●	●																												
	CNMG432LM	CNMG120408-LM	.031								●	●	●																												
	CNMG433LM	CNMG120412-LM	.047								●	●	●																												
Light Cutting																																									
LK	**CNMG431LK**	CNMG120404-LK	.016													●	●	●	●																						
	CNMG432LK	CNMG120408-LK	.031													●	●	●	●																						
	CNMG433LK	CNMG120412-LK	.047													●	★	●	●																						
Light Cutting																																									
LS	**CNMG321LS**	CNMG090304-LS	.016																		●	●	●																		
	CNMG322LS	CNMG090308-LS	.031																		●	●	●																		
	CNMG430.5LS	CNMG120402-LS	.008																		●	●	●																	●	
	CNMG431LS	CNMG120404-LS	.016																		●	●	●																	●	
	CNMG432LS	CNMG120408-LS	.031																		●	●	●																	●	
Light Cutting																																									
LS NEW	**CNGG430.5LS**	CNGG120402-LS	.008																		●	●	●																	●	
	CNGG431LS	CNGG120404-LS	.016																		●	●	●																	●	
	CNGG432LS	CNGG120408-LS	.031																		●	●	●																	●	
Light Cutting																																									
SH	**CNMG32.51SH**	CNMG09T304-SH	.016										★																												
	CNMG431SH	CNMG120404-SH	.016	●	●	●	●						●																	★			★	●							
	CNMG432SH	CNMG120408-SH	.031	●	●	●	●						●																	★			★	●							
	CNMG433SH	CNMG120412-SH	.047	●	●	●	●																																		
Light Cutting																																									
SA	**CNMG431SA**	CNMG120404-SA	.016	●	●	●	●						●																				★	●							
	CNMG432SA	CNMG120408-SA	.031	●	●	●	●						●																				★	●							
	CNMG433SA	CNMG120412-SA	.047	●	●	●	●																											●							
Light Cutting																																									

● = NEW

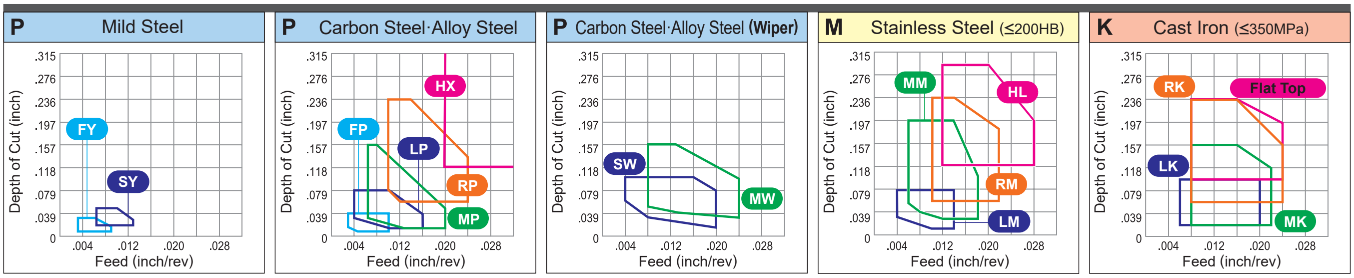
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMG 4 3 1 SW
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting··· Rough Cutting··· Heavy Cutting···



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel		●	✤	○	◔	❁	❁	●																		❁	❁	◐	○	○	◔	○	◔	❁							○
	M	Stainless Steel									●	◐	✤	✤	●										◐		◔	❁	❁		○	○		○		❁							
	K	Cast Iron														●	◐	✤	◔	❁							◔	❁			○	○		○		❁	○	◔					○
	N	Non-ferrous Metal																																				◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✤	○	◐	○	◔	❁										◔	●	◐	●	◐	
				Coated																										Coated Cermet				Cermet		Carbide							
*SW Light Cutting (Wiper)	CNMG431SW	CNMG120404-SW	.016	●	●	●													●	●										●				★	●								
	CNMG432SW	CNMG120408-SW	.031	●	●	●													●	●										●				★	●								
	CNMG433SW	CNMG120412-SW	.047	●	●	●																								●				●	●								
SY Light Cutting	CNMG431SY	CNMG120404-SY	.016																											●		★		★									
	CNMG432SY	CNMG120408-SY	.031																											●		★		★									
MJ Light Cutting	CNMG431MJ	CNMG120404-MJ	.016																		●	●		★		●	●													●			
	CNMG432MJ	CNMG120408-MJ	.031																		●	●		★		●	●													●			
	CNMG433MJ	CNMG120412-MJ	.047																		●	●		★		★	★																
	CNMG434MJ	CNMG120416-MJ	.063																		●	●		★		★	★																
MJ Light Cutting	CNGG431MJ	CNGG120404-MJ	.016																								●	●										●		●			
	CNGG432MJ	CNGG120408-MJ	.031																								●	●										●		●			
MP Medium Cutting	CNMG431MP	CNMG120404-MP	.016	●	●	●	●	●																						●													
	CNMG432MP	CNMG120408-MP	.031	●	●	●	●	●																						●													
	CNMG433MP	CNMG120412-MP	.047	●	●	●	●	●																						●													
	CNMG434MP	CNMG120416-MP	.063	●	●	●	●	●																																			
	CNMG542MP	CNMG160608-MP	.031	●	●		●																																				
	CNMG543MP	CNMG160612-MP	.047	●	●		●																																				
	CNMG544MP	CNMG160616-MP	.063	●	●		●																																				

* Please refer to A032 before using the SW breaker (wiper insert).

● (yellow) = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◕●✣✣● ○◔○○◔○◔❁ ◕○○○◔○◔❁ ❁◔○◔ ○
M	Stainless Steel	◕ ◔❁❁ ○○ ○ ❁
K	Cast Iron	◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✣○◕○◔❁ ◔●●●●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide						
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MM	**CNMG432MM**	CNMG120408-MM	.031								●	●	●																										
	CNMG433MM	CNMG120412-MM	.047								●	●	●																										
	CNMG434MM	CNMG120416-MM	.063								●	●	●																										
	CNMG542MM	CNMG160608-MM	.031								●	●	●																										
	CNMG543MM	CNMG160612-MM	.047								●	●	●																										
	CNMG544MM	CNMG160616-MM	.063								●	●	●																										
	CNMG642MM	CNMG190608-MM	.031								●	●	●																										
	CNMG643MM	CNMG190612-MM	.047								●	●	●																										
Medium Cutting	**CNMG644MM**	CNMG190616-MM	.063								●	●	●																										
MK	**CNMG431MK**	CNMG120404-MK	.016													●	●	●	●	●																			
	CNMG432MK	CNMG120408-MK	.031													●	●	●	●	●																			
	CNMG433MK	CNMG120412-MK	.047													●	●	●	●	●																			
	CNMG434MK	CNMG120416-MK	.063													●	●	●	●	●																			
	CNMG542MK	CNMG160608-MK	.031													●	●	★	★	●																			
	CNMG543MK	CNMG160612-MK	.047													★	●	●	●	●																			
	CNMG544MK	CNMG160616-MK	.063													●	●	★	●	●																			
	CNMG643MK	CNMG190612-MK	.047													●			●	●																			
Medium Cutting	**CNMG644MK**	CNMG190616-MK	.063													★			●	●																			
***MS**	**CNMG321MS**	CNMG090304-MS	.016																		●	●	●																
	CNMG322MS	CNMG090308-MS	.031																		●	●	●																
	CNMG431MS	CNMG120404-MS	.016																		●	●	●																●
	CNMG432MS	CNMG120408-MS	.031																		●	●	●																●
	CNMG433MS	CNMG120412-MS	.047																		●	●	●																●
	CNMG543MS	CNMG160612-MS	.047																		●	●	●																●
Medium Cutting	**CNMG544MS**	CNMG160616-MS	.063																		●	●	●																●
MS	**CNMG321MS**	CNMG090304-MS	.016											●																									
	CNMG322MS	CNMG090308-MS	.031											●																									
	CNMG32.51MS	CNMG09T304-MS	.016											★																						★			
	CNMG32.52MS	CNMG09T308-MS	.031											★																									
	CNMG431MS	CNMG120404-MS	.016											●										●		●	●	●	●								★		●	
	CNMG432MS	CNMG120408-MS	.031											●										●		●	●	●	●						●		★		●	
	CNMG433MS	CNMG120412-MS	.047											●										●		★	●	●											★	
	CNMG542MS	CNMG160608-MS	.031											●																									
	CNMG543MS	CNMG160612-MS	.047											●																									●
Medium Cutting	**CNMG643MS**	CNMG190612-MS	.047											●																									
	CNMG644MS	CNMG190616-MS	.063											●																									
	CNMP432	CNMP120408	.031											●																									
Medium Cutting																																						

* New design MS breaker : MP9005, MP9015, MP9025, MT9015

● = NEW

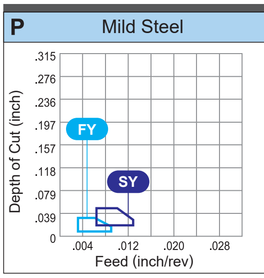
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

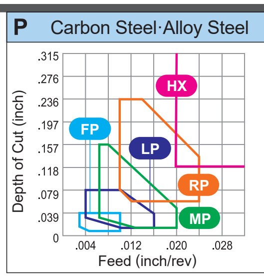
80° CN TYPE INSERTS WITH HOLE

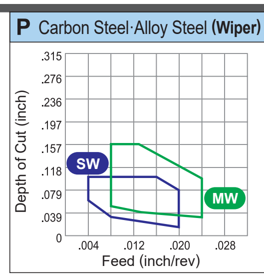
CNMG 4 3 1 GK
Size · Thickness · Corner Radius · Chip Breaker
*Please refer to page A002.

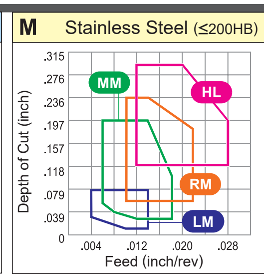
CHIP CONTROL RANGE FOR WORK MATERIALS

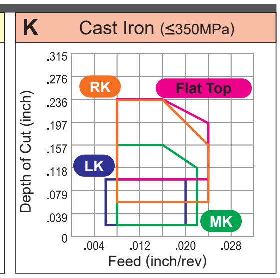
Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···











● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✚ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✜ : Unstable Cutting (2nd recommendation)

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel		●	✚	○	◔	✜	✜	●																		✜	✜	◐	○	○	◔	○	◔	✜							○
	M	Stainless Steel									●	◐	✚	✚	●										◐		◔	✜	✜		○	○		○		✜							
	K	Cast Iron														●	◐	✚	◔	✜							◔	✜			○	○		○		✜	○	◔					○
	N	Non-ferrous Metal																																				◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✚	○	◐	○	◔	✜										◔	●	◐	●	◐	
				Coated																										Coated Cermet				Cermet		Carbide							
GK	CNMG431GK	CNMG120404-GK	.016														●	★	●	●																							
	CNMG432GK	CNMG120408-GK	.031														●	●	●	●																							
	CNMG433GK	CNMG120412-GK	.047														●	★	●	●																							
	NEW CNMG434GK	CNMG120416-GK	.063														★	★																									
	NEW CNMG543GK	CNMG160612-GK	.047														★	●																									
Medium Cutting	NEW CNMG544GK	CNMG160616-GK	.063														★	★																									
GM	CNMG431GM	CNMG120404-GM	.016								●	●	●																														
	CNMG432GM	CNMG120408-GM	.031								●	●	●																														
Medium Cutting	CNMG433GM	CNMG120412-GM	.047								●	●	●																														
MA	CNMG431MA	CNMG120404-MA	.016	●	●	●	●					●	●	●			●	●	●	●		●	●					●							●								
	CNMG432MA	CNMG120408-MA	.031	●	●	●	●	●				●	●	●			●	●	●	●		●	●					●							●								
	CNMG433MA	CNMG120412-MA	.047	●	●	●	●	●				●	●	●			●	●	●	●		●	●					●							●								
	CNMG434MA	CNMG120416-MA	.063	●	●									★			★	★				●	● (NEW)																				
	CNMG542MA	CNMG160608-MA	.031	●	●	●	●	●						★			★	●																									
	CNMG543MA	CNMG160612-MA	.047	●	●	●	●	●						●			★	●																									
	CNMG544MA	CNMG160616-MA	.063	●	●	●	●	●						●			★	★																									
	CNMG643MA	CNMG190612-MA	.047	●	●	●	●	●						●																													
Medium Cutting	CNMG644MA	CNMG190616-MA	.063	●	●	●	●	●						●																													
MH	CNMG431MH	CNMG120404-MH	.016	●	●																																						
	CNMG432MH	CNMG120408-MH	.031	●	●	●	●	●																																			
	CNMG433MH	CNMG120412-MH	.047	●	●	●	●	●																																			
	CNMG434MH	CNMG120416-MH	.063	●	●																																						
	CNMG542MH	CNMG160608-MH	.031	●	●																																						
	CNMG543MH	CNMG160612-MH	.047	●	●	●	●	●																																			
	CNMG544MH	CNMG160616-MH	.063	●	●																																						
	CNMG643MH	CNMG190612-MH	.047	●	●	●	●	●																																			
Medium Cutting	CNMG644MH	CNMG190616-MH	.063	●	●																																						

● (highlighted) = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation)　◐ : General Cutting (1st recommendation)　✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation)　◔ : General Cutting (2nd recommendation)　✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔✣✣● ◐●✣✣● ●◐✣◔✣ ◐✣✣ ✣✣◐ ○○◔○○ ○◔✣ ✣○○◔○ ○
M	Stainless Steel	◐✣ ✣✣✣ ◐✣✣ ○○ ○ ✣
K	Cast Iron	●◐✣◔✣ ◔✣✣ ○○ ○ ✣○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔✣ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet			Cermet		Carbide							
				NEW									NEW		NEW								NEW																			
				MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Standard	**CNMG32.51**	CNMG09T304	.016		★★																										★										
	CNMG32.52	CNMG09T308	.031		★★																										★										
	CNMG431	CNMG120404	.016	●●		●●																							●			★●	●		●						
	CNMG432	CNMG120408	.031	●●		●●	●																			●			●			★	●		●						
	CNMG433	CNMG120412	.047	●●		●●	●																			●						★										
	CNMG434	CNMG120416	.063	●●		●●																																				
	CNMG542	CNMG160608	.031	●●		●●	●																																			
	CNMG543	CNMG160612	.047	●●		●●	●																																			
	CNMG544	CNMG160616	.063	●●		●●	●																																			
	CNMG642	CNMG190608	.031	●●		●●	●																																			
	CNMG643	CNMG190612	.047	●●		●●	●																																			
Medium Cutting	**CNMG644**	CNMG190616	.063	●●		●●	●																																			
***MW**	**CNMG432MW**	CNMG120408-MW	.031	●●		●●	●											●●																								
	CNMG433MW	CNMG120412-MW	.047	●●		●●	●											●●																								
Medium Cutting (Wiper)																																										
RP	**CNMG432RP**	CNMG120408-RP	.031	●●		●●	●																																			
	CNMG433RP	CNMG120412-RP	.047	●●		●●	●																																			
	CNMG434RP	CNMG120416-RP	.063	●●		●●																																				
	CNMG543RP	CNMG160612-RP	.047	●●		●●	●																																			
	CNMG544RP	CNMG160616-RP	.063	●●		●●	●																																			
	CNMG643RP	CNMG190612-RP	.047	●●		●●	●																																			
Rough Cutting	**CNMG644RP**	CNMG190616-RP	.063	●●		●●	●																																			
RM	**CNMG432RM**	CNMG120408-RM	.031								●●●																															
	CNMG433RM	CNMG120412-RM	.047								●●●																															
	CNMG434RM	CNMG120416-RM	.063								●●●																															
	CNMG543RM	CNMG160612-RM	.047								●●●																															
	CNMG544RM	CNMG160616-RM	.063								●●●																															
	CNMG643RM	CNMG190612-RM	.047								●●●																															
Rough Cutting	**CNMG644RM**	CNMG190616-RM	.063								●●●																															
RK	**CNMG432RK**	CNMG120408-RK	.031												●●●		●●																									
	CNMG433RK	CNMG120412-RK	.047												●●●		●●																									
	CNMG434RK	CNMG120416-RK	.063												★●●		●●																									
	CNMG542RK	CNMG160608-RK	.031												★●●		★●																									
	CNMG543RK	CNMG160612-RK	.047												●●●		●●																									
	CNMG544RK	CNMG160616-RK	.063												●●★		●●																									
	CNMG643RK	CNMG190612-RK	.047												●		●●																									
Rough Cutting	**CNMG644RK**	CNMG190616-RK	.063												★		●●																									

* Please refer to A032 before using the MW breaker (wiper insert).

● = NEW

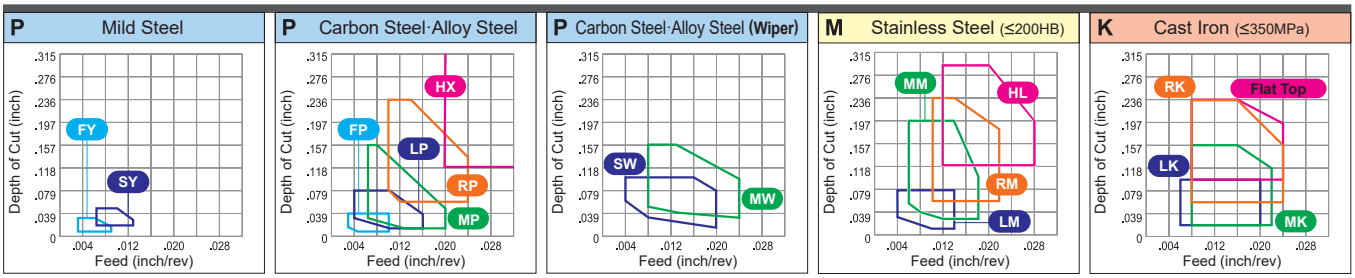
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CN TYPE INSERTS WITH HOLE

CNMG 4 3 2 RS
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide									
			NEW										NEW		NEW						NEW																						
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		●	✠	○	◔	❁	❁	●															✠	✠		◐	○	○	○	◔	○	◔	✠								○
M	Stainless Steel									●	◐	✠	✠	●									◐		◔	✠	✠		○	○		○		✠								
K	Cast Iron														●	◐	✠	◔	❁						◔	✠			○	○		○		✠	○	◔						○
N	Non-ferrous Metal																																		◔	●					○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✠	○	◐	○	◔	✠								◔	●	◐	◐	◐		
Shape	Order Number	(ISO) Number	RE (inch)																																							
RS	CNMG432RS	CNMG120408-RS	.031																		●	●																		●	
	CNMG433RS	CNMG120412-RS	.047																		●	●																		●	
	CNMG434RS	CNMG120416-RS	.063																		●	●																		●	
	CNMG543RS	CNMG160612-RS	.047																		●	●																		●	
	CNMG544RS	CNMG160616-RS	.063																		●	●																		●	
	CNMG643RS	CNMG190612-RS	.047																		●	●																		●	
Rough Cutting	CNMG644RS	CNMG190616-RS	.063																		●	●																		●	
GH	CNMG432GH	CNMG120408-GH	.031	●	●								●																													
	CNMG433GH	CNMG120412-GH	.047	●	●								●																													
	CNMG434GH	CNMG120416-GH	.063	●	●																																					
	CNMG543GH	CNMG160612-GH	.047	●	●								●																													
	CNMG544GH	CNMG160616-GH	.063	●	●																																					
	CNMG643GH	CNMG190612-GH	.047	●	●								●																													
Rough Cutting	CNMG644GH	CNMG190616-GH	.063	●	●								●																													
GJ	CNMG432GJ	CNMG120408-GJ	.031																				●			●	●												●		
	CNMG433GJ	CNMG120412-GJ	.047																				●			●	●												●		
	CNMG434GJ	CNMG120416-GJ	.063																				●			★	★												★		
	CNMG543GJ	CNMG160612-GJ	.047																				●			●												●		
	CNMG643GJ	CNMG190612-GJ	.047																				●			●												●		
Rough Cutting	CNMG644GJ	CNMG190616-GJ	.063																				●			●												●		
HX	CNMM432HX	CNMM120408-HX	.031			★	★																																	
	CNMM433HX	CNMM120412-HX	.047			★	★																																	
	CNMM543HX	CNMM160612-HX	.047			★	★																																	
	CNMM544HX	CNMM160616-HX	.063			★	★																																	
	CNMM643HX	CNMM190612-HX	.047			★	★	★																																
	CNMM644HX	CNMM190616-HX	.063			★	★	★																																
	CNMM646HX	CNMM190624-HX	.094			★	★	★																																
Heavy Cutting	CNMM866HX	CNMM250924-HX	.094			★	★	★																																

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																												Coated Cermet			Cermet		Carbide								
			NEW										NEW		NEW								NEW																					
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		●	✣	○	◔	❁	❁	●																			❁	❁	◐	○	○	◔	○	○	◔	❁						○
M	Stainless Steel									●	◐	✣	✣	●										◐		◔	❁	❁		○	○		○			❁						
K	Cast Iron														●	◐	✣	◔	❁							◔	❁			○	○		○			❁	○	◔					○
N	Non-ferrous Metal																																			◔	●					○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁									◔	●	◐	●	◐		

Shape	Order Number	(ISO) Number	RE (inch)																																									
HL	**CNMM432HL**	CNMM120408-HL	.031				★	★					★																													
	CNMM433HL	CNMM120412-HL	.047				★	★					★																													
	CNMM434HL	CNMM120416-HL	.063					★																																		
	CNMM543HL	CNMM160612-HL	.047				★	★					★																													
	CNMM544HL	CNMM160616-HL	.063				★	★					★																													
	CNMM643HL	CNMM190612-HL	.047				★	★					★																													
	CNMM644HL	CNMM190616-HL	.063				★	★					★																													
Heavy Cutting	**CNMM646HL**	CNMM190624-HL	.094				★	★					★																													
HR	**CNMM866HR**	CNMM250924-HR	.094				★	★																																		
Heavy Cutting																																										
HV	**CNMM644HV**	CNMM190616-HV	.063				★	★	★																																	
	CNMM646HV	CNMM190624-HV	.094				★	★	★																																	
	CNMM866HV	CNMM250924-HV	.094				★	★	★																																	
Heavy Cutting																																										
HZ	**CNMM432HZ**	CNMM120408-HZ	.031				★	★																																	
	CNMM433HZ	CNMM120412-HZ	.047				★	★																																	
	CNMM434HZ	CNMM120416-HZ	.063					★																																	
	CNMM643HZ	CNMM190612-HZ	.047						★																																	
Heavy Cutting	**CNMM644HZ**	CNMM190616-HZ	.063						★																																	
HM	**CNMM543HM**	CNMM160612-HM	.047				★	★					★																													
	CNMM544HM	CNMM160616-HM	.063				★	★					★																													
	CNMM643HM	CNMM190612-HM	.047				★	★					★																													
	CNMM644HM	CNMM190616-HM	.063				★	★					★																													
	CNMM646HM	CNMM190624-HM	.094				★	★					★																													
Heavy Cutting	**CNMM866HM**	CNMM250924-HM	.094				★	★																																	
Flat Top	**CNMA431**	CNMA120404	.016												●	●	●	●	●																	★	●					
	CNMA432	CNMA120408	.031												●	●	●	●	●																	★	●					
	CNMA433	CNMA120412	.047												●	●	●	●	●																							
	CNMA434	CNMA120416	.063												●	●	★	●	●																							
	CNMA543	CNMA160612	.047												●	●	●	●	●																							
	CNMA544	CNMA160616	.063												★	●	●	●	●																							
	CNMA643	CNMA190612	.047												●			●	●																							
	CNMA644	CNMA190616	.063												★			●	●																							
	CNMA646	CNMA190624	.094												★			★	★																							

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

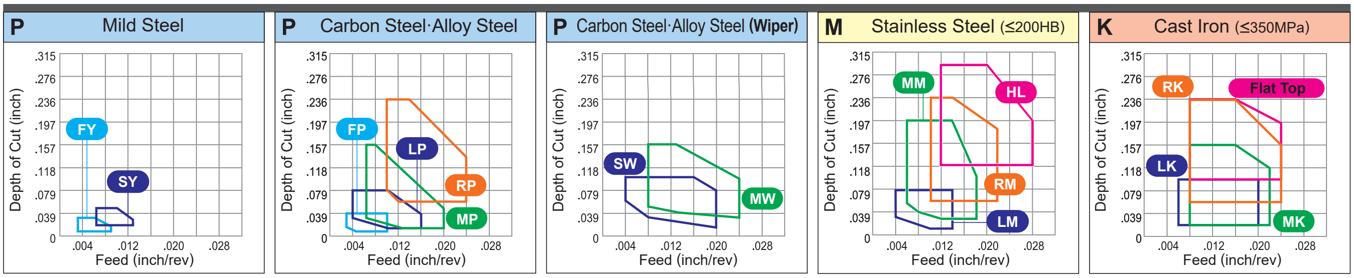
55° DN TYPE INSERTS WITH HOLE

DNMG 4 3 0.5 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

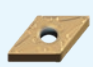
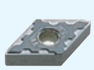
A
TURNING INSERTS
NEG
WITH HOLE
C
D
R
S
T
V
W

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting··· Rough Cutting··· Heavy Cutting···



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✚ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◑ : General Cutting (2nd recommendation) ✙ : Unstable Cutting (2nd recommendation)

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M
Workpiece Material	P	Steel		●	✚	○	◑	✙	✙	●																		✙	✙
Workpiece Material	M	Stainless Steel									●	◐	✚	✚	●										◐		◑	✙	✙
Workpiece Material	K	Cast Iron														●	◐	✚	◑	✙							◑	✙	
Workpiece Material	N	Non-ferrous Metal																											
Workpiece Material	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✚	○	◐	○	◑	✙	
				Coated																									
FP	DNMG430.5FP	DNMG150402-FP	.008			●	●																						
	DNMG431FP	DNMG150404-FP	.016			●	●																						
	DNMG432FP	DNMG150408-FP	.031			●	●																						
	DNMG433FP	DNMG150412-FP	.047			●	●																						
	DNMG440.5FP	DNMG150602-FP	.008			●	●																						
	DNMG441FP	DNMG150604-FP	.016			●	●																						
	DNMG442FP	DNMG150608-FP	.031			●	●																						
Finish Cutting	DNMG443FP	DNMG150612-FP	.047			●	●																						
FH	DNMG430.5FH	DNMG150402-FH	.008																										
	DNMG431FH	DNMG150404-FH	.016																										
	DNMG432FH	DNMG150408-FH	.031																										
	DNMG440.5FH	DNMG150602-FH	.008																										
	DNMG441FH	DNMG150604-FH	.016																										
Finish Cutting	DNMG442FH	DNMG150608-FH	.031																										
FS	DNMG431FS	DNMG150404-FS	.016																										
 Finish Cutting	DNMG432FS	DNMG150408-FS	.031																										
FS NEW	DNGG430.5FS	DNGG150402-FS	.008																		●	●	●						
	DNGG431FS	DNGG150404-FS	.016																		●	●	●						
	DNGG432FS	DNGG150408-FS	.031																		●	●	●						
	DNGG441FS	DNGG150604-FS	.016																		●	●	●						
Finish Cutting	DNGG442FS	DNGG150608-FS	.031																		●	●	●						
FY	DNMG431FY	DNMG150404-FY	.016																										
	DNMG432FY	DNMG150408-FY	.031																										
	DNMG441FY	DNMG150604-FY	.016																										
Finish Cutting	DNMG442FY	DNMG150608-FY	.031																										

Shape	Order Number	(ISO) Number	RE (inch)	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel		◐	○	○	◑	○	◑	✙							○
Workpiece Material	M	Stainless Steel			○	○		○		✙							
Workpiece Material	K	Cast Iron			○	○		○		✙	○	◑					○
Workpiece Material	N	Non-ferrous Metal										◑	●				○
Workpiece Material	S	Heat resistant Alloy, Titanium Alloy										◑	●	◐	●	◐	
				Coated Cermet				Cermet		Carbide							
FP	DNMG430.5FP	DNMG150402-FP	.008	●				★									
	DNMG431FP	DNMG150404-FP	.016	●				★									
	DNMG432FP	DNMG150408-FP	.031	●				★									
	DNMG433FP	DNMG150412-FP	.047	●				★									
	DNMG440.5FP	DNMG150602-FP	.008	●				★									
	DNMG441FP	DNMG150604-FP	.016	●				★									
	DNMG442FP	DNMG150608-FP	.031	●				★									
Finish Cutting	DNMG443FP	DNMG150612-FP	.047	●				★									
FH	DNMG430.5FH	DNMG150402-FH	.008	●				●	●								
	DNMG431FH	DNMG150404-FH	.016	●	●			★	●								
	DNMG432FH	DNMG150408-FH	.031	●	●			★									
	DNMG440.5FH	DNMG150602-FH	.008	●				★	★								
	DNMG441FH	DNMG150604-FH	.016	●													
Finish Cutting	DNMG442FH	DNMG150608-FH	.031	●													
FS	DNMG431FS	DNMG150404-FS	.016		●			★									
Finish Cutting	DNMG432FS	DNMG150408-FS	.031		●			★									
FS NEW	DNGG430.5FS	DNGG150402-FS	.008													●	
	DNGG431FS	DNGG150404-FS	.016													●	
	DNGG432FS	DNGG150408-FS	.031													●	
	DNGG441FS	DNGG150604-FS	.016													●	
Finish Cutting	DNGG442FS	DNGG150608-FS	.031													●	
FY	DNMG431FY	DNMG150404-FY	.016	●		★		★	●								
	DNMG432FY	DNMG150408-FY	.031	●		★		★									
	DNMG441FY	DNMG150604-FY	.016	★													
Finish Cutting	DNMG442FY	DNMG150608-FY	.031	★													

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation)　◐ : General Cutting (1st recommendation)　✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation)　◔ : General Cutting (2nd recommendation)　❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◐●✣✣● ◐●✣◔❁ ●◐✣◔❁ ○◔○○◔○◔❁ ○
M	Stainless Steel	◐ ◔❁❁ ○○ ○ ❁ ○
K	Cast Iron	◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	◔●◐●◐ ●●✣○◐○◔❁

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FJ	**DNGG431FJ**	DNGG150404-FJ	.016																						★	★												★				
	DNGG432FJ	DNGG150408-FJ	.031																						●	●												●				
Finish Cutting																																											
LP	**DNMG331LP**	DNMG110404-LP	.016			●	●	●																					●													
	DNMG332LP	DNMG110408-LP	.031			●	●	●																					●													
	DNMG431LP	DNMG150404-LP	.016	●	●	●	●	●																					●													
	DNMG432LP	DNMG150408-LP	.031	●	●	●	●	●																					●													
	DNMG433LP	DNMG150412-LP	.047	●	●	●	●	●																					●													
	DNMG441LP	DNMG150604-LP	.016	●	●	●	●	●																					●													
	DNMG442LP	DNMG150608-LP	.031	●	●	●	●	●																					●													
Light Cutting	**DNMG443LP**	DNMG150612-LP	.047	●	●	●	●	●																																			
LM	**DNMG331LM**	DNMG110404-LM	.016								●	●	●																														
	DNMG332LM	DNMG110408-LM	.031								●	●	●																														
	DNMG431LM	DNMG150404-LM	.016								●	●	●																														
	DNMG432LM	DNMG150408-LM	.031								●	●	●																														
	DNMG433LM	DNMG150412-LM	.047								●	●	●																														
	DNMG441LM	DNMG150604-LM	.016								●	●	●																														
	DNMG442LM	DNMG150608-LM	.031								●	●	●																														
Light Cutting	**DNMG443LM**	DNMG150612-LM	.047								●	●	●																														
LK	**DNMG332LK**	DNMG110408-LK	.031													●	★	★	●																							
	DNMG431LK	DNMG150404-LK	.016													●	★	●	●																							
	DNMG432LK	DNMG150408-LK	.031													●	●	●	●																							
	DNMG433LK	DNMG150412-LK	.047													●	★	●	●																							
	DNMG441LK	DNMG150604-LK	.016													★	★	●	●																							
	DNMG442LK	DNMG150608-LK	.031													★	★	●	●																							
Light Cutting	**DNMG443LK**	DNMG150612-LK	.047													★	★	●	●																							
LS	**DNMG430.5LS**	DNMG150402-LS	.008																		●	●	●																			●
	DNMG431LS	DNMG150404-LS	.016																		●	●	●																			●
	DNMG432LS	DNMG150408-LS	.031																		●	●	●																			●
	DNMG441LS	DNMG150604-LS	.016																		●	●	●																			●
Light Cutting	**DNMG442LS**	DNMG150608-LS	.031																		●	●	●																			●
LS NEW	**DNGG430.5LS**	DNGG150402-LS	.008																		●	●	●																			●
	DNGG431LS	DNGG150404-LS	.016																		●	●	●																			●
	DNGG432LS	DNGG150408-LS	.031																		●	●	●																			●
	DNGG441LS	DNGG150604-LS	.016																		●	●	●																			●
Light Cutting	**DNGG442LS**	DNGG150608-LS	.031																		●	●	●																			●

● = NEW

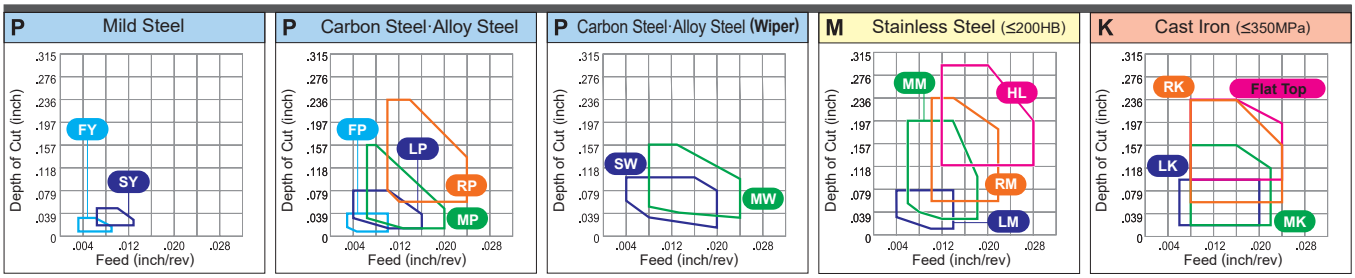
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

55° DN TYPE INSERTS WITH HOLE

DNMG 3 3 1 SH
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SH	**DNMG331SH**	DNMG110404-SH	.016											★																											
	DNMG332SH	DNMG110408-SH	.031											●																											
	DNMG431SH	DNMG150404-SH	.016	●	●	●	●							●																★			★	●								
	DNMG432SH	DNMG150408-SH	.031	●	●	●	●							●																★			★	●								
	DNMG433SH	DNMG150412-SH	.047	●	●	●	●							●																★			★									
	DNMG441SH	DNMG150604-SH	.016	●	●																																				
	DNMG442SH	DNMG150608-SH	.031	●	●																																				
Light Cutting	**DNMG443SH**	DNMG150612-SH	.047	●	●																																				
SA	**DNMG431SA**	DNMG150404-SA	.016	●	●	●	●																										★	●							
	DNMG432SA	DNMG150408-SA	.031	●	●	●	●							●																			★	●							
	DNMG433SA	DNMG150412-SA	.047	●	●	●	●																											●							
	DNMG441SA	DNMG150604-SA	.016	●	●																													★							
Light Cutting	**DNMG442SA**	DNMG150608-SA	.031	●	●																													★							
	DNMG443SA	DNMG150612-SA	.047	●	●																													★							
***SW**	**DNMX331SW**	DNMX110404-SW	.016			●																																			
	DNMX332SW	DNMX110408-SW	.031			●																																			
	DNMX431SW	DNMX150404-SW	.016			●																								●				★	●							
	DNMX432SW	DNMX150408-SW	.031			●																								●				★	●							
	DNMX433SW	DNMX150412-SW	.047			●																												●	●							
	DNMX441SW	DNMX150604-SW	.016			●																								★				★	★							
Light Cutting (Wiper)	**DNMX442SW**	DNMX150608-SW	.031			●																								★				★	★							
	DNMX443SW	DNMX150612-SW	.047			●																												●	●							
SY	**DNMG431SY**	DNMG150404-SY	.016																											●				★	●							
	DNMG432SY	DNMG150408-SY	.031																											●		★		★								
	DNMG441SY	DNMG150604-SY	.016																											★												
Light Cutting	**DNMG442SY**	DNMG150608-SY	.031																											★												

* Please refer to page A032 before using the SW breaker (wiper insert).

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide									
							NEW								NEW		NEW							NEW																						
							MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		MJ	DNMG431MJ	DNMG150404-MJ	.016																		●●			★	●●														●		
				DNMG432MJ	DNMG150408-MJ	.031																		●●			★	●●														●		
				DNMG433MJ	DNMG150412-MJ	.047																		●●			★	★★																
				DNMG434MJ	DNMG150416-MJ	.063																		●●			★	★★																
				DNMG441MJ	DNMG150604-MJ	.016																		●●			★	★★																
				DNMG442MJ	DNMG150608-MJ	.031																		●●			★	★★																
				DNMG443MJ	DNMG150612-MJ	.047																		●●			★	★★																
			Light Cutting	DNMG444MJ	DNMG150616-MJ	.063																		●●			★	★★																
			MJ	DNGM431MJ	DNGM150404-MJ	.016																						●★												●		●		
				DNGM432MJ	DNGM150408-MJ	.031																						●★												●		●		
			Light Cutting																																										
			MP	DNMG431MP	DNMG150404-MP	.016	●●		●●	●																						●												
				DNMG432MP	DNMG150408-MP	.031	●●		●●	●																						●												
				DNMG433MP	DNMG150412-MP	.047	●●		●●	●																						●												
				DNMG434MP	DNMG150416-MP	.063	●●		●●	●																																			
				DNMG441MP	DNMG150604-MP	.016	●●		●●	●																						★												
				DNMG442MP	DNMG150608-MP	.031	●●		●●	●																						★												
				DNMG443MP	DNMG150612-MP	.047	●●		●●	●																						★												
			Medium Cutting	DNMG444MP	DNMG150616-MP	.063	●●		●●	●																																			
			MM	DNMG432MM	DNMG150408-MM	.031							●	●	●																														
				DNMG433MM	DNMG150412-MM	.047							●	●	●																														
				DNMG442MM	DNMG150608-MM	.031							●	●	●																														
				DNMG443MM	DNMG150612-MM	.047							●	●	●																														
			Medium Cutting																																										
			MK	DNMG332MK	DNMG110408-MK	.031													★	●	●	★	●																						
				DNMG431MK	DNMG150404-MK	.016													●	●	●	●	●																						
				DNMG432MK	DNMG150408-MK	.031													●	●	●	●	●																						
				DNMG433MK	DNMG150412-MK	.047													★	●	●	●	●																						
				DNMG441MK	DNMG150604-MK	.016													★	★	★	●	●																						
				DNMG442MK	DNMG150608-MK	.031													★	●	★	●	●																						
			Medium Cutting	DNMG443MK	DNMG150612-MK	.047													★	★	★	●	●																						
			*MS	DNMG431MS	DNMG150404-MS	.016																		●	●	●																		●	
				DNMG432MS	DNMG150408-MS	.031																		●	●	●																		●	
				DNMG433MS	DNMG150412-MS	.047																		●	●	●																		●	
				DNMG441MS	DNMG150604-MS	.016																		●	●	●																		●	
				DNMG442MS	DNMG150608-MS	.031																		●	●	●																		●	
			Medium Cutting	DNMG443MS	DNMG150612-MS	.047																		●	●	●																		●	

* New design MS breaker : MP9005, MP9015, MP9025, MT9015

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

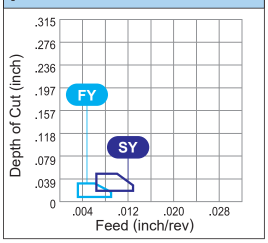
55° DN TYPE INSERTS WITH HOLE

DNMG 3 3 2 MS
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

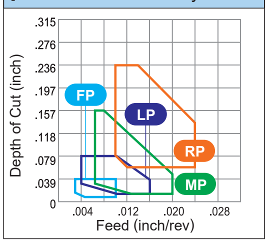
CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting··· Rough Cutting··· Heavy Cutting···

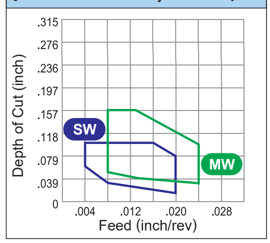
P Mild Steel



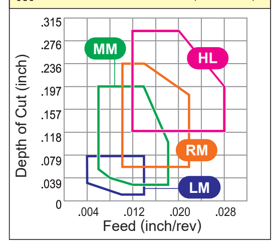
P Carbon Steel·Alloy Steel



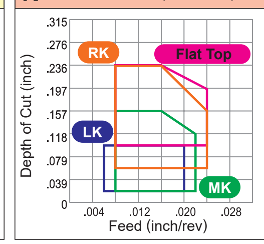
P Carbon Steel·Alloy Steel (Wiper)



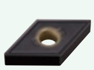
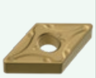
M Stainless Steel (≤200HB)



K Cast Iron (≤350MPa)



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ⊕ : Unstable Cutting (2nd recommendation)

Shape	Order Number	(ISO) Number	RE (inch)	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel		●	✤	○	◔	⊕	⊕	●																		⊕	⊕	◐	○	○	◔	○	◔	⊕							○
	M	Stainless Steel									●	◐	✤	✤	●										◐		◔	⊕	⊕		○	○		○		⊕							
	K	Cast Iron														●	◐	✤	◔	⊕							◔	⊕			○	○		○		⊕	○	◔					○
	N	Non-ferrous Metal																																						◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✤	○	◐	○	◔	⊕										◔	●	◐	●	◐	
				Coated																										Coated Cermet				Cermet		Carbide							
				NEW	NEW										NEW	NEW	NEW	NEW							NEW																		
MS	DNMG332MS	DNMG110408-MS	.031											★																													
	DNMG431MS	DNMG150404-MS	.016											●										●		●	●	●															
	DNMG432MS	DNMG150408-MS	.031											●										●		●	●	●	●											●			
	DNMG433MS	DNMG150412-MS	.047											●										●		★	★																
	DNMG441MS	DNMG150604-MS	.016											★										★		●	★		★														
	DNMG442MS	DNMG150608-MS	.031											★										★		●	★																
Medium Cutting	DNMG443MS	DNMG150612-MS	.047																					★		●	★																
GK	DNMG431GK	DNMG150404-GK	.016														★	★	●	●																							
	DNMG432GK	DNMG150408-GK	.031														●	★	●	●																							
	DNMG433GK	DNMG150412-GK	.047														★	★	●	●																							
	DNMG441GK	DNMG150604-GK	.016														★	★	●	●																							
	DNMG442GK	DNMG150608-GK	.031														★	★	●	●																							
Medium Cutting	DNMG443GK	DNMG150612-GK	.047														★	★	●	●																							
GM	DNMG431GM	DNMG150404-GM	.016								●	●	●																														
	DNMG432GM	DNMG150408-GM	.031								●	●	●																														
	DNMG433GM	DNMG150412-GM	.047								●	●	●																														
	DNMG441GM	DNMG150604-GM	.016								●	●	●																														
	DNMG442GM	DNMG150608-GM	.031								●	●	●																														
Medium Cutting	DNMG443GM	DNMG150612-GM	.047								●	●	●																														
MA	DNMG331MA	DNMG110404-MA	.016			●	●							●																													
	DNMG332MA	DNMG110408-MA	.031			●	●							●																													
	DNMG333MA	DNMG110412-MA	.047			●	●																																				
	DNMG431MA	DNMG150404-MA	.016	●	●	●	●					●	●	●			●	★	●	●		●	●					●							●								
	DNMG432MA	DNMG150408-MA	.031	●	●	●	●	●				●	●	●			●	●	●	●		●	●					●							●								
	DNMG433MA	DNMG150412-MA	.047	●	●	●	●	●				●	●	●			●	★	●	●		●	●					●							●								
	DNMG441MA	DNMG150604-MA	.016	●	●	●	●					●	●	★			★	★	●	●		●	●					●							★								
	DNMG442MA	DNMG150608-MA	.031	●	●	●	●	●				●	●	★			★	★	●	●		●	●					●							★								
Medium Cutting	DNMG443MA	DNMG150612-MA	.047	●	●	●	●	●				●	●	★			★	★	●	●		●	●					●							★								

● (yellow) = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◐●✣✣● ◐◐✣◔❁ ●◐✣○◔ ◔❁❁ ◐○○○◔ ○◔❁ ○
M	Stainless Steel	◐ ◔❁❁ ○○ ○ ❁ ○
K	Cast Iron	◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	◔●◐◐◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MH	**DNMG431MH**	DNMG150404-MH	.016	●	●																																			
	DNMG432MH	DNMG150408-MH	.031	●	●	●	●	●																																
	DNMG433MH	DNMG150412-MH	.047	●	●	●	●	●																																
	DNMG441MH	DNMG150604-MH	.016	●	●																																			
	DNMG442MH	DNMG150608-MH	.031	●	●	●	●	●																																
Medium Cutting	**DNMG443MH**	DNMG150612-MH	.047	●	●	●	●	●																																
Standard	**DNMG431**	DNMG150404	.016	●	●	●	●																						●				★	●		●					
	DNMG432	DNMG150408	.031	●	●	●	●	●																			●		●				★	●		●					
	DNMG433	DNMG150412	.047	●	●	●	●	●																			●						★								
	DNMG434	DNMG150416	.063		●	●	●	●																																
	DNMG441	DNMG150604	.016	●	●	●	●																						★				★								
	DNMG442	DNMG150608	.031	●	●	●	●	●																			●			★				★								
Medium Cutting	**DNMG443**	DNMG150612	.047	●	●	●	●	●																			●														
	DNMG444	DNMG150616	.063			●	●	●																																
***MW**	**DNMX432MW**	DNMX150408-MW	.031			●												●	●																						
	DNMX433MW	DNMX150412-MW	.047			●												●	●																						
	DNMX442MW	DNMX150608-MW	.031			●												●	●																						
Medium Cutting (Wiper)	**DNMX443MW**	DNMX150612-MW	.047			●												●	●																						
R/L	**DNGG431R**	DNGG150404R	.016																														★	●	★		★				
	DNGG431L	DNGG150404L	.016																														★	●	★		★				
	DNGG432R	DNGG150408R	.031																														★	●	★						
	DNGG432L	DNGG150408L	.031																														★	●							
	DNGG441R	DNGG150604R	.016																															★	★						
	DNGG441L	DNGG150604L	.016																															★							
	DNGG442R	DNGG150608R	.031																															★							
Medium Cutting	**DNGG442L**	DNGG150608L	.031																															★							
RP	**DNMG432RP**	DNMG150408-RP	.031	●	●	●	●	●																																
	DNMG433RP	DNMG150412-RP	.047	●	●	●	●	●																																
	DNMG434RP	DNMG150416-RP	.063	●	●	●	●	●																																
	DNMG442RP	DNMG150608-RP	.031	●	●	●	●	●																																
	DNMG443RP	DNMG150612-RP	.047	●	●	●	●	●																																
Rough Cutting	**DNMG444RP**	DNMG150616-RP	.063	●	●	●	●	●																																
RM	**DNMG432RM**	DNMG150408-RM	.031								●	●	●																												
	DNMG433RM	DNMG150412-RM	.047								●	●	●																												
	DNMG434RM	DNMG150416-RM	.063								●	●	●																												
	DNMG442RM	DNMG150608-RM	.031								●	●	●																												
	DNMG443RM	DNMG150612-RM	.047								●	●	●																												
Rough Cutting	**DNMG444RM**	DNMG150616-RM	.063								●	●	●																												

* Please refer to A032 before using the MW breaker (wiper insert).

● = NEW

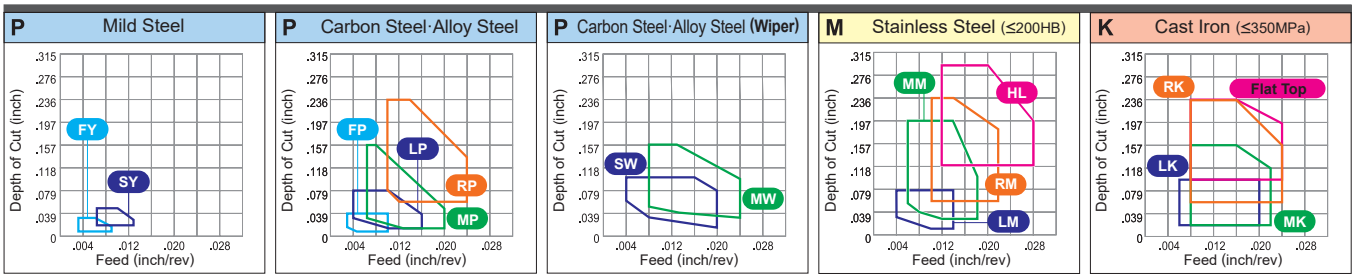
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

55° DN TYPE INSERTS WITH HOLE

DNMG 4 3 2 RK
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❃ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❃❃●◐◐✠✠●✠✠◔❃❃◐○○◔○◔❃○
M	Stainless Steel	●◐✠✠●◐◐✠✠●◐◔❃❃○○○○❃
K	Cast Iron	●◐✠◔❃◔❃❃○○○❃○◔○
N	Non-ferrous Metal	◔●○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔❃◔●◐●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
RK	DNMG432RK	DNMG150408-RK	.031													★	●	●	●	●																						
	DNMG433RK	DNMG150412-RK	.047													★	●	★	●	●																						
	DNMG442RK	DNMG150608-RK	.031													★	★	★	●	●																						
	DNMG443RK	DNMG150612-RK	.047													★	★	★	●	●																						
Rough Cutting																																										
RS	DNMG432RS	DNMG150408-RS	.031																		●	●																				●	
	DNMG433RS	DNMG150412-RS	.047																		●	●																				●	
	DNMG434RS	DNMG150416-RS	.063																		●	●																				●	
	DNMG442RS	DNMG150608-RS	.031																		●	●																				●	
	DNMG443RS	DNMG150612-RS	.047																		●	●																				●	
Rough Cutting	DNMG444RS	DNMG150616-RS	.063																		●	●																				●	
GH	DNMG432GH	DNMG150408-GH	.031	●	●									●																												
	DNMG433GH	DNMG150412-GH	.047	●	●									●																												
	DNMG442GH	DNMG150608-GH	.031	●	●									★																												
	DNMG443GH	DNMG150612-GH	.047	●	●									★																												
Rough Cutting																																										
GJ	DNMG432GJ	DNMG150408-GJ	.031																				●			●													●		
	DNMG433GJ	DNMG150412-GJ	.047																				●			●													●		
	DNMG434GJ	DNMG150416-GJ	.063																				●			★													★		
	DNMG442GJ	DNMG150608-GJ	.031																				★			★															
	DNMG443GJ	DNMG150612-GJ	.047																				★			★															
Rough Cutting	DNMG444GJ	DNMG150616-GJ	.063																				★			★															
HL	DNMM432HL	DNMM150408-HL	.031				★	★						★																											
	DNMM433HL	DNMM150412-HL	.047				★	★						★																											
	DNMM442HL	DNMM150608-HL	.031				★	★						★																											
	DNMM443HL	DNMM150612-HL	.047				★	★						★																											
Heavy Cutting																																										

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																												Coated Cermet			Cermet		Carbide							
							NEW								NEW		NEW								NEW																									
							MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel					●	✣	○	◔	❁	❁	●															❁	❁	◕	○	○	◔	○	○	◔	❁								○
	M	Stainless Steel												●	◕	✣	✣	●									◕		◔	❁	❁		○	○		○		❁							
	K	Cast Iron																	●	◕	✣	◔	❁						◔	❁			○	○		○		❁	○	◔					○
	N	Non-ferrous Metal																																						◔	●					○
	S	Heat resistant Alloy, Titanium Alloy																						●	◕	✣	○	◕	○	◔	❁									◔	●	◕	●	◕	
			HZ Heavy Cutting	**DNMM432HZ**	DNMM150408-HZ	.031				★	★																																		
				DNMM433HZ	DNMM150412-HZ	.047				★	★																																		
				DNMM442HZ	DNMM150608-HZ	.031				★	★																																		
				DNMM443HZ	DNMM150612-HZ	.047				★	★																																		
			Flat Top	**DNMA431**	DNMA150404	.016												★	●	★	●	●																			★					
				DNMA432	DNMA150408	.031												●	●	●	●	●															★			★	★					
				DNMA433	DNMA150412	.047												●	●	★	●	●																		★	★					
				DNMA441	DNMA150604	.016												★	●	★	●	●																								
				DNMA442	DNMA150608	.031												★	●	★	●	●																								
				DNMA443	DNMA150612	.047												★	●	★	●	●																								
			Flat Top	**DNGA431**	DNGA150404	.016																																			★					
				DNGA432	DNGA150408	.031																																			★	★					

● = NEW

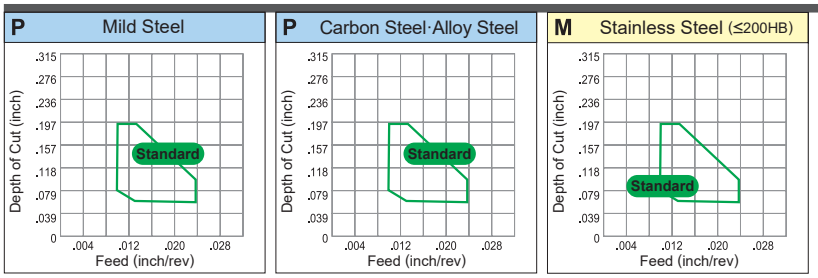
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

RN TYPE INSERTS WITH HOLE

RNMG 4 3
Size Thickness
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting···



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material					Coated																										Coated Cermet								Cermet			Carbide							
					NEW									NEW		NEW								NEW																									
					MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel				●	✠	○	◔	❁	❁	●																❁	❁	◕	○	○	○	◔	○	◔	❁									○
M	Stainless Steel											●	◕	✠	✠	●									◕		◔	❁	❁		○	○		○		❁								
K	Cast Iron																●	◕	✠	◔	❁						◔	❁			○	○		○		❁	○	◔						○
N	Non-ferrous Metal																																						◔	●				○
S	Heat resistant Alloy, Titanium Alloy																				●	◕	✠	○	◕	○	◔	❁											◔	●	◕	●	◕	

Shape	Order Number	(ISO) Number	IC (mm)																																												
Standard	RNMG43	RNMG120400	.500			●	●																																							
Medium Cutting																																															

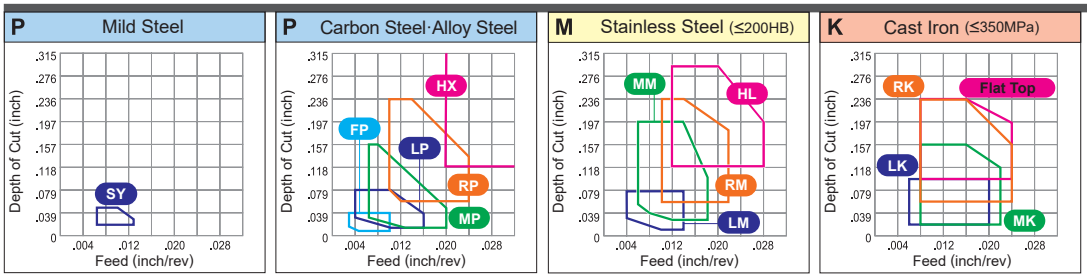
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

90° SN TYPE INSERTS WITH HOLE

SNMG 4 3 1 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ⊛: Unstable Cutting (2nd recommendation)

Workpiece Material		MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel	●	✠	○	◔	⊛	⊛	●																		⊛	⊛	◐	○	○	◔	○	○	◔	⊛							○
M	Stainless Steel								●	◐	✠	✠	●										◐		◔	⊛	⊛		○	○		○		⊛							
K	Cast Iron													●	◐	✠	◔	⊛							◔	⊛			○	○		○		⊛	○	◔					○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																		●	◐	✠	○	◐	○	◔	⊛										◔	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP Finish Cutting	SNMG431FP	SNMG120404-FP	.016			●	●																							●				★									
	SNMG432FP	SNMG120408-FP	.031			●	●																							●				★									
	SNMG433FP	SNMG120412-FP	.047			●	●																							●				★									
FH Finish Cutting	SNMG321FH	SNMG090304-FH	.016																															★									
	SNMG322FH	SNMG090308-FH	.031																												●			★									
	SNMG431FH	SNMG120404-FH	.016																											●				★									
	SNMG432FH	SNMG120408-FH	.031																											●													
FS Finish Cutting	SNMG432FS	SNMG120408-FS	.031																															★									
LP Light Cutting	SNMG431LP	SNMG120404-LP	.016	●	●	●	●	●																						●													
	SNMG432LP	SNMG120408-LP	.031	●	●	●	●	●																						●													
	SNMG433LP	SNMG120412-LP	.047	●	●	●	●	●																																			
LM Light Cutting	SNMG431LM	SNMG120404-LM	.016								●	●	●																														
	SNMG432LM	SNMG120408-LM	.031								●	●	●																														

● = NEW

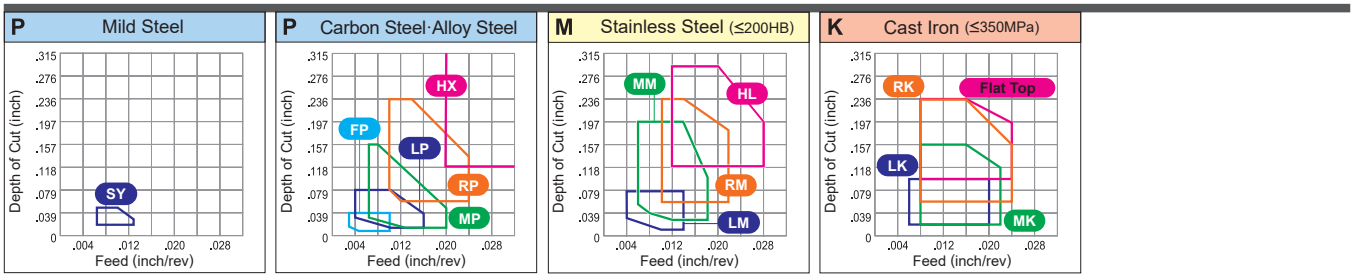
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITH HOLE

SNMG 4 3 2 LK
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◕●✠✠●○◕◔✠✠●○○○◔○◔✠○
M	Stainless Steel	●◕●✠✠●◕✠◔✠✠○○○○
K	Cast Iron	●◕●✠◔✠◔✠✠○○○✠●◔○
N	Non-ferrous Metal	◔●○
S	Heat resistant Alloy, Titanium Alloy	●◕●✠○◕○◔✠◔●◕●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																												Coated Cermet				Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
LK Light Cutting	**SNMG432LK**	SNMG120408-LK	.031														★	●	●																									
	SNMG433LK	SNMG120412-LK	.047														●	★	●	●																									
SH Light Cutting	**SNMG432SH**	SNMG120408-SH	.031	●	●																												★											
SA Light Cutting	**SNMG431SA**	SNMG120404-SA	.016																														●											
	SNMG432SA	SNMG120408-SA	.031	●	●																												●											
	SNMG433SA	SNMG120412-SA	.047																														●											
SY Light Cutting	**SNMG432SY**	SNMG120408-SY	.031																													●											
MP Medium Cutting	**SNMG431MP**	SNMG120404-MP	.016	●	●	●	●	●																									●											
	SNMG432MP	SNMG120408-MP	.031	●	●	●	●	●																									●											
	SNMG433MP	SNMG120412-MP	.047	●	●	●	●	●																									●											

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
							NEW								NEW		NEW							NEW																					
							MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		**MM**	**SNMG432MM**	SNMG120408-MM	.031								●	●	●																											
M	Stainless Steel			**SNMG433MM**	SNMG120412-MM	.047								●	●	●																											
K	Cast Iron			**SNMG434MM**	SNMG120416-MM	.063								●	●	●																											
N	Non-ferrous Metal			**SNMG542MM**	SNMG150608-MM	.031								●	●	●																											
S	Heat resistant Alloy, Titanium Alloy			**SNMG543MM**	SNMG150612-MM	.047								●	●	●																											
				SNMG544MM	SNMG150616-MM	.063								●	●	●																											
				SNMG643MM	SNMG190612-MM	.047								●	●	●																											
			Medium Cutting	**SNMG644MM**	SNMG190616-MM	.063								●	●	●																											
			MK	**SNMG432MK**	SNMG120408-MK	.031													★	●	★	●	●																				
				SNMG433MK	SNMG120412-MK	.047													●	●	★	●	●																				
				SNMG434MK	SNMG120416-MK	.063													★	★	★	●	●																				
				SNMG543MK	SNMG150612-MK	.047													★	●	★	★	●																				
				SNMG544MK	SNMG150616-MK	.063													★	●	★	★	●																				
				SNMG643MK	SNMG190612-MK	.047													★			●	●																				
			Medium Cutting	**SNMG644MK**	SNMG190616-MK	.063													★			●	●																				
			***MS**	**SNMG431MS**	SNMG120404-MS	.016																		●	●	●																	
				SNMG432MS	SNMG120408-MS	.031																		●	●	●																	
				SNMG433MS	SNMG120412-MS	.047																		●	●	●																	
				SNMG543MS	SNMG150612-MS	.047																		●	●	●																	
				SNMG544MS	SNMG150616-MS	.063																		●	●	●																	
			Medium Cutting	**SNMG643MS**	SNMG190612-MS	.047																		●	●	●																	
			MS	**SNMG321MS**	SNMG090304-MS	.016											★																										
				SNMG322MS	SNMG090308-MS	.031											★																										
				SNMG431MS	SNMG120404-MS	.016											●																										
				SNMG432MS	SNMG120408-MS	.031											●										●		★	★	★	●						●			●			
				SNMG433MS	SNMG120412-MS	.047											●										●		★	★	★													
				SNMG434MS	SNMG120416-MS	.063											★																										
			Medium Cutting	**SNMG644MS**	SNMG190616-MS	.063											★																										
			GK	**SNMG431GK**	SNMG120404-GK	.016														●	★	●	●																				
				SNMG432GK	SNMG120408-GK	.031														●	★	●	●																				
				SNMG433GK	SNMG120412-GK	.047														●	★	●	●																				
				NEW **SNMG434GK**	SNMG120416-GK	.063														★	●																						
			Medium Cutting	NEW **SNMG543GK**	SNMG150612-GK	.047														★	●																						

* New design MS breaker : MP9005, MP9015, MP9025, MT9015

● = NEW

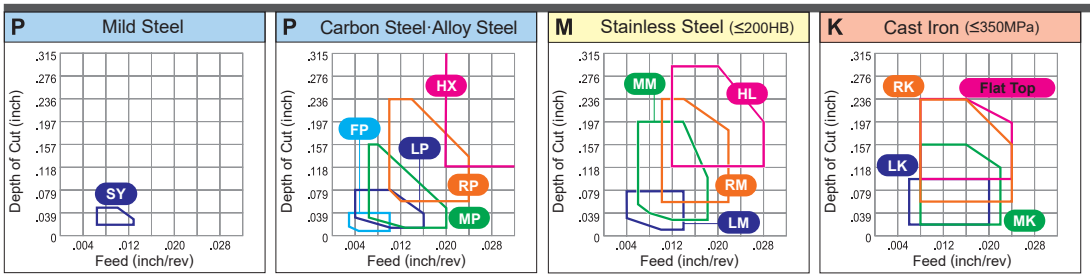
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

90° SN TYPE INSERTS WITH HOLE

SNMG 4 3 1 GM
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ●◕✠✠● ◕✠❁❁ ○○○◔○◔❁ ○
M	Stainless Steel	●◕✠✠● ◕❁❁❁ ○○ ○ ❁
K	Cast Iron	●◕✠◔❁ ◕❁❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔❁ ◔●◕●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
GM	**SNMG431GM**	SNMG120404-GM	.016								●	●	●																													
	SNMG432GM	SNMG120408-GM	.031								●	●	●																													
	SNMG433GM	SNMG120412-GM	.047								●	●	●																													
Medium Cutting																																									
MA	**SNMG431MA**	SNMG120404-MA	.016	●	●	●	●				●	●	●			★	★	●	●		●	●				●							●									
	SNMG432MA	SNMG120408-MA	.031	●	●	●	●	●			●	●	●			●	●	●	●		●	●				●							●									
	SNMG433MA	SNMG120412-MA	.047	●	●	●	●	●			●	●	●			●	★	●	●		●	●				●							●									
	SNMG434MA	SNMG120416-MA	.063													★	★				●	●																				
	SNMG542MA	SNMG150608-MA	.031	●	●									★																													
	SNMG543MA	SNMG150612-MA	.047	●	●	●	●	●						●			★	★																									
	SNMG544MA	SNMG150616-MA	.063			●	●	●																																		
	SNMG643MA	SNMG190612-MA	.047	●	●	●	●	●						●																												
	SNMG644MA	SNMG190616-MA	.063	●	●	●	●	●						★																												
Medium Cutting																																									
MH	**SNMG432MH**	SNMG120408-MH	.031	●	●	●	●	●																																	
	SNMG433MH	SNMG120412-MH	.047	●	●	●	●	●																																	
	SNMG643MH	SNMG190612-MH	.047	●	●																																				
	SNMG644MH	SNMG190616-MH	.063	●	●																																				
Medium Cutting																																									

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◑ : General Cutting (2nd recommendation) ✢ : Unstable Cutting (2nd recommendation)

Workpiece Material			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✤	○	◑	✢	✢	●																		✢	✢	◐	○	○	◑	○	◑	✢							○
	M	Stainless Steel								●	◐	✤	✤	●										◐		◑	✢	✢		○	○		○		✢							
	K	Cast Iron													●	◐	✤	◑	✢							◑	✢			○	○		○		✢	○	◑					○
	N	Non-ferrous Metal																																			◑	●				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✤	○	◐	○	◑	✢										◑	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 (NEW, Coated)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025 (Coated Cermet)	AP25N	VP25N	VP45N	NX2525 (Cermet)	NX3035	UTi20T (Carbide)	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Standard	SNMG321	SNMG090304	.016			●	●																							●				★	●	●							
	SNMG322	SNMG090308	.031			●	●																							●				★	●	●	★	★					
	SNMG431	SNMG120404	.016	●	●	●	●																							●				★		●		★					
	SNMG432	SNMG120408	.031	●	●	●	●	●																				●		●				★	●	●	★	★					
	SNMG433	SNMG120412	.047	●	●	●	●	●																											●	●	★						
	SNMG434	SNMG120416	.063			●	●	●																											●	●							
	SNMG435	SNMG120420	.079			●	●	●																																			
	SNMG543	SNMG150612	.047	●	●	●	●	●																																			
	SNMG544	SNMG150616	.063			●	●	●																																			
	SNMG643	SNMG190612	.047	●	●	●	●	●																												●							
Medium Cutting	SNMG644	SNMG190616	.063	●	●	●	●	●																												●							
R/L	SNGG321R	SNGG090304R	.016																															★	★	★		★					
	SNGG321L	SNGG090304L	.016																															★	★	★							
	SNGG322R	SNGG090308R	.031																															★	★								
	SNGG322L	SNGG090308L	.031																															★	★								
	SNGG431R	SNGG120404R	.016																											●				★	★	★							
	SNGG431L	SNGG120404L	.016																											●				★	★	★							
	SNGG432R	SNGG120408R	.031																											●				★	★								
Medium Cutting	SNGG432L	SNGG120408L	.031																											●				★	★	★		★					
RP	SNMG432RP	SNMG120408-RP	.031	●	●	●	●	●																																			
	SNMG433RP	SNMG120412-RP	.047	●	●	●	●	●																																			
	SNMG434RP	SNMG120416-RP	.063	●	●	●	●	●																																			
	SNMG543RP	SNMG150612-RP	.047	●	●	●	●	●																																			
	SNMG544RP	SNMG150616-RP	.063	●	●	●	●	●																																			
	SNMG643RP	SNMG190612-RP	.047	●	●	●	●	●																																			
Rough Cutting	SNMG644RP	SNMG190616-RP	.063	●	●	●	●	●																																			
RM	SNMG432RM	SNMG120408-RM	.031								●	●	●																														
	SNMG433RM	SNMG120412-RM	.047								●	●	●																														
	SNMG434RM	SNMG120416-RM	.063								●	●	●																														
	SNMG543RM	SNMG150612-RM	.047								●	●	●																														
	SNMG544RM	SNMG150616-RM	.063								●	●	●																														
	SNMG643RM	SNMG190612-RM	.047								●	●	●																														
Rough Cutting	SNMG644RM	SNMG190616-RM	.063								●	●	●																														
RK	SNMG432RK	SNMG120408-RK	.031													★	●	★	●	●																							
	SNMG433RK	SNMG120412-RK	.047													★	●	★	●	●																							
	SNMG434RK	SNMG120416-RK	.063													★	●	★	●	●																							
	SNMG543RK	SNMG150612-RK	.047													●	●	●	★	●																							
	SNMG544RK	SNMG150616-RK	.063													★	★	★	★	●																							
	SNMG643RK	SNMG190612-RK	.047													★			●	●																							
Rough Cutting	SNMG644RK	SNMG190616-RK	.063													★			●	●																							

● = NEW

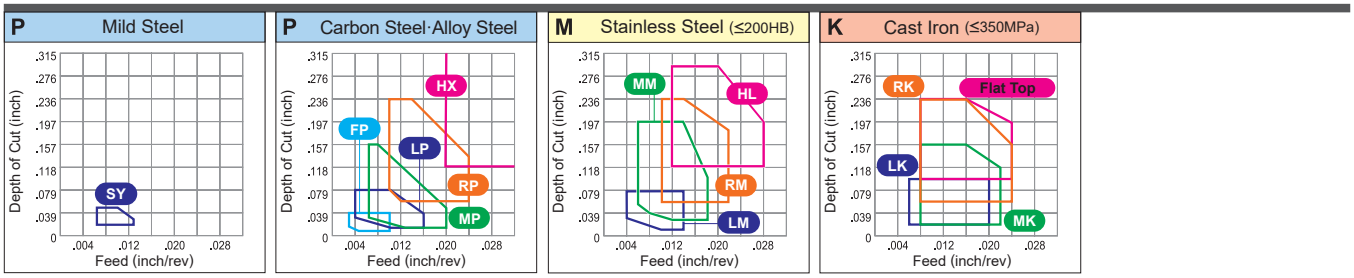
EXTERNAL TURNING ➢ C002
BORING ➢ E002
CHIP BREAKER ➢ A046
GRADES ➢ A034
IDENTIFICATION ➢ A002

90° SN TYPE INSERTS WITH HOLE

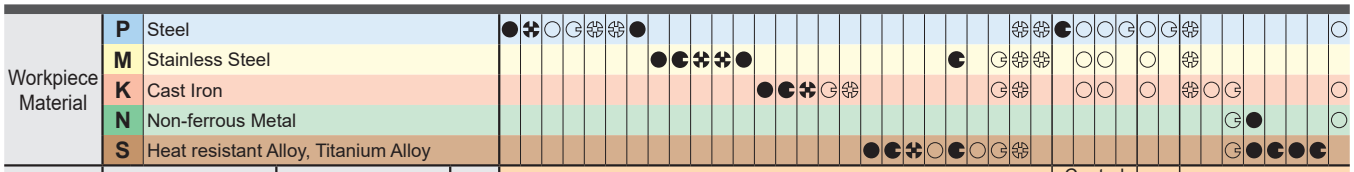
SNMG 4 3 2 RS
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)



Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
RS	**SNMG432RS**	SNMG120408-RS	.031																		●	●																				●	
	SNMG433RS	SNMG120412-RS	.047																		●	●																				●	
	SNMG434RS	SNMG120416-RS	.063																		●	●																				●	
	SNMG544RS	SNMG150616-RS	.063																		●	●																				●	
	SNMG643RS	SNMG190612-RS	.047																		●	●																					
Rough Cutting	**SNMG644RS**	SNMG190616-RS	.063																		●	●																				●	
GH	**SNMG432GH**	SNMG120408-GH	.031	●	●								★																														
	SNMG433GH	SNMG120412-GH	.047	●	●								★																														
	SNMG434GH	SNMG120416-GH	.063	●	●								★																														
	SNMG543GH	SNMG150612-GH	.047	●	●																																						
	SNMG643GH	SNMG190612-GH	.047	●	●								●																														
Rough Cutting	**SNMG644GH**	SNMG190616-GH	.063	●	●								●																														
	SNMG866GH	SNMG250924-GH	.094										●																														
HX	**SNMM432HX**	SNMM120408-HX	.031				★	★																																		
	SNMM433HX	SNMM120412-HX	.047				★	★																																		
	SNMM543HX	SNMM150612-HX	.047				★	★																																		
	SNMM643HX	SNMM190612-HX	.047				★	★	★																																		
	SNMM644HX	SNMM190616-HX	.063				★	★	★																																		
	SNMM646HX	SNMM190624-HX	.094				★	★	★																																		
	SNMM856HX	SNMM250724-HX	.094				★	★	★																																		
Heavy Cutting	**SNMM866HX**	SNMM250924-HX	.094				★	★	★																																		
HL	**SNMM432HL**	SNMM120408-HL	.031				★	★						★																												
	SNMM433HL	SNMM120412-HL	.047				★	★						★																												
	SNMM543HL	SNMM150612-HL	.047				★	★						★																												
	SNMM643HL	SNMM190612-HL	.047				★	★						★																												
	SNMM644HL	SNMM190616-HL	.063				★	★						★																												
Heavy Cutting	**SNMM646HL**	SNMM190624-HL	.094				★	★						★																												

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ●◐✣✣● ●◐✣◔❁ ✣✣◐○◔❁ ○◔❁ ✣○◔ ○
M	Stainless Steel	●◐✣✣● ◐✣✣❁ ◐○○ ○ ❁ ○
K	Cast Iron	●◐✣◔❁ ◐❁❁ ○○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔❁ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
HR	**SNMM856HR**	SNMM250724-HR	.094				★★																																
	SNMM866HR	SNMM250924-HR	.094				★★																																
Heavy Cutting																																							
HV	**SNMM644HV**	SNMM190616-HV	.063				★★★																																
	SNMM646HV	SNMM190624-HV	.094				★★★																																
	SNMM856HV	SNMM250724-HV	.094				★★★																																
	SNMM866HV	SNMM250924-HV	.094				★★★																																
Heavy Cutting																																							
HZ	**SNMM432HZ**	SNMM120408-HZ	.031				★★																																
	SNMM433HZ	SNMM120412-HZ	.047				★★																																
	SNMM643HZ	SNMM190612-HZ	.047					★																																
	SNMM644HZ	SNMM190616-HZ	.063					★																																
Heavy Cutting																																							
HM	**SNMM543HM**	SNMM150612-HM	.047				★★						★																										
	SNMM643HM	SNMM190612-HM	.047				★★						★																										
	SNMM644HM	SNMM190616-HM	.063				★★						★																										
	SNMM646HM	SNMM190624-HM	.094				★★						★																										
	SNMM856HM	SNMM250724-HM	.094				★★																																
Heavy Cutting	**SNMM866HM**	SNMM250924-HM	.094				★★																																
Flat Top	**SNMA321**	SNMA090304	.016																																	★				
	SNMA322	SNMA090308	.031													●●★●●																					●				
	SNMA432	SNMA120408	.031													★●★●●																				●	★	★				
	SNMA433	SNMA120412	.047													●●●●●																					★				
	SNMA434	SNMA120416	.063													★●★●●																									
	SNMA543	SNMA150612	.047													●●★★●																									
	SNMA544	SNMA150616	.063													★●★★●																									
	SNMA643	SNMA190612	.047													● ●●																									
	SNMA644	SNMA190616	.063													● ●●																									
Flat Top	**SNGA321**	SNGA090304	.016																																	★				
	SNGA431	SNGA120404	.016																																		★				
	SNGA432	SNGA120408	.031																																	★	★★				

● = NEW

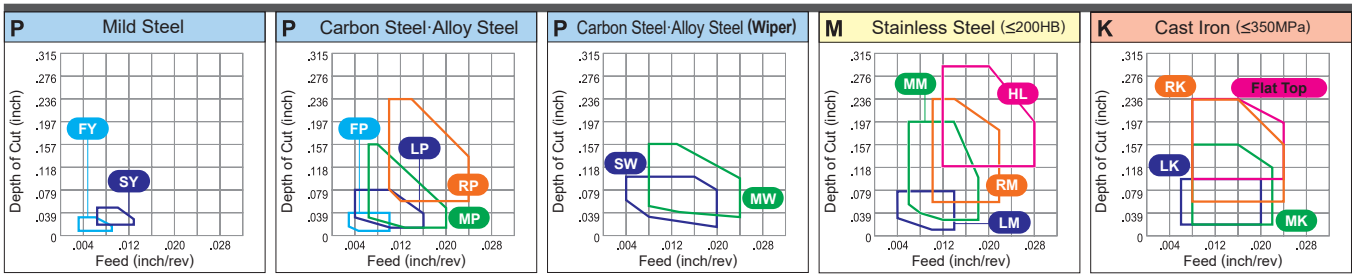
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 0.5 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ●◕●✠✠● ✠✠ ◕○○◔○◔❁ ○○○○ ❁○◔ ○
M	Stainless Steel	●◕●✠✠● ◕ ◔❁❁ ○○ ○ ❁
K	Cast Iron	●◕●✠◔❁ ◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕●✠○◕○◔❁ ◔●◕●●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP	**TNMG330.5FP**	TNMG160402-FP	.008		●	●																							●				★									
	TNMG331FP	TNMG160404-FP	.016		●	●																							●				★									
	TNMG332FP	TNMG160408-FP	.031		●	●																							●				★									
	TNMG333FP	TNMG160412-FP	.047		●	●																							●				★									
Finish Cutting																																											
FH	**TNMG221FH**	TNMG110304-FH	.016																														★									
	TNMG330.5FH	TNMG160402-FH	.008																										●				●									
	TNMG331FH	TNMG160404-FH	.016																										●	●			★									
	TNMG332FH	TNMG160408-FH	.031																										●	●			★									
Finish Cutting																																											
FS	**TNMG331FS**	TNMG160404-FS	.016																														★									
	TNMG332FS	TNMG160408-FS	.031																														●									
Finish Cutting																																											
FS NEW	**TNGG330.5FS**	TNGG160402-FS	.008																			●	●	●																		●
	TNGG331FS	TNGG160404-FS	.016																			●	●	●																		●
	TNGG332FS	TNGG160408-FS	.031																			●	●	●																		●
Finish Cutting																																											
FY	**TNMG331FY**	TNMG160404-FY	.016																										●	★			★									
	TNMG332FY	TNMG160408-FY	.031																										●	★			★									
Finish Cutting																																											

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❃: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❃❃● ◐●✣✣● ◐◐✣◔❃ ●◐✣○◐○◔ ❃◐❃❃ ◐○○◔○◔❃ ❃○◔ ○
M	Stainless Steel	◐ ◔❃❃ ○○ ○ ❃
K	Cast Iron	◔❃ ○○ ○ ❃○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	◔●◐◐◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-FS	**TNGG330.5RFS**	TNGG160402R-FS	.008							●																						★								
	TNGG330.5LFS	TNGG160402L-FS	.008							●																						★								
	TNGG331RFS	TNGG160404R-FS	.016							●																						★								
	TNGG331LFS	TNGG160404L-FS	.016							●																						★								
	TNGG332RFS	TNGG160408R-FS	.031							●																														
Finish Cutting	**TNGG332LFS**	TNGG160408L-FS	.031							●																														
R/L-F	**TNGG330.5RF**	TNGG160402R-F	.008																							●			●			★★								
	TNGG330.5LF	TNGG160402L-F	.008																							●			●			★★								
	TNGG331RF	TNGG160404R-F	.016																							●			●			★★								
	TNGG331LF	TNGG160404L-F	.016																							●			●			★★								
	TNGG332RF	TNGG160408R-F	.031																							●			●			★★								
Finish Cutting	**TNGG332LF**	TNGG160408L-F	.031																							●			●			★★								
LP	**TNMG331LP**	TNMG160404-LP	.016	●	●	●	●	●																					●											
	TNMG332LP	TNMG160408-LP	.031	●	●	●	●	●																					●											
	TNMG333LP	TNMG160412-LP	.047	●	●	●	●	●																					●											
	TNMG432LP	TNMG220408-LP	.031	●	●	●	●	●																					●											
Light Cutting	**TNMG433LP**	TNMG220412-LP	.047	●	●	●	●	●																															
LM	**TNMG331LM**	TNMG160404-LM	.016								●	●	●																											
	TNMG332LM	TNMG160408-LM	.031								●	●	●																											
	TNMG333LM	TNMG160412-LM	.047								●	●	●																											
Light Cutting																																							
LK	**TNMG331LK**	TNMG160404-LK	.016													★	★	●	●																					
	TNMG332LK	TNMG160408-LK	.031													●	★	●	●																					
	TNMG333LK	TNMG160412-LK	.047													★	★	●	●																					
Light Cutting																																							
LS	**TNMG330.5LS**	TNMG160402-LS	.008																		●	●	●																	
	TNMG331LS	TNMG160404-LS	.016																		●	●	●																	
	TNMG332LS	TNMG160408-LS	.031																		●	●	●																	
Light Cutting																																							
LS NEW	**TNGG330.5LS**	TNGG160402-LS	.008																		●	●	●																	●
	TNGG331LS	TNGG160404-LS	.016																		●	●	●																	●
	TNGG332LS	TNGG160408-LS	.031																		●	●	●																	●
Light Cutting																																							
SH	**TNMG331SH**	TNMG160404-SH	.016	●	●	●	●						●																		★		★	●							
	TNMG332SH	TNMG160408-SH	.031	●	●	●	●						●																		★		★	●							
	TNMG432SH	TNMG220408-SH	.031	●	●								●																											
Light Cutting																																							

● = NEW

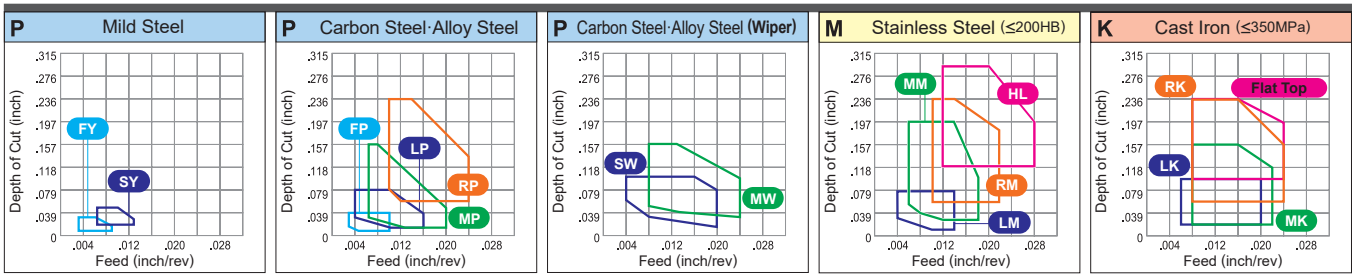
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 1 SA
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ●◐●✠✠● ✠✠◐○○◔○◔✠ ○
M	Stainless Steel	●◐●✠✠● ◐ ◔❁❁ ○○ ○ ✠
K	Cast Iron	●◐●✠◔❁ ◔❁ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐●✠○◐○◔❁ ◔●◐●◐●

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SA	**TNMG331SA**	TNMG160404-SA	.016	●	●	●	●																										★	●									
	TNMG332SA	TNMG160408-SA	.031	●	●	●	●																										★	●									
	TNMG333SA	TNMG160412-SA	.047	●	●																													●									
	TNMG432SA	TNMG220408-SA	.031	●	●																																							
Light Cutting																																												
***SW**	**TNMX331SW**	TNMX160404-SW	.016		●																											●			★	●								
	TNMX332SW	TNMX160408-SW	.031		●																											●			★	●								
Light Cutting (Wiper)																																												
SY	**TNMG331SY**	TNMG160404-SY	.016																													●	★		★	●								
	TNMG332SY	TNMG160408-SY	.031																													●	★		★									
Light Cutting																																												
MJ	**TNMG331MJ**	TNMG160404-MJ	.016																			●	●	★		●	●															●		
	TNMG332MJ	TNMG160408-MJ	.031																			●	●	★		●	●															●		
	TNMG333MJ	TNMG160412-MJ	.047																			●	●	★		★	★																	
Light Cutting																																												
R/L-K	**TNGG330.5RK**	TNGG160402R-K	.008																													●			★	★								
	TNGG330.5LK	TNGG160402L-K	.008																													●			★	★								
	TNGG331RK	TNGG160404R-K	.016																													●			★	★								
	TNGG331LK	TNGG160404L-K	.016																													●				★								
	TNGG332RK	TNGG160408R-K	.031																													●												
Light Cutting	**TNGG332LK**	TNGG160408L-K	.031																													●												

* Please refer to page A032 before using the SW breaker (wiper insert). ● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠● ◐●✠✠● ✠✠◐○○◔○◔✠
M	Stainless Steel	◐✠◔✠✠ ○○ ○ ✠
K	Cast Iron	●◐✠◔✠ ◔✠ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔✠ ◔●●●● ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MP	**TNMG331MP**	TNMG160404-MP	.016	●	●	●	●	●																					●													
	TNMG332MP	TNMG160408-MP	.031	●	●	●	●	●																					●													
	TNMG333MP	TNMG160412-MP	.047	●	●	●	●	●																					●													
	TNMG432MP	TNMG220408-MP	.031	●	●	●	●	●																																		
Medium Cutting	**TNMG433MP**	TNMG220412-MP	.047	●	●	●	●	●																																		
MM	**TNMG332MM**	TNMG160408-MM	.031								●	●	●																													
	TNMG333MM	TNMG160412-MM	.047								●	●	●																													
	TNMG432MM	TNMG220408-MM	.031								●	●	●																													
	TNMG433MM	TNMG220412-MM	.047								●	●	●																													
Medium Cutting	**TNMG434MM**	TNMG220416-MM	.063								●	●	●																													
MK	**TNMG331MK**	TNMG160404-MK	.016													★	●	★	●	●																						
	TNMG332MK	TNMG160408-MK	.031													★	●	★	●	●																						
	TNMG333MK	TNMG160412-MK	.047													★	★	★	●	●																						
	TNMG432MK	TNMG220408-MK	.031													●	★	★	●	●																						
	TNMG433MK	TNMG220412-MK	.047													★	●	★	●	●																						
Medium Cutting	**TNMG434MK**	TNMG220416-MK	.063													★	★	★	●	●																						
***MS**	**TNMG331MS**	TNMG160404-MS	.016																		●	●	●																		●	
	TNMG332MS	TNMG160408-MS	.031																		●	●	●																		●	
	TNMG333MS	TNMG160412-MS	.047																		●	●	●																		●	
	TNMG432MS	TNMG220408-MS	.031																		●	●	●																		●	
Medium Cutting	**TNMG433MS**	TNMG220412-MS	.047																		●	●	●																		●	
MS	**TNMG331MS**	TNMG160404-MS	.016											●										●		●	●	★							★							
	TNMG332MS	TNMG160408-MS	.031											●										●		●	●	★	●					●						●		
	TNMG333MS	TNMG160412-MS	.047											★										★		★	●															
	TNMG432MS	TNMG220408-MS	.031											●										●		●	●	★	●													
Medium Cutting	**TNMG433MS**	TNMG220412-MS	.047											★																												
GK	**TNMG331GK**	TNMG160404-GK	.016														★	★	●	●																						
	TNMG332GK	TNMG160408-GK	.031														●	★	●	●																						
	TNMG333GK	TNMG160412-GK	.047														★	★	●	●																						
	NEW **TNMG334GK**	TNMG160416-GK	.063														★	★																								
	TNMG432GK	TNMG220408-GK	.031														●	★	●	●																						
Medium Cutting	**TNMG433GK**	TNMG220412-GK	.047														★	★	●	●																						
GM	**TNMG331GM**	TNMG160404-GM	.016								●	●	●																													
	TNMG332GM	TNMG160408-GM	.031								●	●	●																													
	TNMG333GM	TNMG160412-GM	.047								●	●	●																													
	TNMG432GM	TNMG220408-GM	.031								●	●	●																													
Medium Cutting	**TNMG433GM**	TNMG220412-GM	.047								●	●	●																													

* New design MS breaker : MP9005, MP9015, MP9025, MT9015

● = NEW

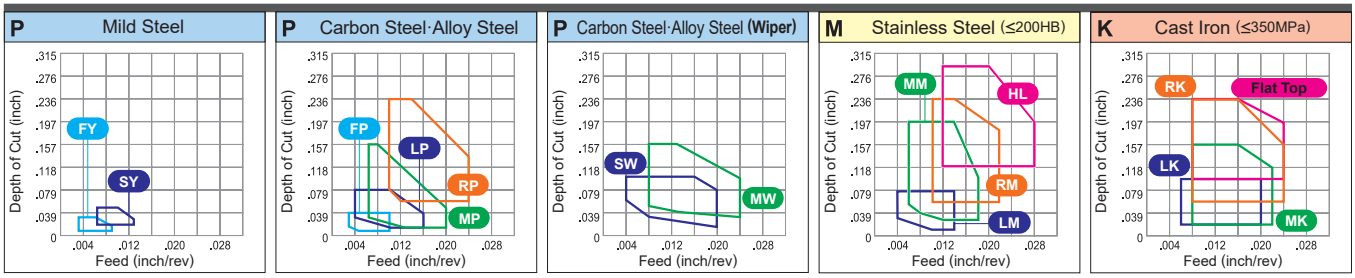
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 1 MA
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●　●◐●✠✠●　　●✠✠　●◐●✠○◐○◔✠　◐◐○○◔○◔✠　　○
M	Stainless Steel	●◐●✠✠●　　●◐●✠◔✠✠　◐○○　○　✠　　○
K	Cast Iron	●◐●✠◔✠　　●◐●✠◔✠✠　◐○○　○　✠○◔　　○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐●✠○◐○◔✠　　◔●◐●◐●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MA	**TNMG331MA**	TNMG160404-MA	.016	●	●	●	●				●	●	●			★	★	●	●		●	●					●							●								
	TNMG332MA	TNMG160408-MA	.031	●	●	●	●	●			●	●	●			●	●	●	●		●	●					●							●								
	TNMG333MA	TNMG160412-MA	.047	●	●	●	●	●			●	●	●			●	★	●	●		●	●					●							●								
	TNMG334MA	TNMG160416-MA	.063													★	★																									
	TNMG432MA	TNMG220408-MA	.031	●	●	●	●	●			●	●	●			●	★	●	●		●	●					●															
	TNMG433MA	TNMG220412-MA	.047	●	●	●	●	●			●	●	●			●	★	●	●		●	●					●															
	TNMG434MA	TNMG220416-MA	.063													★	★					●	●																			
	TNMG542MA	TNMG270608-MA	.031	●	●																																					
	TNMG543MA	TNMG270612-MA	.047	●	●								●																													
	TNMG544MA	TNMG270616-MA	.063																			●	●																			
Medium Cutting	**TNMG666MA**	TNMG330924-MA	.094																			●	●																			
MH	**TNMG331MH**	TNMG160404-MH	.016	●	●																																					
	TNMG332MH	TNMG160408-MH	.031	●	●	●	●	●																																	
	TNMG333MH	TNMG160412-MH	.047	●	●	●	●	●																																	
	TNMG432MH	TNMG220408-MH	.031	●	●	●	●	●																																	
Medium Cutting	**TNMG433MH**	TNMG220412-MH	.047	●	●	●	●	●																																	
Standard	**TNMG221**	TNMG110304	.016			●	●																											★		★					
	TNMG222	TNMG110308	.031			●	●																																	
	TNMG321	TNMG160304	.016			●	●																												●					
	TNMG322	TNMG160308	.031			●	●																												●					
	TNMG331	TNMG160404	.016	●	●	●	●																				●			●				★	●	●	★	●				
	TNMG332	TNMG160408	.031	●	●	●	●	●																			●			●				★	●	●	★	●				
	TNMG333	TNMG160412	.047	●	●	●	●	●																										★								
Medium Cutting	**TNMG334**	TNMG160416	.063			●	●	●																										★								
	TNMG431	TNMG220404	.016	●	●	●	●	●																											●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◕●✣✣● ✣◕◔❁ ◕○○◔○◔❁ ❁●◕◕◕◕ ○
M	Stainless Steel	◕ ◔❁❁ ○○ ○ ❁ ◔● ◕●●●● ○
K	Cast Iron	●◕✣◔❁ ◔❁ ○○ ○ ❁○◔ ◔● ◕●●●● ○
N	Non-ferrous Metal	◔● ◕●●●● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✣○◕○◔❁ ◔● ◕●●●●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Standard	**TNMG432**	TNMG220408	.031	●	●	●	●	●																								★	●	●							
	TNMG433	TNMG220412	.047	●	●	●	●	●																																		
	TNMG434	TNMG220416	.063			●	●	●																																		
	TNMG542	TNMG270608	.031			●	●	●																																		
Medium Cutting	**TNMG543**	TNMG270612	.047			●	●	●																											●							
	TNMG666	TNMG330924	.094																																●							
***MW**	**TNMX332MW**	TNMX160408-MW	.031			●												●	●																							
	TNMX333MW	TNMX160412-MW	.047			●												●	●																							
Medium Cutting (Wiper)																																										
R/L-ES	**TNMG331RES**	TNMG160404R-ES	.016										★																													
	TNMG331LES	TNMG160404L-ES	.016										★																													
	TNMG332RES	TNMG160408R-ES	.031										★																													
	TNMG332LES	TNMG160408L-ES	.031										★																													
	TNMG432RES	TNMG220408R-ES	.031										★																													
Medium Cutting	**TNMG432LES**	TNMG220408L-ES	.031										★																													
R/L-2G	**TNMG331R2G**	TNMG160404R-2G	.016																														★									
	TNMG331L2G	TNMG160404L-2G	.016																														★									
	TNMG332R2G	TNMG160408R-2G	.031																														★									
	TNMG332L2G	TNMG160408L-2G	.031																														★									
Medium Cutting																																										
R/L	**TNGG220.5R**	TNGG110302R	.008																															★									
	TNGG220.5L	TNGG110302L	.008																														★	★								
	TNGG221R	TNGG110304R	.016																														★	★								
	TNGG221L	TNGG110304L	.016																														★	★								
	TNGG222R	TNGG110308R	.031																															★								
	TNGG222L	TNGG110308L	.031																														★	★								
	TNGG321R	TNGG160304R	.016																														★	★	★							
	TNGG321L	TNGG160304L	.016																														★	★								
	TNGG330.5R	TNGG160402R	.008																													●		★	★	★		★				
	TNGG330.5L	TNGG160402L	.008																													●		★	★							
	TNGG331R	TNGG160404R	.016																													●		★	●	★	★	★				
	TNGG331L	TNGG160404L	.016																													●		★	●	★		★				
	TNGG332R	TNGG160408R	.031																													●		★	●	★	★	★				
	TNGG332L	TNGG160408L	.031																													●		★	●	★	★	★				
	TNGG431R	TNGG220404R	.016																															★	●	★						
	TNGG431L	TNGG220404L	.016																															★	●	★						
	TNGG432R	TNGG220408R	.031																															★	●	★						
Medium Cutting	**TNGG432L**	TNGG220408L	.031																															★	●	★						

* Please refer to A032 before using the MW breaker (wiper insert).

● = NEW

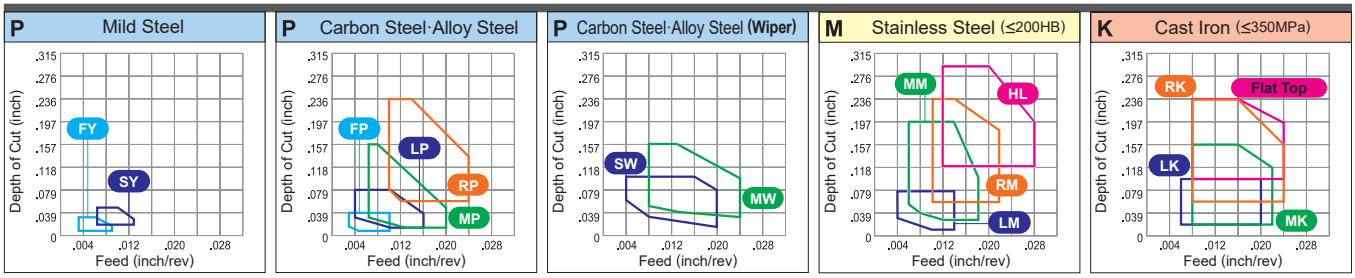
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

60° TN TYPE INSERTS WITH HOLE

TNMG 3 3 2 RP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting ··· Light Cutting ··· Medium Cutting ··· Rough Cutting ··· Heavy Cutting ···



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●　●◕●✠✠●　✠✠◕○○○◔○◔✠　○
M	Stainless Steel	●◕●✠✠●　◕　◔✠✠✠　○○○　○　✠
K	Cast Iron	●◕●✠◔✠　◔✠✠　○○　○　✠○◔　○
N	Non-ferrous Metal	◔●　○
S	Heat resistant Alloy, Titanium Alloy	●◕●✠○◕○◔✠　◔●◕●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
RP	**TNMG332RP**	TNMG160408-RP	.031	●	●	●	●	●																																			
	TNMG333RP	TNMG160412-RP	.047	●	●	●	●	●																																			
	TNMG432RP	TNMG220408-RP	.031	●	●	●	●	●																																			
	TNMG433RP	TNMG220412-RP	.047	●	●	●	●	●																																			
	TNMG434RP	TNMG220416-RP	.063	●	●	●	●	●																																			
	TNMG543RP	TNMG270612-RP	.047	●	●	●	●	●																																			
Rough Cutting	**TNMG544RP**	TNMG270616-RP	.063	●	●	●	●	●																																			
RM	**TNMG332RM**	TNMG160408-RM	.031								●	●	●																														
	TNMG333RM	TNMG160412-RM	.047								●	●	●																														
	TNMG432RM	TNMG220408-RM	.031								●	●	●																														
	TNMG433RM	TNMG220412-RM	.047								●	●	●																														
Rough Cutting	**TNMG434RM**	TNMG220416-RM	.063								●	●	●																														
RK	**TNMG332RK**	TNMG160408-RK	.031													★	●	★	●	●																							
	TNMG333RK	TNMG160412-RK	.047													★	★	★	●	●																							
	TNMG334RK	TNMG160416-RK	.063													●	★	★	●	●																							
	TNMG432RK	TNMG220408-RK	.031													★	●	★	●	●																							
	TNMG433RK	TNMG220412-RK	.047													★	●	★	●	●																							
Rough Cutting	**TNMG434RK**	TNMG220416-RK	.063													★	●	★	●	●																							
RS	**TNMG332RS**	TNMG160408-RS	.031																		●	●																					●
	TNMG333RS	TNMG160412-RS	.047																		●	●																					●
	TNMG432RS	TNMG220408-RS	.031																		●	●																					●
	TNMG433RS	TNMG220412-RS	.047																		●	●																					●
Rough Cutting																																										

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation)　◐ : General Cutting (1st recommendation)　✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation)　◔ : General Cutting (2nd recommendation)　✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔✣✣● ◐●✣✣● ◐✣◔✣○ ◐○○◔○◔✣ ○
M	Stainless Steel	◐ ◔✣✣ ○○ ○ ✣ ○
K	Cast Iron	◐◐✣◔✣ ◔✣ ○○ ○ ✣○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔✣ ◔●●●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	NEW US735	NEW MS7025	NEW MC5105	MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	VP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
GH Rough Cutting	**TNMG332GH**	TNMG160408-GH	.031	●	●									●																														
	TNMG333GH	TNMG160412-GH	.047	●	●									●																														
	TNMG432GH	TNMG220408-GH	.031	●	●									●																														
	TNMG433GH	TNMG220412-GH	.047	●	●									●																														
	TNMG434GH	TNMG220416-GH	.063	●	●																																							
	TNMG543GH	TNMG270612-GH	.047	●	●									●																														
	TNMG544GH	TNMG270616-GH	.063	●	●																																							
	TNMG666GH	TNMG330924-GH	.094											●																														
HL Heavy Cutting	**TNMM332HL**	TNMM160408-HL	.031				★	★						★																														
	TNMM333HL	TNMM160412-HL	.047				★	★						★																														
	TNMM432HL	TNMM220408-HL	.031				★	★						★																														
	TNMM433HL	TNMM220412-HL	.047				★	★						★																														
	TNMM434HL	TNMM220416-HL	.063				★	★						★																														
HZ Heavy Cutting	**TNMM332HZ**	TNMM160408-HZ	.031				★	★																																			
	TNMM333HZ	TNMM160412-HZ	.047				★	★																																			
Flat Top	**TNMA331**	TNMA160404	.016													★	★	★	●	●																		★	★					
	TNMA332	TNMA160408	.031													★	★	★	●	●																		★	★	●				
	TNMA333	TNMA160412	.047													★	★	★	●	●																								
	TNMA334	TNMA160416	.063													★	★	★	●	●																								
	TNMA335	TNMA160420	.079													★	★	★	●	●																								
	TNMA431	TNMA220404	.016																																				★					
	TNMA432	TNMA220408	.031													★	●	★	●	●																★		★		●				
	TNMA433	TNMA220412	.047													★	★	★	●	●																								
	TNMA434	TNMA220416	.063													★	★	★	●	●																		●						
Flat Top	**TNGA221**	TNGA110304	.016																																				★					
	TNGA222	TNGA110308	.031																																	★			★					
	TNGA330.5	TNGA160402	.008																																	★			★					
	TNGA331	TNGA160404	.016																																			★	★	★					
	TNGA332	TNGA160408	.031																																				★	★					
	TNGA431	TNGA220404	.016																																			★						
	TNGA432	TNGA220408	.031																																				★						

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

35° VN TYPE INSERTS WITH HOLE

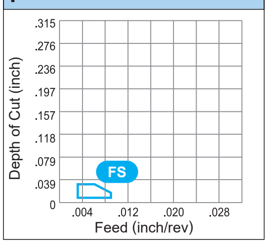
VNMG 3 3 0.5 FP — Size, Thickness, Corner Radius, Chip Breaker
*Please refer to page A002.

A
TURNING INSERTS
NEG
WITH HOLE
C
D
R
S
T
V
W

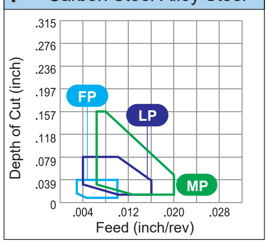
CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting··· Rough Cutting··· Heavy Cutting···

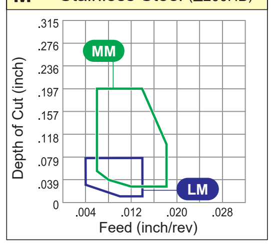
P Mild Steel



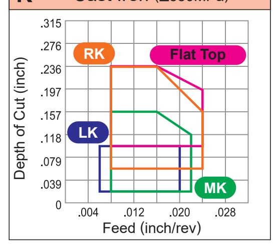
P Carbon Steel·Alloy Steel



M Stainless Steel (≤200HB)



K Cast Iron (≤350MPa)



● : Stable Cutting (1st recommendation)　◐ : General Cutting (1st recommendation)　✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation)　◔ : General Cutting (2nd recommendation)　✧ : Unstable Cutting (2nd recommendation)

Workpiece Material		MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel	●	✤	○	◔	✧	✧	●																		✧	✧	◐	○	○	◔	○	◔	✧							○
M	Stainless Steel								●	◐	✤	✤	●										◐		◔	✧	✧		○	○		○		✧							
K	Cast Iron													●	◐	✤	◔	✧							◔	✧			○	○		○		✧	○	◔					○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																		●	◐	✤	○	◐	○	◔	✧										◔	●	◐	●	◐	

Grade groups: Coated (MC6115 – UP20M); Coated Cermet (MP3025 – VP45N); Cermet (NX2525, NX3035); Carbide (UTi20T – TF15). NEW: MC6115, MC6125, MS7025, MC5105, MC5115, MC5125, MS9025.

Shape	Order Number	(ISO) Number	RE (inch)	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP Finish Cutting	VNMG330.5FP	VNMG160402-FP	.008			●	●																							●				★									
	VNMG331FP	VNMG160404-FP	.016			●	●																							●				★									
	VNMG332FP	VNMG160408-FP	.031			●	●																							●				★									
	VNMG333FP	VNMG160412-FP	.047			●	●																							●				★									
FH Finish Cutting	VNMG330.5FH	VNMG160402-FH	.008																											●				●	●								
	VNMG331FH	VNMG160404-FH	.016																											●	★			★									
	VNMG332FH	VNMG160408-FH	.031																											●	★			★	●								
FS Finish Cutting	VNMG331FS	VNMG160404-FS	.016																												●			★									
	VNMG332FS	VNMG160408-FS	.031																												●			★									
FS NEW Finish Cutting	VNGG33V5FS	VNGG1604V5-FS	.002																		●	●																				●	
	VNGG330.2FS	VNGG160401-FS	.004																		●	●	●																			●	
	VNGG330.5FS	VNGG160402-FS	.008																		●	●	●																			●	
	VNGG331FS	VNGG160404-FS	.016																		●	●	●																			●	
	VNGG332FS	VNGG160408-FS	.031																		●	●	●																			●	
FJ Finish Cutting	VNGG33V5FJ	VNGG1604V5-FJ	.002																								●													●			
	VNGG330.2FJ	VNGG160401-FJ	.004																								●													●			
	VNGG330.5FJ	VNGG160402-FJ	.008																								●													●			
R/L-F Finish Cutting	VNGG330.5RF	VNGG160402R-F	.008																									●		●				●	●								
	VNGG330.5LF	VNGG160402L-F	.008																									●		●				●	●								
	VNGG331RF	VNGG160404R-F	.016																									●		●				●	●								
	VNGG331LF	VNGG160404L-F	.016																									●		●				●	●								

● (yellow) = NEW

● : USA Stock　★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide						
							NEW								NEW		NEW								NEW																		
							MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		LP	VNMG331LP	VNMG160404-LP	.016	●	●	●	●	●																						●										
				VNMG332LP	VNMG160408-LP	.031	●	●	●	●	●																						●										
			Light Cutting																																								
			LM	VNMG331LM	VNMG160404-LM	.016								●	●	●																												
				VNMG332LM	VNMG160408-LM	.031								●	●	●																												
			Light Cutting																																								
			LK	VNMG331LK	VNMG160404-LK	.016													●	★	●	●																					
				VNMG332LK	VNMG160408-LK	.031													●	★	●	●																					
			Light Cutting																																								
			LS	VNMG330.5LS	VNMG160402-LS	.008																	●	●	●																	●	
				VNMG331LS	VNMG160404-LS	.016																	●	●	●																	●	
				VNMG332LS	VNMG160408-LS	.031																	●	●	●																	●	
			Light Cutting																																								
			LS NEW	VNGG330.5LS	VNGG160402-LS	.008																	●	●	●																	●	
				VNGG331LS	VNGG160404-LS	.016																	●	●	●																	●	
				VNGG332LS	VNGG160408-LS	.031																	●	●	●																	●	
			Light Cutting																																								
			SH	VNMG331SH	VNMG160404-SH	.016	●	●	●	●																								★		★	●						
				VNMG332SH	VNMG160408-SH	.031	●	●	●	●																								★		★	●						
			Light Cutting																																								
			SA	VNMG331SA	VNMG160404-SA	.016		●	●																											★							
				VNMG332SA	VNMG160408-SA	.031		●	●																											★							
			Light Cutting																																								
			MJ	VNMG331MJ	VNMG160404-MJ	.016																	●	●	★		●	●													●	
				VNMG332MJ	VNMG160408-MJ	.031																	●	●	★		●	●													●	
				VNMG333MJ	VNMG160412-MJ	.047																	●	●	★		★	★														
			Light Cutting																																								

● = NEW

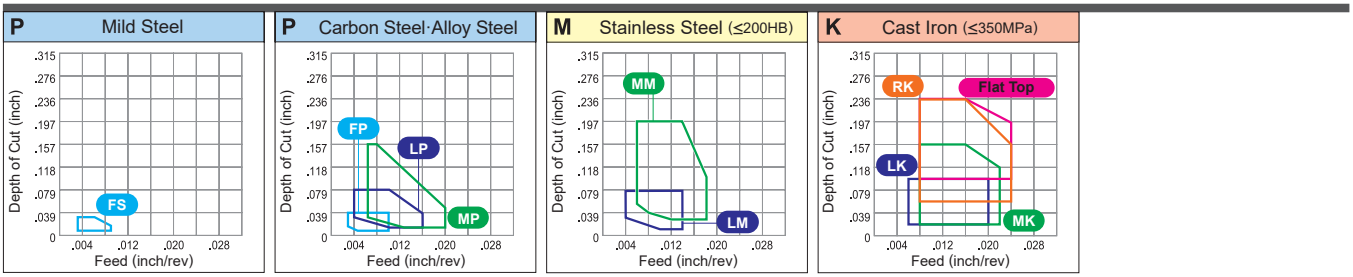
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

35° VN TYPE INSERTS WITH HOLE

VNMG 3 3 1 MJ
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting Rough Cutting Heavy Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ●●✠✠● ◕○○◔○◔❁ ❁❁◕○○◔○◔❁ ○
M	Stainless Steel	●◕✠✠● ◕ ◔❁❁❁ ○○○ ○ ❁
K	Cast Iron	●◕✠◔❁ ◔❁❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔❁ ◔●◕◕●

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MJ	**VNGM331MJ**	VNGM160404-MJ	.016																							●														●			
	VNGM332MJ	VNGM160408-MJ	.031																							●														●			
	VNGM431MJ	VNGM220404-MJ	.016																							●														●			
	VNGM432MJ	VNGM220408-MJ	.031																							●														●			
Light Cutting																																												
MP	**VNMG331MP**	VNMG160404-MP	.016	●	●	●	●	●																					●															
	VNMG332MP	VNMG160408-MP	.031	●	●	●	●	●																					●															
	VNMG333MP	VNMG160412-MP	.047	●	●	●	●	●																																				
Medium Cutting																																												
MM	**VNMG332MM**	VNMG160408-MM	.031								●	●	●																														
Medium Cutting																																												
MK	**VNMG331MK**	VNMG160404-MK	.016													●	●	★	●	●																								
	VNMG332MK	VNMG160408-MK	.031													★	●	●	●	●																								
	VNMG333MK	VNMG160412-MK	.047													★	●	★	●	●																								
Medium Cutting																																												
***MS**	**VNMG331MS**	VNMG160404-MS	.016																		●	●	●																				●	
	VNMG332MS	VNMG160408-MS	.031																		●	●	●																				●	
Medium Cutting																																												
MS	**VNMG331MS**	VNMG160404-MS	.016											●										●		●	●	★															
	VNMG332MS	VNMG160408-MS	.031											●										●		★	●								●							●		
Medium Cutting																																												

* New design MS breaker : MP9005, MP9015, MP9025, MT9015

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◐●✣✣● ○◐✣◔❁ ✣◐○○◔○◔✣ ○
M	Stainless Steel	◐●✣✣● ◐ ◔✣❁❁ ○○ ○ ✣
K	Cast Iron	●◐✣◔❁ ◔✣❁ ○○ ○ ✣○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔✣ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
GK	**VNMG331GK**	VNMG160404-GK	.016														★	★	●	●																								
	VNMG332GK	VNMG160408-GK	.031														●	●	●	●																								
	VNMG333GK	VNMG160412-GK	.047														●	★	★	●																								
Medium Cutting																																												
GM	**VNMG331GM**	VNMG160404-GM	.016								●	●	●																														
	VNMG332GM	VNMG160408-GM	.031								●	●	●																														
Medium Cutting																																												
MA	**VNMG331MA**	VNMG160404-MA	.016	●	●	●	●					●	●	●				★	●	●								●															
	VNMG332MA	VNMG160408-MA	.031	●	●	●	●	●				●	●	●				●	●	●								●															
Medium Cutting																																												
MH	**VNMG331MH**	VNMG160404-MH	.016	●	●																																					
	VNMG332MH	VNMG160408-MH	.031	●	●	●	●	●																																		
Medium Cutting																																												
Standard	**VNMG331**	VNMG160404	.016	●	●	●	●																					●		●				★	●	●		●					
	VNMG332	VNMG160408	.031	●	●	●	●	●																				●		●	●			★	●	●		●					
	VNMG333	VNMG160412	.047	●	●	●	●	●																											★									
Medium Cutting																																												
R/L	**VNGG331R**	VNGG160404R	.016																																★	●	★		★					
	VNGG331L	VNGG160404L	.016																																★	●	★							
Medium Cutting																																												
Flat Top	**VNMA331**	VNMA160404	.016														★	●	★	★	●																								
	VNMA332	VNMA160408	.031														★	●	★	★	●																								
	VNMA333	VNMA160412	.047														★	★	★	★	●																								
Flat Top	**VNGA331**	VNGA160404	.016																																		★	●						
	VNGA332	VNGA160408	.031																																		★	●						

● = NEW

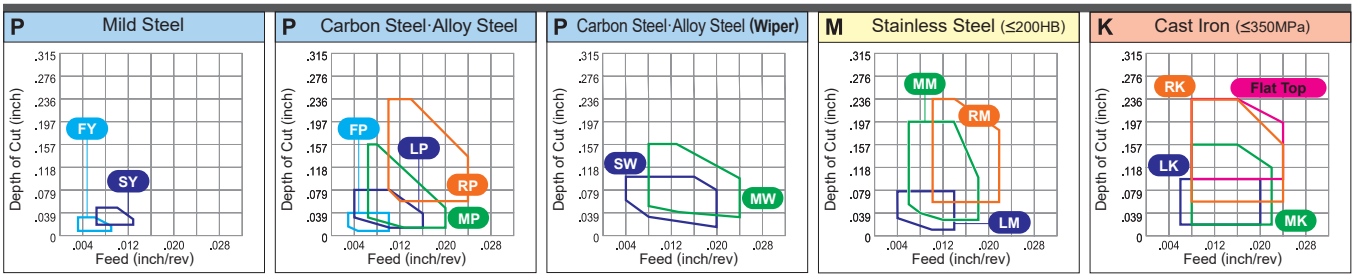
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 4 3 0.5 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting--- Light Cutting--- Medium Cutting--- Rough Cutting--- Heavy Cutting---



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																													Coated Cermet			Cermet		Carbide									
			NEW									NEW		NEW								NEW																									
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Shape	Order Number	(ISO) Number	RE (inch)																																										
FP	**WNMG430.5FP**	WNMG080402-FP	.008		●	●																							●			★											
	WNMG431FP	WNMG080404-FP	.016		●	●																							●			★											
	WNMG432FP	WNMG080408-FP	.031		●	●																							●			★											
	WNMG433FP	WNMG080412-FP	.047		●	●																							●			★											
Finish Cutting																																													
FH	**WNMG431FH**	WNMG080404-FH	.016																										●			★											
	WNMG432FH	WNMG080408-FH	.031																										●	●		★											
Finish Cutting																																													
FS	**WNMG431FS**	WNMG080404-FS	.016																													★											
	WNMG432FS	WNMG080408-FS	.031																													★											
Finish Cutting																																													
FY	**WNMG431FY**	WNMG080404-FY	.016																										●			★											
	WNMG432FY	WNMG080408-FY	.031																										●	★		★											
Finish Cutting																																													
LP	**WNMG32.51LP**	WNMG06T304-LP	.016			●	●	●																					●														
	WNMG32.52LP	WNMG06T308-LP	.031			●	●	●																					●														
	WNMG331LP	WNMG060404-LP	.016			●	●	●																					●														
	WNMG332LP	WNMG060408-LP	.031			●	●	●																					●														
	WNMG431LP	WNMG080404-LP	.016	●	●	●	●	●																					●														
	WNMG432LP	WNMG080408-LP	.031	●	●	●	●	●																					●														
Light Cutting	**WNMG433LP**	WNMG080412-LP	.047	●	●	●	●	●																																				

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◐●✣✣● ○◐✣◔❁ ●◐✣○◐✣ ❁◐○○◔○◔❁ ○
M	Stainless Steel	◐●✣✣● ◔ ❁❁❁ ○○ ○ ❁
K	Cast Iron	●◐✣◔❁ ❁❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐○◔○◔○ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
LM	**WNMG331LM**	WNMG060404-LM	.016								●	●	●																												
	WNMG332LM	WNMG060408-LM	.031								●	●	●																												
	WNMG431LM	WNMG080404-LM	.016								●	●	●																												
Light Cutting	**WNMG432LM**	WNMG080408-LM	.031								●	●	●																												
LK	**WNMG431LK**	WNMG080404-LK	.016														●	●	●	●																						
	WNMG432LK	WNMG080408-LK	.031														●	★	●	●																						
	WNMG433LK	WNMG080412-LK	.047														★	★	●	●																						
Light Cutting																																										
LS	**WNMG430.5LS**	WNMG080402-LS	.008																		●	●	●																		●	
	WNMG431LS	WNMG080404-LS	.016																		●	●	●																		●	
	WNMG432LS	WNMG080408-LS	.031																		●	●	●																		●	
Light Cutting																																										
SH	**WNMG32.51SH**	WNMG06T304-SH	.016										●																												
	WNMG32.52SH	WNMG06T308-SH	.031										●																												
	WNMG331SH	WNMG060404-SH	.016										●																												
	WNMG332SH	WNMG060408-SH	.031										●																												
	WNMG431SH	WNMG080404-SH	.016	●	●	●	●						●																				★								
	WNMG432SH	WNMG080408-SH	.031	●	●	●	●						●																				★								
Light Cutting	**WNMG433SH**	WNMG080412-SH	.047	●	●	●	●						●																												
SA	**WNMG431SA**	WNMG080404-SA	.016	●	●	●	●						●																				★	●							
	WNMG432SA	WNMG080408-SA	.031	●	●	●	●						●																				★	●							
	WNMG433SA	WNMG080412-SA	.047	●	●	●	●																											●							
Light Cutting																																									
***SW**	**WNMG331SW**	WNMG060404-SW	.016		●																									●			★								
	WNMG332SW	WNMG060408-SW	.031		●																									●			★								
	WNMG431SW	WNMG080404-SW	.016	●	●	●													●	●										●				★	●							
Light Cutting (Wiper)	**WNMG432SW**	WNMG080408-SW	.031	●	●	●													●	●										●				★	●							
	WNMG433SW	WNMG080412-SW	.047	●	●	●																								●				●	●							
SY	**WNMG431SY**	WNMG080404-SY	.016																											●				★								
	WNMG432SY	WNMG080408-SY	.031																											●		★		★	●							
Light Cutting																																										
MJ	**WNMG432MJ**	WNMG080408-MJ	.031																		●	●	★			★	★															
	WNMG433MJ	WNMG080412-MJ	.047																		●	●	★			★	★															
	WNMG434MJ	WNMG080416-MJ	.063																		●	●	★			★	★															
Light Cutting																																										

*Please refer to page A032 before using the SW breaker (wiper insert).

● = NEW

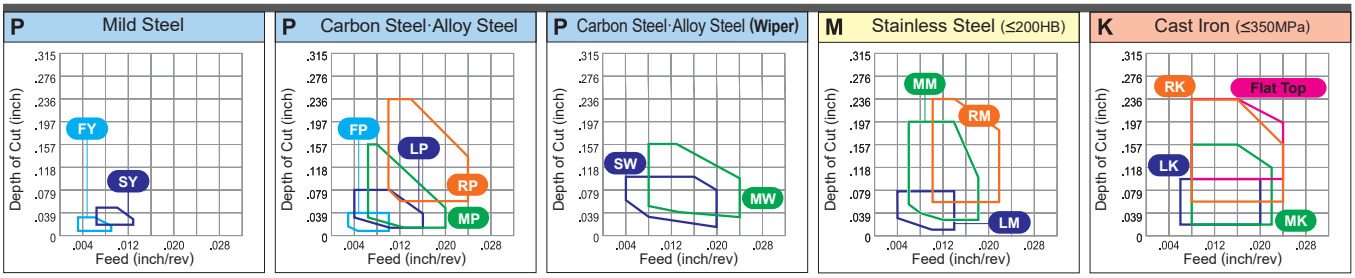
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 3 2.5 1 MP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting--- Light Cutting--- Medium Cutting--- Rough Cutting--- Heavy Cutting---



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◕●●✠✠●◕●●✠✠◕○○○◔○◔✠○
M	Stainless Steel	●◕●✠✠●◕◔✠✠○○○◔○✠
K	Cast Iron	●◕●✠◔✠◔✠✠○○◔○✠◔●○
N	Non-ferrous Metal	◔●
S	Heat resistant Alloy, Titanium Alloy	●◕●✠○◕○◔✠◔●◕●●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MP	**WNMG32.51MP**	WNMG06T304-MP	.016		●	●	●																																		
	WNMG32.52MP	WNMG06T308-MP	.031		●	●	●																																		
	WNMG32.53MP	WNMG06T312-MP	.047		●	●	●																																		
	WNMG331MP	WNMG060404-MP	.016		●	●	●																																		
	WNMG332MP	WNMG060408-MP	.031		●	●	●																																		
	WNMG333MP	WNMG060412-MP	.047		●	●	●																																		
	WNMG431MP	WNMG080404-MP	.016	●	●	●	●	●																						●													
	WNMG432MP	WNMG080408-MP	.031	●	●	●	●	●																						●													
	WNMG433MP	WNMG080412-MP	.047	●	●	●	●	●																						●													
Medium Cutting	**WNMG434MP**	WNMG080416-MP	.063	●	●	●	●	●																																			
MM	**WNMG332MM**	WNMG060408-MM	.031								●	●	●																														
	WNMG333MM	WNMG060412-MM	.047								●	●	●																														
	WNMG432MM	WNMG080408-MM	.031								●	●	●																														
Medium Cutting	**WNMG433MM**	WNMG080412-MM	.047								●	●	●																														
MK	**WNMG431MK**	WNMG080404-MK	.016													●	●	★	●	●																							
	WNMG432MK	WNMG080408-MK	.031													●	●	●	●	●																							
	WNMG433MK	WNMG080412-MK	.047													★	●	★	●	●																							
Medium Cutting	**WNMG434MK**	WNMG080416-MK	.063													★	●	★	●	●																							
***MS**	**WNMG431MS**	WNMG080404-MS	.016																		●	●	●																			●
	WNMG432MS	WNMG080408-MS	.031																		●	●	●	●																		●
Medium Cutting	**WNMG433MS**	WNMG080412-MS	.047																		●	●	●	●																		●

* New design MS breaker : MP9005, MP9015, MP9025, MT9015

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide							
	P	Steel	●	✠	○	◔	✠	✠	●																	✠	✠	◐	○	○	○	◔	○	◔	✠						○
	M	Stainless Steel								●	◐	✠	✠	●										◐		◔	✠	✠		○	○		○		✠						
	K	Cast Iron													●	◐	✠	◔	✠							◔	✠			○	○		○		✠	○	◔				○
	N	Non-ferrous Metal																															◔	●						○
	S	Heat resistant Alloy, Titanium Alloy																	●	◐	✠	○	◐	○	◔	✠							◔	●	◐	●	●	◐		

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 NEW	MC6125 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 NEW	MC5105 NEW	MC5115 NEW	MC5125 NEW	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MS	**WNMG322MS**	WNMG060308-MS	.031										●																												
	WNMG32.51MS	WNMG06T304-MS	.016										●																												
	WNMG32.52MS	WNMG06T308-MS	.031										●																												
	WNMG331MS	WNMG060404-MS	.016										●																												
	WNMG332MS	WNMG060408-MS	.031										●																												
	WNMG431MS	WNMG080404-MS	.016										●													●	●	●														
	WNMG432MS	WNMG080408-MS	.031										●													●	●	●												●		
Medium Cutting	**WNMG433MS**	WNMG080412-MS	.047										●													★	●														
GK	**WNMG331GK**	WNMG060404-GK	.016													●	★	●	●																						
	WNMG332GK	WNMG060408-GK	.031													●	★	●	●																						
	WNMG431GK	WNMG080404-GK	.016													●	★	●	●																						
	WNMG432GK	WNMG080408-GK	.031													●	★	●	●																						
Medium Cutting	**WNMG433GK**	WNMG080412-GK	.047													●	★	●	●																						
	NEW **WNMG434GK**	WNMG080416-GK	.063													★	★																								
GM	**WNMG331GM**	WNMG060404-GM	.016								●	●	●																												
	WNMG332GM	WNMG060408-GM	.031								●	●	●																												
	WNMG431GM	WNMG080404-GM	.016								●	●	●																												
	WNMG432GM	WNMG080408-GM	.031								●	●	●																												
Medium Cutting	**WNMG433GM**	WNMG080412-GM	.047								●	●	●																												
MA	**WNMG32.51MA**	WNMG06T304-MA	.016											★																											
	WNMG32.52MA	WNMG06T308-MA	.031											★																											
	WNMG32.53MA	WNMG06T312-MA	.047											★																											
	WNMG331MA	WNMG060404-MA	.016			●	●							●																											
	WNMG332MA	WNMG060408-MA	.031			●	●					●	●	●		●	★	●	●								●														
	WNMG333MA	WNMG060412-MA	.047			●	●					●	●	★		★	★	●	●								●														
	WNMG431MA	WNMG080404-MA	.016	●	●	●	●					●	●	●		●	★	●	●			●	●				●								●						
	WNMG432MA	WNMG080408-MA	.031	●	●	●	●	●				●	●	●		●	●	●	●			●	●				●								●						
Medium Cutting	**WNMG433MA**	WNMG080412-MA	.047	●	●	●	●	●				●	●	●		●	●	●	●			●	●				●								●						
	WNMG434MA	WNMG080416-MA	.063	●	●											★	●					●	●																	
MH	**WNMG431MH**	WNMG080404-MH	.016	●	●																																			
	WNMG432MH	WNMG080408-MH	.031	●	●	●	●	●																																
	WNMG433MH	WNMG080412-MH	.047	●	●	●	●	●																																
Medium Cutting																																								
Standard	**WNMG431**	WNMG080404	.016	●	●	●	●																							●				★							
	WNMG432	WNMG080408	.031	●	●	●	●	●																			●			●				★		★					
	WNMG433	WNMG080412	.047	●	●	●	●	●																			●									★					
Medium Cutting																																								

● = NEW

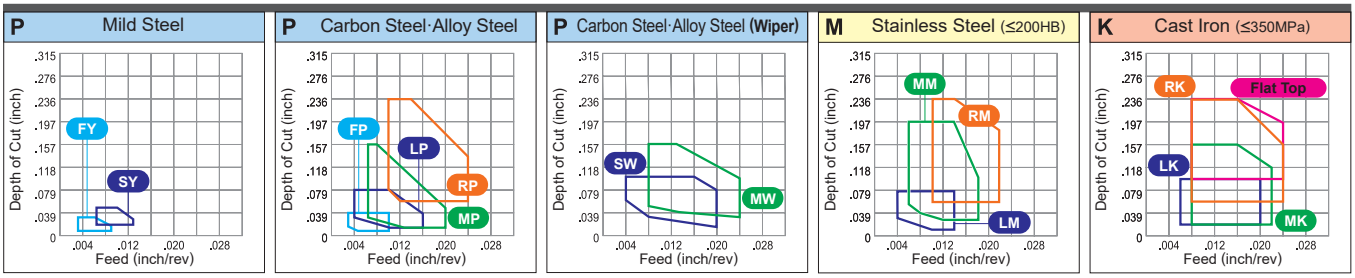
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° WN TYPE INSERTS WITH HOLE

WNMG 3 3 2 MW
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting--- Light Cutting--- Medium Cutting--- Rough Cutting--- Heavy Cutting---



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ✠: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◐◐✠✠●◐✠✠✠◐○○○◔○◔✠✠○
M	Stainless Steel	●◐✠✠●◐✠✠◐○○○✠○◔✠
K	Cast Iron	●◐✠◔✠◐✠✠○○✠◔○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔✠ ◔●◐●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
*MW	WNMG332MW	WNMG060408-MW	.031		●	●												●	●																								
	WNMG333MW	WNMG060412-MW	.047		●	●												●	●																								
	WNMG432MW	WNMG080408-MW	.031	●	●	●	●											●	●																								
	WNMG433MW	WNMG080412-MW	.047	●	●	●	●											●	●																								
Medium Cutting (Wiper)																																											
RP	WNMG432RP	WNMG080408-RP	.031	●	●	●	●	●																																			
	WNMG433RP	WNMG080412-RP	.047	●	●	●	●	●																																			
Rough Cutting																																											
RM	WNMG332RM	WNMG060408-RM	.031								●	●	●																														
	WNMG333RM	WNMG060412-RM	.047								●	●	●																														
	WNMG432RM	WNMG080408-RM	.031								●	●	●																														
	WNMG433RM	WNMG080412-RM	.047								●	●	●																														
Rough Cutting																																											
RK	WNMG432RK	WNMG080408-RK	.031													●	●	●	●	●																							
	WNMG433RK	WNMG080412-RK	.047													●	●	★	●	●																							
	WNMG434RK	WNMG080416-RK	.063													★	●	★	●	●																							
Rough Cutting																																											
RS	WNMG432RS	WNMG080408-RS	.031																			●	●																				●
	WNMG433RS	WNMG080412-RS	.047																			●	●																				●
	WNMG434RS	WNMG080416-RS	.063																			●	●																				●
	WNMG543RS	WNMG100612-RS	.047																			●	●																				●
Rough Cutting																																											

* Please refer to A032 before using the MW breaker (wiper insert).

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
							NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		GH	WNMG432GH	WNMG080408-GH	.031	●	●									●																											
M	Stainless Steel		Rough Cutting	WNMG433GH	WNMG080412-GH	.047	●	●									●																											
K	Cast Iron																																											
N	Non-ferrous Metal		GJ	WNMG432GJ	WNMG080408-GJ	.031																				●			●												●		
S	Heat resistant Alloy, Titanium Alloy			WNMG433GJ	WNMG080412-GJ	.047																				●			●												●		
			Rough Cutting	WNMG434GJ	WNMG080416-GJ	.063																				●			●												●		
				WNMG543GJ	WNMG100612-GJ	.047																							●												●		
			Flat Top	WNMA332	WNMA060408	.031													★	★	★	★	●																				
				WNMA333	WNMA060412	.047													●	★	★	★	●																				
				WNMA431	WNMA080404	.016													★	★	★	●	●																	★			
				WNMA432	WNMA080408	.031													●	●	●	●	●																	★			
				WNMA433	WNMA080412	.047													●	●	●	●	●																				
				WNMA434	WNMA080416	.063													★	●	★	●	●																				

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A046
GRADES ➤ A034
IDENTIFICATION ➤ A002

55° KN TYPE INSERTS WITHOUT HOLE

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide							
			NEW									NEW		NEW								NEW																			
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✣	○	◔	❁	❁	●																❁	❁	◐	○	○	◔	○	◔	❁							○
	M	Stainless Steel								●	◐	✣	✣	●									◐		◔	❁	❁		○	○		○		❁							
	K	Cast Iron													●	◐	✣	◔	❁						◔	❁			○	○		○		❁	○	◔					○
	N	Non-ferrous Metal																																		◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	○	◔	❁								◔	●	◐	●	◐		
Shape	Order Number	(ISO) Number	RE (inch)																																						
	KNUX160405RM1	KNUX160405R-M1	.020																															●							

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

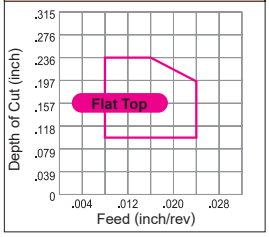
80° CN TYPE INSERTS WITHOUT HOLE

CNMN 4 3 2
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Heavy Cutting ···

K Cast Iron (≤350MPa)



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet						Cermet		Carbide									
			NEW									NEW		NEW							NEW																							
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		●✠○◔❁❁●							●◕✠✠●					●◕✠◔❁							◕		❁❁			◕○○○◔	○◔	✠				○										○
M	Stainless Steel													●	◕✠✠●							◕		◔❁❁			○○	○	✠													
K	Cast Iron													●	◕✠◔❁									◔❁❁			○○	○	✠	○◔												○
N	Non-ferrous Metal																																			◔●						○
S	Heat resistant Alloy, Titanium Alloy																	●	◕✠○	◕	○	◔❁														◔●	◕	●	●	◕		
Shape	Order Number	(ISO) Number	RE (inch)																																								
Flat Top	**CNMN432**	CNMN120408	.031												★●★★★																											
	CNMN433	CNMN120412	.047												★●★★★																											
	CNMN434	CNMN120416	.063												★●★★★																											

● = NEW

EXTERNAL TURNING	➤ –	CHIP BREAKER	➤ A078
BORING	➤ –	GRADES	➤ A034
		IDENTIFICATION	➤ A002

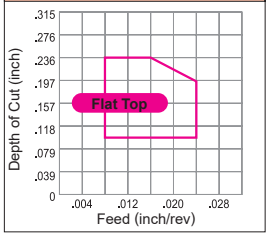
90° SN TYPE INSERTS WITHOUT HOLE

SNMN 4 3 2
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Heavy Cutting ---

K Cast Iron (≤350MPa)



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ●◕●✠✠● ✠✠◕○○◔○◔✠ ○
M	Stainless Steel	●◕●✠✠● ◕ ◔✠✠✠ ○○ ○ ✠
K	Cast Iron	●◕●✠◔❁ ◔✠✠ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕●✠○◕○◔✠ ◔●●●●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																												Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Flat Top	SNMN432	SNMN120408	.031													●●★		●●															★		★	★								
	SNMN433	SNMN120412	.047													★★★		●●															★		★								
	SNMN434	SNMN120416	.063													★★★		●●																										
	NEW SNMN435	SNMN120420	.079													★★★																												
	SNMN633	SNMN190412	.047																																★									
Flat Top	SNG322	SNGN090308	.031																																	★								
	SNG431	SNGN120404	.016																																★	★								
	SNG432	SNGN120408	.031																																★									

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

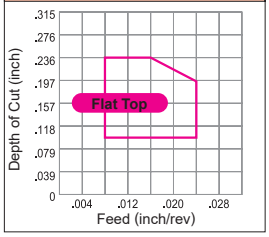
60° TN TYPE INSERTS WITHOUT HOLE

TNMN 3 2 2
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Heavy Cutting---

K Cast Iron (≤350MPa)



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ⊛: Unstable Cutting (2nd recommendation)

Workpiece Material		MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
		Coated																										Coated Cermet				Cermet		Carbide							
		NEW											NEW	NEW									NEW																		
P	Steel	●	✠	○	◔	⊛	⊛	●																		⊛	⊛	◐	○	○	◔	○	◔	⊛							○
M	Stainless Steel								●	◐	✠	✠	●										◐		◔	⊛	⊛		○	○		○		⊛							
K	Cast Iron													●	◐	✠	◔	⊛							◔	⊛			○	○		○		⊛	○	◔					○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																		●	◐	✠	○	◐	○	◔	⊛										◔	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Flat Top	**TNMN322**	TNMN160308	.031																															★									
	TNMN332	TNMN160408	.031													★	★	★	●	●														★									
	TNMN333	TNMN160412	.047													★	★	★	●	●																							
	TNMN334	TNMN160416	.063													★	★	★	●	●																							
	TNMN335	TNMN160420	.079													★	★	★																									
	TNMN432	TNMN220408	.031																															★									
	TNMN433	TNMN220412	.047																																	★							
Flat Top	**TNG221**	TNGN110304	.016																																			★					
	TNG222	TNGN110308	.031																																			★					
	TNG331	TNGN160404	.016																																			★					
	TNG332	TNGN160408	.031																																			★					

● = NEW

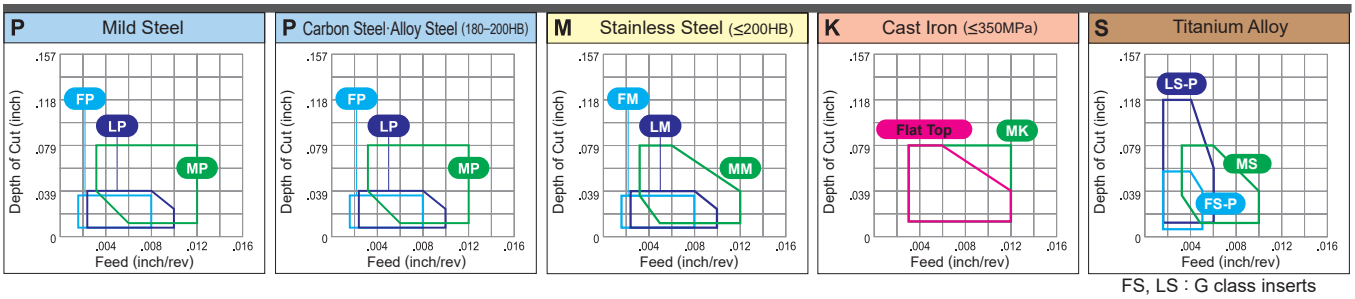
EXTERNAL TURNING ➤ –
BORING ➤ –
CHIP BREAKER ➤ A078
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCMT 2 1.5 0.5 FP
Size / Thickness / Corner Radius / Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◐●✠✠●◐●✠✠●○◔✠✠◐○○◔○◔✠○
M	Stainless Steel	●◐●✠✠●◐●✠✠●◐◔✠✠○○◔○✠○
K	Cast Iron	●◐●✠◔✠◐◔✠✠○○◔✠○◔○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐●✠○◐○◔✠◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide													
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP	**CCMT21.50.5FP**	CCMT060202-FP	.008	●	●	●	●																						●			●												
	CCMT21.51FP	CCMT060204-FP	.016	●	●	●	●																						●			●												
	CCMT32.50.5FP	CCMT09T302-FP	.008	●	●	●	●																						●			●												
	CCMT32.51FP	CCMT09T304-FP	.016	●	●	●	●																						●			●												
Finish Cutting	**CCMT32.52FP**	CCMT09T308-FP	.031	●	●	●	●																						●			●												
FM	**CCMT21.50.5FM**	CCMT060202-FM	.008																								●																
	CCMT21.51FM	CCMT060204-FM	.016																								●																
	CCMT32.50.5FM	CCMT09T302-FM	.008																								●																
	CCMT32.51FM	CCMT09T304-FM	.016																								●																
Finish Cutting	**CCMT32.52FM**	CCMT09T308-FM	.031																								●																
FS	**CCGT21.50.2MFS**	CCGT060201M-FS	.004*																		●	●	●																				
	CCGT21.50.5MFS	CCGT060202M-FS	.008*																		●	●	●																				
	CCGT32.50.2MFS	CCGT09T301M-FS	.004*																		●	●	●																				
	CCGT32.50.5MFS	CCGT09T302M-FS	.008*																		●	●	●																				
Finish Cutting	**CCGT32.51MFS**	CCGT09T304M-FS	.016*																		●	●	●																				
FS-P	**CCGT21.50.2MFS-P**	CCGT060201M-FS-P	.004*											●										●																	●		
	CCGT21.50.5MFS-P	CCGT060202M-FS-P	.008*											●										●																	●		
	CCGT32.50.2MFS-P	CCGT09T301M-FS-P	.004*											●										●																	●		
	CCGT32.50.5MFS-P	CCGT09T302M-FS-P	.008*											●										●																	●		
Finish Cutting	**CCGT32.51MFS-P**	CCGT09T304M-FS-P	.016*											●										●																	●		
FV	**CCMT21.50.5FV**	CCMT060202-FV	.008		●																						●			●	★	★	●											
	CCMT21.51FV	CCMT060204-FV	.016		●																						●			●	★	★	●											
	CCMT32.50.5FV	CCMT09T302-FV	.008		★																										●	●	●											
	CCMT32.51FV	CCMT09T304-FV	.016		●																						●			●	★	★	●											
Finish Cutting	**CCMT32.52FV**	CCMT09T308-FV	.031		●																						●			●	★	★	●											

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◐●✣✣● ✣◐●◔❁ ✣●◐✣○◐◔ ✣○◐○○◔○ ◔○◔✣○◔○ ○
M	Stainless Steel	◐●✣✣● ◐ ✣◐❁❁ ●○○ ○ ✣ ○
K	Cast Iron	●◐✣◔❁ ✣◐❁ ●○○ ○ ✣○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔ ◔●◐●●◐ ◔●◐●●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FJ	**CCGT21.5V5FJ**	CCGT0602V5-FJ	.002																							●														
	CCGT21.50.2FJ	CCGT060201-FJ	.004																							●														
	CCGT21.50.5FJ	CCGT060202-FJ	.008																							●														
	CCGT32.5V5FJ	CCGT09T3V5-FJ	.002																							●														
	CCGT32.50.2FJ	CCGT09T301-FJ	.004																							●													★	
	CCGT32.50.5FJ	CCGT09T302-FJ	.008																							●													★	
Finish Cutting	**CCGT32.51FJ**	CCGT09T304-FJ	.016																							●													★	
FJ-P	**CCGT21.5V5FJ-P**	CCGT0602V5-FJ-P	.002																																			●		
	CCGT21.50.2FJ-P	CCGT060201-FJ-P	.004																																			●		
	CCGT21.50.5FJ-P	CCGT060202-FJ-P	.008																																			●		
	CCGT32.5V5FJ-P	CCGT09T3V5-FJ-P	.002																																			●		
	CCGT32.50.2FJ-P	CCGT09T301-FJ-P	.004																																			●		
	CCGT32.50.5FJ-P	CCGT09T302-FJ-P	.008																																			●		
Finish Cutting	**CCGT32.51FJ-P**	CCGT09T304-FJ-P	.016																																			●		
AZ	**CCGT21.50.5AZ**	CCGT060202-AZ	.008																																	●				
	CCGT21.51AZ	CCGT060204-AZ	.016																																	●				
	CCGT32.50.5AZ	CCGT09T302-AZ	.008																																	●				
	CCGT32.51AZ	CCGT09T304-AZ	.016																																	●				
	CCGT32.52AZ	CCGT09T308-AZ	.031																																	●				
	CCGT430.5AZ	CCGT120402-AZ	.008																																	●				
Medium Cutting-Finish Cutting	**CCGT431AZ**	CCGT120404-AZ	.016																																	●				
	CCGT432AZ	CCGT120408-AZ	.031																																	●				
R/L-F	✱1**CCGT03S1V3L-F**	CCGT03S1V3L-F	.001																								●						●							
	✱1**CCGT03S101L-F**	CCGT03S101L-F	.004																								●						●							
	✱1**CCGT03S102L-F**	CCGT03S102L-F	.008																								●		●				★							
	✱1**CCGT03S104L-F**	CCGT03S104L-F	.016																								●		●				★							
	✱1**CCGT04T0V3L-F**	CCGT04T0V3L-F	.001																								●						●							
	✱1**CCGT04T001L-F**	CCGT04T001L-F	.004																								●						●							
	✱1**CCGT04T002L-F**	CCGT04T002L-F	.008																								●		●				★							
	✱1**CCGT04T004L-F**	CCGT04T004L-F	.016																								●		●				★							
	✱1**CCGT03S101MR-F**	CCGT03S101MR-F	.004✱2							●																														
	✱1**CCGT03S101ML-F**	CCGT03S101ML-F	.004✱2							●																														
	✱1**CCGT03S102MR-F**	CCGT03S102MR-F	.008✱2							●																														
	✱1**CCGT03S102ML-F**	CCGT03S102ML-F	.008✱2							●																														
	✱1**CCGT03S104MR-F**	CCGT03S104MR-F	.016✱2							●																														
	✱1**CCGT03S104ML-F**	CCGT03S104ML-F	.016✱2							●																														
	✱1**CCGT04T001MR-F**	CCGT04T001MR-F	.004✱2							●																														
	✱1**CCGT04T001ML-F**	CCGT04T001ML-F	.004✱2							●																														
	✱1**CCGT04T002MR-F**	CCGT04T002MR-F	.008✱2							●																														
	✱1**CCGT04T002ML-F**	CCGT04T002ML-F	.008✱2							●																														
	✱1**CCGT04T004MR-F**	CCGT04T004MR-F	.016✱2							●																														
Finish Cutting	✱1**CCGT04T004ML-F**	CCGT04T004ML-F	.016✱2							●																														

✱1 Diameter of inscribed circle is special. (For SCLC type)
✱2 Indicates the maximum value of the corner R. For more details, see page D003.

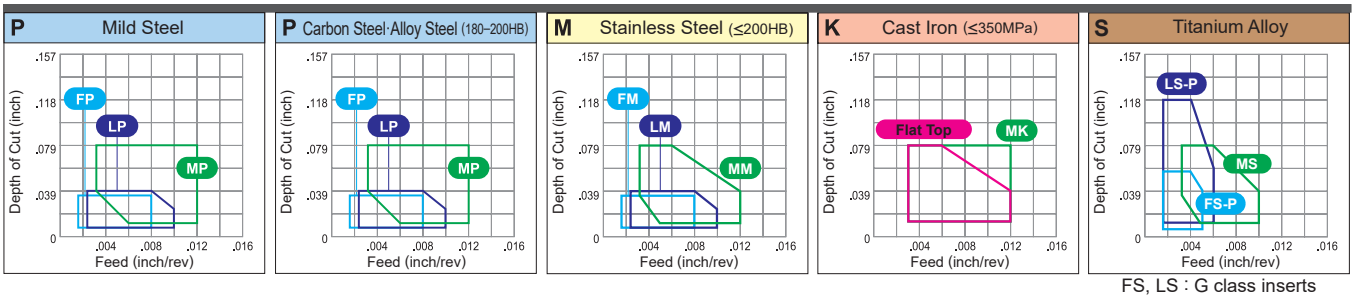
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCGH 2 1.5 0.5 R F
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◐◐✠✠●◐◐✠◔✠●◐○✠✠●○○○◔○◔✠✠○
M	Stainless Steel	◐◐✠✠●◔✠✠✠○○○✠✠
K	Cast Iron	◐◐✠◔✠◔✠✠○○○✠✠◔◔○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	◔●◐◐◐◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-F	**CCGH21.50.5RF**	CCGH060202R-F	.008																								●		★		★			●						
	CCGH21.50.5LF	CCGH060202L-F	.008																								●		★		★			●						
	CCGH21.51RF	CCGH060204R-F	.016																								●		★		★			●						
	CCGH21.51LF	CCGH060204L-F	.016																								●		★		★			●						
	CCGH21.50.5MRF	CCGH060202MR-F	.008*							●																															
	CCGH21.50.5MLF	CCGH060202ML-F	.008*							●																															
	CCGH21.51MRF	CCGH060204MR-F	.016*							●																															
Finish Cutting	**CCGH21.51MLF**	CCGH060204ML-F	.016*							●																															
LP	NEW **CCMT21.50.5LP**	CCMT060202-LP	.008		★																																			
	CCMT21.51LP	CCMT060204-LP	.016	●	●	●	●																						●		●										
	CCMT21.52LP	CCMT060208-LP	.031	●	●	●	●																						●		●										
	CCMT32.51LP	CCMT09T304-LP	.016	●	●	●	●																						●		●										
Light Cutting	**CCMT32.52LP**	CCMT09T308-LP	.031	●	●	●	●																						●		●										
LM	**CCMT21.51LM**	CCMT060204-LM	.016								●	●															●													
	CCMT21.52LM	CCMT060208-LM	.031								●	●															●													
	CCMT32.51LM	CCMT09T304-LM	.016								●	●															●													
Light Cutting	**CCMT32.52LM**	CCMT09T308-LM	.031								●	●															●													
LS	**CCMT21.50.5LS**	CCMT060202-LS	.008																		●	●	●																●	
	CCMT21.51LS	CCMT060204-LS	.016																		●	●	●																●	
	CCMT32.50.5LS	CCMT09T302-LS	.008																		●	●	●																●	
	CCMT32.51LS	CCMT09T304-LS	.016																		●	●	●																●	
Light Cutting	**CCMT32.52LS**	CCMT09T308-LS	.031																		●	●	●																●	
LS	**CCGT21.50.2MLS**	CCGT060201M-LS	.004*																		●	●	●																	
	CCGT21.50.5MLS	CCGT060202M-LS	.008*																		●	●	●																	
	CCGT32.50.2MLS	CCGT09T301M-LS	.004*																		●	●	●																	
	CCGT32.50.5MLS	CCGT09T302M-LS	.008*																		●	●	●																	
Light Cutting	**CCGT32.51MLS**	CCGT09T304M-LS	.016*																		●	●	●																	

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✥ : Unstable Cutting (2nd recommendation)

				Coated																										Coated Cermet				Cermet		Carbide							
Shape	Order Number	(ISO) Number	RE (inch)	MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel		●	✤	○	◔	✥	✥	●																		✥	✥	◐	○	○	◔	○	◔	✥							○
	M	Stainless Steel									●	◐	✤	✤	●										◐		◔	✥	✥		○	○		○		✥							
	K	Cast Iron														●	◐	✤	◔	✥							◔	✥			○	○		○		✥	○	◔					○
	N	Non-ferrous Metal																																				◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✤	○	◐	○	◔	✥										◔	●	◐	●	◐	
LS-P Light Cutting	CCGT21.50.2MLS-P	CCGT060201M-LS-P	.004*2							●					●										●																●		
	CCGT21.50.5MLS-P	CCGT060202M-LS-P	.008*2							●					●										●																●		
	CCGT32.50.2MLS-P	CCGT09T301M-LS-P	.004*2							●					●										●																●		
	CCGT32.50.5MLS-P	CCGT09T302M-LS-P	.008*2							●					●										●																●		
	CCGT32.51MLS-P	CCGT09T304M-LS-P	.016*2							●					●										●																●		
MJ Light Cutting	CCGT21.51MJ	CCGT060204-MJ	.016																								●																
	CCGT32.52MJ	CCGT09T308-MJ	.031																								●																
MJ-P Light Cutting	CCGT21.51MJ-P	CCGT060204-MJ-P	.016																																				●				
	CCGT32.52MJ-P	CCGT09T308-MJ-P	.031																																				●				
SV Light Cutting	CCMH21.50.5SV	CCMH060202-SV	.008				●							●														★		●			★	★	●								
	CCMH21.51SV	CCMH060204-SV	.016				●							●														★		●			★	★	●								
*1SW Light Cutting (Wiper)	CCMT21.50.5SW	CCMT060202-SW	.008	●	★	●	●																							●		●		●									
	CCMT21.51SW	CCMT060204-SW	.016	★	★	●	●																							●		●		●									
	CCMT32.50.5SW	CCMT09T302-SW	.008	●	●	●	●																							●		●		●									
	CCMT32.51SW	CCMT09T304-SW	.016	●	●	●	●																							●		●		●									

*1 Please refer to page A032 before using the SW breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

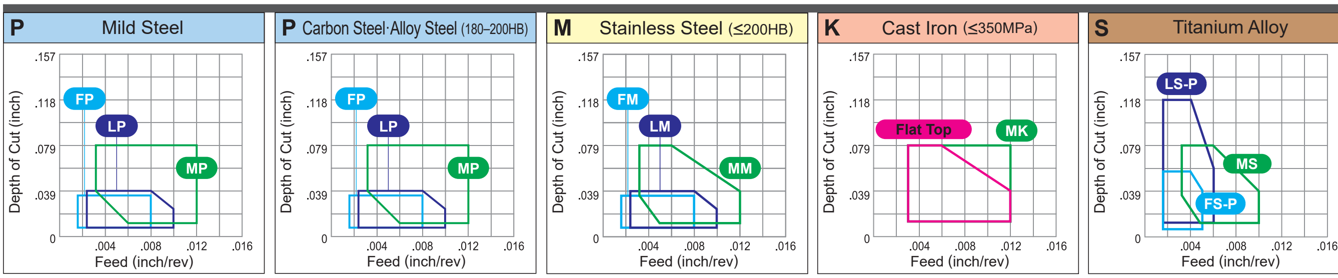
● = NEW

80° CC TYPE INSERTS WITH HOLE

CCGT 2 1.5 V3 R SS
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

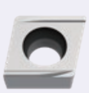
CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting···



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✥ : Unstable Cutting (2nd recommendation)

Shape	Order Number	(ISO) Number	RE (inch)	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
				Coated																										Coated Cermet				Cermet		Carbide							
				NEW	NEW										NEW	NEW	NEW	NEW							NEW																		
Workpiece Material	P	Steel		●	✤	○	◔	✥	✥	●																		✥	✥	◐	○	○	◔	○	◔	✥							○
Workpiece Material	M	Stainless Steel									●	◐	✤	✤	●										◐		◔	✥	✥		○	○		○		✥							
Workpiece Material	K	Cast Iron														●	◐	✤	◔	✥							◔	✥			○	○		○		✥	○	◔					○
Workpiece Material	N	Non-ferrous Metal																																					◔	●				○
Workpiece Material	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✤	○	◐	○	◔	✥										◔	●	◐	●	◐	
R/L-SS	CCGT21.5V3RSS	CCGT0602V3R-SS	.001																									●															
	CCGT21.5V3LSS	CCGT0602V3L-SS	.001																									●															
	CCGT21.50.2RSS	CCGT060201R-SS	.004																									●															
	CCGT21.50.2LSS	CCGT060201L-SS	.004																									●															
	CCGT21.50.5RSS	CCGT060202R-SS	.008																									●															
	CCGT21.50.5LSS	CCGT060202L-SS	.008																									●															
	CCGT32.5V3RSS	CCGT09T3V3R-SS	.001																									●															
	CCGT32.5V3LSS	CCGT09T3V3L-SS	.001																									●															
	CCGT32.50.2RSS	CCGT09T301R-SS	.004																									●															
	CCGT32.50.2LSS	CCGT09T301L-SS	.004																									●															
	CCGT32.50.5RSS	CCGT09T302R-SS	.008																									●															
	CCGT32.50.5LSS	CCGT09T302L-SS	.008																									●															
	CCGT21.50.2MRSS	CCGT060201MR-SS	.004*							●																																	
	CCGT21.50.2MLSS	CCGT060201ML-SS	.004*							●																																	
	CCGT21.50.5MRSS	CCGT060202MR-SS	.008*							●																																	
	CCGT21.50.5MLSS	CCGT060202ML-SS	.008*							●																																	
	CCGT32.50.2MRSS	CCGT09T301MR-SS	.004*							●																																	
	CCGT32.50.2MLSS	CCGT09T301ML-SS	.004*							●																																	
	CCGT32.50.5MRSS	CCGT09T302MR-SS	.008*							●																																	
	CCGT32.50.5MLSS	CCGT09T302ML-SS	.008*							●																																	
	CCGT32.51MRSS	CCGT09T304MR-SS	.016*							●																																	
Light Cutting	CCGT32.51MLSS	CCGT09T304ML-SS	.016*							●																																	

* Indicates the maximum value of the corner R. For more details, see page D003.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

A
TURNING INSERTS
POSI 7°
WITH HOLE
C
D
R
S
T
V
W
X

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide									
							NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel					●✣○◔❁❁●							●◐✣✣●					●◐✣◔❁									◔❁❁			❁❁	◐	○○○◔	○○		○	○◔❁							○
	M	Stainless Steel																									◐		◔❁❁			○○		○	❁									
	K	Cast Iron																	●◐✣◔❁										◔❁			○○		○	❁	○	◔						○
	N	Non-ferrous Metal																																				◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																						●◐✣○		◔	○◔❁											◔	●◐◐●	●	●	◐	
			MP	NEW **CCMT21.50.5MP**	CCMT060202-MP	.008	●●																																				
				CCMT21.51MP	CCMT060204-MP	.016	●●	●●																									●		●									
				CCMT21.52MP	CCMT060208-MP	.031	●●	●●																									●		●									
				NEW **CCMT2.520.5MP**	CCMT080302-MP	.008	★★																																				
				NEW **CCMT2.521MP**	CCMT080304-MP	.016	★★																																				
				NEW **CCMT2.522MP**	CCMT080308-MP	.031	★★																																				
				NEW **CCMT32.50.5MP**	CCMT09T302-MP	.008	●●																																				
				CCMT32.51MP	CCMT09T304-MP	.016	●●	●●																									●		●									
				CCMT32.52MP	CCMT09T308-MP	.031	●●	●●																									●		●									
				CCMT431MP	CCMT120404-MP	.016	●●	●●																									●		●									
				CCMT432MP	CCMT120408-MP	.031	●●	●●																									●		●									
			Medium Cutting	**CCMT433MP**	CCMT120412-MP	.047	★★	●●																									●		●									
			MM	**CCMT21.51MM**	CCMT060204-MM	.016								●●																	●												
				CCMT21.52MM	CCMT060208-MM	.031								●●																	●												
				CCMT32.51MM	CCMT09T304-MM	.016								●●																	●												
				CCMT32.52MM	CCMT09T308-MM	.031								●●																	●												
				CCMT431MM	CCMT120404-MM	.016								●●																	●												
				CCMT432MM	CCMT120408-MM	.031								●●																	●												
			Medium Cutting	**CCMT433MM**	CCMT120412-MM	.047								●●																	●												
			MK	**CCMT21.51MK**	CCMT060204-MK	.016														●●	●●																						
				CCMT21.52MK	CCMT060208-MK	.031														●●	●●																						
				CCMT32.51MK	CCMT09T304-MK	.016														●●	●●																						
				CCMT32.52MK	CCMT09T308-MK	.031														●●	●●																						
				CCMT431MK	CCMT120404-MK	.016														★★	●●																						
				CCMT432MK	CCMT120408-MK	.031														●●	●●																						
			Medium Cutting	**CCMT433MK**	CCMT120412-MK	.047														●★	★●																						
			MS	**CCMT21.50.5MS**	CCMT060202-MS	.008																		●●	●																●		
				CCMT21.51MS	CCMT060204-MS	.016																		●●	●																●		
				CCMT21.52MS	CCMT060208-MS	.031																		●●	●																●		
				CCMT32.50.5MS	CCMT09T302-MS	.008																		●●	●																		
				CCMT32.51MS	CCMT09T304-MS	.016																		●●	●																●		
				CCMT32.52MS	CCMT09T308-MS	.031																		●●	●																●		
				CCMT431MS	CCMT120404-MS	.016																		●●	●																●		
				CCMT432MS	CCMT120408-MS	.031																		●●	●																●		
			Medium Cutting	**CCMT433MS**	CCMT120412-MS	.047																		●●	●																●		

● = NEW

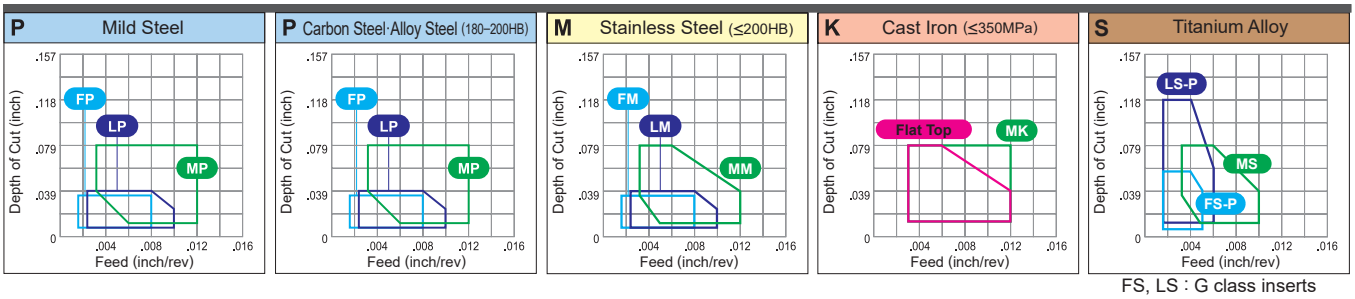
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCMT 2 1.5 0.5
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ◕◕✠✠● ✠◕◕◔○○◔○◔❁ ❁○
M	Stainless Steel	◕◕✠✠● ◕ ◔❁❁ ○○ ○ ❁
K	Cast Iron	●◕✠◔❁ ◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔❁ ◔●◕◕◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Standard	CCMT21.50.5	CCMT060202	.008											●																●●				★●		●		●						
	CCMT21.51	CCMT060204	.016											●														●		●●				★●		●		●						
	CCMT21.52	CCMT060208	.031											●														●						★		●		●						
	CCMT2.521	CCMT080304	.016											●																●●				★●		●								
	CCMT2.522	CCMT080308	.031											●																						●									
	CCMT32.50.5	CCMT09T302	.008											●																●●				★●				●						
	CCMT32.51	CCMT09T304	.016											●														●		●●				★●		●		●						
	CCMT32.52	CCMT09T308	.031											●														●		●●				★●		●		●						
	CCMT431	CCMT120404	.016											●														●		●●				★●		★		●						
Medium Cutting	CCMT432	CCMT120408	.031											●														●		●				★●		●		●						
	CCMT433	CCMT120412	.047											●																					●									
MV	CCMH21.50.5MV	CCMH060202-MV	.008		★		●							●														★		●●		●		★●										
	CCMH21.51MV	CCMH060204-MV	.016		●		●							●						●								●		●●		●		★●										
Medium Cutting																																												
*MW	CCMT21.51MW	CCMT060204-MW	.016		★★		●●																							●		●		●										
	CCMT21.52MW	CCMT060208-MW	.031		●●		●●																							●		●		●										
	CCMT32.51MW	CCMT09T304-MW	.016		●●		●●																							●		●		★										
	CCMT32.52MW	CCMT09T308-MW	.031		●●		●●																							●		●		●										
Medium Cutting (Wiper)	CCMT431MW	CCMT120404-MW	.016		★★		●●																									●		●										
	CCMT432MW	CCMT120408-MW	.031		★★		●●																									●		●										

* Please refer to A032 before using the MW breaker (wiper insert).

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	● ✣ ○ ◔ ❁ ❁ ● ✣ ◐ ✣ ✣ ● ○ ◐ ✣ ✣ ◔ ❁ ❁ ◐ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	● ◐ ✣ ✣ ● ○ ◐ ✣ ❁ ❁ ○ ○ ○ ◔ ❁
K	Cast Iron	● ◐ ✣ ◔ ❁ ○ ◔ ❁ ○ ○ ○ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ● ◐ ● ● ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◔ ● ◐ ● ● ◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-SR	CCET21.5V3RSR	CCET0602V3R-SR	.001*																							●					★			●						
	CCET21.5V3LSR	CCET0602V3L-SR	.001*																							●					★			●						
	CCET21.50.2RSR	CCET060201R-SR	.004*																							●					★			●						
	CCET21.50.2LSR	CCET060201L-SR	.004*																							●					★			●						
	CCET21.50.5RSR	CCET060202R-SR	.008*																							●					★			●						
	CCET21.50.5LSR	CCET060202L-SR	.008*																							●					★			●						
	CCET21.51RSR	CCET060204R-SR	.016*																							●					★			●						
	CCET21.51LSR	CCET060204L-SR	.016*																							●					★			●						
	CCET32.5V3RSR	CCET09T3V3R-SR	.001*																							●					★			●						
	CCET32.5V3LSR	CCET09T3V3L-SR	.001*																							●					★			●						
	CCET32.50.2RSR	CCET09T301R-SR	.004*																							●					★			●						
	CCET32.50.2LSR	CCET09T301L-SR	.004*																							●					★			●						
	CCET32.50.5RSR	CCET09T302R-SR	.008*																							●					★			●						
	CCET32.50.5LSR	CCET09T302L-SR	.008*																							●					★			●						
	CCET32.51RSR	CCET09T304R-SR	.016*																							●					★			●						
Medium Cutting	CCET32.51LSR	CCET09T304L-SR	.016*																							●					★			●						
R/L-SN	CCGT21.5V3RSN	CCGT0602V3R-SN	.001																							●														
	CCGT21.50.2RSN	CCGT060201R-SN	.004																							●														
	CCGT21.50.2LSN	CCGT060201L-SN	.004																							●														
	CCGT21.50.5RSN	CCGT060202R-SN	.008																							●														
	CCGT21.50.5LSN	CCGT060202L-SN	.008																							●														
	CCGT32.5V3RSN	CCGT09T3V3R-SN	.001																							●														
	CCGT32.5V3LSN	CCGT09T3V3L-SN	.001																							●														
	CCGT32.50.2RSN	CCGT09T301R-SN	.004																							●														
	CCGT32.50.2LSN	CCGT09T301L-SN	.004																							●														
	CCGT32.50.5RSN	CCGT09T302R-SN	.008																							●														
	CCGT32.50.5LSN	CCGT09T302L-SN	.008																							●														
	CCGT32.51RSN	CCGT09T304R-SN	.016																							●														
	CCGT32.51LSN	CCGT09T304L-SN	.016																							●														
	CCGT21.50.2MRSN	CCGT060201MR-SN	.004*							●					●										●															
	CCGT21.50.2MLSN	CCGT060201ML-SN	.004*							●																														
	CCGT21.50.5MRSN	CCGT060202MR-SN	.008*							●					●										●															
	CCGT21.50.5MLSN	CCGT060202ML-SN	.008*							●																														
	CCGT32.50.2MRSN	CCGT09T301MR-SN	.004*							●					●										●															
	CCGT32.50.2MLSN	CCGT09T301ML-SN	.004*							●																														
	CCGT32.50.5MRSN	CCGT09T302MR-SN	.008*							●					●										●															
	CCGT32.50.5MLSN	CCGT09T302ML-SN	.008*							●																														
	CCGT32.51MRSN	CCGT09T304MR-SN	.016*							●					●										●															
Medium Cutting	CCGT32.51MLSN	CCGT09T304ML-SN	.016*							●																														

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

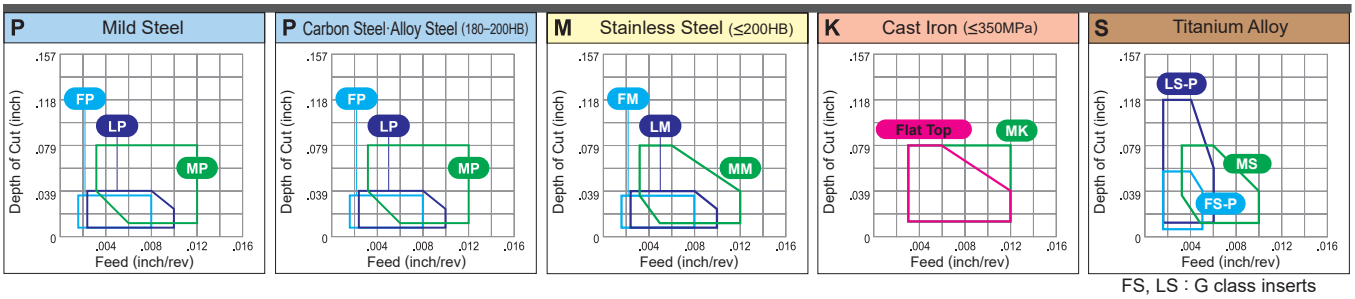
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CC TYPE INSERTS WITH HOLE

CCET 2 1.5 V0 R SN
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◐◐✠✠●◐◐✠◔✠✠◐○○○◔○◔✠✠○
M	Stainless Steel	●◐◐✠✠●◐◐✠◔✠✠◐○○○✠✠○
K	Cast Iron	●◐◐✠◔✠◐◔✠✠◐○○○✠✠○◔◔○
N	Non-ferrous Metal	◔●○
S	Heat resistant Alloy, Titanium Alloy	●◐◐✠○◐○◔✠◔●◐◐●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-SN	CCET21.5V0RSN	CCET060200R-SN	0*2																								●						★			●					
	CCET21.5V0LSN	CCET060200L-SN	0*2																								●						★			●					
	CCET21.5V3RSN	CCET0602V3R-SN	.001*2																								●						★			●					
	CCET21.5V3LSN	CCET0602V3L-SN	.001*2																								●						★			●					
	CCET21.50.2RSN	CCET060201R-SN	.004*2																								●						★			●					
	CCET21.50.2LSN	CCET060201L-SN	.004*2																								●						★			●					
	CCET21.50.5RSN	CCET060202R-SN	.008*2																								●						★			●					
	CCET21.50.5LSN	CCET060202L-SN	.008*2																								●						★			●					
	CCET21.51RSN	CCET060204R-SN	.016*2																								●						★			●					
	CCET21.51LSN	CCET060204L-SN	.016*2																								●						★			●					
	CCET32.5V0RSN	CCET09T300R-SN	0*2																								●						★			●					
	CCET32.5V0LSN	CCET09T300L-SN	0*2																								●						★			●					
	CCET32.5V3RSN	CCET09T3V3R-SN	.001*2																								●						★			●					
	CCET32.5V3LSN	CCET09T3V3L-SN	.001*2																								●						★			●					
	CCET32.50.2RSN	CCET09T301R-SN	.004*2																								●						★			●					
	CCET32.50.2LSN	CCET09T301L-SN	.004*2																								●						★			●					
	CCET32.50.5RSN	CCET09T302R-SN	.008*2																								●						★			●					
	CCET32.50.5LSN	CCET09T302L-SN	.008*2																								●						★			●					
	CCET32.51RSN	CCET09T304R-SN	.016*2																								●						★			●					
Medium Cutting	CCET32.51LSN	CCET09T304L-SN	.016*2																								●						★			●					
*1R/LW-SN	CCET21.5V3RWSN	CCET0602V3RW-SN	.001*2																								●															
	CCET21.5V3LWSN	CCET0602V3LW-SN	.001*2																								●															
	CCET32.5V3RWSN	CCET09T3V3RW-SN	.001*2																								●															
Medium Cutting (Wiper)	CCET32.5V3LWSN	CCET09T3V3LW-SN	.001*2																								●															

*1 Please refer to A032 before using the R/LW-SN breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠● ◐●✠✠● ✠◐○◔○◔✠ ○◔○ ○
M	Stainless Steel	◐ ◔✠✠ ○○ ○ ✠ ○ ○
K	Cast Iron	◔✠ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●●✠○◐○◔✠ ◔●●●●● ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SMG	**CCGT21.50.2MSMG**	CCGT060201M-SMG	.004*						●																																
	CCGT21.50.5MSMG	CCGT060202M-SMG	.008*						●																	●															
	CCGT21.51MSMG	CCGT060204M-SMG	.016*						●																	●															
	CCGT32.50.2MSMG	CCGT09T301M-SMG	.004*						●																																
	CCGT32.50.5MSMG	CCGT09T302M-SMG	.008*						●																																
Medium Cutting	**CCGT32.51MSMG**	CCGT09T304M-SMG	.016*						●																																
Flat Top	**CCMW21.50.5**	CCMW060202	.008																																	★					
	CCMW21.51	CCMW060204	.016															●	●																★	★					
	CCMW21.52	CCMW060208	.031															●	●																						
	CCMW32.51	CCMW09T304	.016															●	●																		★				
	CCMW32.52	CCMW09T308	.031															●	●																★	★					
	CCMW32.53	CCMW09T312	.047															●	●																						
	CCMW431	CCMW120404	.016															●	●																		★				
	CCMW432	CCMW120408	.031															●	●																		★				
	CCMW433	CCMW120412	.047															●	●																						
Flat Top	**CCGW21.5V0**	CCGW060200	0																														●								
	CCGW21.5V5	CCGW0602V5	.002																														●								
	CCGW21.50.5	CCGW060202	.008																																						★
	CCGW21.51	CCGW060204	.016																																						★
	CCGW21.52	CCGW060208	.031																																						★
	CCGW32.5V0	CCGW09T300	0																														●								
	CCGW32.5V5	CCGW09T3V5	.002																														●								
	CCGW21.50.5E	CCGW060202E	.008																														★								
	CCGW21.51E	CCGW060204E	.016																														★								
	CCGW21.52E	CCGW060208E	.031																														★								

* Indicates the maximum value of the corner R. For more details, see page D003.

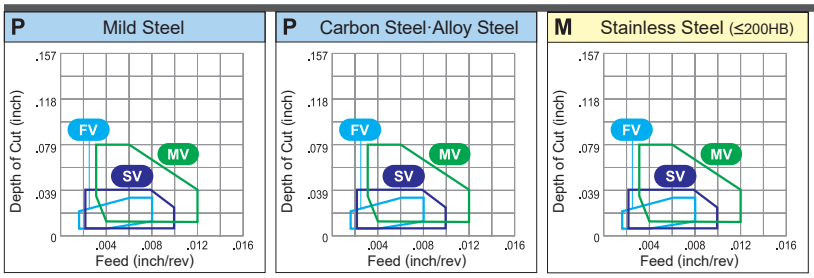
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° CP TYPE INSERTS WITH HOLE

CPMH 2.5 1.5 0.5 FV
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																							Coated Cermet			Cermet		Carbide									
			NEW								NEW		NEW								NEW																			
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✠	○	◔	✠	✠	●														◐		✠	✠		●	○	○	◔	○	◔	✠							○
	M	Stainless Steel								●	◐	✠	✠	●									◐			◔	✠	✠		○	○		○		✠						
	K	Cast Iron													●	◐	✠	◔	✠							◔	✠			○	○		○		✠	○	◔					○
	N	Non-ferrous Metal																																			◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✠	○	◐	○	◔	✠									◔	●	◐	●	◐		
Shape	Order Number	(ISO) Number	RE (inch)																																						
FV	**CPMH2.51.50.5FV**	CPMH080202-FV	.008	★																				●			●			●	★								
	CPMH2.51.51FV	CPMH080204-FV	.016	★																				●			●			●	★								
	CPMH320.5FV	CPMH090302-FV	.008	★																				●			●			●	★								
	CPMH321FV	CPMH090304-FV	.016	★																				●			●			●	★								
Finish Cutting	**CPMH322FV**	CPMH090308-FV	.031	★																				●			●			●	★								
Standard	**CPGT2.51.50.5**	CPGT080202	.008																																	●					
	CPGT2.51.51	CPGT080204	.016																																	●					
	CPGT320.5	CPGT090302	.008																																	●					
Finish Cutting	**CPGT321**	CPGT090304	.016																																	●					
R/L-F	**CPMH2.51.51RF**	CPMH080204R-F	.016																						●						★				●					
	CPMH2.51.51LF	CPMH080204L-F	.016																						●						★				●					
	CPMH321RF	CPMH090304R-F	.016																						●						★				●					
Finish Cutting	**CPMH321LF**	CPMH090304L-F	.016																						●				★		★				●					
R/L-F	**CPGT2.51.51RF**	CPGT080204R-F	.016																												★									
	CPGT2.51.51LF	CPGT080204L-F	.016																												★									
	CPGT320.5RF	CPGT090302R-F	.008																												★									
	CPGT320.5LF	CPGT090302L-F	.008																												★									
	CPGT321RF	CPGT090304R-F	.016																												★									
Finish Cutting	**CPGT321LF**	CPGT090304L-F	.016																												★									
SQ	**CPMT21.50.5SQ**	CPMT060202-SQ	.008										●																											
	CPMT21.51SQ	CPMT060204-SQ	.016										●																											
	CPMT21.52SQ	CPMT060208-SQ	.031										●																											
	CPMT32.50.5SQ	CPMT09T302-SQ	.008										●																											
	CPMT32.51SQ	CPMT09T304-SQ	.016										●																											
Finish Cutting	**CPMT32.52SQ**	CPMT09T308-SQ	.031										●																											

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet				Cermet		Carbide									
							NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel					●	✣	○	◔	✣	✣	●															◔			✣	✣	◔	○	○	◔	○	◔	✣							○
	M	Stainless Steel												●	◔	✣	✣	●									◔		◔	✣	✣		○	○		○		✣			◔				
	K	Cast Iron																	●	◔	✣	◔	✣							◔	✣		○	○		○		✣	○	◔					○
	N	Non-ferrous Metal																																						◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																						●	◔	✣	○	◔	○	◔	✣									◔	●	◔	●	◔	
			LP NEW Light Cutting	**CPMH2.51.50.5LP**	CPMH080202-LP	.008	★																																						
				CPMH2.51.51LP	CPMH080204-LP	.016	★																																						
				CPMH320.5LP	CPMH090302-LP	.008	★																																						
				CPMH321LP	CPMH090304-LP	.016	★																																						
				CPMH322LP	CPMH090308-LP	.031	★																																						
			SV Light Cutting	**CPMH2.51.50.5SV**	CPMH080202-SV	.008			●						●															★		●		●	★	●											
				CPMH2.51.51SV	CPMH080204-SV	.016			●						●														★		●		●	★	●											
				CPMH320.5SV	CPMH090302-SV	.008			●						●														★		●		●	★	●											
				CPMH321SV	CPMH090304-SV	.016			●						●														★		●		●	★	●											
				CPMH322SV	CPMH090308-SV	.031			●						●														★		●		●	★	●											
			Standard Medium Cutting	**CPMX2.51.51**	CPMX080204	.016																							★								★		★								
				CPMX2.51.52	CPMX080208	.031																							★										★								
				CPMX321	CPMX090304	.016																							★								★		★								
				CPMX322	CPMX090308	.031																							★										★								
			MV Medium Cutting	**CPMH2.51.51MV**	CPMH080204-MV	.016		●	●						●									●							●			●	●	●		●	●									
				CPMH2.51.52MV	CPMH080208-MV	.031		●	●						●									●							●			●	●	●		●	●									
				CPMH321MV	CPMH090304-MV	.016		●	●						●									●							●			●	●	●		●	●									
				CPMH322MV	CPMH090308-MV	.031		●	●						●									●							●			●	●	●		●	●									
			MQ Medium Cutting	**CPMT21.51MQ**	CPMT060204-MQ	.016									●																			●													
				CPMT21.52MQ	CPMT060208-MQ	.031									●																			●													
				CPMT32.51MQ	CPMT09T304-MQ	.016									●																			●													
				CPMT32.52MQ	CPMT09T308-MQ	.031									●																			●													
			Standard NEW Medium Cutting	**CPMH2.51.51**	CPMH080204	.016	★	★																																							
				CPMH2.51.52	CPMH080208	.031	★	●																																							
				CPMH321	CPMH090304	.016	★	★																																							
				CPMH322	CPMH090308	.031	★	●																																							

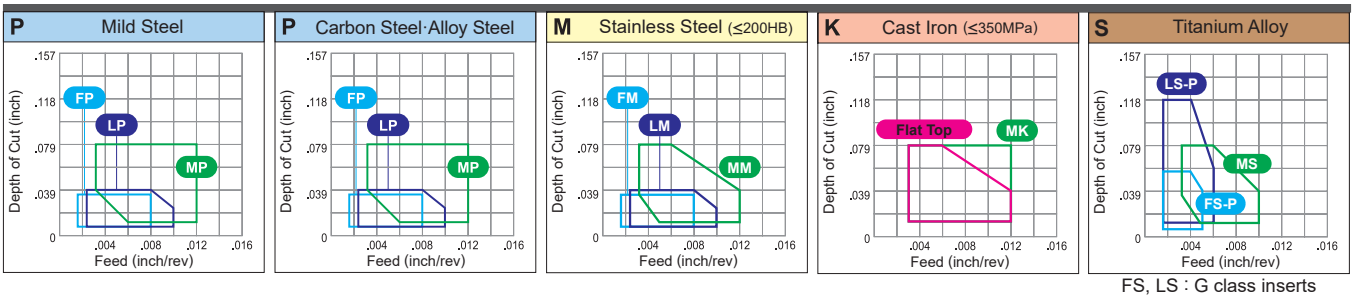
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A072
GRADES ➤ A034
IDENTIFICATION ➤ A002

55° DC TYPE INSERTS WITH HOLE

DCMT 2 1.5 0.5 FP
Size / Thickness / Corner Radius / Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◕◕✠✠●✠✠●◕○○◔○◔✠✠○
M	Stainless Steel	◕◕✠✠●◕○◔✠✠○○○✠✠
K	Cast Iron	●◕✠◔✠◔✠✠○○✠○◔◔○
N	Non-ferrous Metal	◔●○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔✠◔◕●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP	DCMT21.50.5FP	DCMT070202-FP	.008	●	●	●	●																						●			●									
	DCMT21.51FP	DCMT070204-FP	.016	●	●	●	●																						●			●									
	DCMT32.50.5FP	DCMT11T302-FP	.008	●	●	●	●																						●			●									
	DCMT32.51FP	DCMT11T304-FP	.016	●	●	●	●																						●			●									
Finish Cutting	DCMT32.52FP	DCMT11T308-FP	.031	●	●	●	●																						●			●									
FM	DCMT21.50.5FM	DCMT070202-FM	.008																							●															
	DCMT21.51FM	DCMT070204-FM	.016																							●															
	DCMT32.50.5FM	DCMT11T302-FM	.008																							●															
	DCMT32.51FM	DCMT11T304-FM	.016																							●															
Finish Cutting	DCMT32.52FM	DCMT11T308-FM	.031																							●															
FS	DCGT21.50.2MFS	DCGT070201M-FS	.004*																		●	●	●																			
	DCGT21.50.5MFS	DCGT070202M-FS	.008*																		●	●	●																			
	NEW DCGT21.51MFS	DCGT070204M-FS	.016*																		●	●	●																			
	DCGT32.50.2MFS	DCGT11T301M-FS	.004*																		●	●	●																			
	DCGT32.50.5MFS	DCGT11T302M-FS	.008*																		●	●	●																			
Finish Cutting	NEW DCGT32.51MFS	DCGT11T304M-FS	.016*																		●	●	●																			
FS-P	DCGT21.50.2MFS-P	DCGT070201M-FS-P	.004*											●										●																	●	
	DCGT21.50.5MFS-P	DCGT070202M-FS-P	.008*											●										●																	●	
	NEW DCGT21.51MFS-P	DCGT070204M-FS-P	.016*											●										●																	●	
	DCGT32.50.2MFS-P	DCGT11T301M-FS-P	.004*											●										●																	●	
	DCGT32.50.5MFS-P	DCGT11T302M-FS-P	.008*											●										●																	●	
Finish Cutting	NEW DCGT32.51MFS-P	DCGT11T304M-FS-P	.016*											●										●																	●	
FV	DCMT21.50.5FV	DCMT070202-FV	.008	★	★																					●			●			★	●								
	DCMT21.51FV	DCMT070204-FV	.016	★	●																					●			●			★	●								
	DCMT21.52FV	DCMT070208-FV	.031		★																					●						●	★								
	DCMT32.50.5FV	DCMT11T302-FV	.008		★																					●						●	★								
	DCMT32.51FV	DCMT11T304-FV	.016	★	●																					●			●			★	●								
Finish Cutting	DCMT32.52FV	DCMT11T308-FV	.031	★	●																					●			●			★	●								

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
			Coated																										Coated Cermet				Cermet		Carbide							
			NEW	NEW										NEW	NEW									NEW																			
Shape	Order Number	(ISO) Number	RE (inch)																																								
FJ	DCGT21.5V5FJ	DCGT0702V5-FJ	.002																							●																
	DCGT21.50.2FJ	DCGT070201-FJ	.004																							●																
	DCGT21.50.5FJ	DCGT070202-FJ	.008																							●																
	DCGT32.5V5FJ	DCGT11T3V5-FJ	.002																							●																
	DCGT32.50.2FJ	DCGT11T301-FJ	.004																							●																
Finish Cutting	DCGT32.50.5FJ	DCGT11T302-FJ	.008																							●																
FJ-P	DCGT21.5V5FJ-P	DCGT0702V5-FJ-P	.002																																		●					
	DCGT21.50.2FJ-P	DCGT070201-FJ-P	.004																																		●					
	DCGT21.50.5FJ-P	DCGT070202-FJ-P	.008																																		●					
	DCGT32.5V5FJ-P	DCGT11T3V5-FJ-P	.002																																		●					
	DCGT32.50.2FJ-P	DCGT11T301-FJ-P	.004																																		●					
Finish Cutting	DCGT32.50.5FJ-P	DCGT11T302-FJ-P	.008																																		●					
AZ	DCGT21.50.5AZ	DCGT070202-AZ	.008																																	●						
	DCGT21.51AZ	DCGT070204-AZ	.016																																	●						
	DCGT32.50.5AZ	DCGT11T302-AZ	.008																																	●						
Medium Cutting — Finish Cutting	DCGT32.51AZ	DCGT11T304-AZ	.016																																	●						
	DCGT32.52AZ	DCGT11T308-AZ	.031																																	●						
R/L-F	DCGT21.50.5RF	DCGT070202R-F	.008																								●							★		●						
	DCGT21.50.5LF	DCGT070202L-F	.008																								●				●			★		●						
	DCGT21.51RF	DCGT070204R-F	.016																								●							★		●						
	DCGT21.51LF	DCGT070204L-F	.016																								●				●			★		●						
	DCGT32.50.5RF	DCGT11T302R-F	.008																								●							★		●						
	DCGT32.50.5LF	DCGT11T302L-F	.008																								●				●			★		●						
	DCGT32.51RF	DCGT11T304R-F	.016																								●							★		●						
Finish Cutting	DCGT32.51LF	DCGT11T304L-F	.016																								●				●			★		●						
R-SRF	DCGT32.50.2MRSRF	DCGT11T301MR-SRF	.004*											●										●																		
NEW	DCGT32.50.5MRSRF	DCGT11T302MR-SRF	.008*											●										●																		
	DCGT32.51MRSRF	DCGT11T304MR-SRF	.016*											●										●																		
Finish Cutting																																											
LP	NEW DCMT21.50.5LP	DCMT070202-LP	.008		★																																					
	DCMT21.51LP	DCMT070204-LP	.016	●	●	●	●																							●				●								
	DCMT21.52LP	DCMT070208-LP	.031	★	●	●	●																							●				●								
	NEW DCMT32.50.5LP	DCMT11T302-LP	.008	★	★																																					
	DCMT32.51LP	DCMT11T304-LP	.016	●	●	●	●																							●				●								
Light Cutting	DCMT32.52LP	DCMT11T308-LP	.031	●	●	●	●																							●				●								
LM	DCMT21.51LM	DCMT070204-LM	.016								●	●															●															
	DCMT21.52LM	DCMT070208-LM	.031								●	●															●															
	DCMT32.51LM	DCMT11T304-LM	.016								●	●															●															
	DCMT32.52LM	DCMT11T308-LM	.031								●	●															●															
Light Cutting																																											

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

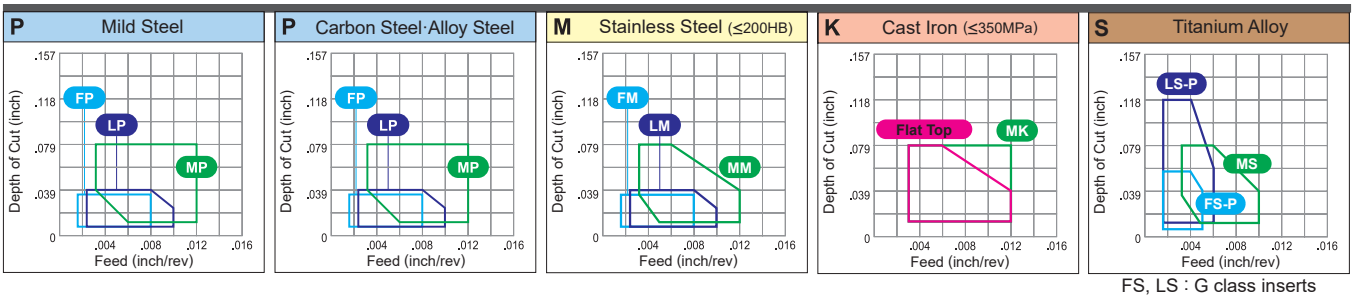
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

55° DC TYPE INSERTS WITH HOLE

DCMT 2 1.5 0.5 LS
Size / Thickness / Corner Radius / Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠● ●●●✠✠● ✠✠●◔○◔○◔○◔✠ ○
M	Stainless Steel	●●✠✠● ●●✠◔✠ ◔✠✠●○○ ○◔✠
K	Cast Iron	●●✠◔✠ ◔✠✠ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ●●● ○
S	Heat resistant Alloy, Titanium Alloy	●●✠○●○◔✠ ◔●●●●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
LS	**DCMT21.50.5LS**	DCMT070202-LS	.008																		●	●	●																	●		
	DCMT21.51LS	DCMT070204-LS	.016																		●	●	●																	●		
	DCMT32.50.5LS	DCMT11T302-LS	.008																		●	●	●																	●		
	DCMT32.51LS	DCMT11T304-LS	.016																		●	●	●																	●		
Light Cutting	**DCMT32.52LS**	DCMT11T308-LS	.031																		●	●	●																	●		
LS	**DCGT21.50.2MLS**	DCGT070201M-LS	.004*																		●	●	●																			
	DCGT21.50.5MLS	DCGT070202M-LS	.008*																		●	●	●																			
	DCGT21.51MLS	DCGT070204M-LS	.016*																		●	●	●																			
	DCGT32.50.2MLS	DCGT11T301M-LS	.004*																		●	●	●																			
	DCGT32.50.5MLS	DCGT11T302M-LS	.008*																		●	●	●																			
Light Cutting	**DCGT32.51MLS**	DCGT11T304M-LS	.016*																		●	●	●																			
LS-P	**DCGT21.50.2MLS-P**	DCGT070201M-LS-P	.004*							●					●									●																	●		
	DCGT21.50.5MLS-P	DCGT070202M-LS-P	.008*							●					●									●																	●		
	DCGT21.51MLS-P	DCGT070204M-LS-P	.016*							●					●									●																	●		
	DCGT32.50.2MLS-P	DCGT11T301M-LS-P	.004*							●					●									●																	●		
	DCGT32.50.5MLS-P	DCGT11T302M-LS-P	.008*							●					●									●																	●		
Light Cutting	**DCGT32.51MLS-P**	DCGT11T304M-LS-P	.016*							●					●									●																	●		
MJ	**DCGT21.51MJ**	DCGT070204-MJ	.016																							●															
	DCGT32.51MJ	DCGT11T304-MJ	.016																							●															
Light Cutting	**DCGT32.52MJ**	DCGT11T308-MJ	.031																							●															
MJ-P	**DCGT21.51MJ-P**	DCGT070204-MJ-P	.016																																		●				
	DCGT32.51MJ-P	DCGT11T304-MJ-P	.016																																		●				
Light Cutting	**DCGT32.52MJ-P**	DCGT11T308-MJ-P	.031																																		●				

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁● ◐●✣✣● ◐✣❁ ◐○○◔○◔❁ ○◔○◔❁ ○
M	Stainless Steel	◐●✣✣● ◐ ◔❁❁ ○○ ○ ❁ ○
K	Cast Iron	●◐✣◔❁ ◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔❁ ◔●◐●● ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	MP905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SV	**DCMT21.50.5SV**	DCMT070202-SV	.008										●														●					●	★	●									
	DCMT21.51SV	DCMT070204-SV	.016										●														●					●	★	●									
	DCMT21.52SV	DCMT070208-SV	.031										●														●					●	★	●									
	DCMT32.50.5SV	DCMT11T302-SV	.008										●														●					●	★	●									
	DCMT32.51SV	DCMT11T304-SV	.016										●														●					●	★	●									
Light Cutting	**DCMT32.52SV**	DCMT11T308-SV	.031										●														●					★	★	●									
R/L-SS	**DCGT21.5V3RSS**	DCGT0702V3R-SS	.001																								●																
	DCGT21.5V3LSS	DCGT0702V3L-SS	.001																								●																
	DCGT21.50.2RSS	DCGT070201R-SS	.004																								●																
	DCGT21.50.2LSS	DCGT070201L-SS	.004																								●																
	DCGT21.50.5RSS	DCGT070202R-SS	.008																								●																
	DCGT21.50.5LSS	DCGT070202L-SS	.008																								●																
	DCGT32.5V3RSS	DCGT11T3V3R-SS	.001																								●																
	DCGT32.50.2RSS	DCGT11T301R-SS	.004																								●																
	DCGT32.50.5RSS	DCGT11T302R-SS	.008																								●																
	DCGT21.50.2MRSS	DCGT070201MR-SS	.004*							●																																	
	DCGT21.50.2MLSS	DCGT070201ML-SS	.004*							●																																	
	DCGT21.50.5MRSS	DCGT070202MR-SS	.008*							●																																	
	DCGT21.50.5MLSS	DCGT070202ML-SS	.008*							●																																	
	DCGT32.50.2MRSS	DCGT11T301MR-SS	.004*							●																																	
	DCGT32.50.2MLSS	DCGT11T301ML-SS	.004*							●																																	
	DCGT32.50.5MRSS	DCGT11T302MR-SS	.008*							●																																	
	DCGT32.50.5MLSS	DCGT11T302ML-SS	.008*							●																																	
	DCGT32.51MRSS	DCGT11T304MR-SS	.016*							●																																	
Light Cutting	**DCGT32.51MLSS**	DCGT11T304ML-SS	.016*							●																																	
MP	NEW **DCMT21.50.5MP**	DCMT070202-MP	.008	★	★																																					
	DCMT21.51MP	DCMT070204-MP	.016	●	●	●	●																							●			●									
	DCMT21.52MP	DCMT070208-MP	.031	★	●	●	●																							●			●									
	NEW **DCMT32.50.5MP**	DCMT11T302-MP	.008	★	●																																					
	DCMT32.51MP	DCMT11T304-MP	.016	●	●	●	●																							●			●									
	DCMT32.52MP	DCMT11T308-MP	.031	●	●	●	●																							●			●									
	NEW **DCMT32.53MP**	DCMT11T312-MP	.047	★	★																																					
	DCMT431MP	DCMT150404-MP	.016	●	●	●	●																							●			●									
	DCMT432MP	DCMT150408-MP	.031	●	●	●	●																							●			●									
Medium Cutting	NEW **DCMT433MP**	DCMT150412-MP	.047	★	★																																					
MM	**DCMT21.51MM**	DCMT070204-MM	.016									●	●														●																
	DCMT21.52MM	DCMT070208-MM	.031									●	●														●																
	DCMT32.51MM	DCMT11T304-MM	.016									●	●														●																
	DCMT32.52MM	DCMT11T308-MM	.031									●	●														●																
	DCMT431MM	DCMT150404-MM	.016									●	●														●																
Medium Cutting	**DCMT432MM**	DCMT150408-MM	.031									●	●														●																

* Indicates the maximum value of the corner R. For more details, see page D003.

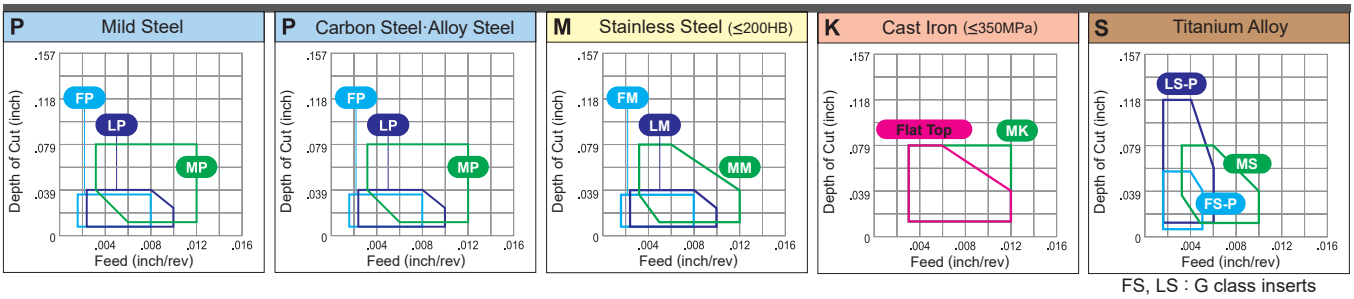
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

55° DC TYPE INSERTS WITH HOLE

DCMT 2 1.5 1 MK
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting --- Light Cutting --- Medium Cutting ---



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◔ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●　●◔✠✠●　✠✠●◔○◔✠✠　✠✠○○◔○◔✠　○
M	Stainless Steel	●◔✠✠●　◔✠✠　○○◔○　✠
K	Cast Iron	●◔✠◔✠　◔✠　○○◔○　✠○◔　○
N	Non-ferrous Metal	◔●　○
S	Heat resistant Alloy, Titanium Alloy	●◔✠○◔○◔✠　◔●◔◔●

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MK	DCMT21.51MK	DCMT070204-MK	.016														●	●	●	●																							
	DCMT21.52MK	DCMT070208-MK	.031														●	★	●	●																							
	DCMT32.51MK	DCMT11T304-MK	.016														●	●	●	●																							
	DCMT32.52MK	DCMT11T308-MK	.031														●	●	●	●																							
	DCMT431MK	DCMT150404-MK	.016														●	★	●	●																							
Medium Cutting	DCMT432MK	DCMT150408-MK	.031														●	★	●	●																							
MS	DCMT21.51MS	DCMT070204-MS	.016																		●	●	●																		●		
	DCMT21.52MS	DCMT070208-MS	.031																		●	●	●																		●		
	DCMT32.51MS	DCMT11T304-MS	.016																		●	●	●																		●		
	DCMT32.52MS	DCMT11T308-MS	.031																		●	●	●																		●		
Medium Cutting	DCMT32.53MS	DCMT11T312-MS	.047																		●	●	●																		●		
Standard	DCMT21.50.5	DCMT070202	.008											●															●	●			★	●	★								
	DCMT21.51	DCMT070204	.016											●														●	●	●			★	●	★								
	DCMT21.52	DCMT070208	.031											★														●	●			★	●										
	DCMT32.50.5	DCMT11T302	.008											●														●	●			★	●	★								
	DCMT32.51	DCMT11T304	.016											●														●	●	●		★	●	★		●						
	DCMT32.52	DCMT11T308	.031											●														●	●			★	●	★								
	DCMT431	DCMT150404	.016											●															●	★			★	●	★								
Medium Cutting	DCMT432	DCMT150408	.031											●															●				★	●	★								
MV	DCMT21.50.5MV	DCMT070202-MV	.008	★	●		●							●														●	●		●	★	●									
	DCMT21.51MV	DCMT070204-MV	.016	★	●		●							●						●								●	●		★	★	●									
	DCMT21.52MV	DCMT070208-MV	.031	★	●		●							●						●								●	●		★	★	●									
	DCMT32.50.5MV	DCMT11T302-MV	.008	★	●		●							●														●	●		●	★	●									
	DCMT32.51MV	DCMT11T304-MV	.016	★	●		●							●						●								●	●		●	★	●									
Medium Cutting	DCMT32.52MV	DCMT11T308-MV	.031	★	●		●							●						●								●	●		★	★	●									

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	● ✣ ○ ◔ ❁ ❁ ● ❁ ❁ ◐ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	● ◐ ✣ ✣ ● ◔ ❁ ❁ ◐ ○ ○ ○ ❁
K	Cast Iron	● ◐ ✣ ◔ ❁ ◔ ❁ ○ ○ ○ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ● ◐ ● ● ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✣ ○ ◐ ○ ◔ ❁ ◔ ● ● ● ◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-SR	**DCET21.5V3RSR**	DCET0702V3R-SR	.001*																							●							★			●						
	DCET21.5V3LSR	DCET0702V3L-SR	.001*																							●							★			●						
	DCET21.50.2RSR	DCET070201R-SR	.004*																							●							★			●						
	DCET21.50.2LSR	DCET070201L-SR	.004*																							●							★			●						
	DCET21.50.5RSR	DCET070202R-SR	.008*																							●							★			●						
	DCET21.50.5LSR	DCET070202L-SR	.008*																							●							★			●						
	DCET21.51RSR	DCET070204R-SR	.016*																							●							★			●						
	DCET21.51LSR	DCET070204L-SR	.016*																							●							★			●						
	DCET32.5V3RSR	DCET11T3V3R-SR	.001*																							●							★			●						
	DCET32.5V3LSR	DCET11T3V3L-SR	.001*																							●							★			●						
	DCET32.50.2RSR	DCET11T301R-SR	.004*																							●							★			●						
	DCET32.50.2LSR	DCET11T301L-SR	.004*																							●							★			●						
	DCET32.50.5RSR	DCET11T302R-SR	.008*																							●							★			●						
	DCET32.50.5LSR	DCET11T302L-SR	.008*																							●							★			●						
	DCET32.51RSR	DCET11T304R-SR	.016*																							●							★			●						
Medium Cutting	**DCET32.51LSR**	DCET11T304L-SR	.016*																							●							★			●						
R/L-SN	**DCGT21.5V3RSN**	DCGT0702V3R-SN	.001																							●																
	DCGT21.50.2RSN	DCGT070201R-SN	.004																							●																
	DCGT21.50.5RSN	DCGT070202R-SN	.008																							●																
	DCGT21.50.5LSN	DCGT070202L-SN	.008																							●																
	DCGT32.5V3RSN	DCGT11T3V3R-SN	.001																							●																
	DCGT32.5V3LSN	DCGT11T3V3L-SN	.001																							●																
	DCGT32.50.2RSN	DCGT11T301R-SN	.004																							●																
	DCGT32.50.2LSN	DCGT11T301L-SN	.004																							●																
	DCGT32.50.5RSN	DCGT11T302R-SN	.008																							●																
	DCGT32.50.5LSN	DCGT11T302L-SN	.008																							●																
	DCGT32.51RSN	DCGT11T304R-SN	.016																							●																
	DCGT32.51LSN	DCGT11T304L-SN	.016																							●																
	DCGT21.50.2MRSN	DCGT070201MR-SN	.004*							●					●										●																	
	DCGT21.50.2MLSN	DCGT070201ML-SN	.004*							●																																
	DCGT21.50.5MRSN	DCGT070202MR-SN	.008*							●					●										●																	
	DCGT21.50.5MLSN	DCGT070202ML-SN	.008*							●																																
	NEW **DCGT21.51MRSN**	DCGT070204MR-SN	.016*												●										●																	
	DCGT32.50.2MRSN	DCGT11T301MR-SN	.004*							●					●										●																	
	DCGT32.50.2MLSN	DCGT11T301ML-SN	.004*							●																																
	DCGT32.50.5MRSN	DCGT11T302MR-SN	.008*							●					●										●																	
	DCGT32.50.5MLSN	DCGT11T302ML-SN	.008*							●																																
	DCGT32.51MRSN	DCGT11T304MR-SN	.016*							●					●										●																	
Medium Cutting	**DCGT32.51MLSN**	DCGT11T304ML-SN	.016*							●																																

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

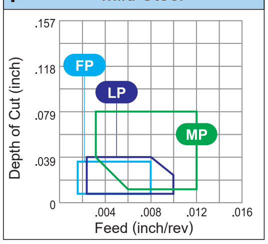
55° DC TYPE INSERTS WITH HOLE

DCET 2 1.5 V0 R SN
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

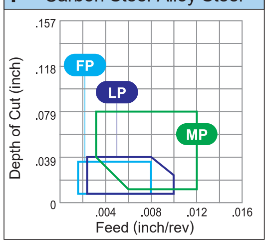
CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting···

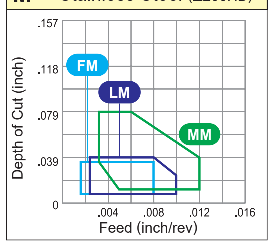
P Mild Steel



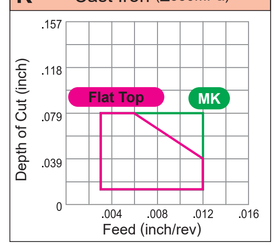
P Carbon Steel·Alloy Steel



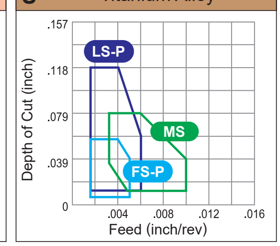
M Stainless Steel (≤200HB)



K Cast Iron (≤350MPa)

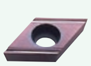


S Titanium Alloy



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✚ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel		●	✚	○	◔	✣	✣	●																		✣	✣	◐	○	○	◔	○	◔	✣							○
Workpiece Material	M	Stainless Steel									●	◐	✚	✚	●										◐		◔	✣	✣		○	○		○		✣							
Workpiece Material	K	Cast Iron														●	◐	✚	◔	✣							◔	✣			○	○		○		✣	○	◔					○
Workpiece Material	N	Non-ferrous Metal																																				◔	●				○
Workpiece Material	S	Heat resistant Alloy, Titanium Alloy																			●	◐	✚	○	◐	○	◔	✣										◔	●	◐	●	◐	
				Coated																										Coated Cermet				Cermet		Carbide							
Shape	Order Number	(ISO) Number	RE (inch)																																								
R/L-SN	DCET21.5V0RSN	DCET070200R-SN	.000*2																									●						★				●					
	DCET21.5V0LSN	DCET070200L-SN	.000*2																									●						★				●					
	DCET21.5V3RSN	DCET0702V3R-SN	.001*2																									●						★				●					
	DCET21.5V3LSN	DCET0702V3L-SN	.001*2																									●						★				●					
	DCET21.50.2RSN	DCET070201R-SN	.004*2																									●						★				●					
	DCET21.50.2LSN	DCET070201L-SN	.004*2																									●						★				●					
	DCET21.50.5RSN	DCET070202R-SN	.008*2																									●						★				●					
	DCET21.50.5LSN	DCET070202L-SN	.008*2																									●						★				●					
	DCET21.51RSN	DCET070204R-SN	.016*2																									●						★				●					
	DCET21.51LSN	DCET070204L-SN	.016*2																									●						★				●					
	DCET32.5V0RSN	DCET11T300R-SN	0*2																									●						★				●					
	DCET32.5V0LSN	DCET11T300L-SN	0*2																									●						★				●					
	DCET32.5V3RSN	DCET11T3V3R-SN	.001*2																									●						★				●					
	DCET32.5V3LSN	DCET11T3V3L-SN	.001*2																									●						★				●					
	DCET32.50.2RSN	DCET11T301R-SN	.004*2																									●						★				●					
	DCET32.50.2LSN	DCET11T301L-SN	.004*2																									●						★				●					
	DCET32.50.5RSN	DCET11T302R-SN	.008*2																									●						★				●					
	DCET32.50.5LSN	DCET11T302L-SN	.008*2																									●						★				●					
	DCET32.51RSN	DCET11T304R-SN	.016*2																									●						★				●					
Medium Cutting	DCET32.51LSN	DCET11T304L-SN	.016*2																									●						★				●					
*1 R/LW-SN	DCET21.5V3RWSN	DCET0702V3RW-SN	.001*2																									●															
	DCET21.5V3LWSN	DCET0702V3LW-SN	.001*2																									●															
	DCET32.5V3RWSN	DCET11T3V3RW-SN	.001*2																									●															
Medium Cutting (Wiper)	DCET32.5V3LWSN	DCET11T3V3LW-SN	.001*2																									●															

*1 Please refer to page A032 before using the R/LW SN breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

●: USA Stock ★: Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ❁ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide							
			NEW										NEW		NEW							NEW																	
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		●	❁	○	◔	❁	❁	●																		❁	❁	◐	○	○	◔	○	◔	❁							○
M	Stainless Steel									●	◐	❁	❁	●									◐		◔	❁	❁		○	○		○		❁							
K	Cast Iron														●	◐	❁	◔	❁						◔	❁			○	○		○		❁	○	◔					○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	❁	○	◐	○	◔	❁									◔	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)																																					
SMG	**DCGT21.50.2MSMG**	DCGT070201M-SMG	.004*						●																														
	DCGT21.50.5MSMG	DCGT070202M-SMG	.008*						●																	●													
	DCGT21.51MSMG	DCGT070204M-SMG	.016*						●																	●													
	DCGT32.50.2MSMG	DCGT11T301M-SMG	.004*						●																														
	DCGT32.50.5MSMG	DCGT11T302M-SMG	.008*						●																	●													
Medium Cutting	**DCGT32.51MSMG**	DCGT11T304M-SMG	.016*						●																	●													
Flat Top	**DCMW21.51**	DCMW070204	.016														●	●																		★				
	DCMW32.51	DCMW11T304	.016														●	●																	●	★				
	DCMW32.52	DCMW11T308	.031														●	●																		★				
	DCMW431	DCMW150404	.016																																	★				
	DCMW432	DCMW150408	.031																																	★				
Flat Top	**DCGW21.5V0**	DCGW070200	0																														★							
	DCGW21.5V5	DCGW0702V5	.002																														★							
	DCGW32.5V0	DCGW11T300	0																														★							
	DCGW32.5V5	DCGW11T3V5	.002																														★							

* Indicates the maximum value of the corner R. For more details, see page D003.

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

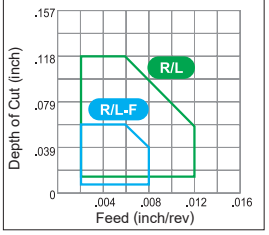
55° DE TYPE INSERTS WITH HOLE

DEGX 4 3 0.5 R F
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Medium Cutting

N Aluminum Alloy



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet				Cermet		Carbide								
							NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	R/L-F	**DEGX430.5RF**	DEGX150402R-F	.008																																		★						
	M	Stainless Steel		**DEGX430.5LF**	DEGX150402L-F	.008																																		★						
	K	Cast Iron		**DEGX431RF**	DEGX150404R-F	.016																																		★						
	N	Non-ferrous Metal		**DEGX431LF**	DEGX150404L-F	.016																																		★						
	S	Heat resistant Alloy, Titanium Alloy	Finish Cutting (For Aluminium Alloy)																																											
			R/L	**DEGX430.5R**	DEGX150402R	.008																																		●						
				DEGX430.5L	DEGX150402L	.008																																		●						
				DEGX431R	DEGX150404R	.016																																		●						
				DEGX431L	DEGX150404L	.016																																		●						
			Medium Cutting (For Aluminium Alloy)	**DEGX432R**	DEGX150408R	.031																																		●						

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

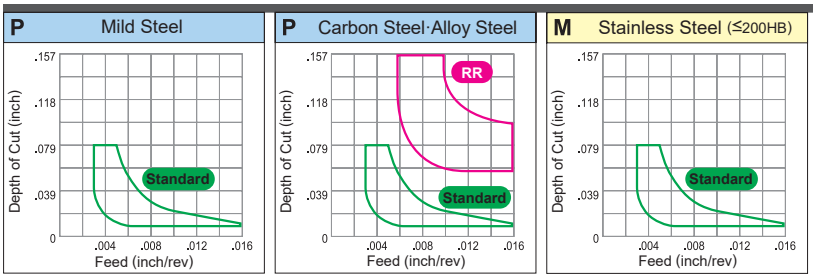
CHIP BREAKER ➤ A076

RC TYPE INSERTS WITH HOLE

RCGT 08 03 M0 AZ
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting··· Heavy Cutting···



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ◐●✠✠● ✠✠◐ ○○○◔○◔✠ ○
M	Stainless Steel	●◐✠✠● ◐ ◔✠✠ ○○ ○ ✠
K	Cast Iron	●◐✠◔❁ ◔✠ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔✠ ◔●◐◐◐

Shape	Order Number	(ISO) Number	IC (mm)	Coated: MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
				NEW											NEW		NEW								NEW																			
AZ	**RCGT0803M0-AZ**	RCGT0803M0-AZ	.315																																		●						
	RCGT10T3M0-AZ	RCGT10T3M0-AZ	.394																																		●						
Medium Cutting-Finish Cutting																																											
Standard	**RCMT0602M0**	RCMT0602M0	.236	★★																	●●●																				●●		
	RCMT0803M0	RCMT0803M0	.315	★●									★								●●●									●				★●		★					●●		
Medium Cutting	NEW **RCMT10T3M0**	RCMT10T3M0	.394																		●●●																				●●		
	NEW **RCMT1204M0**	RCMT1204M0	.472																		●●●																				●●		
	NEW **RCMT1606M0**	RCMT1606M0	.630																		●●●																				●●		
Standard	**RCMX1003M0**	RCMX1003M0	.394	★★		★							★													★				●				★★									
	RCMX1204M0	RCMX1204M0	.472	★★		★							●					●					★			★★			●				★●									
	RCMX1606M0	RCMX1606M0	.630	★★		★	★						★										★			★★																	
Medium Cutting	**RCMX2006M0**	RCMX2006M0	.787	★★		★	★						★																															
	RCMX2507M0	RCMX2507M0	.984			★																																						
RR	**RCMX1606M0-RR**	RCMX1606M0-RR	.630	★★		★	★						★																															
	RCMX2006M0-RR	RCMX2006M0-RR	.787	★★		★	★						★																															
	RCMX2507M0-RR	RCMX2507M0-RR	.984			★	★						★																															
Heavy Cutting																																											

● = NEW

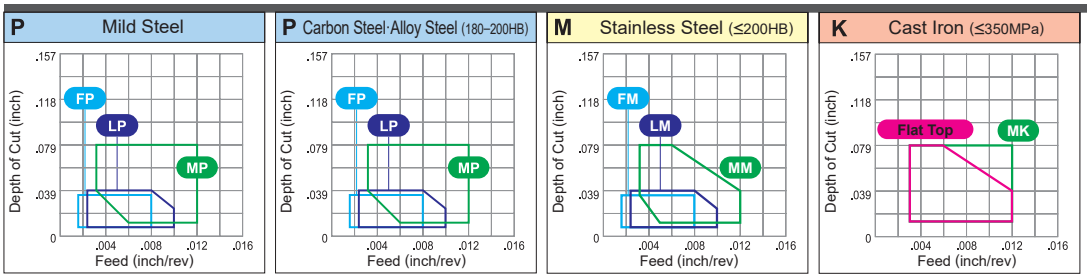
EXTERNAL TURNING ➤ C002
BORING ➤ –
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

90° SC TYPE INSERTS WITH HOLE

SCMT 3 2.5 1 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ◐●✠✠● ✠◐❁ ✠◐❁ ○◐◔○ ○◔○ ❁ ○
M	Stainless Steel	◐●✠✠● ◐ ◔✠❁ ○○ ○ ❁
K	Cast Iron	●◐✠◔❁ ◔✠❁ ○○ ○ ❁ ○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔❁ ◔ ◔●◐◐●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP Finish Cutting	**SCMT32.51FP**	SCMT09T304-FP	.016	★	★	●	●																						●				●									
	SCMT32.52FP	SCMT09T308-FP	.031	★	★	●	●																						●				●									
FM Finish Cutting	**SCMT32.51FM**	SCMT09T304-FM	.016																							●																	
	SCMT32.52FM	SCMT09T308-FM	.031																							●																	
FV Finish Cutting	**SCMT32.51FV**	SCMT09T304-FV	.016		★																									●		★	★●									
LP Light Cutting	**SCMT32.51LP**	SCMT09T304-LP	.016	★	★	●	●																						●				●									
	SCMT32.52LP	SCMT09T308-LP	.031	★	★	●	●																						●				●									
LM Light Cutting	**SCMT32.51LM**	SCMT09T304-LM	.016								●	●														●																	
	SCMT32.52LM	SCMT09T308-LM	.031								●	●														●																	
MP Medium Cutting	**SCMT32.51MP**	SCMT09T304-MP	.016	★	●	●	●																						●				●									
	SCMT32.52MP	SCMT09T308-MP	.031	●	●	●	●																						●				●									
	SCMT431MP	SCMT120404-MP	.016	★	★	●	●																						●				●									
	SCMT432MP	SCMT120408-MP	.031	★	●	●	●																						●				●									
	NEW **SCMT433MP**	SCMT120412-MP	.047	★	★																																					

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠● ◐●✠✠● ✠◐✠✠○ ◐○○◔○◔✠
M	Stainless Steel	◐ ◔ ✠
K	Cast Iron	●◐✠◔✠ ◔✠ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔✠ ○○ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MM	**SCMT32.51MM**	SCMT09T304-MM	.016								●	●															●														
	SCMT32.52MM	SCMT09T308-MM	.031								●	●															●														
	SCMT431MM	SCMT120404-MM	.016								●	●															●														
	SCMT432MM	SCMT120408-MM	.031								●	●															●														
Medium Cutting																																									
MK	**SCMT32.51MK**	SCMT09T304-MK	.016															●	●																						
	SCMT32.52MK	SCMT09T308-MK	.031															●	●																						
	SCMT431MK	SCMT120404-MK	.016															●	●																						
	SCMT432MK	SCMT120408-MK	.031															●	●																						
Medium Cutting																																									
MS	**SCMT32.51MS**	SCMT09T304-MS	.016																	●	●	●																			●
	SCMT32.52MS	SCMT09T308-MS	.031																	●	●	●																			●
	SCMT431MS	SCMT120404-MS	.016																	●	●	●																			●
	SCMT432MS	SCMT120408-MS	.031																	●	●	●																			●
Medium Cutting	**SCMT433MS**	SCMT120412-MS	.047																	●	●	●																			●
Standard	**SCMT32.51**	SCMT09T304	.016										●																●	●			★	●	●						
	SCMT32.52	SCMT09T308	.031										●																●	●			★	●	★						
	SCMT431	SCMT120404	.016										●																●				★	●							
	SCMT432	SCMT120408	.031										●																●	●			★	●	★						
Medium Cutting																																									
Flat Top	**SCMW32.51**	SCMW09T304	.016															●	●																★	★						
	SCMW32.52	SCMW09T308	.031															●	●																						
	SCMW432	SCMW120408	.031															●	●																						

● = NEW

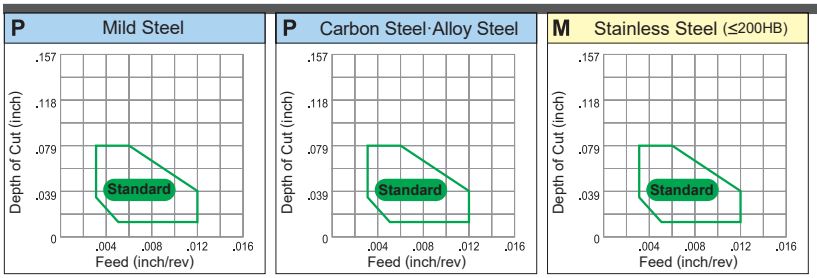
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

90° SP TYPE INSERTS WITH HOLE

SPMT 3 2 1
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet	Carbide								
			NEW								NEW		NEW							NEW																			
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✠	○	◔	❁	❁	●														◕			❁	❁	◕	○	○	○	◔	○	◔	❁							○
	M	Stainless Steel								●	◕	✠	✠	●									◕		◔	❁	❁		○	○		○		❁							
	K	Cast Iron													●	◕	✠	◔	❁						◔	❁			○	○		○		❁	○	◔						○
	N	Non-ferrous Metal																																		◔	●					○
	S	Heat resistant Alloy, Titanium Alloy																		●	◕	✠	○	◕	○	◔	❁									◔	●	◕	●	●	◕	
Shape	Order Number	(ISO) Number	RE (inch)																																					
Standard	SPMT321	SPMT090304	.016																												★									
	SPMT322	SPMT090308	.031																												★									
	SPMT422	SPMT120308	.031																												★	★								
Medium Cutting																																								
Flat Top	SPMW321	SPMW090304	.016																							●	★				★	★	★							
	SPMW322	SPMW090308	.031																							★	★				★	★	★							
	SPMW421	SPMW120304	.016																							●	●				★	●	●							
	SPMW422	SPMW120308	.031																							●	●				★	●	●							
Flat Top	SPGX321	SPGX090304	.016																												★		★							
	SPGX322	SPGX090308	.031																														★							
	SPGX421	SPGX120304	.016																														★							
	SPGX422	SPGX120308	.031																														★							

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

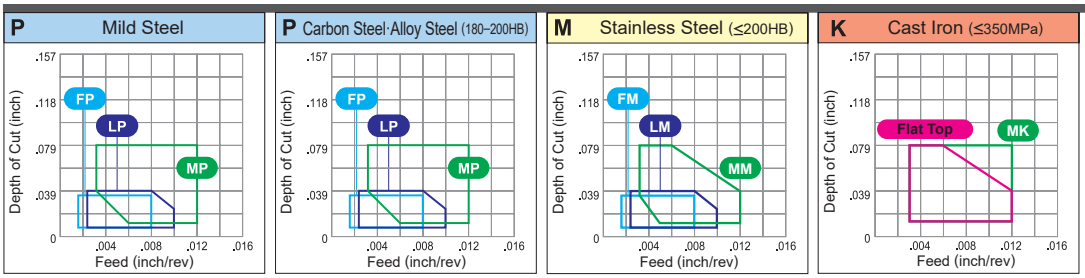
CHIP BREAKER ➤ A072

60° TC TYPE INSERTS WITH HOLE

TCMT 1.8 1.5 0.5 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting--- Light Cutting--- Medium Cutting---



●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁●◐◐✠✠●◐◐✠◔❁●✠❁❁◐○○◔○◔❁○
M	Stainless Steel	●◐✠✠●◐✠❁❁○○○❁
K	Cast Iron	●◐✠◔❁◔❁○○○❁◔○◔○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐✠○◐○◔❁◔●◐◐●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet				Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP	**TCMT1.81.50.5FP**	TCMT090202-FP	.008	★	★	●	●																							●				●										
	TCMT1.81.51FP	TCMT090204-FP	.016	●	★	●	●																							●				●										
	TCMT21.50.5FP	TCMT110202-FP	.008	●	●	●	●																							●				●										
	TCMT21.51FP	TCMT110204-FP	.016	●	●	●	●																							●				●										
Finish Cutting	**TCMT32.51FP**	TCMT16T304-FP	.016	★	★	●	●																							●				●										
FM	**TCMT1.81.50.5FM**	TCMT090202-FM	.008																								●																	
	TCMT1.81.51FM	TCMT090204-FM	.016																								●																	
	TCMT21.50.5FM	TCMT110202-FM	.008																								●																	
	TCMT21.51FM	TCMT110204-FM	.016																								●																	
Finish Cutting	**TCMT32.51FM**	TCMT16T304-FM	.016																								●																	
FV	**TCMT21.51FV**	TCMT110204-FV	.016		●																									●		★	★	●										
	TCMT32.51FV	TCMT16T304-FV	.016		★																									●				★	●									
Finish Cutting																																														
FJ-P	**TCGT21.5V5FJ-P**	TCGT1102V5-FJ-P	.002																																										
	TCGT21.50.2FJ-P	TCGT110201-FJ-P	.004																																									
	TCGT21.50.5FJ-P	TCGT110202-FJ-P	.008																																									
	TCGT32.5V5FJ-P	TCGT16T3V5-FJ-P	.002																																									
	TCGT32.50.2FJ-P	TCGT16T301-FJ-P	.004																																									
Finish Cutting	**TCGT32.50.5FJ-P**	TCGT16T302-FJ-P	.008																																									
AZ	**TCGT21.50.5AZ**	TCGT110202-AZ	.008																																									
	TCGT21.51AZ	TCGT110204-AZ	.016																																									
	TCGT21.52AZ	TCGT110208-AZ	.031																																									
	TCGT32.50.5AZ	TCGT16T302-AZ	.008																																									
	TCGT32.51AZ	TCGT16T304-AZ	.016																																									
Medium Cutting-Finish Cutting	**TCGT32.52AZ**	TCGT16T308-AZ	.031																																									

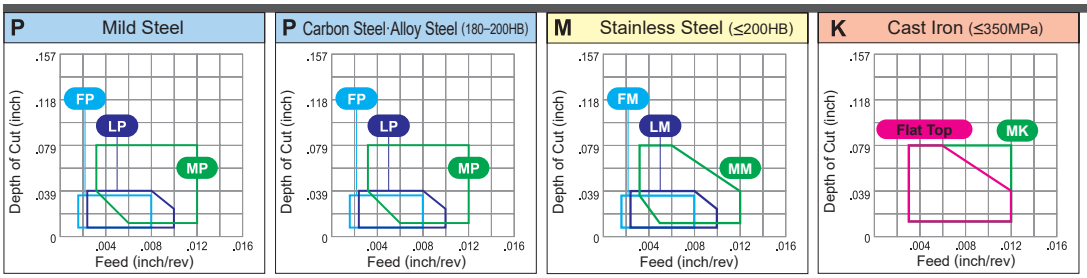
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

60° TC TYPE INSERTS WITH HOLE

TCGT 1.2 1 V3 L F
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔✣✣●◐◐✣✣●●◐✣✣◐○◐○◔○◔✣✣○
M	Stainless Steel	◐◐✣✣●◐✣✣✣○○○○✣
K	Cast Iron	●◐✣◔✣◔✣✣○○○✣○◔●○
N	Non-ferrous Metal	◔●○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔✣◔●◐●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-F	TCGT1.21V3LF	TCGT0601V3L-F	.001																															★										
	TCGT1.210.2LF	TCGT060101L-F	.004																									●						★										
	TCGT1.210.5RF	TCGT060102R-F	.008																									★						★				★						
	TCGT1.210.5LF	TCGT060102L-F	.008																									●						★				●						
	TCGT1.211RF	TCGT060104R-F	.016																															★				★						
	TCGT1.211LF	TCGT060104L-F	.016																									●						★				●						
	TCGT1.210.2MRF	TCGT060101MR-F	.004*							●																																		
	TCGT1.210.2MLF	TCGT060101ML-F	.004*							●																																		
	TCGT1.210.5MRF	TCGT060102MR-F	.008*							●																																		
	TCGT1.210.5MLF	TCGT060102ML-F	.008*							●																																		
	TCGT1.211MRF	TCGT060104MR-F	.016*							●																																		
Finish Cutting	TCGT1.211MLF	TCGT060104ML-F	.016*							●																																		
LP	TCMT1.81.51LP	TCMT090204-LP	.016	★	★	●	●																							●				●										
	TCMT1.81.52LP	TCMT090208-LP	.031	★	★	●	●																							●				●										
	TCMT21.51LP	TCMT110204-LP	.016	●	●	●	●																							●				●										
	TCMT21.52LP	TCMT110208-LP	.031	★	●	●	●																							●				●										
	TCMT32.51LP	TCMT16T304-LP	.016	●	★	●	●																							●				●										
Light Cutting	TCMT32.52LP	TCMT16T308-LP	.031	●	●	●	●																							●				●										
LM	TCMT1.81.51LM	TCMT090204-LM	.016									●	●															●																
	TCMT1.81.52LM	TCMT090208-LM	.031									●	●															●																
	TCMT21.51LM	TCMT110204-LM	.016									●	●															●																
	TCMT21.52LM	TCMT110208-LM	.031									●	●															●																
	TCMT32.51LM	TCMT16T304-LM	.016									●	●															●																
Light Cutting	TCMT32.52LM	TCMT16T308-LM	.031									●	●															●																
LS	TCMT1.81.50.5LS	TCMT090202-LS	.008																			●	●	●																		●		
	TCMT21.50.5LS	TCMT110202-LS	.008																			●	●	●																		●		
Light Cutting																																												

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✠: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ◐●✠✠● ✠◐❁○◔ ✠❁○◔○◔✠ ○◔✠
M	Stainless Steel	◐●✠✠● ◐ ✠❁❁ ○○ ○ ✠
K	Cast Iron	●◐✠◔❁ ✠❁ ○○ ○ ✠○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◐○○◐○◔❁ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MJ	**TCGT21.51MJ**	TCGT110204-MJ	.016																						●																	
	TCGT32.51MJ	TCGT16T304-MJ	.016																						●																	
	TCGT32.52MJ	TCGT16T308-MJ	.031																						●																	
Light Cutting																																											
MJ-P	**TCGT21.51MJ-P**	TCGT110204-MJ-P	.016																																		●					
	TCGT32.51MJ-P	TCGT16T304-MJ-P	.016																																		●					
	TCGT32.52MJ-P	TCGT16T308-MJ-P	.031																																		●					
Light Cutting																																											
MP	**TCMT1.81.51MP**	TCMT090204-MP	.016	●	●	●	●																							●			●									
	TCMT1.81.52MP	TCMT090208-MP	.031	★	★	●	●																							●			●									
	NEW **TCMT21.50.5MP**	TCMT110202-MP	.008	★	★																																					
	TCMT21.51MP	TCMT110204-MP	.016	●	●	●	●																							●			●									
	TCMT21.52MP	TCMT110208-MP	.031	●	●	●	●																							●			●									
	TCMT2.521MP	TCMT130304-MP	.016	★	●	●	●																							●			●									
	TCMT32.51MP	TCMT16T304-MP	.016	●	●	●	●																							●			●									
	TCMT32.52MP	TCMT16T308-MP	.031	●	●	●	●																							●			●									
Medium Cutting	**TCMT32.53MP**	TCMT16T312-MP	.047	●	★	●	●																							●			●									
MM	**TCMT1.81.51MM**	TCMT090204-MM	.016								●	●															●															
	TCMT1.81.52MM	TCMT090208-MM	.031								●	●															●															
	TCMT21.51MM	TCMT110204-MM	.016								●	●															●															
	TCMT21.52MM	TCMT110208-MM	.031								●	●															●															
	TCMT2.521MM	TCMT130304-MM	.016								●	●															●															
	TCMT32.51MM	TCMT16T304-MM	.016								●	●															●															
	TCMT32.52MM	TCMT16T308-MM	.031								●	●															●															
Medium Cutting	**TCMT32.53MM**	TCMT16T312-MM	.047								●	●															●															
MK	**TCMT21.51MK**	TCMT110204-MK	.016																●	●																							
	TCMT21.52MK	TCMT110208-MK	.031																●	●																							
	TCMT32.51MK	TCMT16T304-MK	.016																●	●																							
	TCMT32.52MK	TCMT16T308-MK	.031																●	●																							
Medium Cutting	**TCMT32.53MK**	TCMT16T312-MK	.047																●	●																							
MS	**TCMT1.81.51MS**	TCMT090204-MS	.016																		●	●	●																	●		
	TCMT1.81.52MS	TCMT090208-MS	.031																		●	●	●																	●		
	TCMT21.51MS	TCMT110204-MS	.016																		●	●	●																			
	TCMT21.52MS	TCMT110208-MS	.031																		●	●	●																			
	TCMT32.51MS	TCMT16T304-MS	.016																		●	●	●																	●		
	TCMT32.52MS	TCMT16T308-MS	.031																		●	●	●																	●		
Medium Cutting	**TCMT32.53MS**	TCMT16T312-MS	.047																		●	●	●																	●		

● = NEW

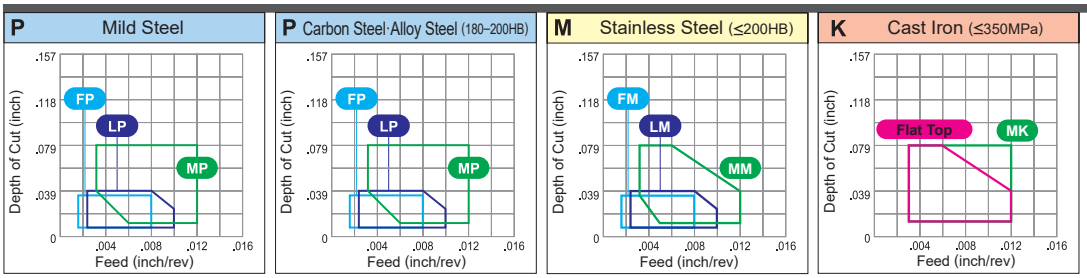
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

60° TC TYPE INSERTS WITH HOLE

TCMT 1.5 1.5 1
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁● ●◕●✠✠● ○◔❁❁ ◕○○○◔○◔❁ ❁○○○ ○❁○◔ ○
M	Stainless Steel	●◕●✠✠● ◕ ◔❁❁ ○○ ○ ❁
K	Cast Iron	●◕●✠◔❁ ◔❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔❁ ◔● ◕●●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated: NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	Coated Cermet: MP3025	AP25N	VP25N	VP45N	Cermet: NX2525	NX3035	Carbide: UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Standard	TCMT1.51.51	TCMT080204	.016																										●					●	★								
	TCMT1.81.51	TCMT090204	.016											★															●●				★	●	★		●					
	TCMT21.50.5	TCMT110202	.008											●														●	●●				★	●								
	TCMT21.51	TCMT110204	.016											●														●	●●				★	●	●		●					
	TCMT21.52	TCMT110208	.031																									●	●														
	TCMT2.520.5	TCMT130302	.008																										●●														
	TCMT2.521	TCMT130304	.016											●															●					●									
	TCMT32.51	TCMT16T304	.016											●														●	●●				★	●	●		●					
Medium Cutting	TCMT32.52	TCMT16T308	.031											●														●	●●				★	●	●		●					
Flat Top	TCMW21.51	TCMW110204	.016																●●																	★								
	TCMW2.521	TCMW130304	.016																●●																	★								
	TCMW32.51	TCMW16T304	.016																●●																	★								
	TCMW32.52	TCMW16T308	.031																●●																	★								
	TCMW32.53	TCMW16T312	.047																●●																	★								
Flat Top	TCGW21.51	TCGW110204	.016																																									★
	TCGW21.51E	TCGW110204E	.016																																★								
	TCGW21.52	TCGW110208	.031																																								★
	TCGW21.52E	TCGW110208E	.031																																★								

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

CHIP BREAKER ➤ A064

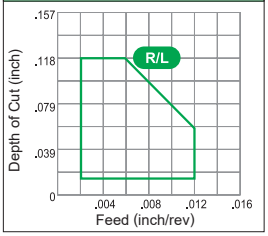
60° TE TYPE INSERTS WITH HOLE

TEGX 3 2 0.5 R
Size Thickness Corner Radius R/L
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting···

N Aluminum Alloy



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material					Coated																									Coated Cermet						Cermet		Carbide									
					NEW								NEW		NEW								NEW																									
Shape	Order Number	(ISO) Number	RE (inch)		MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L	**TEGX320.5R**	TEGX160302R	.008																																		●								
	TEGX320.5L	TEGX160302L	.008																																		●								
	TEGX321R	TEGX160304R	.016																																		●								
	TEGX321L	TEGX160304L	.016																																		●								
Medium Cutting (For Aluminium Alloy)																																														

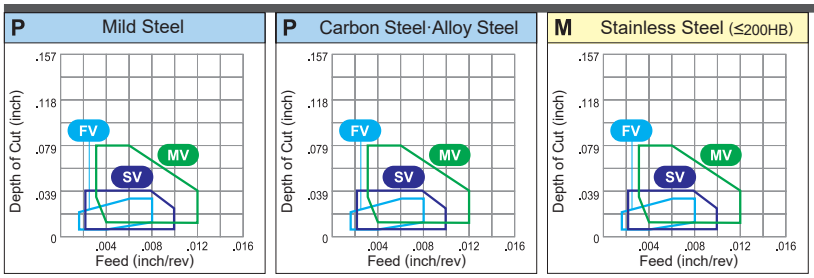
EXTERNAL TURNING	➤ C002	CHIP BREAKER	➤ A076
BORING	➤ E002	GRADES	➤ A034
		IDENTIFICATION	➤ A002

60° TP TYPE INSERTS WITH HOLE

TPMH 1.5 1.5 0.5 FV
Size / Thickness / Corner Radius / Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet			Cermet		Carbide									
			NEW								NEW		NEW							NEW																					
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●★	✣	○	◔	❁	❁	●															◐	❁	❁	◐	●	○	○	◔	○	◔	❁								○
	M	Stainless Steel								●	◐	✣	✣	●									◐		◔	❁	❁		○	○		○		❁								
	K	Cast Iron													●	◐	✣	◔	❁						◔	❁	❁		○	○		○		❁	○	◔						○
	N	Non-ferrous Metal																																		◔	●					○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	◔	❁									◔	●	◐	◐	◐	◐	
Shape	Order Number	(ISO) Number	RE (inch)																																						
FV	TPMH1.51.50.5FV	TPMH080202-FV	.008	★																					●			●			●★									
	TPMH1.51.51FV	TPMH080204-FV	.016	★																					●			●			●★									
	TPMH1.81.50.5FV	TPMH090202-FV	.008	●																					●			●			●★									
	TPMH1.81.51FV	TPMH090204-FV	.016	★																					●			●			●★									
	TPMH220.5FV	TPMH110302-FV	.008	★																					●			●			●★									
	TPMH221FV	TPMH110304-FV	.016	★																					●			●			●★									
	TPMH222FV	TPMH110308-FV	.031	★																					●			●			●★									
	TPMH320.5FV	TPMH160302-FV	.008	★																					●			●			●★									
	TPMH321FV	TPMH160304-FV	.016	★																					●			●			●★									
Finish Cutting	TPMH322FV	TPMH160308-FV	.031	●																					●			●			●★									
R/L-FS	TPGH1.51.50.5RFS	TPGH080202R-FS	.008																						●						★				●					
	TPGH1.51.50.5LFS	TPGH080202L-FS	.008																						●			●★			★				●					
	TPGH1.51.51RFS	TPGH080204R-FS	.016																						●						★				●					
	TPGH1.51.51LFS	TPGH080204L-FS	.016																						●			●★			★				●					
	TPGH1.81.50.5RFS	TPGH090202R-FS	.008																						●						★				●					
	TPGH1.81.50.5LFS	TPGH090202L-FS	.008																						●			●★			★				●					
	TPGH1.81.51RFS	TPGH090204R-FS	.016																						●						★				●					
	TPGH1.81.51LFS	TPGH090204L-FS	.016																						●			●★			★				●					
	TPGH220.5RFS	TPGH110302R-FS	.008																						●						★				●					
	TPGH220.5LFS	TPGH110302L-FS	.008																						●			●★			★				●					
	TPGH221RFS	TPGH110304R-FS	.016																						●						★				●					
	TPGH221LFS	TPGH110304L-FS	.016																						●			●★			★				●					
	TPGH321RFS	TPGH160304R-FS	.016																						●						★				●					
	TPGH321LFS	TPGH160304L-FS	.016																						●			●			★				●					
	TPGH322RFS	TPGH160308R-FS	.031																						●						★				●					
Finish Cutting	TPGH322LFS	TPGH160308L-FS	.031																						●			●			★				●					

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	● ✠ ○ ◔ ✠ ✠ ● ◐ ✠ ✠ ● ○ ◔ ✠ ✠ ◐ ○ ○ ◔ ○ ◔ ✠ ○
M	Stainless Steel	● ◐ ✠ ✠ ● ◐ ◔ ✠ ✠ ○ ○ ○ ◔ ✠ ✠
K	Cast Iron	● ◐ ✠ ◔ ✠ ◔ ✠ ○ ○ ○ ✠ ○ ◔ ○
N	Non-ferrous Metal	◔ ● ○
S	Heat resistant Alloy, Titanium Alloy	◔ ● ◐ ● ● ●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SQ	**TPMT1.81.51SQ**	TPMT090204-SQ	.016										●																											
	TPMT21.50.5SQ	TPMT110202-SQ	.008										●																											
	TPMT21.51SQ	TPMT110204-SQ	.016										●																											
	TPMT21.52SQ	TPMT110208-SQ	.031										●																											
	TPMT32.51SQ	TPMT16T304-SQ	.016										●																											
Finish Cutting	**TPMT32.52SQ**	TPMT16T308-SQ	.031										●																											
R/L	**TPGX1.51.50.5R**	TPGX080202R	.008																														★								
	TPGX1.51.50.5L	TPGX080202L	.008																														★		★		●				
	TPGX1.51.51R	TPGX080204R	.016																														★				★				
	TPGX1.51.51L	TPGX080204L	.016																									★					★		★		●				
	TPGX1.81.50.5R	TPGX090202R	.008																														★								
	TPGX1.81.50.5L	TPGX090202L	.008																														★		★		●				
	TPGX1.81.51R	TPGX090204R	.016																														★				●				
	TPGX1.81.51L	TPGX090204L	.016																									★					★		★		●				
	TPGX1.81.52R	TPGX090208R	.031																																		★				
	TPGX1.81.52L	TPGX090208L	.031																														★				★				
	TPGX220.5L	TPGX110302L	.008																														★		★		★				
	TPGX221R	TPGX110304R	.016																									★					★				★				
	TPGX221L	TPGX110304L	.016																									★					★		★		★				
	TPGX222R	TPGX110308R	.031																														★				★				
Finish Cutting	**TPGX222L**	TPGX110308L	.031																									★					★		★	★	●				
L	**TPMX1.81.51L**	TPMX090204L	.016																														★								
	TPMX221L	TPMX110304L	.016																														★								
Finish Cutting																																									
LP NEW	**TPMH1.51.50.5LP**	TPMH080202-LP	.008		★																																			
	TPMH1.51.51LP	TPMH080204-LP	.016		★																																			
	TPMH1.81.50.5LP	TPMH090202-LP	.008		★																																			
	TPMH1.81.51LP	TPMH090204-LP	.016		★																																			
	TPMH220.5LP	TPMH110302-LP	.008		★																																			
	TPMH221LP	TPMH110304-LP	.016		★																																			
	TPMH222LP	TPMH110308-LP	.031		★																																			
	TPMH320.5LP	TPMH160302-LP	.008		★																																			
	TPMH321LP	TPMH160304-LP	.016		●																																			
Light Cutting	**TPMH322LP**	TPMH160308-LP	.031		●																																			

EXTERNAL TURNING ➤ –
BORING ➤ E002
CHIP BREAKER ➤ A072
GRADES ➤ A034
IDENTIFICATION ➤ A002

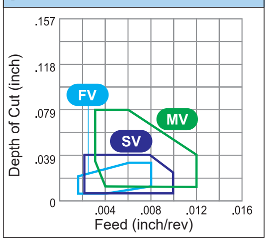
60° TP TYPE INSERTS WITH HOLE

TPMH 1.5 1.5 0.5 SV
Size / Thickness / Corner Radius / Chip Breaker
*Please refer to page A002.

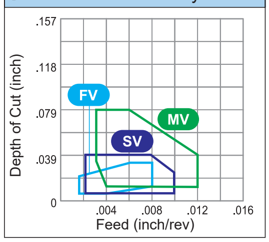
CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting···

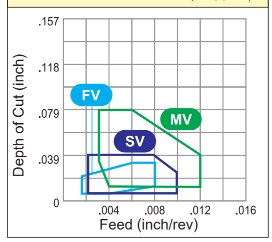
P Mild Steel



P Carbon Steel·Alloy Steel



M Stainless Steel (≤200HB)



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✤ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	Coated (NEW)	Coated (NEW)	Coated	Coated	Coated	Coated	Coated	Coated	Coated	Coated	Coated	Coated (NEW)	Coated (NEW)	Coated (NEW)	Coated (NEW)	Coated	Coated	Coated	Coated	Coated	Coated	Coated (NEW)	Coated	Coated	Coated	Coated	Coated Cermet	Coated Cermet	Coated Cermet	Coated Cermet	Cermet	Cermet	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide	Carbide
P Steel	●	✤	○	◔	✣	✣	●																		✣	✣	◐	○	○	◔	○	◔	✣							○
M Stainless Steel								●	◐	✤	✤	●										◐		◔	✣	✣		○	○		○		✣							
K Cast Iron													●	◐	✤	◔	✣							◔	✣			○	○		○		✣	○	◔					○
N Non-ferrous Metal																																			◔	●				○
S Heat resistant Alloy, Titanium Alloy																	●	◐	✤	○	◐	○	◔	✣											◔	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SV	TPMH1.51.50.5SV	TPMH080202-SV	.008				●							●														★		●				★	●								
	TPMH1.51.51SV	TPMH080204-SV	.016				●							●														★		●			●	★	●								
	TPMH1.81.50.5SV	TPMH090202-SV	.008				●							●														★		●				★	●								
	TPMH1.81.51SV	TPMH090204-SV	.016				●							●														★		●			●	★	●								
	TPMH220.5SV	TPMH110302-SV	.008				●							●														★		●			●	★	●								
	TPMH221SV	TPMH110304-SV	.016				●							●														★		●			●	★	●								
	TPMH222SV	TPMH110308-SV	.031				●							●														★		●			●	★	●								
	TPMH320.5SV	TPMH160302-SV	.008				●							●														★		●			★	★	★								
	TPMH321SV	TPMH160304-SV	.016				●							●														★		●			★	★	★								
Light Cutting	TPMH322SV	TPMH160308-SV	.031				●							●														★		●			●	★	★								
Standard	TPMX221	TPMX110304	.016																											●				★	●								
Medium Cutting	TPMX222	TPMX110308	.031																											●				★	●								
MV	TPMH1.51.50.5MV	TPMH080202-MV	.008		★		●							●														●		●				★	●								
	TPMH1.51.51MV	TPMH080204-MV	.016		●		●							●						●								●		●	●		●	★	●								
	TPMH1.81.50.5MV	TPMH090202-MV	.008		★		●							●														●		●				★	●								
	TPMH1.81.51MV	TPMH090204-MV	.016		●		●							●						●								●		●	●		●	★	●								
	TPMH1.81.52MV	TPMH090208-MV	.031		★		●													●								●		●					●								
	TPMH220.5MV	TPMH110302-MV	.008		●		●							●														★		●	●		★	★	●								
	TPMH221MV	TPMH110304-MV	.016		●		●							●						●								●		●	●		●	★	●								
	TPMH222MV	TPMH110308-MV	.031		●		●							●						●								●		●	●		●	★	●								
	TPMH321MV	TPMH160304-MV	.016		●		●							●						●								●		●	●		★	★	★								
Medium Cutting	TPMH322MV	TPMH160308-MV	.031		●		●							●						●								●		●	●		●	★	★								
MQ	TPMT21.51MQ	TPMT110204-MQ	.016											●																													
	TPMT21.52MQ	TPMT110208-MQ	.031											●																	●												
	TPMT32.51MQ	TPMT16T304-MQ	.016											●																													
Medium Cutting	TPMT32.52MQ	TPMT16T308-MQ	.031											●																													

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																									Coated Cermet			Cermet		Carbide							
			NEW										NEW		NEW								NEW																		
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		●	✣	○	◔	❁	❁	●																		❁	❁	◕	○	○	○	◔	○	◔	❁					○
M	Stainless Steel									●	◕	✣	✣	●									◕			◔	❁	❁		○	○		○		❁						
K	Cast Iron														●	◕	✣	◔	❁							◔	❁			○	○		○		❁	○	◔				○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																			●	◕	✣	○	◕	○	○	◔	❁								◔	●	◕	●	◕		

Shape	Order Number	(ISO) Number	RE (inch)																																						
Flat Top	**TPGX1.51.50.5**	TPGX080202	.008																															●		●				
	TPGX1.51.51	TPGX080204	.016																							★	★					★		●		●				
	TPGX1.51.52	TPGX080208	.031																													★		●		★				
	TPGX1.81.50.5	TPGX090202	.008																																	●				
	TPGX1.81.51	TPGX090204	.016																								★					★		●		●				
	TPGX1.81.52	TPGX090208	.031																								★					★		●		●				
	TPGX220.5	TPGX110302	.008																																	●				
	TPGX221	TPGX110304	.016																							★	★					★		●	★	●				
	TPGX222	TPGX110308	.031																								★					★		●	★	●				
	TPGX321	TPGX160304	.016																													★		★		●				
	TPGX322	TPGX160308	.031																															★		●				

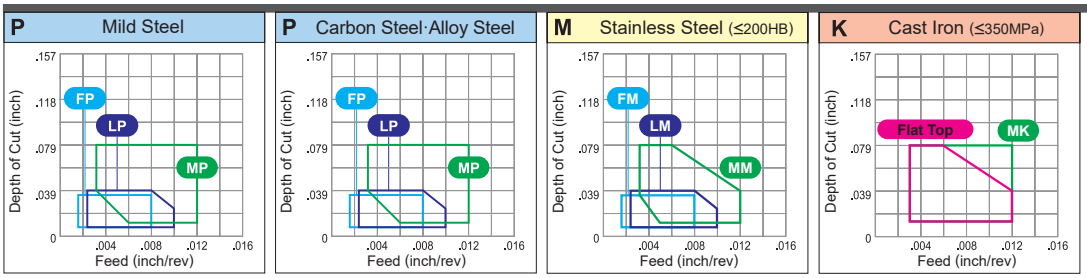
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A072
GRADES ➤ A034
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBMT 2 2 0.5 FP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◐●✠✠●✠✠◐○○○◔○◔✠✠○
M	Stainless Steel	●◐●✠✠●◐✠✠✠○○○✠✠
K	Cast Iron	●◐●✠◔✠◔✠✠○○✠✠○
N	Non-ferrous Metal	◔●
S	Heat resistant Alloy, Titanium Alloy	●◐●✠○◐○◔✠◔●●●◐

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP	**VBMT220.5FP**	VBMT110302-FP	.008	●	●	●	●																						●			●									
	VBMT221FP	VBMT110304-FP	.016	●	●	●	●																						●			●									
	VBMT222FP	VBMT110308-FP	.031	●	●	●	●																						●			●									
	VBMT331FP	VBMT160404-FP	.016	●	●	●	●																						●			●									
Finish Cutting	**VBMT332FP**	VBMT160408-FP	.031	★	★	●	●																						●			●									
FM	**VBMT220.5FM**	VBMT110302-FM	.008																							●															
	VBMT221FM	VBMT110304-FM	.016																							●															
	VBMT222FM	VBMT110308-FM	.031																							●															
	VBMT331FM	VBMT160404-FM	.016																							●															
Finish Cutting	**VBMT332FM**	VBMT160408-FM	.031																							●															
FV	**VBMT221FV**	VBMT110304-FV	.016		★																					●							●★								
	VBMT222FV	VBMT110308-FV	.031		★																					●							●★								
	VBMT331FV	VBMT160404-FV	.016		★																					●							●★								
Finish Cutting	**VBMT332FV**	VBMT160408-FV	.031		★																					●							●★								
FJ	**VBGT33V5FJ**	VBGT1604V5-FJ	.002																								●														
	VBGT330.2FJ	VBGT160401-FJ	.004																								●														
	VBGT330.5FJ	VBGT160402-FJ	.008																								●														
Finish Cutting																																										
FJ-P	**VBGT33V5FJ-P**	VBGT1604V5-FJ-P	.002																																			●				
	VBGT330.2FJ-P	VBGT160401-FJ-P	.004																																			●				
	VBGT330.5FJ-P	VBGT160402-FJ-P	.008																																			●				
Finish Cutting																																										

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✣ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔✣✣● ◐●✣✣● ◐✣◔✣○ ✣✣◐○○◔○◔✣ ○
M	Stainless Steel	◐✣ ◔✣✣ ○○ ○ ✣
K	Cast Iron	●◐✣◔✣ ◔✣ ○○ ○ ✣○◔ ○
N	Non-ferrous Metal	◔● ◐ ○
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔ ◔●◐●◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-F	**VBGT220.5RF**	VBGT110302R-F	.008																							●			●★			★			●				
	VBGT220.5LF	VBGT110302L-F	.008																							●			●★			★			●				
	VBGT221RF	VBGT110304R-F	.016																							●			★			★			●				
	VBGT221LF	VBGT110304L-F	.016																							●			★			★			●				
	VBGT330.5RF	VBGT160402R-F	.008																							★			★			★			★				
	VBGT330.5LF	VBGT160402L-F	.008																							★			★			★			★				
	VBGT331RF	VBGT160404R-F	.016																							★			★			★			★				
Finish Cutting	**VBGT331LF**	VBGT160404L-F	.016																							★			★			★			★				
LP	**VBMT221LP**	VBMT110304-LP	.016	●★	●	●																							●			●							
	VBMT222LP	VBMT110308-LP	.031	●●	●	●																							●			●							
	VBMT331LP	VBMT160404-LP	.016	●●	●	●																							●			●							
Light Cutting	**VBMT332LP**	VBMT160408-LP	.031	●●	●	●																							●			●							
LM	**VBMT221LM**	VBMT110304-LM	.016									●●															●													
	VBMT222LM	VBMT110308-LM	.031									●●															●													
	VBMT331LM	VBMT160404-LM	.016									●●															●													
Light Cutting	**VBMT332LM**	VBMT160408-LM	.031									●●															●													
LS	**VBMT220.5LS**	VBMT110302-LS	.008																		●●	●																	●		
	VBMT221LS	VBMT110304-LS	.016																		●●	●																	●		
	VBMT222LS	VBMT110308-LS	.031																		●●	●																	●		
Light Cutting	**VBMT331LS**	VBMT160404-LS	.016																		●●	●																	●		
	VBMT332LS	VBMT160408-LS	.031																		●●	●																	●		
SV	**VBMT221SV**	VBMT110304-SV	.016																								●							●						
	VBMT222SV	VBMT110308-SV	.031																								●							●						
	VBMT331SV	VBMT160404-SV	.016																								●							●						
Light Cutting	**VBMT332SV**	VBMT160408-SV	.031																								●							●						
MJ	**VBGT331MJ**	VBGT160404-MJ	.016																							●													
	VBGT332MJ	VBGT160408-MJ	.031																							●													
Light Cutting																																								
MJ-P	**VBGT331MJ-P**	VBGT160404-MJ-P	.016																																		●			
	VBGT332MJ-P	VBGT160408-MJ-P	.031																																		●			
Light Cutting																																								

● = NEW

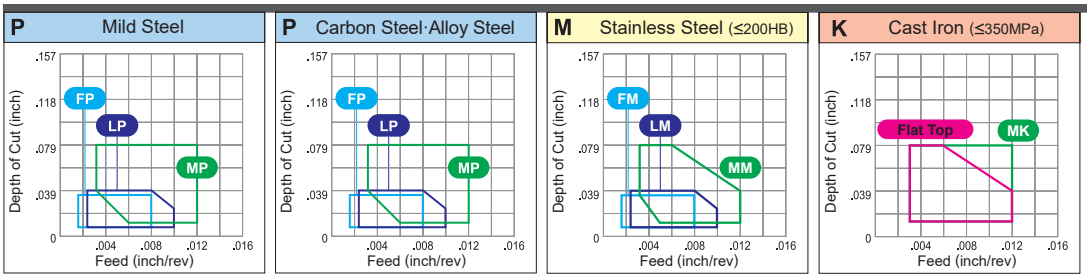
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A058
GRADES ➤ A034
IDENTIFICATION ➤ A002

35° VB TYPE INSERTS WITH HOLE

VBMT 3 3 1 MP
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Light Cutting··· Medium Cutting···



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	RE (inch)	Coated																						Coated Cermet			Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MP	VBMT331MP	VBMT160404-MP	.016	●	●	●	●																						●			●									
	VBMT332MP	VBMT160408-MP	.031	●	●	●	●																						●			●									
Medium Cutting																																									
MM	VBMT331MM	VBMT160404-MM	.016								●	●															●														
	VBMT332MM	VBMT160408-MM	.031								●	●															●														
Medium Cutting																																									
MK	VBMT331MK	VBMT160404-MK	.016															●	●																						
	VBMT332MK	VBMT160408-MK	.031															●	●																						
Medium Cutting																																									
MS	VBMT330.5MS	VBMT160402-MS	.008																		●	●	●																	●	
	VBMT331MS	VBMT160404-MS	.016																		●	●	●																	●	
	VBMT332MS	VBMT160408-MS	.031																		●	●	●																	●	
	VBMT333MS	VBMT160412-MS	.047																		●	●	●																	●	
Medium Cutting																																									
Standard	VBMT332	VBMT160408	.031										●																												
Medium Cutting																																									
MV	VBMT221MV	VBMT110304-MV	.016		●		●						●						●								●			●	●	★	★	●							
	VBMT222MV	VBMT110308-MV	.031		●		●						●						●								●			●	●	★	★	●							
	VBMT331MV	VBMT160404-MV	.016		★		●						●						●								●			●	●	★	★	●							
	VBMT332MV	VBMT160408-MV	.031		●		●						●						●								●			●	●	★	★	●							
Medium Cutting																																									

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

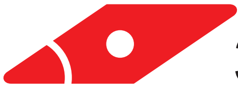
●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide								
			NEW										NEW		NEW								NEW																			
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✣	○	◔	❁	❁	●																	❁	❁	◐	○	○	○	◔	○	◔	❁							○
	M	Stainless Steel								●	◐	✣	✣	●										◐		◔	❁	❁		○	○		○		❁			◔				
	K	Cast Iron													●	◐	✣	◔	❁							◔	❁			○	○		○		❁	○	◔					○
	N	Non-ferrous Metal																																			◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✣	○	◐	○	◔	❁										◔	●	◐	●	◐		

Shape	Order Number	(ISO) Number	RE (inch)																																						
R/L-SR	**VBET22V3RSR**	VBET1103V3R-SR	.001*2																							●					★			●						
	VBET22V3LSR	VBET1103V3L-SR	.001*2																							●					★			●						
	VBET220.2RSR	VBET110301R-SR	.004*2																							●					★			●						
	VBET220.2LSR	VBET110301L-SR	.004*2																							●					★			●						
	VBET220.5RSR	VBET110302R-SR	.008*2																							●					★			●						
	VBET220.5LSR	VBET110302L-SR	.008*2																							●					★			●						
	VBET221RSR	VBET110304R-SR	.016*2																							●					★			●						
Medium Cutting	**VBET221LSR**	VBET110304L-SR	.016*2																							●					★			●						
R/L-SN	**VBET22V0RSN**	VBET110300R-SN	0*2																							●					★			●						
	VBET22V0LSN	VBET110300L-SN	0*2																							●					★			●						
	VBET22V3RSN	VBET1103V3R-SN	.001*2																							●					★			●						
	VBET22V3LSN	VBET1103V3L-SN	.001*2																							●					★			●						
	VBET220.2RSN	VBET110301R-SN	.004*2																							●					★			●						
	VBET220.2LSN	VBET110301L-SN	.004*2																							●					★			●						
	VBET220.5RSN	VBET110302R-SN	.008*2																							●					★			●						
	VBET220.5LSN	VBET110302L-SN	.008*2																							●					★			●						
	VBET221RSN	VBET110304R-SN	.016*2																							●					★			●						
Medium Cutting	**VBET221LSN**	VBET110304L-SN	.016*2																							●					★			●						
R/LW-SN *1	**VBET22V3RWSN**	VBET1103V3RW-SN	.001*2																							●															
	VBET22V3LWSN	VBET1103V3LW-SN	.001*2																							●															
Medium Cutting (Wiper)																																										
Flat Top	**VBMW332**	VBMW160408	.031															●	●																								

*1 Please refer to A032 before using the R/LW-SN breaker (wiper insert).
*2 Indicates the maximum value of the corner R. For more details, see page D003.

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A058
GRADES ➤ A034
IDENTIFICATION ➤ A002

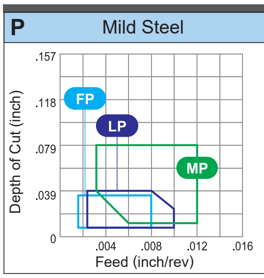


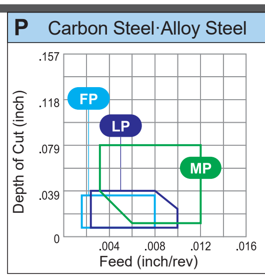
35° VC TYPE INSERTS WITH HOLE

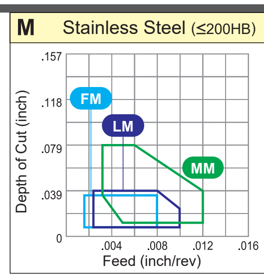
VCMT 2 2 0.5 FP
Size / Thickness / Corner Radius / Chip Breaker
*Please refer to page A002.

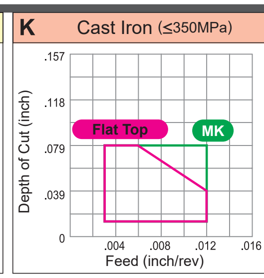
CHIP CONTROL RANGE FOR WORK MATERIALS

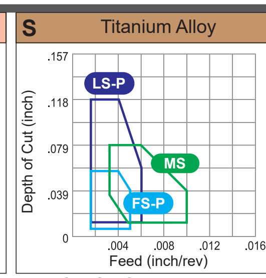
Finish Cutting··· Light Cutting··· Medium Cutting···







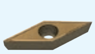




FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✚ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✜ : Unstable Cutting (2nd recommendation)

Workpiece Material		MC6115 (NEW)	MC6125 (NEW)	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 (NEW)	MC5105 (NEW)	MC5115 (NEW)	MC5125 (NEW)	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 (NEW)	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
		Coated																										Coated Cermet				Cermet		Carbide							
P	Steel	●	✚	○	◔	✜	✜	●																		✜	✜	◐	○	○	◔	○	◔	✜							○
M	Stainless Steel								●	◐	✚	✚	●										◐		◔	✜	✜		○	○		○		✜							
K	Cast Iron													●	◐	✚	◔	✜							◔	✜			○	○		○		✜	○	◔					○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																	●	◐	✚	○	◐	○	◔	✜											◔	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FP Finish Cutting	VCMT220.5FP	VCMT110302-FP	.008	★	★	●	●																							●				●									
	VCMT221FP	VCMT110304-FP	.016	●	●	●	●																							●				●									
	VCMT331FP	VCMT160404-FP	.016	●	●	●	●																							●				●									
	VCMT332FP	VCMT160408-FP	.031	★	★	●	●																							●				●									
FM Finish Cutting	VCMT220.5FM	VCMT110302-FM	.008																									●															
	VCMT221FM	VCMT110304-FM	.016																									●															
	VCMT331FM	VCMT160404-FM	.016																									●															
	VCMT332FM	VCMT160408-FM	.031																									●															
FV  Finish Cutting	VCMT1.51.50.5FV	VCMT080202-FV	.008		●		●																					●		●				●	★								
	VCMT1.51.51FV	VCMT080204-FV	.016		●		●																					●		●				●	★								
	VCMT331FV	VCMT160404-FV	.016	★	●																										●			★	●								
	VCMT332FV	VCMT160408-FV	.031	★	●																										●			★	●								
AZ Medium Cutting-Finish Cutting	VCGT331AZ	VCGT160404-AZ	.016																																			●					
	VCGT332AZ	VCGT160408-AZ	.031																																			●					
	VCGT333AZ	VCGT160412-AZ	.047																																			●					
R/L-F Finish Cutting	VCGT1.51.50.5RF	VCGT080202R-F	.008																									●			●			★				●					
	VCGT1.51.50.5LF	VCGT080202L-F	.008																									●			●			★				●					
	VCGT1.51.51RF	VCGT080204R-F	.016																									●			●			★				●					
	VCGT1.51.51LF	VCGT080204L-F	.016																									●			●			★				●					

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

A
TURNING INSERTS
POSI 7°
WITH HOLE
C
D
R
S
T
V
W
X

● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet			Cermet		Carbide								
							NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	NEW MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
Workpiece Material	P	Steel					●	✣	○	◔	❁	❁	●															❁	❁	◐	○	○	◔	○	◔	❁								○
	M	Stainless Steel												●	◐	✣	✣	●									◐		◔	❁	❁		○	○		○		❁						
	K	Cast Iron																	●	◐	✣	◔	❁						◔	❁			○	○		○		❁	○	◔				○
	N	Non-ferrous Metal																																						◔	●				○
	S	Heat resistant Alloy, Titanium Alloy																						●	◐	✣	○	◐	○	◔	❁									◔	●	◐	●	●	◐	
LP		NEW **VCMT1.51.50.5LP**	VCMT080202-LP	.008		★																																						
		NEW **VCMT1.51.51LP**	VCMT080204-LP	.016		★																																						
		VCMT221LP	VCMT110304-LP	.016	●	●	●	●																									●			●								
		VCMT222LP	VCMT110308-LP	.031	●	★	●	●																									●			●								
		VCMT331LP	VCMT160404-LP	.016	●	●	●	●																									●			●								
Light Cutting		**VCMT332LP**	VCMT160408-LP	.031	●	●	●	●																									●			●								
LM		**VCMT221LM**	VCMT110304-LM	.016									●	●															●															
		VCMT222LM	VCMT110308-LM	.031									●	●															●															
		VCMT331LM	VCMT160404-LM	.016									●	●															●															
Light Cutting		**VCMT332LM**	VCMT160408-LM	.031									●	●															●															
LS		**VCMT220.5LS**	VCMT110302-LS	.008																			●	●	●																	●		
		VCMT221LS	VCMT110304-LS	.016																			●	●	●																	●		
		VCMT331LS	VCMT160404-LS	.016																			●	●	●																	●		
Light Cutting		**VCMT332LS**	VCMT160408-LS	.031																			●	●	●																	●		
LS		**VCGT220.2MLS**	VCGT110301M-LS	.004*																			●	●	●																			
		VCGT220.5MLS	VCGT110302M-LS	.008*																			●	●	●																			
		VCGT221MLS	VCGT110304M-LS	.016*																			●	●	●																			
		VCGT2.520.2MLS	VCGT130301M-LS	.004*																			●	●	●																			
		VCGT2.520.5MLS	VCGT130302M-LS	.008*																			●	●	●																			
Light Cutting		**VCGT2.521MLS**	VCGT130304M-LS	.016*																			●	●	●																			
LS-P		**VCGT220.2MLS-P**	VCGT110301M-LS-P	.004*													●																									●		
		VCGT220.5MLS-P	VCGT110302M-LS-P	.008*													●																									●		
		VCGT221MLS-P	VCGT110304M-LS-P	.016*													●																									●		
		VCGT2.520.2MLS-P	VCGT130301M-LS-P	.004*																																					●		
		VCGT2.520.5MLS-P	VCGT130302M-LS-P	.008*																																					●		
Light Cutting		**VCGT2.521MLS-P**	VCGT130304M-LS-P	.016*																																					●		
SV		**VCMT1.51.50.5SV**	VCMT080202-SV	.008				●																					●				●			●								
		VCMT1.51.51SV	VCMT080204-SV	.016				●																					●				●			●								
Light Cutting																																													
MP		NEW **VCMT221MP**	VCMT110304-MP	.016	●	●																																						
		VCMT331MP	VCMT160404-MP	.016	●	●	●	●																									●			●								
		VCMT332MP	VCMT160408-MP	.031	●	●	●	●																									●			●								
Medium Cutting		**VCMT333MP**	VCMT160412-MP	.047	★	★	●	●																									●			●								

* Indicates the maximum value of the corner R. For more details, see page D003.

● = NEW

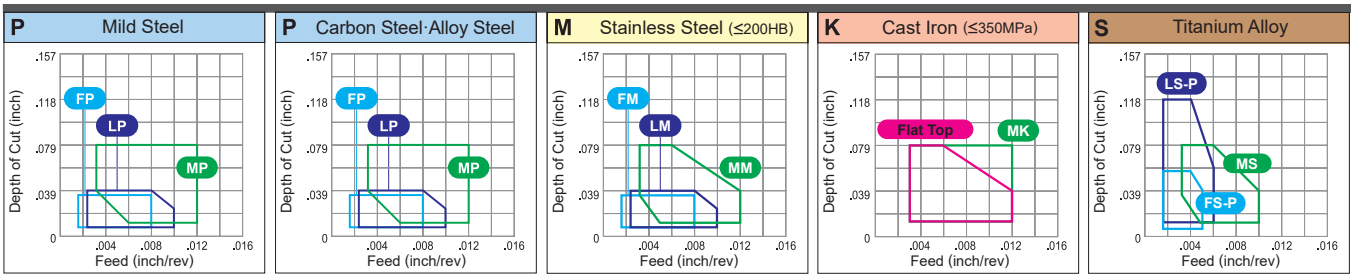
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

35° VC TYPE INSERTS WITH HOLE

VCMT 3 3 1 MM
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Light Cutting Medium Cutting



FS, LS : G class inserts

● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ✠ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔✠✠●◕●✠✠●●◕●✠✠◕○○◔○◔✠✠○
M	Stainless Steel	●◕✠✠●◕●✠✠◔✠✠○○○✠✠
K	Cast Iron	●◕✠◔✠◔✠✠○○✠○◔
N	Non-ferrous Metal	◔●○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔✠◔●◕●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet			Cermet		Carbide								
				NEW MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
MM	**VCMT331MM**	VCMT160404-MM	.016								●	●															●															
	VCMT332MM	VCMT160408-MM	.031								●	●															●															
	VCMT333MM	VCMT160412-MM	.047								●	●															●															
Medium Cutting																																										
MK	**VCMT331MK**	VCMT160404-MK	.016																●	●																							
	VCMT332MK	VCMT160408-MK	.031																●	●																							
Medium Cutting																																										
MS	**VCMT220.5MS**	VCMT110302-MS	.008																		●	●	●																			
	VCMT221MS	VCMT110304-MS	.016																		●	●	●																	●		
	VCMT222MS	VCMT110308-MS	.031																		●	●	●																	●		
	VCMT331MS	VCMT160404-MS	.016																		●	●	●																	●		
	VCMT332MS	VCMT160408-MS	.031																		●	●	●																	●		
Medium Cutting																																										
Standard	**VCMT221**	VCMT110304	.016										●														●		●●			★●	★	★							
	VCMT331	VCMT160404	.016										●														●		●●			★●	●	●							
	VCMT332	VCMT160408	.031										●														●		●●			★●	●								
	VCMT333	VCMT160412	.047										●																			★●									
Medium Cutting																																										
MV	**VCMT1.51.50.5MV**	VCMT080202-MV	.008		●		●						●														●		●●		★	★●									
	VCMT1.51.51MV	VCMT080204-MV	.016		●		●						●							●							●		●●		★	★●									
Medium Cutting																																										
Flat Top	**VCMW221**	VCMW110304	.016																																	★						
	VCMW331	VCMW160404	.016																●	●																★						
	VCMW332	VCMW160408	.031																●	●																★						

● = NEW

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

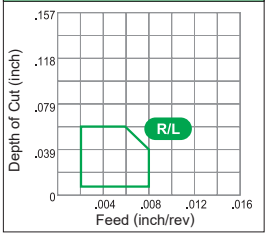
CHIP BREAKER ➤ A064

VDGX 3 2 0.5 R
Size Thickness Corner Radius R/L
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting···

N Aluminum Alloy



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✠○◔❁❁●◕●✠✠●◕●✠◔❁ ❁❁◕○○◔○◔❁ ❁○◔○
M	Stainless Steel	●◕✠✠●◕ ◔❁❁❁ ○○○ ○ ❁
K	Cast Iron	●◕✠◔❁ ◔❁❁ ○○ ○ ❁○◔ ○
N	Non-ferrous Metal	◔● ○
S	Heat resistant Alloy, Titanium Alloy	●◕✠○◕○◔❁ ◔❁❁ ◔●◕●◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																												Coated Cermet				Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L Medium Cutting (For Aluminium)	**VDGX320.5R**	VDGX160302R	.008																																	●								
	VDGX320.5L	VDGX160302L	.008																																	●								
	VDGX321R	VDGX160304R	.016																																	●								
	VDGX321L	VDGX160304L	.016																																	●								

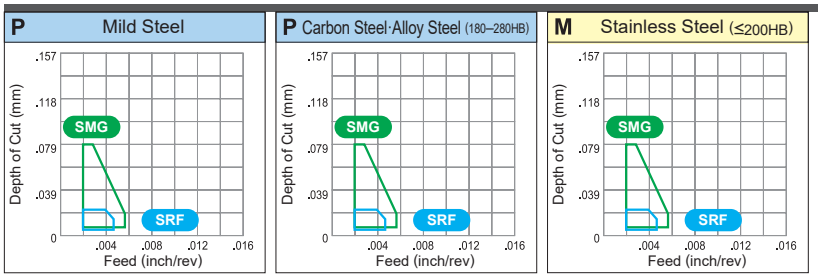
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A076
GRADES ➤ A034
IDENTIFICATION ➤ A002

35° VP TYPE INSERTS WITH HOLE

VPET 1.5 1.5 0.2 R SRF
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting--- Medium Cutting---



● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																										Coated Cermet				Cermet		Carbide									
			NEW									NEW		NEW							NEW																							
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✠	○	◔	❁	❁	●															❁	❁	◐	○	○	○	◔	○	◔	❁									○
	M	Stainless Steel								●	◐	✠	✠	●									◐		◔	❁	❁		○	○		○		❁								
	K	Cast Iron													●	◐	✠	◔	❁						◔	❁	❁		○	○		○		❁	○	◔						○
	N	Non-ferrous Metal																																		◔	●					○
	S	Heat resistant Alloy, Titanium Alloy																		●	◐	✠	○	◐	○	◔	❁									◔	●	◐	◐	◐	◐	
Shape	Order Number	(ISO) Number	RE (inch)																																							
R/L-SRF	VPET1.51.50.2RSRF	VPET080201R-SRF	.004*																							●																
	VPET1.51.50.2LSRF	VPET080201L-SRF	.004*																							●																
	VPET1.51.50.5RSRF	VPET080202R-SRF	.008*																							●																
	VPET1.51.50.5LSRF	VPET080202L-SRF	.008*																							●																
	VPET22V3RSRF	VPET1103V3R-SRF	.001*																							●																
	VPET22V3LSRF	VPET1103V3L-SRF	.001*																							●																
	VPET220.2RSRF	VPET110301R-SRF	.004*																							●																
	VPET220.2LSRF	VPET110301L-SRF	.004*																							●																
Finish Cutting	VPET220.5RSRF	VPET110302R-SRF	.008*																							●																
	VPET220.5LSRF	VPET110302L-SRF	.008*																							●																
SMG	VPGT1.51.50.2MSMG	VPGT080201M-SMG	.004*																							●																
	VPGT1.51.50.5MSMG	VPGT080202M-SMG	.008*																							●																
	VPGT220.2MSMG	VPGT110301M-SMG	.004*																							●																
Medium Cutting	VPGT220.5MSMG	VPGT110302M-SMG	.008*																							●																

* Indicates the maximum value of the corner R. For more details, see page D003.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

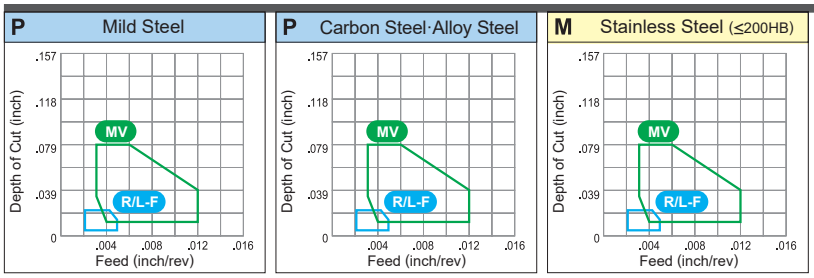
CHIP BREAKER ➤ A072

80° WB TYPE INSERTS WITH HOLE

WBGT 1.2 1 V3 L F
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting--- Medium Cutting---



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			MC6115 NEW	MC6125 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 NEW	MC5105 NEW	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●	✠	○	◔	❁	❁	●																	❁	❁	◕	○	○	○	◔	○	◔	❁								○
	M	Stainless Steel								●	◕	✠	✠	●									◕		◔	❁	❁		○	○		○		❁								
	K	Cast Iron													●	◕	✠	◔	❁						◔	❁			○	○		○		❁	○	◔						○
	N	Non-ferrous Metal																																		◔	●					○
	S	Heat resistant Alloy, Titanium Alloy																		●	◕	✠	○	◕	○	◔	❁									◔	●	◕	●	◕		

Shape	Order Number	(ISO) Number	RE (inch)	MC6115 NEW	MC6125 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 NEW	MC5105 NEW	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L-F	**WBGT1.21V3LF**	WBGT0201V3L-F	.001																								●						★								
	WBGT1.210.2LF	WBGT020101L-F	.004																								●						★								
	WBGT1.210.5LF	WBGT020102L-F	.008																								●			●			★								
	WBGT1.211LF	WBGT020104L-F	.016																								●			●			★								
	WBGT1.51.5V3LF	WBGTL302V3L-F	.001																								●						★								
	WBGT1.51.50.2LF	WBGTL30201L-F	.004																								●						★								
	WBGT1.51.50.5RF	WBGTL30202R-F	.008																								●						★								
	WBGT1.51.50.5LF	WBGTL30202L-F	.008																								●			●			★								
	WBGT1.51.51RF	WBGTL30204R-F	.016																								●						★								
Finish Cutting	**WBGT1.51.51LF**	WBGTL30204L-F	.016																								●			●			★								
R/L-MV	**WBMT1.51.50.5RMV**	WBMTL30202R-MV	.008		★		●																				★			●		★	★	●								
	WBMT1.51.50.5LMV	WBMTL30202L-MV	.008		★		●																				★			●		★	★	●								
	WBMT1.51.51RMV	WBMTL30204R-MV	.016		★		●																				★			●		★	★	●								
Medium Cutting	**WBMT1.51.51LMV**	WBMTL30204L-MV	.016		★		●																				★			●		★	★	●								

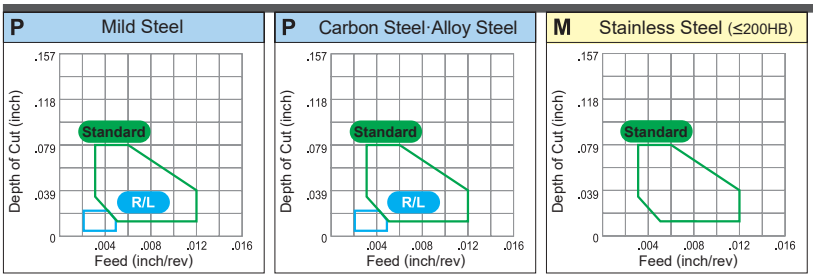
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A058
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° WC TYPE INSERTS WITH HOLE

WCGT 2 1.5 V5 FJ-P
Size Thickness Corner Radius Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Medium Cutting···



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloy, Titanium Alloy	

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet				Cermet		Carbide							
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	NEW MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
FJ-P	**WCGT21.5V5FJ-P**	WCGT0402V5-FJ-P	.002																																		●					
	WCGT21.50.2FJ-P	WCGT040201-FJ-P	.004																																		●					
	WCGT21.50.5FJ-P	WCGT040202-FJ-P	.008																																		●					
	WCGT32.5V5FJ-P	WCGT06T3V5-FJ-P	.002																																		●					
	WCGT32.50.2FJ-P	WCGT06T301-FJ-P	.004																																		●					
Finish Cutting	**WCGT32.50.5FJ-P**	WCGT06T302-FJ-P	.008																																		●					
R/L	**WCGT1.210.5R**	WCGT020102R	.008																															★									
	WCGT1.210.5L	WCGT020102L	.008																															★			●						
	WCGT1.211R	WCGT020104R	.016																															★									
	WCGT1.211L	WCGT020104L	.016																															★			●						
	WCGT1.51.50.5L	WCGTL30202L	.008																															★									
Finish Cutting	**WCGT1.51.51L**	WCGTL30204L	.016																															★									
MJ	**WCGT21.51MJ**	WCGT040204-MJ	.016																								●																
	WCGT32.51MJ	WCGT06T304-MJ	.016																								●																
	WCGT32.52MJ	WCGT06T308-MJ	.031																								●																
Light Cutting																																											
MJ-P	**WCGT21.51MJ-P**	WCGT040204-MJ-P	.016																																		●					
	WCGT32.51MJ-P	WCGT06T304-MJ-P	.016																																		●					
	WCGT32.52MJ-P	WCGT06T308-MJ-P	.031																																		●					
Light Cutting																																											

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

● : Stable Cutting (1st recommendation)　◐ : General Cutting (1st recommendation)　✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation)　◔ : General Cutting (2nd recommendation)　✣ : Unstable Cutting (2nd recommendation)

Workpiece Material			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
			Coated																										Coated Cermet				Cermet		Carbide							
			NEW											NEW	NEW									NEW																			
Shape	Order Number	(ISO) Number	RE (inch)																																							
MP NEW	WCMT1.210.5MP	WCMT020102-MP	.008	●	●																																				
	WCMT1.211MP	WCMT020104-MP	.016	●	●																																				
	WCMT1.51.50.5MP	WCMTL30202-MP	.008	●	●																																				
	WCMT1.51.51MP	WCMTL30204-MP	.016	●	●																																				
	WCMT21.50.5MP	WCMT040202-MP	.008	●	●																																				
	WCMT21.51MP	WCMT040204-MP	.016	●	●																																				
	WCMT21.52MP	WCMT040208-MP	.031		●																																				
Medium Cutting	WCMT32.51MP	WCMT06T304-MP	.016	●	●																																				
	WCMT32.52MP	WCMT06T308-MP	.031	●	●																																				
Standard	WCMT1.210.5	WCMT020102	.008										●																●	●			★	●	●			●			
	WCMT1.211	WCMT020104	.016										●																●	●			★	●	●			●			
	WCMT1.51.50.5	WCMTL30202	.008										●																●	●			★	●	●			●			
	WCMT1.51.51	WCMTL30204	.016										●																●	●			★	●	●			●			
	WCMT21.50.5	WCMT040202	.008										●																●	●			★	●	●						
	WCMT21.51	WCMT040204	.016										●																●	●			★	●	●			●			
Medium Cutting	WCMT32.51	WCMT06T304	.016										●																●	●			★	●	●						
	WCMT32.52	WCMT06T308	.031										●																●	●			★	●	●						

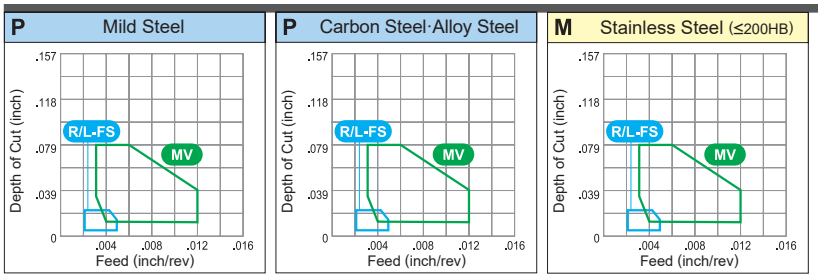
EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

80° WP TYPE INSERTS WITH HOLE

WPGT 2 1.5 1 R FS
Size Thickness Corner Radius R/L Chip Breaker
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting Medium Cutting



● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

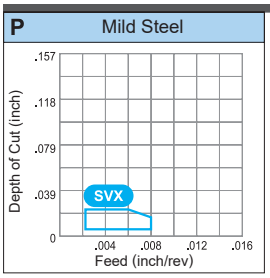
Workpiece Material			Coated																								Coated Cermet				Cermet		Carbide									
			NEW								NEW		NEW							NEW																					
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
	P	Steel	●✠○◔❁❁●							●◕✠✠●													◕			❁❁	◕○○◔				○◔❁									○
	M	Stainless Steel													●◕✠○◕									◕	◔	❁❁	❁		○○			○		❁							
	K	Cast Iron													●◕✠◔❁										◔	❁❁			○○			○		❁○◔						○
	N	Non-ferrous Metal																																		◔●					○
	S	Heat resistant Alloy, Titanium Alloy																		●◕✠○◕	○◔	❁														◔●◕●◕				
Shape	Order Number	(ISO) Number	RE (inch)																																							
R/L-FS	**WPGT21.51RFS**	WPGT040204R-FS	.016																							★					★										
	WPGT21.51LFS	WPGT040204L-FS	.016																							★					★										
	WPGT321RFS	WPGT060304R-FS	.016																							★					★										
	WPGT321LFS	WPGT060304L-FS	.016																							★					★										
Finish Cutting																																									
MV	**WPMT21.50.5MV**	WPMT040202-MV	.008	★	●							●														★		●			★●										
	WPMT21.51MV	WPMT040204-MV	.016	●	●							●					●									★		●		★	★●										
	WPMT321MV	WPMT060304-MV	.016	★	●							●					●									●		●			★●										
	WPMT322MV	WPMT060308-MV	.031	●	●							●					●									●		●		★	★●										
Medium Cutting																																									

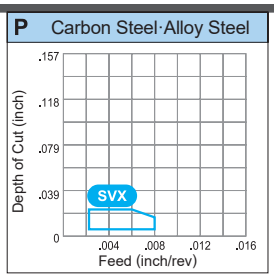
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

CHIP BREAKER ➤ A072

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting





● : Stable Cutting (1st recommendation) ◕ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	● ✠ ○ ◔ ❁ ❁ ● ◕ ◕ ✠ ✠ ● ✠ ◕ ✠ ✠ ❁ ❁ ◕ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	● ◕ ✠ ✠ ● ◕ ✠ ❁ ❁ ❁ ○ ○ ○ ○ ❁
K	Cast Iron	● ◕ ✠ ◔ ❁ ◔ ✠ ❁ ❁ ○ ○ ○ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ● ○
S	Heat resistant Alloy, Titanium Alloy	● ◕ ✠ ○ ◕ ○ ◔ ❁ ◔ ● ◕ ● ◕

Shape	Order Number	(ISO) Number	RE (inch)	Coated																						Coated Cermet				Cermet		Carbide								
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
SVX	**XCMT220.5SVX**	XCMT150302-SVX	.008																							●															
	XCMT221SVX	XCMT150304-SVX	.016		★																					●															
	XCMT222SVX	XCMT150308-SVX	.031		●																					●															
Finish Cutting																																									

EXTERNAL TURNING ➤ C002
BORING ➤ E002
CHIP BREAKER ➤ A064
GRADES ➤ A034
IDENTIFICATION ➤ A002

RTG TYPE INSERTS WITHOUT HOLE

● : Stable Cutting (1st recommendation)　◐ : General Cutting (1st recommendation)　✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation)　◔ : General Cutting (2nd recommendation)　❁ : Unstable Cutting (2nd recommendation)

Workpiece Material			MC6115 NEW	MC6125 NEW	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025 NEW	MC5105 NEW	MC5115 NEW	MC5125 NEW	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025 NEW	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
			Coated																									Coated Cermet					Cermet		Carbide							
P	Steel		●	✣	○	◔	❁	❁	●															❁	❁			◐	○	○	◔	○	◔	❁								○
M	Stainless Steel									●	◐	✣	✣	●									◐		◔	❁	❁		○	○		○		❁								
K	Cast Iron														●	◐	✣	◔	❁						◔	❁			○	○		○		❁	○	◔						○
N	Non-ferrous Metal																																		◔	●					○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁								◔	●	◐	●	●	◐		
Shape	Order Number	(ISO) Number	IC (inch)																																							
For Special Use (For TL Holder)	**RTG05A**	RTG05A	.197																																●		●					
	RTG06A	RTG06A	.236																																●		●					
	RTG07A	RTG07A	.276																																●							
	RTG08A	RTG08A	.315																																●		●					
	RTG10A	RTG10A	.394																																●		●					

● : USA Stock　★ : Stocked in Japan
<10 inserts in one case>

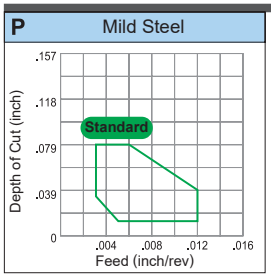
CHIP BREAKER ➤ A079

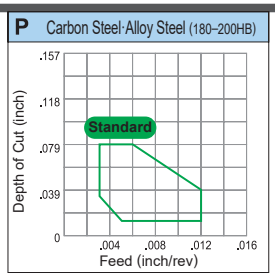
90° SP TYPE INSERTS WITHOUT HOLE

SPGR 3 2 1 R
Size Thickness Corner Radius R/L
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Medium Cutting





● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✣ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	●✣○◔❁❁●◐◐✣✣●✣◐○◔✣✣◐○○◔○◔❁○
M	Stainless Steel	●◐✣✣●◐✣❁❁○○○❁○
K	Cast Iron	●◐✣◔❁◔❁❁○○○❁○◔○
N	Non-ferrous Metal	◔●
S	Heat resistant Alloy, Titanium Alloy	●◐✣○◐○◔❁◔●

Shape	Order Number	(ISO) Number	RE (inch)	Coated																								Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R	**SPGR321R**	SPGR090304R	.016																															★								
Finish Cutting																																											
Standard	**SPMR321**	SPMR090304	.016	★	★																							●				★	●									
	SPMR322	SPMR090308	.031	★	★																							●				★	●									
	SPMR421	SPMR120304	.016	★	●																							●				★	★									
	SPMR422	SPMR120308	.031	●	●																							●				●	★									
Medium Cutting																																											
Flat Top	**SPMN321**	SPMN090304	.016																													★		★	★							
	SPMN322	SPMN090308	.031	●																												★		★	●							
	SPMN421	SPMN120304	.016	★																						★								★	★							
	SPMN422	SPMN120308	.031	●																						●	★							●	●							
	SPMN423	SPMN120312	.047	★																						★								★	★							
	SPMN432	SPMN120408	.031																															★	★							
	SPMN433	SPMN120412	.047																															●								
	SPMN532	SPMN150408	.031																															★								
	SPMN533	SPMN150412	.047																															●								
	SPMN631	SPMN190404	.016																															●								
	SPMN632	SPMN190408	.031																															★								
	SPMN633	SPMN190412	.047																															●								
Flat Top	**SPG321**	SPGN090304	.016																													★		●	★							
	SPG322	SPGN090308	.031																																★							
	SPG421	SPGN120304	.016																													●		●	●							
	SPG422	SPGN120308	.031																								●					●		●	●							
	SPG423	SPGN120312	.047																																★							
	SPG431	SPGN120404	.016																																●							
	SPG432	SPGN120408	.031																															●	★							
	SPG531	SPGN150404	.016																															★								
	SPG532	SPGN150408	.031																																★							

60° TC TYPE INSERTS WITHOUT HOLE

TCG 1.2 1 1
Size Thickness Corner Radius
*Please refer to page A002.

●: Stable Cutting (1st recommendation) ◐: General Cutting (1st recommendation) ✣: Unstable Cutting (1st recommendation)
○: Stable Cutting (2nd recommendation) ◔: General Cutting (2nd recommendation) ❁: Unstable Cutting (2nd recommendation)

Workpiece Material			Coated																										Coated Cermet			Cermet		Carbide							
			NEW									NEW		NEW							NEW																			
			MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
P	Steel		●	✣	○	◔	❁	❁	●															❁	❁	◐	○	○	◔	○	◔	❁								○
M	Stainless Steel									●	◐	✣	✣	●									◐		◔	❁	❁		○	○		○		❁							
K	Cast Iron														●	◐	✣	◔	❁						◔	❁			○	○		○		❁	○	◔					○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																			●	◐	✣	○	◐	○	◔	❁									◔	●	◐	●	◐	
Shape	Order Number	(ISO) Number	RE (inch)																																					
Flat Top	TCGN1.211	TCGN060104	.016																																★					
	TCGN1.81.51	TCGN090204	.016																																★					

●: USA Stock ★: Stocked in Japan
<10 inserts in one case>

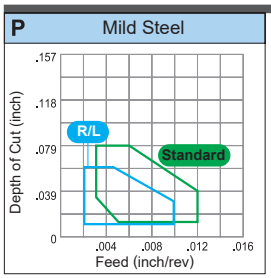
CHIP BREAKER ➤ A078

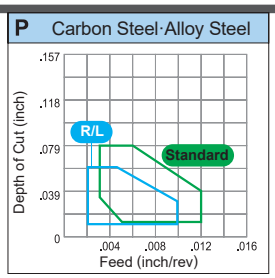
60° TP TYPE INSERTS WITHOUT HOLE

TPGR 2 2 1 R
Size Thickness Corner Radius R/L
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Medium Cutting···





● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ❁ : Unstable Cutting (2nd recommendation)

Workpiece Material		
P	Steel	● ✠ ○ ◔ ❁ ❁ ● ◐ ◐ ✠ ✠ ● ✠ ◐ ✠ ○ ◐ ○ ◔ ❁ ❁ ◐ ○ ○ ○ ◔ ○ ◔ ❁ ○
M	Stainless Steel	● ◐ ✠ ✠ ● ✠ ○ ◐ ○ ◔ ❁ ❁ ○ ○ ○ ○ ❁
K	Cast Iron	● ◐ ✠ ◔ ❁ ✠ ○ ◔ ❁ ❁ ○ ○ ○ ❁ ○ ◔ ○
N	Non-ferrous Metal	◔ ● ○
S	Heat resistant Alloy, Titanium Alloy	● ◐ ✠ ○ ◐ ○ ◔ ❁ ◔ ● ◐ ● ◐ ○

Shape	Order Number	(ISO) Number	RE (inch)	Coated																										Coated Cermet				Cermet		Carbide									
				NEW MC6115	NEW MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	NEW MS7025	NEW MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	NEW MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
R/L	**TPGR221R**	TPGR110304R	.016																														★			★							
	TPGR221L	TPGR110304L	.016																														★		★	★							
	TPGR321R	TPGR160304R	.016																														★		★	★							
	TPGR321L	TPGR160304L	.016																														★		★	★							
Finish Cutting	**TPGR322R**	TPGR160308R	.031																														★										
	TPGR322L	TPGR160308L	.031																														★		★	★							
Standard	**TPMR1.81.50.5**	TPMR090202	.008																															●										
	TPMR1.81.51	TPMR090204	.016																															●		★	●							
	TPMR1.81.52	TPMR090208	.031																															●										
	TPMR220.5	TPMR110302	.008																															●		★	●							
	TPMR221	TPMR110304	.016	●	●																													●		★	●							
	TPMR222	TPMR110308	.031	●	★																													●		★	●							
	TPMR321	TPMR160304	.016	●	●																													●		★	●							
	TPMR322	TPMR160308	.031	●	●																													●		★	●							
Medium Cutting	**TPMR323**	TPMR160312	.047	★	●																													●			●							
Flat Top	**TPMN221**	TPMN110304	.016	★														●	●									★						★		●		★						
	TPMN222	TPMN110308	.031	★														●	●									★						★		●		★						
	TPMN321	TPMN160304	.016	★														●	●								●	★						★		●		●						
	TPMN322	TPMN160308	.031	●														●	●								●	★						★		●	★	●						
	TPMN323	TPMN160312	.047	★														●	●									★										●						
	TPMN325	TPMN160320	.079																																	★								
	TPMN431	TPMN220404	.016	●																																●								
	TPMN432	TPMN220408	.031	●																							●	★								●		★						
	TPMN433	TPMN220412	.047	●																								★								●		●						

EXTERNAL TURNING ➤ –
BORING ➤ –

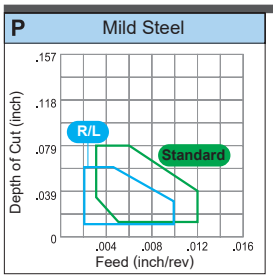
CHIP BREAKER ➤ A078
GRADES ➤ A034
IDENTIFICATION ➤ A002

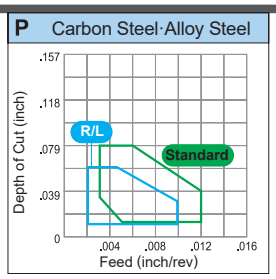
60° TP TYPE INSERTS WITHOUT HOLE

TPG 2 2 0.5
Size Thickness Corner Radius
*Please refer to page A002.

CHIP CONTROL RANGE FOR WORK MATERIALS

Finish Cutting··· Medium Cutting···





● : Stable Cutting (1st recommendation) ◐ : General Cutting (1st recommendation) ✠ : Unstable Cutting (1st recommendation)
○ : Stable Cutting (2nd recommendation) ◔ : General Cutting (2nd recommendation) ⊛ : Unstable Cutting (2nd recommendation)

Workpiece Material		MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
		Coated																										Coated Cermet				Cermet		Carbide							
		NEW	NEW										NEW	NEW	NEW								NEW																		
P	Steel	●	✠	○	◔	⊛	⊛	●																		⊛	⊛	◐	○	○	◔	○	○	◔	⊛						○
M	Stainless Steel								●	◐	✠	✠	●										◐		◔	⊛	⊛		○	○		○		⊛							
K	Cast Iron													●	◐	✠	◔	⊛							◔	⊛			○	○		○		⊛	○	◔						○
N	Non-ferrous Metal																																			◔	●				○
S	Heat resistant Alloy, Titanium Alloy																		●	◐	✠	○	◐	○	◔	⊛										◔	●	◐	●	◐	

Shape	Order Number	(ISO) Number	RE (inch)
Flat Top	TPG220.5	TPGN110302	.008
	TPG221	TPGN110304	.016
	TPG222	TPGN110308	.031
	TPG320.5	TPGN160302	.008
	TPG321	TPGN160304	.016
	TPG322	TPGN160308	.031
	TPG323	TPGN160312	.047
	TPG324	TPGN160316	.063
	TPG332	TPGN160408	.031
	TPG431	TPGN220404	.016
	TPG432	TPGN220408	.031

Order Number	MC6115	MC6125	MC6015	MC6025	MC6035	UH6400	MS6015	MC7015	MC7025	MP7035	US735	MS7025	MC5105	MC5115	MC5125	MC5005	MC5015	MP9005	MP9015	MP9025	US905	MS9025	VP05RT	VP10RT	VP15TF	UP20M	MP3025	AP25N	VP25N	VP45N	NX2525	NX3035	UTi20T	HTi05T	HTi10	RT9005	RT9010	MT9005	MT9015	TF15
TPG220.5																																			●					
TPG221																															★		★	★	●					
TPG222																										●									●					
TPG320.5																																			★					
TPG321																										●					★		★	★	●					
TPG322																										●					★		●	★	●					
TPG323																																			●					
TPG324																																			●					
TPG332																																	★							
TPG431																										●									●					
TPG432																										●									●					

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

EXTERNAL TURNING ➤ –
BORING ➤ –
CHIP BREAKER ➤ A078
GRADES ➤ A034
IDENTIFICATION ➤ A002

Memo

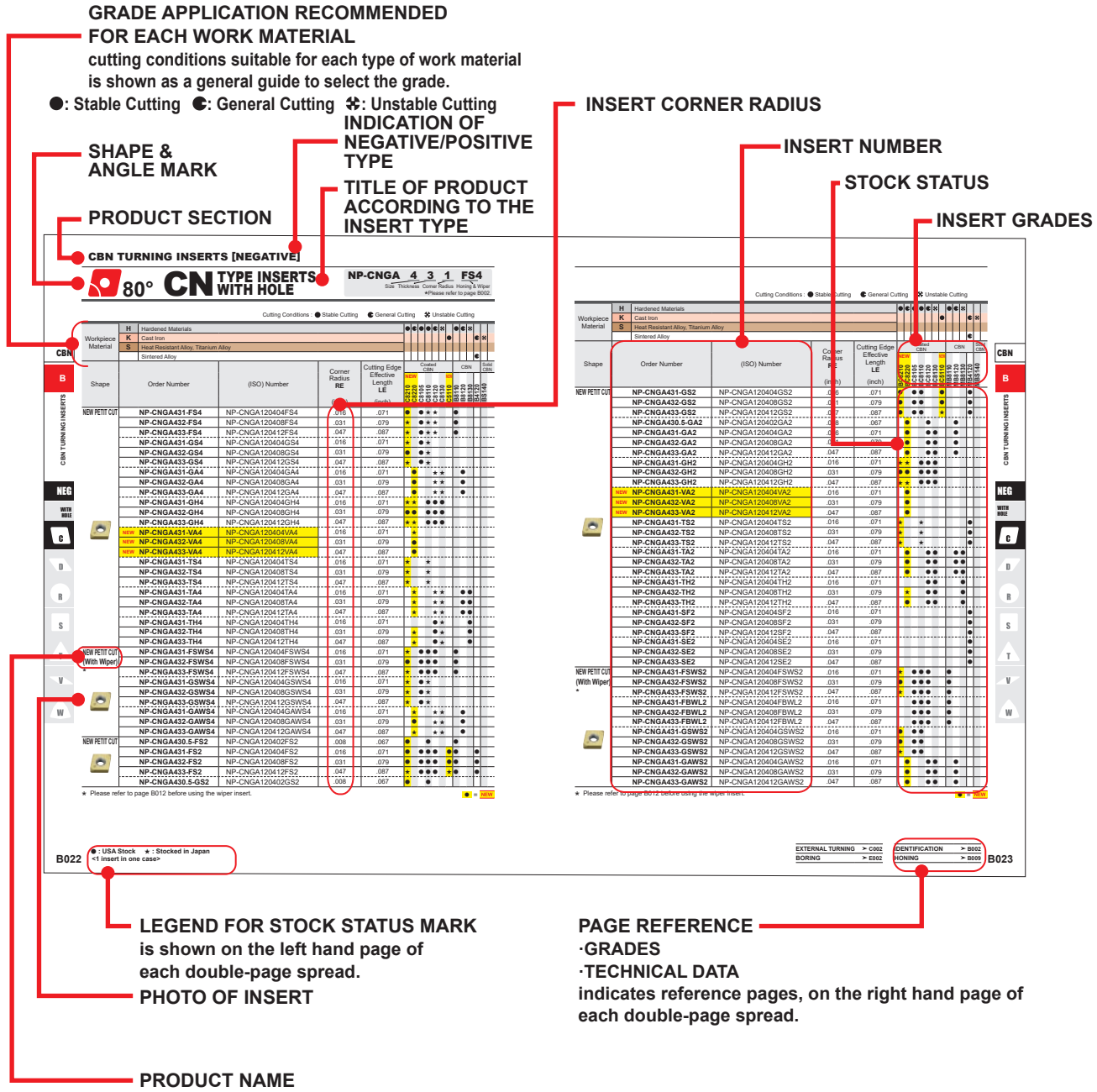
HOW TO READ THE STANDARD OF CBN & PCD TURNING INSERTS

●How this section page is organized

①Organized according to turning insert shape.
(Refer to the index on the next page.)

②Inserts are arranged in order of :

- Negative inserts (with hole→without hole)
- Positive inserts (with hole→without hole)



●To Order : Please specify insert number and grade.

TURNING TOOLS

CBN & PCD INSERT STANDARDS
CBN & PCD INSERT GRADES

IDENTIFICATION ····· B002
CLASSIFICATION OF CBN & PCD GRADES ····· B004
INTRODUCTION OF CBN GRADES ····· B006
CBN ····· B008
HONING ····· B009
CBN BREAKER INSERT ····· B010
WIPER INSERT ····· B012
CBN GROOVING SERIES (GY) ····· B014
INTRODUCTION OF PCD (SINTERED DIAMOND) GRADES ··· B015
CLASSIFICATION OF CBN & PCD INSERTS ····· B016

STANDARD OF CBN TURNING INSERTS

NEGATIVE INSERTS WITH HOLE
CN○○TYPE···RHOMBIC 80° ····· B022
DN○○TYPE···RHOMBIC 55° ····· B025
SN○○TYPE···SQUARE 90° ····· B029
TN○○TYPE···TRIANGULAR 60° ····· B030
VN○○TYPE···RHOMBIC 35° ····· B032
WN○○TYPE···TRIGON 80° ····· B034

NEGATIVE INSERTS WITHOUT HOLE
CN○○TYPE···RHOMBIC 80° ····· B034
DN○○TYPE···RHOMBIC 55° ····· B035
RN○○TYPE···ROUND ····· B035
SN○○TYPE···SQUARE 90° ····· B036
TN○○TYPE···TRIANGULAR 60° ····· B036

POSITIVE INSERTS WITH HOLE
CC○○TYPE···RHOMBIC 80° ····· B037
CP○○TYPE···RHOMBIC 80° ····· B039
DC○○TYPE···RHOMBIC 55° ····· B040
TC○○TYPE···TRIANGULAR 60° ····· B042
TP○○TYPE···TRIANGULAR 60° ····· B043
VB○○TYPE···RHOMBIC 35° ····· B045
VC○○TYPE···RHOMBIC 35° ····· B046

POSITIVE INSERTS WITHOUT HOLE
SP○○TYPE···SQUARE 90° ····· B047
GY TYPE ····· B048

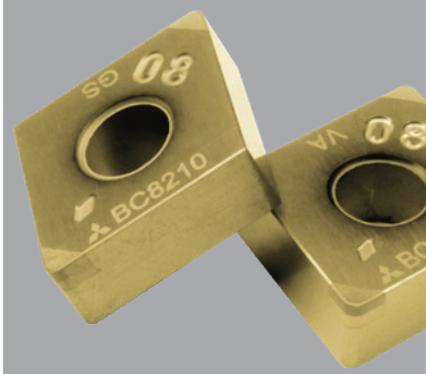
STANDARD OF PCD TURNING INSERTS

NEGATIVE INSERTS WITH HOLE
CN○○TYPE···RHOMBIC 80° ····· B049
DN○○TYPE···RHOMBIC 55° ····· B049
SN○○TYPE···SQUARE 90° ····· B050
TN○○TYPE···TRIANGULAR 60° ····· B050
VN○○TYPE···RHOMBIC 35° ····· B051

NEGATIVE INSERTS WITHOUT HOLE
SN○○TYPE···SQUARE 90° ····· B052

POSITIVE INSERTS WITH HOLE
CC○○TYPE···RHOMBIC 80° ····· B053
CP○○TYPE···RHOMBIC 80° ····· B053
DC○○TYPE···RHOMBIC 55° ····· B054
SP○○TYPE···SQUARE 90° ····· B054
TC○○TYPE···TRIANGULAR 60° ····· B055
TP○○TYPE···TRIANGULAR 60° ····· B056
VB○○TYPE···RHOMBIC 35° ····· B058
VC○○TYPE···RHOMBIC 35° ····· B058
WC○○TYPE···TRIGON 80° ····· B059
WP○○TYPE···TRIGON 80° ····· B059
DE○○TYPE···RHOMBIC 55° ····· B060
TE○○TYPE···TRIANGULAR 60° ····· B060
VD○○TYPE···RHOMBIC 35° ····· B061

POSITIVE INSERTS WITHOUT HOLE
SP○○TYPE···SQUARE 90° ····· B062
TP○○TYPE···TRIANGULAR 60° ····· B062



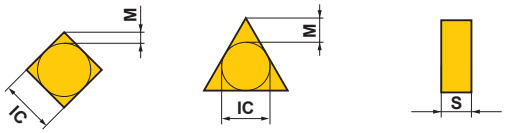
IDENTIFICATION

Symbol	Insert Shape
S	Square
T	Triangular
C	Rhombic 80°
D	Rhombic 55°
V	Rhombic 35°
W	Trigon
R	Round

② Symbol for Insert Shape

BM	With Breaker
BF	With Breaker
NP	Petit Tip
No mark	Standard Type

① Insert Geometry



Triangular insert with a facet (Secondary Cutting Edge)

④ Symbol for Tolerance Class

Symbol	Tolerance of Nose Height **M** (inch)	Tolerance of Inscribed Circle **IC** (inch)	Tolerance of Thickness **S** (inch)
G	±.001	±.001	±.005
M*	±.003 – ±.0063	±.002 – ±.003	±.005

*As a rule, the sides of these inserts are as sintered. Tolerance differs with insert size. For the accuracy of class M, refer to the table on the right.

Detail of M Class Insert Tolerance

●Tolerance of Nose Height **M** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.003	±.003	±.003	±.004	±.0063	–
.375	±.003	±.003	±.003	±.004	±.0063	–
.500	±.005	±.005	±.005	±.006	–	–

●Tolerance of Inscribed Circle **IC** (inch)

I.C.	Triangular	Square	Rhombic 80°	Rhombic 55°	Rhombic 35°	Round
.250	±.002	±.002	±.002	±.002	±.002	–
.375	±.002	±.002	±.002	±.002	±.002	±.002
.500	±.003	±.003	±.003	±.003	–	±.003

④ Symbol for Tolerance Class

	①	②		④	
INCH	NP	- C	N	G	A
METRIC	NP	- C	N	G	A
			③		⑤

③ Symbol for Relief Angle

Symbol	Relief Angle
B	5°
C	7°
D	15°
E	20°
N	0°
P	11°

⑤ Symbol for Chipbreaker and Clamping System

Inch			Metric									
Figure	I.C. .250" and over	I.C. under .250"	Symbol	Hole	Hole Configuration	Chip Breaker	Figure	Symbol	Hole	Hole Configuration	Chip Breaker	Figure
	A	D	W	With Hole	Cylindrical Hole + One Countersink (40—60°)	No		A	With Hole	Cylindrical Hole	No	
	M	P	T	With Hole		One Sided		M	With Hole	Cylindrical Hole	One Sided	
	N	E	B	With Hole	Cylindrical Hole + One Countersink (70—90°)	No		N	Without Hole	–	No	
Special Design	X	X	H	With Hole		One Sided		X	–	–	–	Special Design

Inch		Diameter of Inscribed Circle (inch)	Metric						
I.C. .250" and over	I.C. under .250"		R	W	V	D	C	S	T
	1.2	.156		**02**		**04**	**03**	**03**	**06**
	1.5	.187		**L3**	**08**	**05**	**04**	**04**	**08**
	1.8	.219		**03**	**09**	**06**	**05**	**05**	**09**
2		.250		**04**	**11**	**07**	**06**	**06**	**11**
2.5		.313		**05**	**13**	**09**	**08**	**07**	**13**
3		.375	**09**	**06**	**16**	**11**	**09**	**09**	**16**
4		.500	**12**	**08**	**22**	**15**	**12**	**12**	**22**

⑥ Symbol for Insert Size

Thickness is from the bottom of the insert to the top of the cutting edge.

Inch		Thickness (inch)	Metric
I.C. .250" and over	I.C. under .250"		
–	**0.9**	.055	**S1**
–	**1**	.063	**01**
–	**1.1**	.070	**T0**
–	**1.5**	.094	**02**
–	**1.8**	.109	**T2**
2	–	.125	**03**
2.5	–	.156	**T3**
3	–	.187	**04**

⑦ Symbol for Insert Thickness

⑥	⑦				
4	**3**	**1**	**GA**	**WS**	**2**
12	**04**	**04**	**GA**	**WS**	**2**
		⑧	⑨	⑩	⑪

⑧ Symbol for Insert Corner Configuration		
Inch	Corner Radius (inch)	Metric
0.5	.008	**02**
1	.016	**04**
2	.031	**08**
3	.047	**12**
4	.063	**16**

⑨ Application (Honing)	
F FA FB FS	Continuous Cutting
G GA GB GH GS GN	General Cutting
T TA TH TS	Interrupted Cutting
SF SE	Edge Treatment for Sintered Alloy

Please refer to page B009 for further information.

⑩ Wiper	
WS	For High Rigidity Work Material
WL	For Deflection and Vibration Prevention
No mark	Without Wiper

⑪ Number of Tips	
2	2
3	3
⋮	⋮
No mark	1

CLASSIFICATION OF CBN & PCD GRADES

UNCOATED CBN MATERIALS

CBN sintered material based cutting tools are produced by binding CBN (cubic Boron Nitride) and ceramic. Its hardness is next to diamond and it is sintered under ultra-high pressure and high temperature.
CBN has a lower affinity to iron than diamond. The low affinity and high hardness properties mean that sintered CBN delivers a superior cutting performance especially during high-speed machining of materials such as hardened steel, cast iron and sintered alloys, etc.

COATED CBN MATERIALS

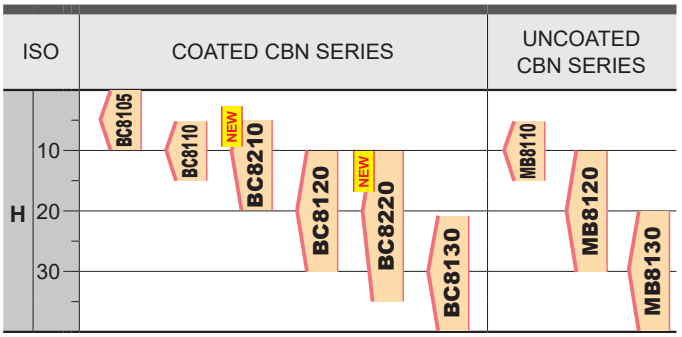
Mitsubishi Materials achieves longer tool life by using a unique "particle-activated sintering method" and combines it with an increased cutting edge strength. This specially developed PVD ceramic coating for CBN grades has a high crater wear resistance, longer tool life, and improved machine efficiency that exceed the conventional CBN grades.

PCD MATERIALS (Sintered Diamond)

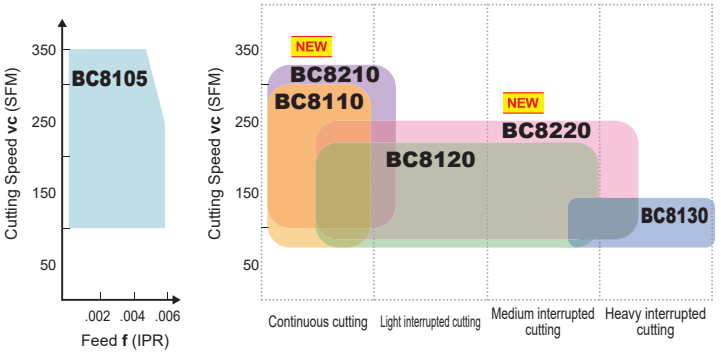
Suitable for cutting materials such as non ferrous metals and fiber reinforced plastics (FRP) including aluminum alloys.
It supports ultra-high-speed finish cutting.

Workpiece materials for turning grades/application area

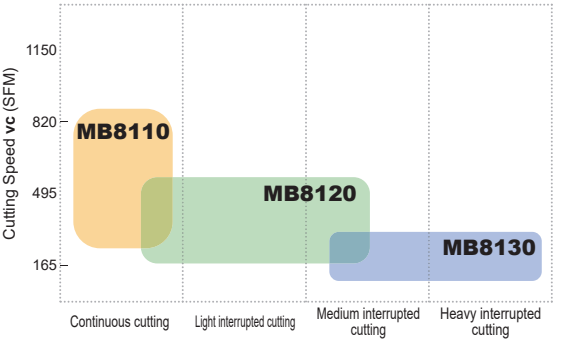
Hardened Steel



COATED CBN MATERIALS



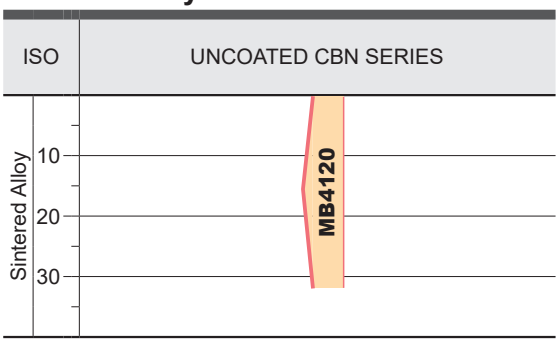
UNCOATED CBN MATERIALS

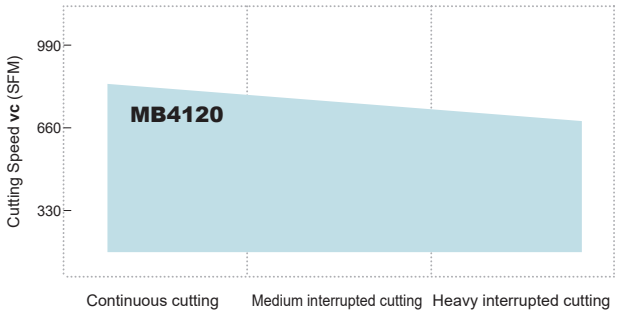


Suitable for finishing with surface roughness Ra .024 µinch or Rz .094 µinch or less.

Coated CBN Grades BC8200, BC8100 and Uncoated CBN Grade MB8100 for high hardness steel machining are available in a wide range of areas from finishing to continuous cutting of hardened steels and strongly interrupted machining.

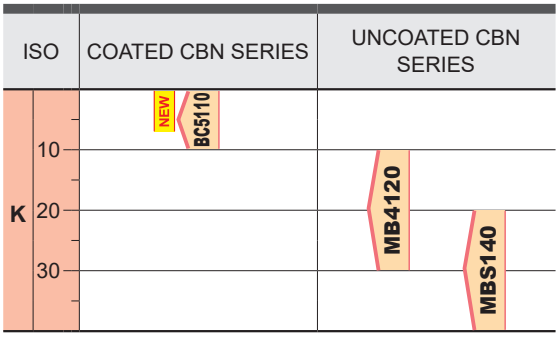
Sintered Alloys

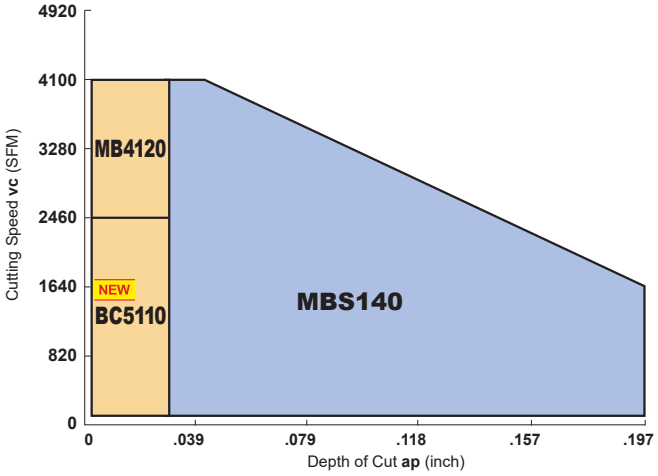




The CBN grade MB4120 for sintered alloys and cast iron cutting can be used widely from continuous cutting to interrupted cutting in the machining of cast iron and sintered alloys for valve mechanism parts and oil pump parts.

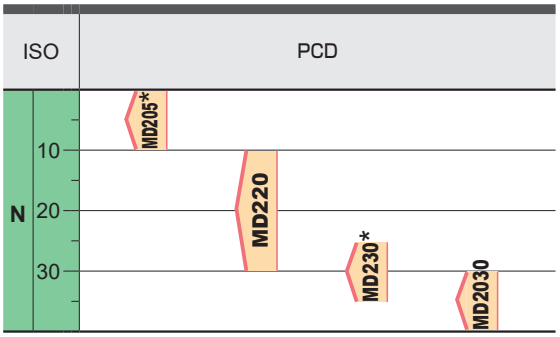
Cast Iron

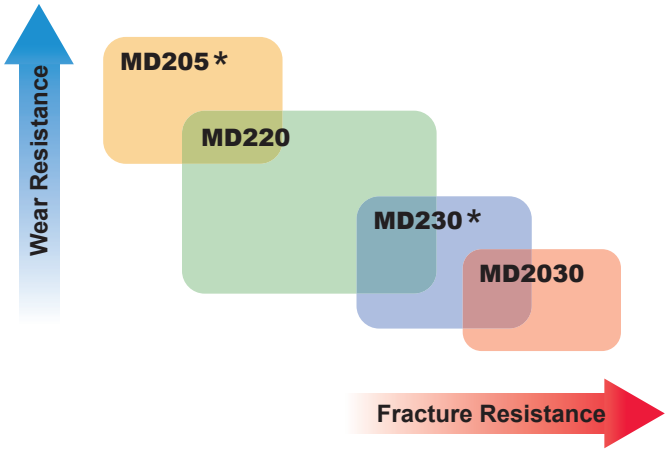




Lineup of grades available from general cutting to cutting of deep depths for high efficiency machining.

Aluminum Alloys





Suitable for cutting materials such as non ferrous metals and fiber reinforced plastics (FRP) including aluminum alloys.
It supports ultra-high-speed finish cutting.

*MD205 and MD230 are produced-to-order products.

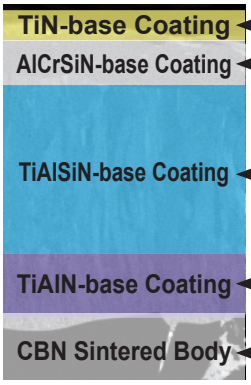
INTRODUCTION OF CBN GRADES

Coated CBN Grade for Machining of Hardened Steel

NEW BC8200 series

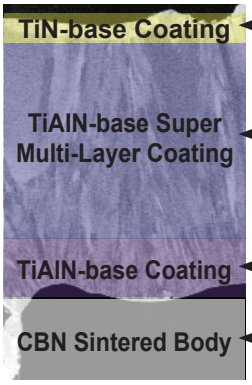
The new CBN substrate contains a new ultra micro-particle and heat resistant binder that suppress both chipping and crater wear which promotes longer tool life.

BC8210 NEW



- TiN-base Coating: Gold color assists easy identification of edge use.
- AlCrSiN-base Coating: Excellent chipping resistance. Absorbs impact forces.
- TiAlSiN-base Coating: Excellent wear resistance. Abrasion resistant layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8210.
- CBN Sintered Body: Excellent crater wear and chipping resistance. Exclusive BC8210 sintered body.

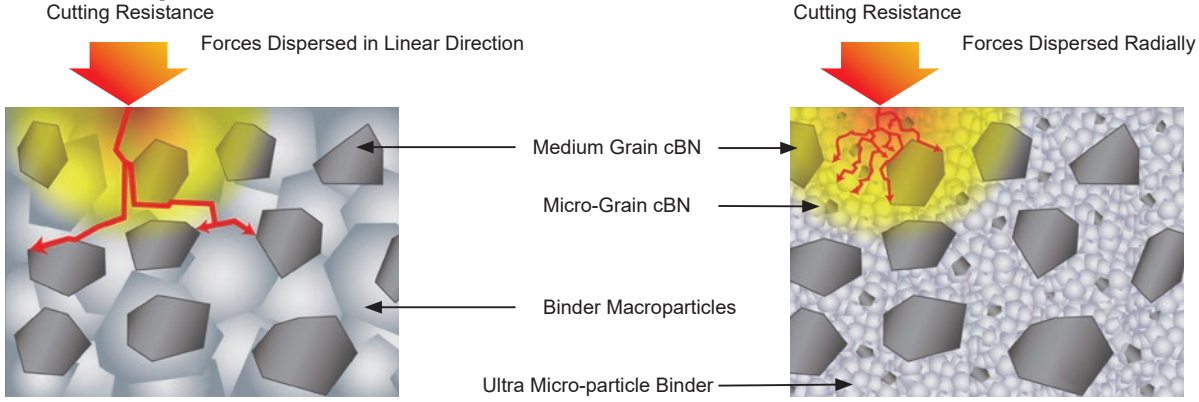
BC8220 NEW



- TiN-base Coating: Gold color assists easy identification of edge use.
- TiAlN-base Super Multi-Layer Coating: High wear and chipping resistance. Super Multi-Layer.
- TiAlN-base Coating: Improved strength of adhesion to the CBN substrate prevents peeling. High adhesion layer for BC8220.
- CBN Sintered Body: Excellent crater wear and fracture resistance. Exclusive BC8220 sintered body.

Ultra Micro-Particle Binder Prevents Sudden Defects

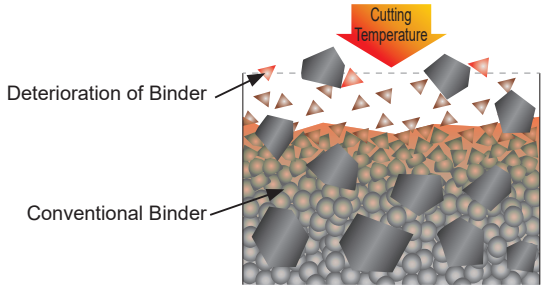
The ultra micro-particle binder cBN added to the CBN base material prevents linear crack development and avoids sudden fracturing.



Conventional **BC8200, BC8100 Series**

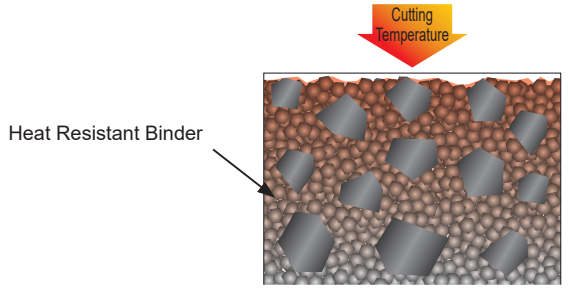
Heat Resistant Binder Suppresses Crater Wear

By increasing the heat reistance of the binder, wear resistance due to the deterioration of the binder component increases, thereby suppressing crater wear, chipping, and fracturing.



As binder wear progresses due to the heat produced during cutting, the cBN particles are exposed and lost.

Conventional



Suppresses the binder wear caused by cutting heat.

BC8200 Series

Coated CBN Grade for Machining Cast Iron

NEW BC5110

BC5110 uses a tough substrate with a remarkably hard coating to provide excellent chipping and wear resistance.

Excellent Chipping Resistance

Compared to conventional grades, the fine grain and high cBN content greatly improve chipping resistance and provide stability and long tool life.

Excellent Wear Resistance Coating

The hard ceramic coating layer provides excellent surface finishes as well as wear and notch resistance during continuous cutting.
Additionally, chipping and peeling of the coating layer is suppressed due to the improved bonding strength to the cBN substrate.

FOR CYLINDER LINER

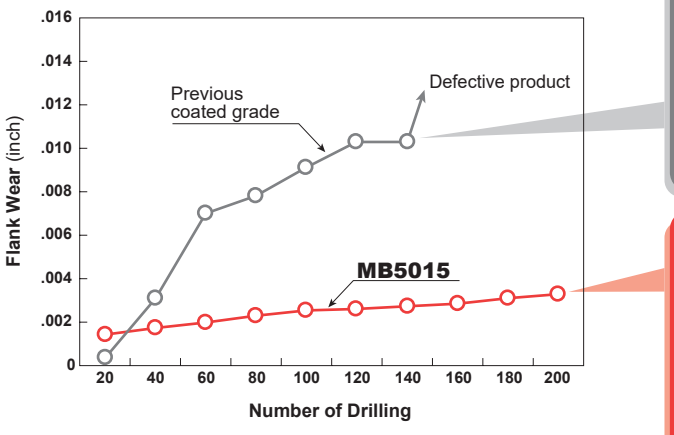
MB5015 *Produced to order only.

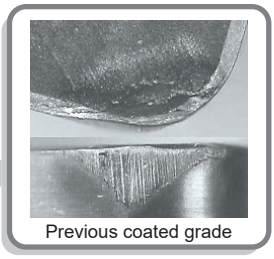
MB5015 is an exclusive grade for boring of centrifugal casting cylinder liners in semi finishing or finishing applications with high wear resistance.

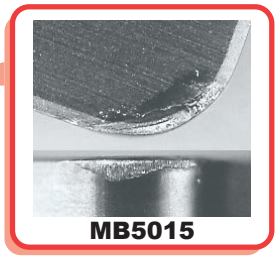
■ Recommended Cutting Conditions

Work Material		Cutting Mode	Cutting Speed vc (SFM) 330 1640 3280 4920	Feed f (IPR)	Depth of Cut ap (inch)	Cutting Mode
Centrifugal casting	Cast Iron	Continuous cutting		–.012(Finishing) –.031(Semi-finishing)	–.002(Finishing) –.008(Semi-finishing)	Wet Cutting

■ Cutting Performance







<Cutting Conditions>
Work material : AISI No 30 B (Centrifugal casting) ϕ2.48"
Cutting Speed : vc=2625 SFM Feed : f=.014 IPR Depth of Cut : ap=.001 inch
Compornent : Centrifugal casting Cylinder liner Hole Depth : 3.94 inch

CBN

- Suitable for high speed finishing of heat treated steel, sintered ferrous alloy and cast iron.
- Low affinity to iron, thus good surface finishes are possible.
- Grinding can be replaced by machining.

●Heat Treated Steel

Work Material		Type	Cutting Mode	Recommended Grade	Recommended Cutting Conditions			
					Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)	Cutting Mode
Structural Steel Esp. Carburized Steel High Alloy Steel	35—65 HRC	Coated	High speed finishing cutting	**BC8105**	820 (330—1150)	≤.006	≤.008	Dry,Wet
			Continuous cutting for general purpose	NEW **BC8210** **BC8110**	655 (330—985)	≤.008	≤.014	Dry,Wet
				NEW **BC8220** **BC8120**	655 (330—755)	≤.012	≤.031	Dry,Wet
			Medium interrupted cutting	NEW **BC8220** **BC8120**	490 (195—655)	≤.008	≤.012	Dry,Wet
			Interrupted cutting	**BC8130**	390 (195—490)	≤.008	≤.012	Dry,Wet
		Non-coated	Continuous cutting for general purpose	**MB8110**	655 (330—820)	≤.008	≤.012	Dry,Wet
				MB8120	490 (260—720)	≤.008	≤.020	Dry,Wet
			Medium interrupted cutting	**MB8120**	425 (280—590)	≤.008	≤.012	Dry,Wet
			Interrupted cutting	**MB8130**	330 (195—490)	≤.008	≤.012	Dry,Wet

●Cast Iron

Work Material		Work Structure	Cutting Speed vc (SFM) 820 1640 2460 3280 4100	Feed f (IPR)	Depth of Cut ap (inch)	Cutting Mode
Gray Cast Iron	AISI No 35 B	Ferritic + Pearlitic	**MBS140** / **BC5110** / **MB4120**	—.020	—.039 MBS140 —.200	Dry,Wet
	AISI No 45 B	Pearlitic				
Alloy Cast Iron		Pearlitic		—.016	—.020	Dry,Wet
Ductile Cast Iron	AISI 60-40-18	Ferritic	**MB4120**	—.016	—.020	Dry,Wet
	AISI 100-70-03	Ferritic + Pearlitic Pearlitic				

●Sintered Alloy

Work Material	Recommended Grade	Recommended Cutting Conditions		
		Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)
General Sintered Alloy	**MB4120**	590 (260—985)	—.008	—.012
High Density Sintered Alloy	**MB4120**	490 (260—755)	—.008	—.012
Sintered Alloy	**MB4120**	425 (260—590)	—.008	—.012

●Valve Seat

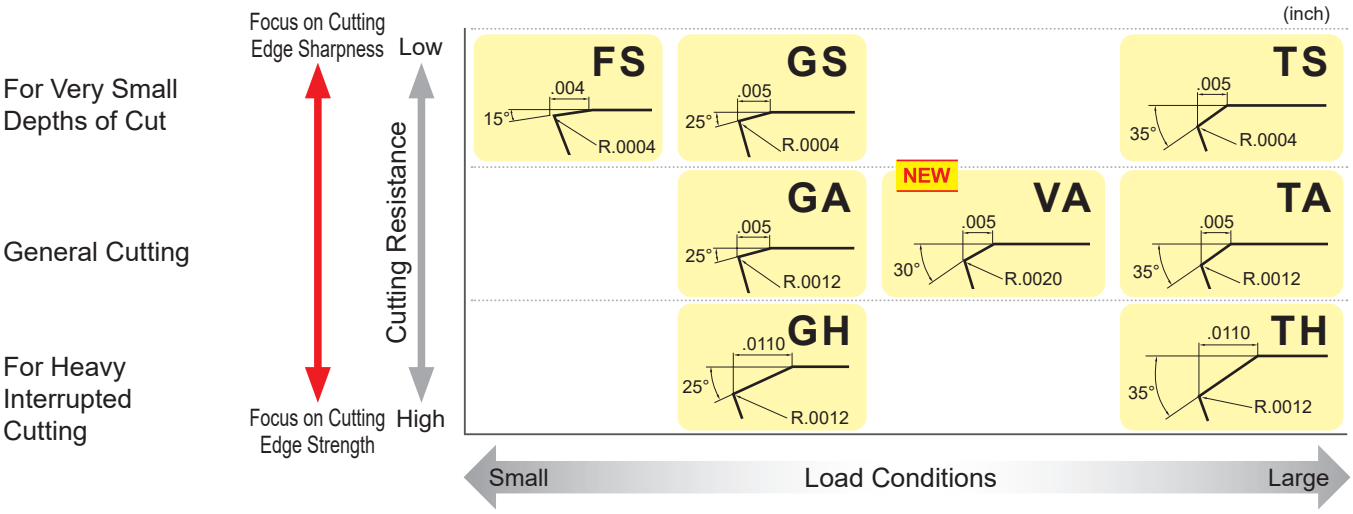
Amount of Hard Particles	None or Small ← → Large			
Hardness of Workpiece (HV)	150	250	300	350
Plunge Cut	**MB4120**			
Traverse Cut	**MB4120**			

●Roll

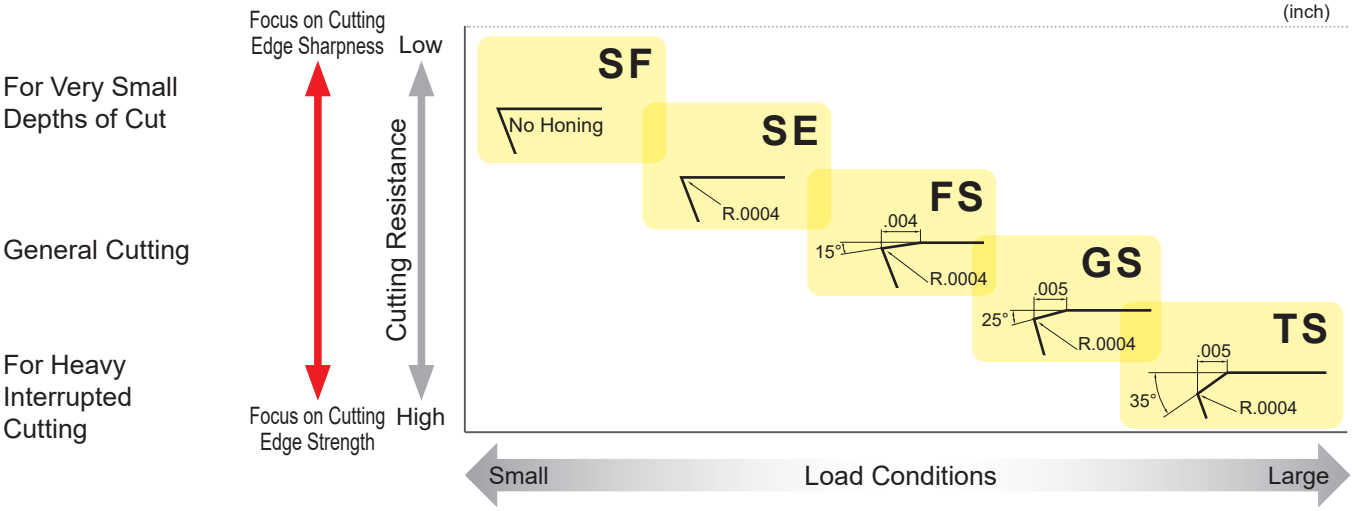
Work Material	Grade	Recommended Cutting Conditions		
		Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)
Cemented Carbide	**MBS140**	65 (30—100)	—.008	—.008

HONING

Honing for Machining Hardened Steel

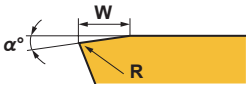


Honing for Machining Sintered Alloys



NP-CNGA120408-GA2

Main Application — **Edge Honing Type**



(inch)

	A General			S Vibration and burr control			H High efficiency			F Focus on dimensional precision			E Chipping control		
	α	W	R	α	W	R	α	W	R	α	W	R	α	W	R
F Continuous cutting	15°	.004	0	15°	.004	.0004	—	—	—	—	—	—	—	—	—
G General cutting	25°	.005	.0012	25°	.005	.0004	25°	.0110	.0012	—	—	—	—	—	—
V For high-speed, High feed cutting	30°	.005	.0020	—	—	—	—	—	—	—	—	—	—	—	—
T Interrupted cutting	35°	.005	.0012	35°	.005	.0004	35°	.0110	.0012	—	—	—	—	—	—
S High precision cutting	—	—	—	—	—	—	—	—	—	0°	0	0	0°	0	.0004

Conventional honing shapes
F honing : .004 inch×15°+R0 **G** honing : .005 inch×25°+R.0012 **T** honing : .005 inch×35°+R.0012

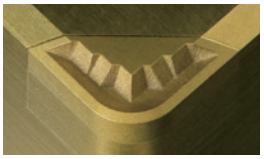
New Petit Cut Series

The surface area of the CBN sintered body has been optimized to allow for a lower price. Tool management is easier because repolishing is not required.

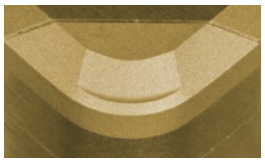
CBN BREAKER INSERT

■Application Area

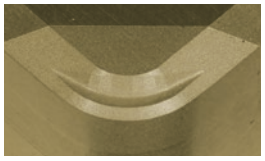
A BR breaker has been added to achieve better chip control at higher depths of cut.
A versatile range of chip breakers are available for a wide range of applications.



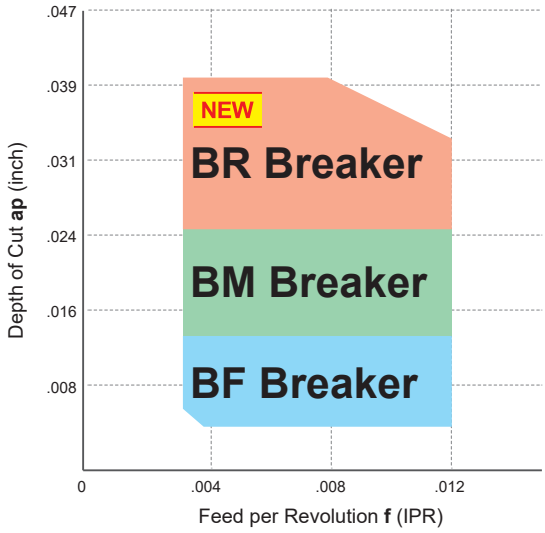
BR Breaker



BM Breaker



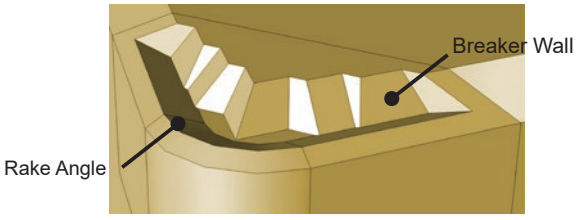
BF Breaker

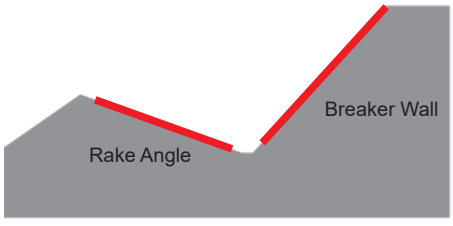


NEW BR Breaker (BC8220)

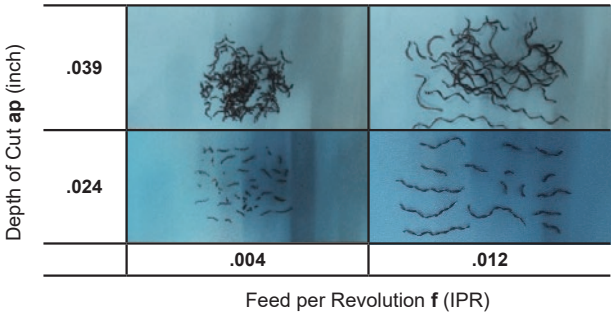
A reduced number of passes needed and improved chip control during high depth of cut.
Chips are formed with the effect from the rake angle, and the multi stage chip breaker wall supports a wide range of cuts.

Recommended Cutting Conditions : vc=260-655 SFM, f≤ .012 IPR, ap=.024-.039 inch





Achieves ideal chip control even at high depths of cut.

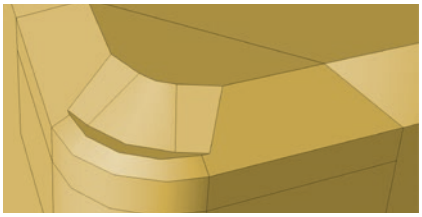


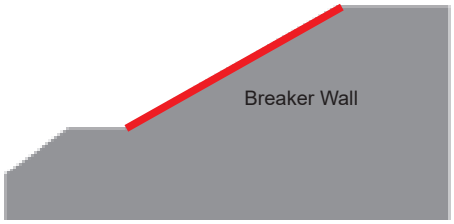
<Cutting Conditions>
Workpiece Material : AISI 5120H (60 HRC)
Insert : BR-CNGM432-TA2
Cutting Speed : vc= 655 SFM
Feed per Rev. : f= .004 IPR
.012 IPR
Depth of Cut : ap= .024 inch
.039 inch
Cutting Mode : Dry Cutting

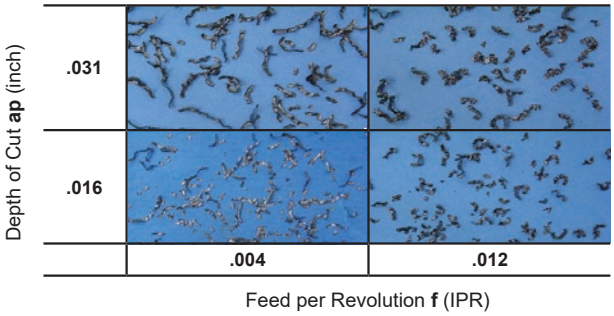
BM Breaker (BC8220)

Great chip control when machining at medium depths of cut. (.012-.031 inch)

Recommended Cutting Conditions : vc=260-655 SFM, f≤ .012 IPR, ap=.012-.031 inch





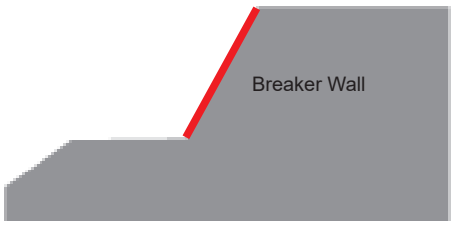


<Cutting Conditions>
Workpiece Material : JIS SCM415 (60 HRC)
Insert : BM-CNGM432-TA2
Cutting Speed : vc= 525 SFM
Feed per Rev. : f=.004 IPR
.012 IPR
Depth of Cut : ap=.016 inch
.031 inch
Cutting Mode : Dry Cutting

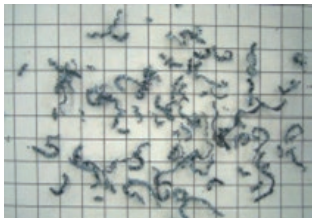
BF Breaker (BC8210, BC8220)

Achieves excellent chip control while finish cutting at depths of .012 inch or less.

Recommended Cutting Conditions : vc=260-655 SFM, f≤ .012 IPR, ap=.004-.012 inch

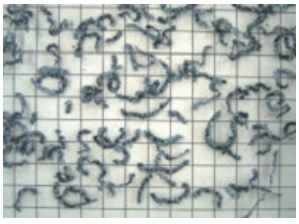


External Turning



Cutting Speed : vc = 330 SFM
Feed per Rev. : f=.008 IPR
Depth of Cut : ap = .012 inch

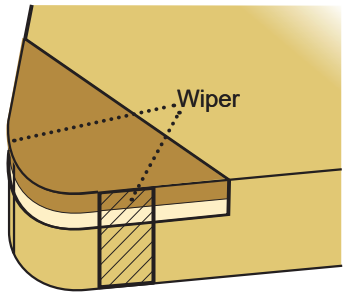
Boring



Cutting Speed : vc = 395 SFM
Feed per Rev. : f = .008 IPR
Depth of Cut : ap = .012 inch

<Cutting Conditions>
Workpiece Material : JIS SCM415 (60 HRC)
Insert : BF-CNGM432-TS2
Cutting Mode : Dry Cutting

WIPER INSERT



Improving Surface Finish

Under the same machining conditions as conventional breakers, but with the feed rate increased, the surface finish of the workpiece can be improved.

Improving Efficiency

High feed rates not only shorten machining times but also make it possible to combine roughing and finishing operations.

Increased Tool Life

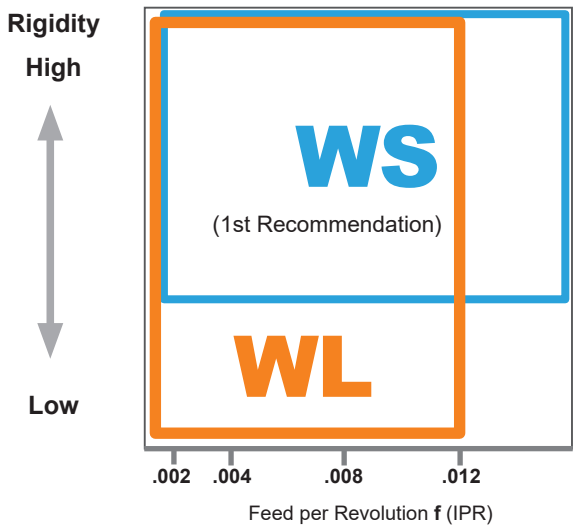
When changed to high feed conditions, the time required to cut one component is decreased, thus more parts can be machined with each insert. In addition, the high feed rate prevents rubbing, therefore, delaying the progression of wear and increasing the tool life of the insert.

Improving Chip Control

Under high feed conditions, the chips generated become thicker and are more easily broken, thus, chip control is improved.

■ Application of Wiper Inserts

The most recommended wiper shape is the WS Wiper. If deflection or chatter occur, use the WL Wiper.

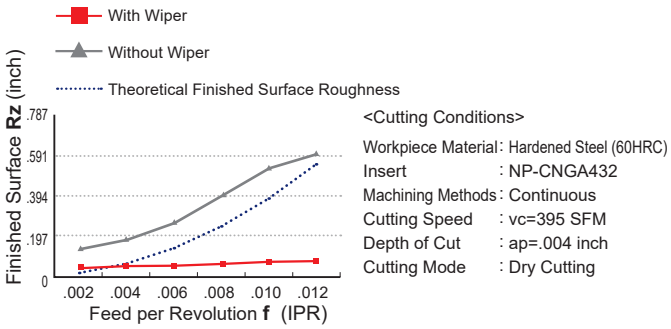


Examples of Low Rigidity:

- When overhang length is long due to boring
- When the workpiece material has a small diameter

■ Cutting Performance

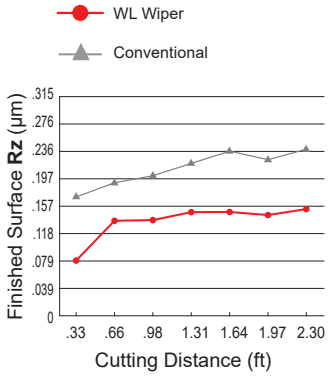
WL Wiper (External Turning)



<Cutting Conditions>

Workpiece Material	: Hardened Steel (60HRC)
Insert	: NP-CNGA432
Machining Methods	: Continuous
Cutting Speed	: vc=395 SFM
Depth of Cut	: ap=.004 inch
Cutting Mode	: Dry Cutting

WL Wiper (Boring)



<Cutting Conditions>

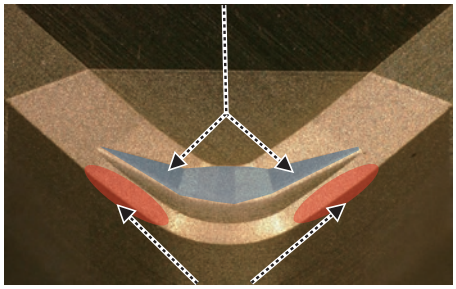
Workpiece Material	: AISI 5115 (60HRC)
Insert	: NP-CNGA432-FBWL2
Machining Methods	: Continuous
Cutting Speed	: vc=525 SFM
Feed	: f=.012 IPR
Depth of Cut	: ap=.004 inch
Cutting Mode	: Dry Cutting

Stable surface finish is maintained even in unstable cutting.

Combination of BF Breaker and WS Wiper Insert

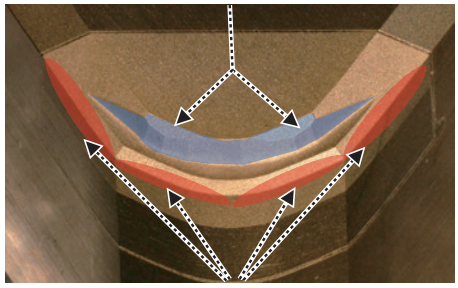
CNGM and DNGM types are now available with new inserts that combine a BF chip breaker with a WS wiper Insert.
(BC8210 : BF-○NGM○○○○○○TSWS2, BC8220 : BF-○NGM○○○○○○TAWS2)
It is effective for chip control and an improvement of finished surface roughness without worrying about the hand of the tool even when continuous external or internal turning and facing.

BF breaker



WL Wiper (No hand)
BF-CNGM120408TSWS2

BF breaker



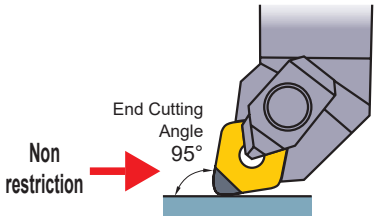
WL Wiper (No hand)
BF-DNGM150412TAWS2

■ Precautions when Using Wiper Inserts

When Using CNGM Type

No Restriction for Holders

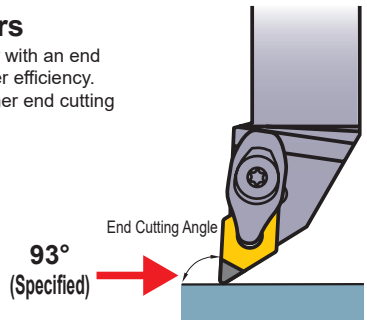
A standard holder can be used.
(*A double clamp, high rigidity tool is recommended.)



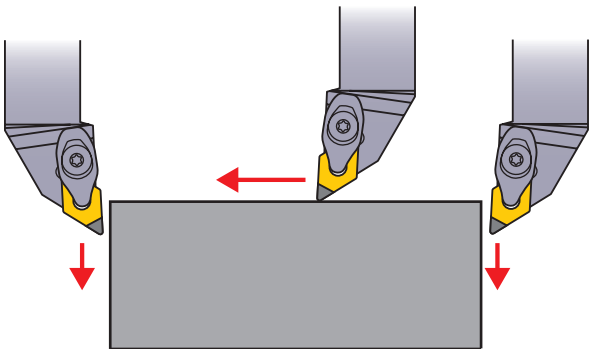
When Using DNGM Type

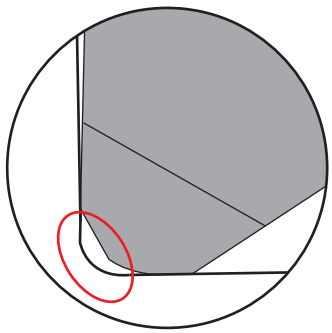
Restriction for Holders

Use a PDJN holder or DDJN holder with an end cutting angle of 93° to improve wiper efficiency.
There is no wiper efficiency with other end cutting angles (60°, 90°,107°, etc.).



Displays great wiper efficiency when machining the end face and outer diameter in both right-hand and left-hand machining.





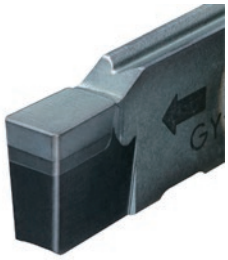
*The DNGM type is not suitable for machining the R that connects the end face and the outer diameter because it will leave uncut parts.

CBN GROOVING SERIES
(GY)

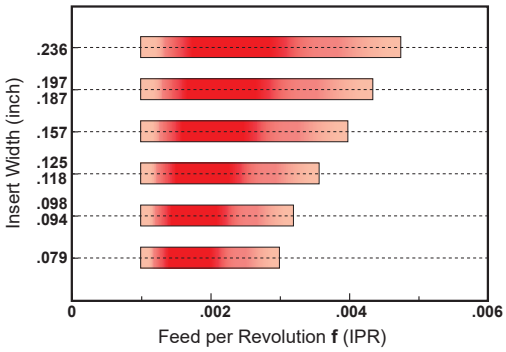
BC8110 coating for continuous machining of hardened steel has been added to GY inserts.

GY is a grooving tool series that achieves high rigidity with the "Tri-Lock System". (See page F004 for more details.)

BC8110 coating with excellent wear resistance has been added. Compared to conventional coating, it displays excellent wear resistance that achieves a longer tool life. A blade width of 6.0 has also been added to the BC8110 lineup.



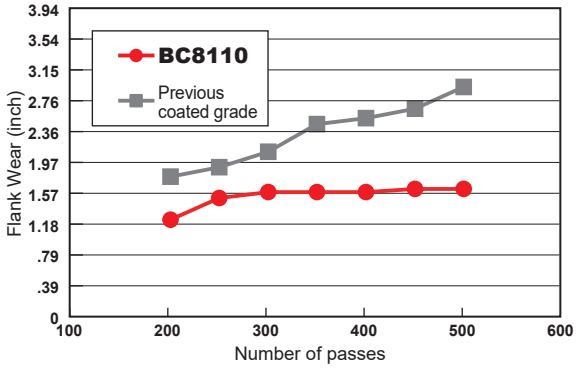
■ Recommended Cutting Conditions



Workpiece Material		Hardness	Grade	Cutting Speed vc (SFM)	Cutting Mode
H	Hardened Steel	35—65HRC	**BC8110**	330 (195—395)	Dry,Wet

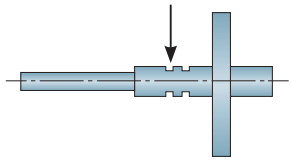
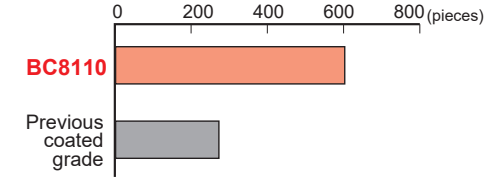
■ Cutting Performance

Tool life evaluation for the GY holder



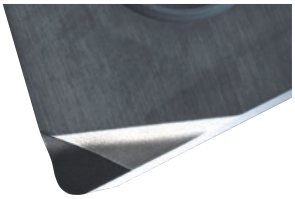
<Cutting Conditions>
Insert : GY1G0200D020N-GFGS
Workpiece Material : Hardened Steel (60HRC)
Cutting Speed : vc=395 SFM
Feed : f=.004 IPR
Depth of Cut : ap=.012 inch
Cutting Mode : Dry Cutting

■ Application Example

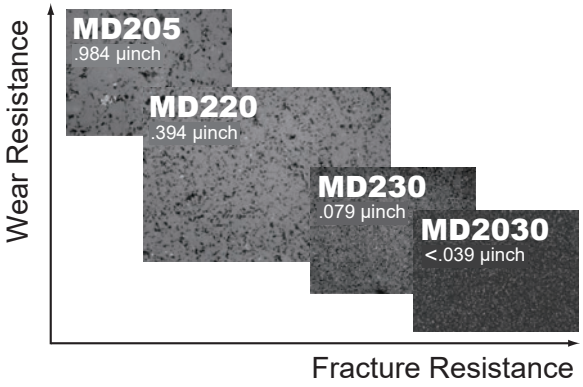
Insert	**GY1G0300F020N-GFGS** (Grade : **BC8110**)
Workpiece Material	 SNCM230H (58—62HRC)
Component	Input shaft
Cutting Conditions — Cutting Speed vc (SFM)	425
Cutting Conditions — Feed f (IPR)	.004
Result	 Tool life over twice as long as conventional products

INTRODUCTION OF PCD (SINTERED DIAMOND) GRADES

- Suitable for materials such as aluminum alloy, non ferrous metals, and fiber strengthened plastic.
- Suitable for extremely high speed finishing.



FEATURES



Grade	Features
MD205 *	**For Continuous Cutting** Coarse grain diamond particles are sintered and wear resistance is excellent. Use when wear resistance with MD220 is insufficient.
MD220	**Materials for General Machining** Sintered medium grain diamond particles. Wear resistance and fracture resistance are superbly balanced. Applicable to general finishing of non ferrous metals, non-metal cutting, and similar machining.
MD230 *	**For Interrupted Cutting** Fine grain diamond particles are used. Fracture resistance and cutting edge sharpness are excellent. Use when fracture and a high quality finished surface is demanded with MD220.
MD2030	**For Heavy Interrupted Cutting** Strong sintering of ultra micro-grain PCD particles provides exceptional fracture resistance. Chipping during high-speed finish turning can be controlled.

*MD205 and MD230 are produced-to-order products.

■ SELECTION STANDARD

TURNING

Work Material	Recommended Grade			Recommended Cutting Conditions		
	MD205	MD220	MD2030	Cutting Speed vc (SFM)	Feed f (IPR)	Depth of Cut ap (inch)
Aluminum Alloy (Si ≤ 12%)		◎	○	2625 (655—3935)	—.008	—.039
Aluminum Alloy (Si ≥13%)	◎	○		1970 (655—3280)	—.008	—.039
Copper Alloy		◎		2295 (655—3935)	—.008	—.039
Strengthened Plastic		◎		1970 (330—3280)	—.016	—.039
Glass Fiber Reinforced Plastic		◎		1640 (330—2625)	—.010	—.039
Carbon	○	◎		1310 (330—1970)	—.012	—.039
Ceramics		○		165 (100—260)	—.004	—.039
Hard Rubber		◎		1970 (985—2625)	—.006	—.039
Wood Inorganic Board		◎		4265 (985—13120)	—.016	—
Cemented Carbide	◎	○		50 (15—65)	—.008	—.020

Note1) ◎ : 1st recommendation. ○ : 2nd recommendation
Note2) Not suitable for steel.

■ NEW PETIT CUT INSERT SERIES

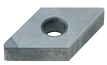
- **Economical** Low cost is achieved by reducing the area of the diamond sintered body. In addition, tool management is economical because regrinding is unnecessary.
- **With Breaker** Chip breaker formed directly on the PCD portion delivers superior chip control.
- Corner R.002" inserts are available, making it suitable for the machining of small work corner radii.

CLASSIFICATION

NEGATIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type Double-Sided	G	Flat Top	NP-CNGA_○4 → B022	NP-DNGA_○4 → B025		NP-TNGA_○6 → B030	NP-VNGA_○4 → B032	NP-WNGA_○6 → B034
	Multi-Corner Type Double-Sided With Wiper		Flat Top	NP-CNGA_○W○4 → B022					
	Multi-Corner Type Single Sided		Flat Top	NP-CNGA_○2 → B023	NP-DNGA_○2 → B026	NP-SNGA_○2 → B029	NP-TNGA_○3 → B030	NP-VNGA_○2 → B032	NP-WNGA_○3 → B034
	Multi-Corner Type Single Sided With Wiper		Flat Top	NP-CNGA_○W○2 → B023	NP-DNGA_○W○2J_R/L → B028				NP-WNGA_○W○3 → B034
	Multi-Corner Type Single Sided With Breaker		BF	BF-CNGM_○2 → B025	BF-DNGM_○2 → B028				
	Multi-Corner Type Single Sided With Breaker With Wiper		BF	BF-CNGM_○WS2 NEW → B025	BF-DNGM_○WS2 NEW → B028				
	Multi-Corner Type Single Sided With Breaker		BM	BM-CNGM_○2 → B025	BM-DNGM_○2 → B028		BM-TNGM_○3 → B031		
	Multi-Corner Type Single Sided With Breaker		BR	BR-CNGM_○2 NEW → B025	BR-DNGM_○2 NEW → B028				
	One-Corner Type Single Sided With Breaker	M	R/L-F	NP-CNMM_R-F → B049	NP-DNMM_R-F → B049	NP-SNMM_R-F → B050	NP-TNMM_R-F → B050	NP-VNMM_R-F → B051	

NEGATIVE INSERTS WITH HOLE

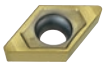
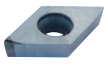
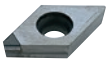
Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
STANDARD	Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGA B024		SNGA B029	TNGA B031		
	One-Corner Type Single Sided	M	Flat Top	CNMA B049					
	One-Corner Type Single Sided	G	Flat Top		DNGA  B049	SNGA B050	TNGA B050	VNGA B051	

5° POSITIVE INSERTS WITH HOLE

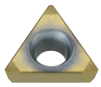
Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top					NP-VBGW_○2 B045	
	One-Corner Type With Breaker		R-F					NP-VBGT_R-F B058	

CLASSIFICATION

7° POSITIVE INSERTS WITH HOLE

Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CCGW_○2 B038	NP-DCGW_○2  B040		NP-TCGW_○3 B042	NP-VCGW_○2 B046	
	Multi-Corner Type With Wiper		Flat Top	NP-CCGW_○W○2 B038					
	Multi-Corner Type With Breaker		BF	BF-CCGT_○2 B038	BF-DCGT_○2 B041				
	Multi-Corner Type With Breaker		BM	BM-CCGT_○2 B038	BM-DCGT_○2 B041				
	One-Corner Type With Breaker	M	Breaker	NP-CCMH B053					
	One-Corner Type	G	Flat Top	NP-CCGW_○ B038					
	One-Corner Type	M	Flat Top	NP-CCMW B053					
	One-Corner Type With Breaker		R/L-F		NP-DCMT_R/L-F  B054				
	One-Corner Type With Breaker	G	R-F					NP-VCGT_R-F B058	
STANDARD	One-Corner Type	M G	Flat Top	CCMW B053	DCMW  B054		TCMW TCGW B055	VCGW NEW B058	WCMW B059

11° POSITIVE INSERTS WITH HOLE

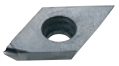
Product Name	Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Rhombic 35°	Trigon 80°
NEW PETIT CUT	Multi-Corner Type	G	Flat Top	NP-CPGB_○2 B039			NP-TPGB_○3  B044		
NEW PETIT CUT	One-Corner Type With Breaker	M	Breaker	NP-CPMH B053					
NEW PETIT CUT	One-Corner Type With Breaker	M	R/L-F				NP-TPMX_R/L-F B056		
NEW PETIT CUT	One-Corner Type With Breaker	M	R/L-F				NP-TPMH_R/L-F B056		
STANDARD	One-Corner Type With Breaker	G	Breaker	CPGT B053					WPGT B059
STANDARD	One-Corner Type	G	Flat Top			SPGX B054	TPGX B057		
STANDARD	One-Corner Type With Breaker	G	R/L-F				TPGT/V_R/L-F B056, B057		

CLASSIFICATION

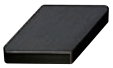
15° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 35°
One-Corner Type (For Aluminum With Breaker)	G	R/L	VDGX_R/L-F ➔ B061

20° POSITIVE INSERTS WITH HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 55°	Triangular 60°
One-Corner Type (For Aluminum With Breaker)	G	R/L		TEGX_R/L ➔ B060
One-Corner Type (For Aluminum With Breaker)		R/L-F	DEGX_R/L-F  ➔ B060	
One-Corner Type (For Aluminum)		Flat Top		TEGX ➔ B060

NEGATIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Rhombic 80°	Rhombic 55°	Square 90°	Triangular 60°	Round
One-Corner Type Single Sided	G	Flat Top			SNGN B052		
Multi-Corner Type Double-Sided (Solid CBN)	G	Flat Top	CNGN B034	DNGN  B035	SNGN B036	TNGN B036	RNGN B035

11° POSITIVE INSERTS WITHOUT HOLE

Type	Tolerance	Breaker Name and Cross Section	Square 90°	Triangular 60°
Multi-Corner Type	G	Flat Top	NP-SPGN_◌2 NEW B047	
One-Corner Type	G	Flat Top	SPGN B062	TPGN B062

SPECIAL PURPOSE INSERTS

Tool Holder Type	Tolerance	Inserts
GY Type	G	GY_GFGS B048

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 FS4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN BC8210	Coated CBN BC8220	Coated CBN BC8105	Coated CBN BC8110	Coated CBN BC8120	Coated CBN BC8130	Coated CBN BC5110	CBN MB8110	CBN MB8120	CBN MB8130	CBN MB4120	Solid CBN MBS140
NEW PETIT CUT	NP-CNGA431-FS4	NP-CNGA120404FS4	.016	.071	●		●	★	★			●				
	NP-CNGA432-FS4	NP-CNGA120408FS4	.031	.079	★		●	★	★			●				
	NP-CNGA433-FS4	NP-CNGA120412FS4	.047	.087	★		●	★	★			●				
	NP-CNGA431-GS4	NP-CNGA120404GS4	.016	.071	★		●	★								
	NP-CNGA432-GS4	NP-CNGA120408GS4	.031	.079	●		●	★								
	NP-CNGA433-GS4	NP-CNGA120412GS4	.047	.087	★		●	★								
	NP-CNGA431-GA4	NP-CNGA120404GA4	.016	.071		●			★	★			●			
	NP-CNGA432-GA4	NP-CNGA120408GA4	.031	.079		●			★	★			●			
	NP-CNGA433-GA4	NP-CNGA120412GA4	.047	.087		●			★	★			●			
	NP-CNGA431-GH4	NP-CNGA120404GH4	.016	.071	★	★		●	●	●						
	NP-CNGA432-GH4	NP-CNGA120408GH4	.031	.079	●	●		●	●	●						
	NP-CNGA433-GH4	NP-CNGA120412GH4	.047	.087	★	★		●	●	●						
	NEW NP-CNGA431-VA4	NP-CNGA120404VA4	.016	.071		★										
	NEW NP-CNGA432-VA4	NP-CNGA120408VA4	.031	.079		●										
	NEW NP-CNGA433-VA4	NP-CNGA120412VA4	.047	.087		●										
	NP-CNGA431-TS4	NP-CNGA120404TS4	.016	.071	★			★								
	NP-CNGA432-TS4	NP-CNGA120408TS4	.031	.079	★			★								
	NP-CNGA433-TS4	NP-CNGA120412TS4	.047	.087	★			★								
	NP-CNGA431-TA4	NP-CNGA120404TA4	.016	.071		★			★	★			●	●		
	NP-CNGA432-TA4	NP-CNGA120408TA4	.031	.079		★			★	★			●	●		
	NP-CNGA433-TA4	NP-CNGA120412TA4	.047	.087		★			★	★			●	●		
	NP-CNGA431-TH4	NP-CNGA120404TH4	.016	.071					●	★				●		
	NP-CNGA432-TH4	NP-CNGA120408TH4	.031	.079		★			●	★				●		
	NP-CNGA433-TH4	NP-CNGA120412TH4	.047	.087		★			●	★				●		
NEW PETIT CUT (With Wiper) *	NP-CNGA431-FSWS4	NP-CNGA120404FSWS4	.016	.071	★		●	●	●			●				
	NP-CNGA432-FSWS4	NP-CNGA120408FSWS4	.031	.079	●		●	●	●			●				
	NP-CNGA433-FSWS4	NP-CNGA120412FSWS4	.047	.087	★		●	●	●			●				
	NP-CNGA431-GSWS4	NP-CNGA120404GSWS4	.016	.071	★		●	★								
	NP-CNGA432-GSWS4	NP-CNGA120408GSWS4	.031	.079	★		●	★								
	NP-CNGA433-GSWS4	NP-CNGA120412GSWS4	.047	.087	★		●	★								
	NP-CNGA431-GAWS4	NP-CNGA120404GAWS4	.016	.071		★			★	★			●			
	NP-CNGA432-GAWS4	NP-CNGA120408GAWS4	.031	.079		●			★	★			●			
	NP-CNGA433-GAWS4	NP-CNGA120412GAWS4	.047	.087		★			★	★			●			
NEW PETIT CUT	NP-CNGA430.5-FS2	NP-CNGA120402FS2	.008	.067	●			●				●				
	NP-CNGA431-FS2	NP-CNGA120404FS2	.016	.071	●		●	●	●		●	●			●	
	NP-CNGA432-FS2	NP-CNGA120408FS2	.031	.079	●		●	●	●		●	●			●	
	NP-CNGA433-FS2	NP-CNGA120412FS2	.047	.087	★		●	●	●		★	●			●	
	NP-CNGA430.5-GS2	NP-CNGA120402GS2	.008	.067	●			●								

* Please refer to page B012 before using the wiper insert.

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material						Coated CBN							CBN				Solid CBN
	H	Hardened Materials				●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron										●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy															
		Sintered Alloy														◐	
Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		**NP-CNGA431-GS2**	NP-CNGA120404GS2	.016	.071	●		●	●			●				●	
		NP-CNGA432-GS2	NP-CNGA120408GS2	.031	.079	●		●	●			●				●	
		NP-CNGA433-GS2	NP-CNGA120412GS2	.047	.087	●		●	●			★				●	
		NP-CNGA430.5-GA2	NP-CNGA120402GA2	.008	.067		●			●				●			
		NP-CNGA431-GA2	NP-CNGA120404GA2	.016	.071		●			●	●			●			
		NP-CNGA432-GA2	NP-CNGA120408GA2	.031	.079		●			●	●			●			
		NP-CNGA433-GA2	NP-CNGA120412GA2	.047	.087		●			●	●			●			
		NP-CNGA431-GH2	NP-CNGA120404GH2	.016	.071	★	★		●	●	●						
		NP-CNGA432-GH2	NP-CNGA120408GH2	.031	.079	●	●		●	●	●						
		NP-CNGA433-GH2	NP-CNGA120412GH2	.047	.087	★	★		●	●	●						
	NEW	**NP-CNGA431-VA2**	NP-CNGA120404VA2	.016	.071		●										
	NEW	**NP-CNGA432-VA2**	NP-CNGA120408VA2	.031	.079		●										
	NEW	**NP-CNGA433-VA2**	NP-CNGA120412VA2	.047	.087		●										
		NP-CNGA431-TS2	NP-CNGA120404TS2	.016	.071	★			★							●	
		NP-CNGA432-TS2	NP-CNGA120408TS2	.031	.079	★			★							●	
		NP-CNGA433-TS2	NP-CNGA120412TS2	.047	.087	★			★							●	
		NP-CNGA431-TA2	NP-CNGA120404TA2	.016	.071		●			●	●			●	●		
		NP-CNGA432-TA2	NP-CNGA120408TA2	.031	.079		●			●	●			●	●		
		NP-CNGA433-TA2	NP-CNGA120412TA2	.047	.087		●			●	●			●	●		
		NP-CNGA431-TH2	NP-CNGA120404TH2	.016	.071					●	●				●		
		NP-CNGA432-TH2	NP-CNGA120408TH2	.031	.079		★			●	●				●		
		NP-CNGA433-TH2	NP-CNGA120412TH2	.047	.087		●			●	●				●		
		NP-CNGA431-SF2	NP-CNGA120404SF2	.016	.071											●	
		NP-CNGA432-SF2	NP-CNGA120408SF2	.031	.079											●	
		NP-CNGA433-SF2	NP-CNGA120412SF2	.047	.087											●	
		NP-CNGA431-SE2	NP-CNGA120404SE2	.016	.071											●	
		NP-CNGA432-SE2	NP-CNGA120408SE2	.031	.079											●	
		NP-CNGA433-SE2	NP-CNGA120412SE2	.047	.087											●	
NEW PETIT CUT (With Wiper) *		**NP-CNGA431-FSWS2**	NP-CNGA120404FSWS2	.016	.071	★		●	●	●			●				
		NP-CNGA432-FSWS2	NP-CNGA120408FSWS2	.031	.079	●		●	●	●			●				
		NP-CNGA433-FSWS2	NP-CNGA120412FSWS2	.047	.087	★		●	●	●			●				
		NP-CNGA431-FBWL2	NP-CNGA120404FBWL2	.016	.071			●	●	●			●				
		NP-CNGA432-FBWL2	NP-CNGA120408FBWL2	.031	.079			●	●	●			●				
		NP-CNGA433-FBWL2	NP-CNGA120412FBWL2	.047	.087			●	●	●			●				
		NP-CNGA431-GSWS2	NP-CNGA120404GSWS2	.016	.071	●		●	●								
		NP-CNGA432-GSWS2	NP-CNGA120408GSWS2	.031	.079	●		●	●								
		NP-CNGA433-GSWS2	NP-CNGA120412GSWS2	.047	.087	★		●	●								
		NP-CNGA431-GAWS2	NP-CNGA120404GAWS2	.016	.071		●			●	●			●			
		NP-CNGA432-GAWS2	NP-CNGA120408GAWS2	.031	.079		●			●	●			●			
		NP-CNGA433-GAWS2	NP-CNGA120412GAWS2	.047	.087		●			●	●			●			

* Please refer to page B012 before using the wiper insert.

● = NEW

80° CN TYPE INSERTS WITH HOLE

NP-CNGA 4 3 1 GBWL2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣		
	K	Cast Iron							●				◐	✣
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT (With Wiper) *	**NP-CNGA431-GBWL2**	NP-CNGA120404GBWL2	.016	.071			●	●	●			●				
	NP-CNGA432-GBWL2	NP-CNGA120408GBWL2	.031	.079			●	●	●			●				
	NP-CNGA433-GBWL2	NP-CNGA120412GBWL2	.047	.087			●	●	●			●				
NEW PETIT CUT (With Breaker)	**BF-CNGM431-TS2**	BF-CNGM120404TS2	.016	.071	★			★								
	BF-CNGM432-TS2	BF-CNGM120408TS2	.031	.079	★			★								
	BF-CNGM433-TS2	BF-CNGM120412TS2	.047	.087	★			★								
NEW PETIT CUT (With Wiper) * NEW (With Breaker)	**BF-CNGM432-TSWS2**	BF-CNGM120408TSWS2	.031	.079	★											
	BF-CNGA433-TSWS2	BF-CNGM120412TSWS2	.047	.087	★											
	BF-CNGM432-TAWS2	BF-CNGM120408TAWS2	.031	.079		●										
	BF-CNGM433-TAWS2	BF-CNGM120412TAWS2	.047	.087		●										
NEW PETIT CUT (With Breaker)	**BM-CNGM431-TA2**	BM-CNGM120404TA2	.016	.071		★			●							
	BM-CNGM432-TA2	BM-CNGM120408TA2	.031	.079		●			●							
	BM-CNGM433-TA2	BM-CNGM120412TA2	.047	.087		●			●							
NEW PETIT CUT NEW (With Breaker)	**BR-CNGM431-TA2**	BR-CNGM120404TA2	.016	.071		★										
	BR-CNGM432-TA2	BR-CNGM120408TA2	.031	.079		★										
	BR-CNGM433-TA2	BR-CNGM120412TA2	.047	.087		★										
	CNGA432	CNGA120408	.031	—												●
	CNGA433	CNGA120412	.047	—												●

* Please refer to page B012 before using the wiper insert.

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 3 1 FS4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-DNGA431-FS4	NP-DNGA150404FS4	.016	.083	★		●	★	★			●				
	NP-DNGA432-FS4	NP-DNGA150408FS4	.031	.079	★		●	★	★			●				
	NP-DNGA433-FS4	NP-DNGA150412FS4	.047	.071	★		●	★	★			●				
	NP-DNGA441-FS4	NP-DNGA150604FS4	.016	.083	★			★	★			●				
	NP-DNGA442-FS4	NP-DNGA150608FS4	.031	.079	★			★	★			●				
	NP-DNGA443-FS4	NP-DNGA150612FS4	.047	.071	★			★	★			●				
	NP-DNGA431-GS4	NP-DNGA150404GS4	.016	.083	★		●	★								
	NP-DNGA432-GS4	NP-DNGA150408GS4	.031	.079	●		●	★								
	NP-DNGA433-GS4	NP-DNGA150412GS4	.047	.071	★		●	★								
	NP-DNGA441-GS4	NP-DNGA150604GS4	.016	.083	★			★	★							
	NP-DNGA442-GS4	NP-DNGA150608GS4	.031	.079	★			★	★							
	NP-DNGA443-GS4	NP-DNGA150612GS4	.047	.071	★			★	★							
	NP-DNGA431-GA4	NP-DNGA150404GA4	.016	.083		●			★	★		●				
	NP-DNGA432-GA4	NP-DNGA150408GA4	.031	.079		●			★	★		●				
	NP-DNGA433-GA4	NP-DNGA150412GA4	.047	.071		★			★	★		●				
	NP-DNGA441-GA4	NP-DNGA150604GA4	.016	.083		★			★	★		●				
	NP-DNGA442-GA4	NP-DNGA150608GA4	.031	.079		★			★	★		●				
	NP-DNGA443-GA4	NP-DNGA150612GA4	.047	.071		★			★	★		●				
	NP-DNGA431-GH4	NP-DNGA150404GH4	.016	.083	★	●		●	●	●						
	NP-DNGA432-GH4	NP-DNGA150408GH4	.031	.079	★	★		●	●	●						
	NP-DNGA433-GH4	NP-DNGA150412GH4	.047	.071	★	★		●	●	●						
	NP-DNGA441-GH4	NP-DNGA150604GH4	.016	.083	★	★		★	★	★						
	NP-DNGA442-GH4	NP-DNGA150608GH4	.031	.079	★	★		★	★	★						
	NP-DNGA443-GH4	NP-DNGA150612GH4	.047	.071	★	★		★	★	★						
	NEW NP-DNGA431-VA4	NP-DNGA150404VA4	.016	.083		★										
	NEW NP-DNGA432-VA4	NP-DNGA150408VA4	.031	.079		●										
	NEW NP-DNGA433-VA4	NP-DNGA150412VA4	.047	.071		★										
	NEW NP-DNGA441-VA4	NP-DNGA150604VA4	.016	.083		★										
	NEW NP-DNGA442-VA4	NP-DNGA150608VA4	.031	.079		★										
	NEW NP-DNGA443-VA4	NP-DNGA150612VA4	.047	.071		★										
	NP-DNGA431-TS4	NP-DNGA150404TS4	.016	.083	★			★								
	NP-DNGA432-TS4	NP-DNGA150408TS4	.031	.079	★			★								
	NP-DNGA433-TS4	NP-DNGA150412TS4	.047	.071	★			★								
	NP-DNGA441-TS4	NP-DNGA150604TS4	.016	.083	★			★								
	NP-DNGA442-TS4	NP-DNGA150608TS4	.031	.079	★			★								
	NP-DNGA443-TS4	NP-DNGA150612TS4	.047	.071	★			★								
	NP-DNGA431-TA4	NP-DNGA150404TA4	.016	.083		★			★	★		●	●			
	NP-DNGA432-TA4	NP-DNGA150408TA4	.031	.079		★			★	★		●	●			
	NP-DNGA433-TA4	NP-DNGA150412TA4	.047	.071		●			★	★		●	●			

● = NEW

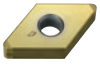
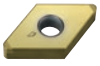
EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 4 1 TA4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

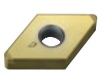
Workpiece Material																		
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠						
	K	Cast Iron							●					◐	✠			
	S	Heat Resistant Alloy, Titanium Alloy																
		Sintered Alloy												◐				

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-DNGA441-TA4**	NP-DNGA150604TA4	.016	.083		★			★	★		●				
	NP-DNGA442-TA4	NP-DNGA150608TA4	.031	.079		★			★	★		●				
	NP-DNGA443-TA4	NP-DNGA150612TA4	.047	.071		★			★	★		●				
	**NP-DNGA431-TH4**	NP-DNGA150404TH4	.016	.083					●	★				●		
	NP-DNGA432-TH4	NP-DNGA150408TH4	.031	.079		★			●	★				●		
	NP-DNGA433-TH4	NP-DNGA150412TH4	.047	.071		★			●	★				●		
	NP-DNGA441-TH4	NP-DNGA150604TH4	.016	.083					★	★						
	NP-DNGA442-TH4	NP-DNGA150608TH4	.031	.079		★			★	★						
	NP-DNGA443-TH4	NP-DNGA150612TH4	.047	.071		★			★	★						
NEW PETIT CUT	**NP-DNGA430.5-FS2**	NP-DNGA150402FS2	.008	.087	●			●				●				
	NP-DNGA431-FS2	NP-DNGA150404FS2	.016	.083	●		●	●	●		★	●			●	
	NP-DNGA432-FS2	NP-DNGA150408FS2	.031	.079	●		●	●	●		●	●			●	
	NP-DNGA433-FS2	NP-DNGA150412FS2	.047	.071	●		●	●	●			●			●	
	NP-DNGA441-FS2	NP-DNGA150604FS2	.016	.083	★		★	★	★		★	●			●	
	NP-DNGA442-FS2	NP-DNGA150608FS2	.031	.079	★		★	★	★		★	●			●	
	NP-DNGA443-FS2	NP-DNGA150612FS2	.047	.071	★		★	★	★			●			●	
	NP-DNGA430.5-GS2	NP-DNGA150402GS2	.008	.087	●			●								
	NP-DNGA431-GS2	NP-DNGA150404GS2	.016	.083	●		●	●			★				●	
	NP-DNGA432-GS2	NP-DNGA150408GS2	.031	.079	●		●	●			●				●	
	NP-DNGA433-GS2	NP-DNGA150412GS2	.047	.071	★		●	●							●	
	NP-DNGA441-GS2	NP-DNGA150604GS2	.016	.083	★		★	★							●	
	NP-DNGA442-GS2	NP-DNGA150608GS2	.031	.079	★		★	★			★				●	
	**NP-DNGA443-GS2**	NP-DNGA150612GS2	.047	.071	★		★	★							●	
	NP-DNGA332-GA2	NP-DNGA110408GA2	.031	.079		●			●	●		●				
	NP-DNGA430.5-GA2	NP-DNGA150402GA2	.008	.087		●			●							
	NP-DNGA431-GA2	NP-DNGA150404GA2	.016	.083		●			●	●		●				
	NP-DNGA432-GA2	NP-DNGA150408GA2	.031	.079		●			●	●		●				
	NP-DNGA433-GA2	NP-DNGA150412GA2	.047	.071		●			●	●		●				
	NP-DNGA440.5-GA2	NP-DNGA150602GA2	.008	.087					★							
	NP-DNGA441-GA2	NP-DNGA150604GA2	.016	.083		★			★	★		●				
	NP-DNGA442-GA2	NP-DNGA150608GA2	.031	.079		★			★	★		●				
	NP-DNGA443-GA2	NP-DNGA150612GA2	.047	.071		★			★	★		●				
	NP-DNGA431-GH2	NP-DNGA150404GH2	.016	.083	★	★		●	●	●						
	NP-DNGA432-GH2	NP-DNGA150408GH2	.031	.079	★	★		●	●	●						
	NP-DNGA433-GH2	NP-DNGA150412GH2	.047	.071	★	★		●	●	●						
	NP-DNGA441-GH2	NP-DNGA150604GH2	.016	.083	★	★		★	★	★						
	NP-DNGA442-GH2	NP-DNGA150608GH2	.031	.079	★	★		★	★	★						
	NP-DNGA443-GH2	NP-DNGA150612GH2	.047	.071	★	★		★	★	★						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material																
	H	Hardened Materials			●	◐	●	●	◐	✣		●	◐	✣		
	K	Cast Iron									●				◐	✣
	S	Heat Resistant Alloy, Titanium Alloy														
		Sintered Alloy													◐	
					Coated CBN							CBN				Solid CBN
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NEW NP-DNGA431-VA2	NP-DNGA150404VA2	.016	.083		●										
	NEW NP-DNGA432-VA2	NP-DNGA150408VA2	.031	.079		●										
	NEW NP-DNGA433-VA2	NP-DNGA150412VA2	.047	.071		●										
	NEW NP-DNGA441-VA2	NP-DNGA150604VA2	.016	.083		★										
	NEW NP-DNGA442-VA2	NP-DNGA150608VA2	.031	.079		★										
	NEW NP-DNGA443-VA2	NP-DNGA150612VA2	.047	.071		★										
	NP-DNGA431-TS2	NP-DNGA150404TS2	.016	.083	★			★							●	
	NP-DNGA432-TS2	NP-DNGA150408TS2	.031	.079	★			★							●	
	NP-DNGA433-TS2	NP-DNGA150412TS2	.047	.071	★			★							●	
	NP-DNGA441-TS2	NP-DNGA150604TS2	.016	.083	★			★							●	
	NP-DNGA442-TS2	NP-DNGA150608TS2	.031	.079	★			★							●	
	NP-DNGA443-TS2	NP-DNGA150612TS2	.047	.071	★			★							●	
	NP-DNGA431-TA2	NP-DNGA150404TA2	.016	.083		●			●	●			●	●		
	NP-DNGA432-TA2	NP-DNGA150408TA2	.031	.079		●			●	●			●	●		
	NP-DNGA433-TA2	NP-DNGA150412TA2	.047	.071		●			●	●			●	●		
	NP-DNGA441-TA2	NP-DNGA150604TA2	.016	.083		★			★	★			●			
	NP-DNGA442-TA2	NP-DNGA150608TA2	.031	.079		★			★	★			●			
	NP-DNGA443-TA2	NP-DNGA150612TA2	.047	.071		★			★	★			●			
	NP-DNGA431-TH2	NP-DNGA150404TH2	.016	.083					●	●				●		
	NP-DNGA432-TH2	NP-DNGA150408TH2	.031	.079		★			●	●				●		
	NP-DNGA433-TH2	NP-DNGA150412TH2	.047	.071		★			●	●				●		
	NP-DNGA441-TH2	NP-DNGA150604TH2	.016	.083					★	★						
	NP-DNGA442-TH2	NP-DNGA150608TH2	.031	.079		★			★	★						
	NP-DNGA443-TH2	NP-DNGA150612TH2	.047	.071		★			★	★						
	NP-DNGA431-SF2	NP-DNGA150404SF2	.016	.083											●	
	NP-DNGA432-SF2	NP-DNGA150408SF2	.031	.079											●	
	NP-DNGA433-SF2	NP-DNGA150412SF2	.047	.071											●	
	NP-DNGA441-SF2	NP-DNGA150604SF2	.016	.083											●	
	NP-DNGA442-SF2	NP-DNGA150608SF2	.031	.079											●	
	NP-DNGA443-SF2	NP-DNGA150612SF2	.047	.071											●	
	NP-DNGA431-SE2	NP-DNGA150404SE2	.016	.083											●	
	NP-DNGA432-SE2	NP-DNGA150408SE2	.031	.079											●	
	NP-DNGA433-SE2	NP-DNGA150412SE2	.047	.071											●	
	NP-DNGA441-SE2	NP-DNGA150604SE2	.016	.083											●	
	NP-DNGA442-SE2	NP-DNGA150608SE2	.031	.079											●	
	NP-DNGA443-SE2	NP-DNGA150612SE2	.047	.071											●	

● = NEW

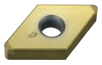
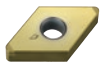
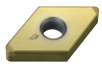
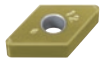
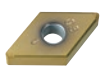
EXTERNAL TURNING ➢ C002
BORING ➢ E002
IDENTIFICATION ➢ B002
HONING ➢ B009

55° DN TYPE INSERTS WITH HOLE

NP-DNGA 4 3 1 GSWS2JR
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material																		
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠						
	K	Cast Iron							●				◐	✠				
	S	Heat Resistant Alloy, Titanium Alloy																
		Sintered Alloy											◐					

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT (With Wiper) *	NP-DNGA431-GSWS2JR	NP-DNGA150404GSWS2JR	.016	.071	★											
	NP-DNGA431-GSWS2JL	NP-DNGA150404GSWS2JL	.016	.071	★											
	NP-DNGA432-GSWS2JR	NP-DNGA150408GSWS2JR	.031	.067	★											
	NP-DNGA432-GSWS2JL	NP-DNGA150408GSWS2JL	.031	.067	★											
	NP-DNGA441-GSWS2JR	NP-DNGA150604GSWS2JR	.016	.071	★											
	NP-DNGA441-GSWS2JL	NP-DNGA150604GSWS2JL	.016	.071	★											
	NP-DNGA442-GSWS2JR	NP-DNGA150608GSWS2JR	.031	.067	★											
	NP-DNGA442-GSWS2JL	NP-DNGA150608GSWS2JL	.031	.067	★											
	NP-DNGA431-GAWS2JR	NP-DNGA150404GAWS2JR	.016	.071		★			●				●			
	NP-DNGA431-GAWS2JL	NP-DNGA150404GAWS2JL	.016	.071		★			●				●			
	NP-DNGA432-GAWS2JR	NP-DNGA150408GAWS2JR	.031	.067		●			●				●			
	NP-DNGA432-GAWS2JL	NP-DNGA150408GAWS2JL	.031	.067		●			●				●			
	NP-DNGA441-GAWS2JR	NP-DNGA150604GAWS2JR	.016	.071		★			★				●			
	NP-DNGA441-GAWS2JL	NP-DNGA150604GAWS2JL	.016	.071		★			★				●			
	NP-DNGA442-GAWS2JR	NP-DNGA150608GAWS2JR	.031	.067		★			★				●			
	NP-DNGA442-GAWS2JL	NP-DNGA150608GAWS2JL	.031	.067		●			●				●			
NEW PETIT CUT	BF-DNGM431-TS2	BF-DNGM150404TS2	.016	.083	★			★								
	BF-DNGM432-TS2	BF-DNGM150408TS2	.031	.079	★			★								
	BF-DNGM433-TS2	BF-DNGM150412TS2	.047	.071	●			★								
(With Breaker)																
NEW PETIT CUT (With Wiper) * NEW	BF-DNGM432-TSWS2	BF-DNGM150408TSWS2	.031	.094	★											
	BF-DNGM433-TSWS2	BF-DNGM150412TSWS2	.047	.102	★											
	BF-DNGM432-TAWS2	BF-DNGM150408TAWS2	.031	.094		●										
	BF-DNGM433-TAWS2	BF-DNGM150412TAWS2	.047	.102		●										
(With Breaker)																
NEW PETIT CUT	BM-DNGM431-TA2	BM-DNGM150404TA2	.016	.083		●			●							
	BM-DNGM432-TA2	BM-DNGM150408TA2	.031	.079		★			●							
	BM-DNGM433-TA2	BM-DNGM150412TA2	.047	.071		●			●							
	BM-DNGM441-TA2	BM-DNGM150604TA2	.016	.083					★							
	BM-DNGM442-TA2	BM-DNGM150608TA2	.031	.079					★							
(With Breaker)	BM-DNGM443-TA2	BM-DNGM150612TA2	.047	.071					★							
NEW PETIT CUT NEW	BR-DNGM431-TA2	BR-DNGM150404TA2	.016	.083		★										
	BR-DNGM432-TA2	BR-DNGM150408TA2	.031	.079		★										
	BR-DNGM433-TA2	BR-DNGM150412TA2	.047	.071		★										
	BR-DNGM441-TA2	BR-DNGM150604TA2	.016	.083		★										
	BR-DNGM442-TA2	BR-DNGM150608TA2	.031	.079		★										
(With Breaker)	BR-DNGM443-TA2	BR-DNGM150612TA2	.047	.071		★										

* Please refer to page B012 before using the wiper insert.

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

90° SN TYPE INSERTS WITH HOLE

NP-SNGA 4 3 1 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shapew	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
NEW PETIT CUT	**NP-SNGA431-FS2**	NP-SNGA120404FS2	.016	.079											●	
	NP-SNGA432-FS2	NP-SNGA120408FS2	.031	.087											●	
	NP-SNGA433-FS2	NP-SNGA120412FS2	.047	.098											●	
	NP-SNGA431-GS2	NP-SNGA120404GS2	.016	.079											●	
	NP-SNGA432-GS2	NP-SNGA120408GS2	.031	.087							★				●	
	NP-SNGA433-GS2	NP-SNGA120412GS2	.047	.098											●	
	NP-SNGA432-GA2	NP-SNGA120408GA2	.031	.087		★			●	●			●			
	NP-SNGA433-GA2	NP-SNGA120412GA2	.047	.098		★			●	●			●			
	NP-SNGA431-TS2	NP-SNGA120404TS2	.016	.079											●	
	NP-SNGA432-TS2	NP-SNGA120408TS2	.031	.087											●	
	NP-SNGA433-TS2	NP-SNGA120412TS2	.047	.098											●	
	NP-SNGA431-SF2	NP-SNGA120404SF2	.016	.079											●	
	NP-SNGA432-SF2	NP-SNGA120408SF2	.031	.087											●	
	NP-SNGA433-SF2	NP-SNGA120412SF2	.047	.098											●	
	NP-SNGA431-SE2	NP-SNGA120404SE2	.016	.079											●	
	NP-SNGA432-SE2	NP-SNGA120408SE2	.031	.087											●	
	NP-SNGA433-SE2	NP-SNGA120412SE2	.047	.098											●	
	SNGA432	SNGA120408	.031	—												●
	SNGA433	SNGA120412	.047	—												●

● = NEW

CBN
B
CBN TURNING INSERTS
NEG
WITH HOLE
C
D
R
S
T
V
W

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

60° TN TYPE INSERTS WITH HOLE

NP-TNGA 3 3 1 FS6
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material																		
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣						
	K	Cast Iron							●				◐	✣				
	S	Heat Resistant Alloy, Titanium Alloy																
		Sintered Alloy											◐					

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-TNGA331-FS6	NP-TNGA160404FS6	.016	.063	★		●	★	★			●				
	NP-TNGA332-FS6	NP-TNGA160408FS6	.031	.067	★		●	★	★			●				
	NP-TNGA333-FS6	NP-TNGA160412FS6	.047	.075	★		●	★	★			●				
	NP-TNGA331-GS6	NP-TNGA160404GS6	.016	.063	●		●	★								
	NP-TNGA332-GS6	NP-TNGA160408GS6	.031	.067	★		●	★								
	NP-TNGA333-GS6	NP-TNGA160412GS6	.047	.075	★		●	★								
	NP-TNGA331-GA6	NP-TNGA160404GA6	.016	.063		★			★	★			●			
	NP-TNGA332-GA6	NP-TNGA160408GA6	.031	.067		★			★	★			●			
	NP-TNGA333-GA6	NP-TNGA160412GA6	.047	.075		★			★	★			●			
	NP-TNGA331-GH6	NP-TNGA160404GH6	.016	.063		★		●	●	●						
	NP-TNGA332-GH6	NP-TNGA160408GH6	.031	.067		★		●	●	●						
	NP-TNGA333-GH6	NP-TNGA160412GH6	.047	.075		★		●	●	●						
	NEW NP-TNGA331-VA6	NP-TNGA160404VA6	.016	.063		★										
	NEW NP-TNGA332-VA6	NP-TNGA160408VA6	.031	.067		★										
	NEW NP-TNGA333-VA6	NP-TNGA160412VA6	.047	.075		★										
	NP-TNGA331-TS6	NP-TNGA160404TS6	.016	.063	★			★								
	NP-TNGA332-TS6	NP-TNGA160408TS6	.031	.067	★			★								
	NP-TNGA333-TS6	NP-TNGA160412TS6	.047	.075	★			★								
	NP-TNGA331-TA6	NP-TNGA160404TA6	.016	.063		★			★	★			●	●		
	NP-TNGA332-TA6	NP-TNGA160408TA6	.031	.067		★			★	★			●	●		
	NP-TNGA333-TA6	NP-TNGA160412TA6	.047	.075		★			★	★			●	●		
	NP-TNGA331-TH6	NP-TNGA160404TH6	.016	.063					●	★				●		
	NP-TNGA332-TH6	NP-TNGA160408TH6	.031	.067		★			●	★				●		
	NP-TNGA333-TH6	NP-TNGA160412TH6	.047	.075		★			●	★				●		
NEW PETIT CUT	NP-TNGA330.5-FS3	NP-TNGA160402FS3	.008	.059	●			●				●				
	NP-TNGA331-FS3	NP-TNGA160404FS3	.016	.063	★		●	●	●		★	●			●	
	NP-TNGA332-FS3	NP-TNGA160408FS3	.031	.067	★		●	●	●		●	●			●	
	NP-TNGA333-FS3	NP-TNGA160412FS3	.047	.075	★		●	●	●		★	●			●	
	NP-TNGA330.5-GS3	NP-TNGA160402GS3	.008	.059	★			●								
	NP-TNGA331-GS3	NP-TNGA160404GS3	.016	.063	★		●	●			★				●	
	NP-TNGA332-GS3	NP-TNGA160408GS3	.031	.067	●		●	●			★				●	
	NP-TNGA333-GS3	NP-TNGA160412GS3	.047	.075	★		●	●			★				●	
	NP-TNGA330.5-GA3	NP-TNGA160402GA3	.008	.059		★			●				●			
	NP-TNGA331-GA3	NP-TNGA160404GA3	.016	.063		●			●	●			●			
	NP-TNGA332-GA3	NP-TNGA160408GA3	.031	.067		●			●	●			●			
	NP-TNGA333-GA3	NP-TNGA160412GA3	.047	.075		●			●	●			●			
	NP-TNGA331-GH3	NP-TNGA160404GH3	.016	.063		●		●	●	●						
	NP-TNGA332-GH3	NP-TNGA160408GH3	.031	.067		★		●	●	●						
	NP-TNGA333-GH3	NP-TNGA160412GH3	.047	.075		★		●	●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material																	
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣			
	K	Cast Iron							●				◐	✣	
	S	Heat Resistant Alloy, Titanium Alloy													
		Sintered Alloy											◐		

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
						NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NEW	NP-TNGA331-VA3	NP-TNGA160404VA3	.016	.063		●										
	NEW	NP-TNGA332-VA3	NP-TNGA160408VA3	.031	.067		●										
	NEW	NP-TNGA333-VA3	NP-TNGA160412VA3	.047	.075		●										
		NP-TNGA331-TS3	NP-TNGA160404TS3	.016	.063	★			★							●	
		NP-TNGA332-TS3	NP-TNGA160408TS3	.031	.067	★			★							●	
		NP-TNGA333-TS3	NP-TNGA160412TS3	.047	.075	★			★							●	
		NP-TNGA331-TA3	NP-TNGA160404TA3	.016	.063		★			●	●			●	●		
		NP-TNGA332-TA3	NP-TNGA160408TA3	.031	.067		★			●	●			●	●		
		NP-TNGA333-TA3	NP-TNGA160412TA3	.047	.075		★			●	●			●	●		
		NP-TNGA331-TH3	NP-TNGA160404TH3	.016	.063					●	●				●		
		NP-TNGA332-TH3	NP-TNGA160408TH3	.031	.067		★			●	●				●		
		NP-TNGA333-TH3	NP-TNGA160412TH3	.047	.075		★			●	●				●		
		NP-TNGA331-SF3	NP-TNGA160404SF3	.016	.063											●	
		NP-TNGA332-SF3	NP-TNGA160408SF3	.031	.067											●	
		NP-TNGA333-SF3	NP-TNGA160412SF3	.047	.075											●	
		NP-TNGA331-SE3	NP-TNGA160404SE3	.016	.063											●	
		NP-TNGA332-SE3	NP-TNGA160408SE3	.031	.067											●	
		NP-TNGA333-SE3	NP-TNGA160412SE3	.047	.075											●	
NEW PETIT CUT		BM-TNGM332-TA3	BM-TNGM160408TA3	.031	.067					●							
		BM-TNGM333-TA3	BM-TNGM160412TA3	.047	.075					●							
(With Breaker)																	
		TNGA332	TNGA160408	.031	–												●
		TNGA333	TNGA160412	.047	–												●

● = NEW

CBN
B
CBN TURNING INSERTS
NEG
WITH HOLE
C
D
R
S
T
V
W

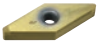
EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

35° VN TYPE INSERTS WITH HOLE

NP-VNGA 3 3 1 FS4
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

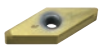
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-VNGA331-FS4**	NP-VNGA160404FS4	.016	.098	★		●	★	★			●				
	NP-VNGA332-FS4	NP-VNGA160408FS4	.031	.079	★		●	★	★			●				
	NP-VNGA333-FS4	NP-VNGA160412FS4	.047	.059					★							
	NP-VNGA331-GS4	NP-VNGA160404GS4	.016	.098	★		●	★								
	NP-VNGA332-GS4	NP-VNGA160408GS4	.031	.079	★		●	★								
	NP-VNGA333-GS4	NP-VNGA160412GS4	.047	.059	★			★								
	NP-VNGA331-GA4	NP-VNGA160404GA4	.016	.098		★			★	★			●			
	NP-VNGA332-GA4	NP-VNGA160408GA4	.031	.079		★			★	★			●			
	NP-VNGA333-GA4	NP-VNGA160412GA4	.047	.059		★			★	★			●			
	NP-VNGA331-GH4	NP-VNGA160404GH4	.016	.098		★		●	●	●						
	NP-VNGA332-GH4	NP-VNGA160408GH4	.031	.079		★		●	●	●						
	NP-VNGA333-GH4	NP-VNGA160412GH4	.047	.059				●	●	●						
	NEW **NP-VNGA331-VA4**	NP-VNGA160404VA4	.016	.098		★										
	NEW **NP-VNGA332-VA4**	NP-VNGA160408VA4	.031	.079		★										
	NEW **NP-VNGA333-VA4**	NP-VNGA160412VA4	.047	.059		★										
	NP-VNGA331-TS4	NP-VNGA160404TS4	.016	.098	★			★								
	NP-VNGA332-TS4	NP-VNGA160408TS4	.031	.079	★			★								
	NP-VNGA331-TA4	NP-VNGA160404TA4	.016	.098		★			★	★			●			
	NP-VNGA332-TA4	NP-VNGA160408TA4	.031	.079		★			★	★			●			
	NP-VNGA333-TA4	NP-VNGA160412TA4	.047	.059					★	★			●			
	NP-VNGA331-TH4	NP-VNGA160404TH4	.016	.098		★			●	★						
	NP-VNGA332-TH4	NP-VNGA160408TH4	.031	.079		★			●	★						
	NP-VNGA333-TH4	NP-VNGA160412TH4	.047	.059					●	★						
NEW PETIT CUT	**NP-VNGA330.5-FS2**	NP-VNGA160402FS2	.008	.098	●			●				●				
	NP-VNGA331-FS2	NP-VNGA160404FS2	.016	.098	●			●	●	●	★	●			●	
	NP-VNGA332-FS2	NP-VNGA160408FS2	.031	.079	●			●	●	●	★	●			●	
	NP-VNGA333-FS2	NP-VNGA160412FS2	.047	.059					●							
	NP-VNGA330.5-GS2	NP-VNGA160402GS2	.008	.098	●			●								
	NP-VNGA331-GS2	NP-VNGA160404GS2	.016	.098	●			●	●		●				●	
	NP-VNGA332-GS2	NP-VNGA160408GS2	.031	.079	●			●	●		●				●	
	**NP-VNGA333-GS2**	NP-VNGA160412GS2	.047	.059	★			●								
	NP-VNGA330.5-GA2	NP-VNGA160402GA2	.008	.098		●			●				●			
	NP-VNGA331-GA2	NP-VNGA160404GA2	.016	.098		●			●	●			●			
	NP-VNGA332-GA2	NP-VNGA160408GA2	.031	.079		●			●	●			●			
	NP-VNGA333-GA2	NP-VNGA160412GA2	.047	.059		●			●	●			●			
	NP-VNGA331-GH2	NP-VNGA160404GH2	.016	.098		★		●	●	●						
	NP-VNGA332-GH2	NP-VNGA160408GH2	.031	.079		★		●	●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		**NP-VNGA333-GH2**	NP-VNGA160412GH2	.047	.059				●	●	●						
	NEW	**NP-VNGA331-VA2**	NP-VNGA160404VA2	.016	.098		●										
	NEW	**NP-VNGA332-VA2**	NP-VNGA160408VA2	.031	.079		★										
	NEW	**NP-VNGA333-VA2**	NP-VNGA160412VA2	.047	.059		★										
NEW PETIT CUT		**NP-VNGA331-TS2**	NP-VNGA160404TS2	.016	.098	★			★							●	
		NP-VNGA332-TS2	NP-VNGA160408TS2	.031	.079	★			★							●	
		NP-VNGA331-TA2	NP-VNGA160404TA2	.016	.098		★			●	●			●			
		NP-VNGA332-TA2	NP-VNGA160408TA2	.031	.079		★			●	●			●			
		NP-VNGA333-TA2	NP-VNGA160412TA2	.047	.059					●	●			●			
		**NP-VNGA331-TH2**	NP-VNGA160404TH2	.016	.098		★			●	●						
		NP-VNGA332-TH2	NP-VNGA160408TH2	.031	.079		★			●	●						
		NP-VNGA333-TH2	NP-VNGA160412TH2	.047	.059					●	●						
		NP-VNGA331-SF2	NP-VNGA160404SF2	.016	.098											●	
		NP-VNGA332-SF2	NP-VNGA160408SF2	.031	.079											●	
		NP-VNGA331-SE2	NP-VNGA160404SE2	.016	.098											●	
		NP-VNGA332-SE2	NP-VNGA160408SE2	.031	.079											●	

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

CBN TURNING INSERTS [NEGATIVE]

80° WN TYPE INSERTS WITH HOLE

NP-WNGA 4 3 2 FS6
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-WNGA432-FS6**	NP-WNGA080408FS6	.031	.079	★		●	★								
	NP-WNGA432-GS6	NP-WNGA080408GS6	.031	.079	★		●	★								
	NP-WNGA432-TS6	NP-WNGA080408TS6	.031	.079	★			★								
NEW PETIT CUT	**NP-WNGA432-FS3**	NP-WNGA080408FS3	.031	.079	●		●	★	●						●	
	NP-WNGA432-GS3	NP-WNGA080408GS3	.031	.079	●		●	★							●	
	NP-WNGA432-GA3	NP-WNGA080408GA3	.031	.079		●			●	●						
	NP-WNGA432-GH3	NP-WNGA080408GH3	.031	.079				●	●	●						
	NP-WNGA432-TS3	NP-WNGA080408TS3	.031	.079	★			★							●	
	NP-WNGA432-TA3	NP-WNGA080408TA3	.031	.079		★			●	●						
	NP-WNGA432-TH3	NP-WNGA080408TH3	.031	.079					●	●						
	NP-WNGA432-SF3	NP-WNGA080408SF3	.031	.079											●	
	NP-WNGA432-SE3	NP-WNGA080408SE3	.031	.079											●	
NEW PETIT CUT (With Wiper) *	**NP-WNGA432-GSWS3**	NP-WNGA080408GSWS3	.031	.079	●			★								

* Please refer to page B012 before using the wiper insert.

● = NEW

80° CN TYPE INSERTS WITHOUT HOLE

CNG 4 3 1
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	CNG431	CNGN120404	.016	—												★
	CNG432	CNGN120408	.031	—												●
	CNG433	CNGN120412	.047	—												●

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

55° DN TYPE INSERTS WITHOUT HOLE

DNG 3 2 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	MBS140
	DNG322	DNGN110308	.031	—	★
	DNG323	DNGN110312	.047	—	★

● = NEW

RN TYPE INSERTS WITHOUT HOLE

RNG 3 2
Size Thickness
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN				Solid CBN
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠		
	K	Cast Iron							●				◐	✠
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	MBS140
	RNG32	RNGN090300	—	—	●
	RNG42	RNGN120300	—	—	●
	RNG43	RNGN120400	—	—	●

● = NEW

90° SN TYPE INSERTS WITHOUT HOLE

SNG 3 2 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣		
	K	Cast Iron							●				◐	✣
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN BC8210 (NEW)	Coated CBN BC8220	Coated CBN BC8105	Coated CBN BC8110	Coated CBN BC8120	Coated CBN BC8130	Coated CBN BC5110 (NEW)	CBN MB8110	CBN MB8120	CBN MB8130	CBN MB4120	Solid CBN MBS140
	SNG322	SNGN090308	.031	—												●
	SNG323	SNGN090312	.047	—												●
	SNG324	SNGN090316	.063	—												●
	SNG432	SNGN120408	.031	—												●
	SNG433	SNGN120412	.047	—												★
	SNG434	SNGN120416	.063	—												●

● = NEW

60° TN TYPE INSERTS WITHOUT HOLE

TNG 3 3 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣		
	K	Cast Iron							●				◐	✣
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN BC8210 (NEW)	Coated CBN BC8220	Coated CBN BC8105	Coated CBN BC8110	Coated CBN BC8120	Coated CBN BC8130	Coated CBN BC5110 (NEW)	CBN MB8110	CBN MB8120	CBN MB8130	CBN MB4120	Solid CBN MBS140
	TNG332	TNGN160408	.031	—												●
	TNG333	TNGN160412	.047	—												●
	TNG334	TNGN160416	.063	—												●

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CC TYPE INSERTS WITH HOLE

NP-CCGW 2 1.5 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material			Coated CBN						CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✣	●	◐	✣		
	K	Cast Iron						●				◐	✣
	S	Heat Resistant Alloy, Titanium Alloy											
		Sintered Alloy										◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-CCGW21.50.5-FS2	NP-CCGW060202FS2	.008	.067	●		●				★	●			●	
	NP-CCGW21.51-FS2	NP-CCGW060204FS2	.016	.071	●		●				★	●			●	
	NP-CCGW21.52-FS2	NP-CCGW060208FS2	.031	.079	●		●					●			●	
	NP-CCGW32.50.5-FS2	NP-CCGW09T302FS2	.008	.067	●		●	●				●			●	
	NP-CCGW32.51-FS2	NP-CCGW09T304FS2	.016	.071	●		●	●	●		●	●			●	
	NP-CCGW32.52-FS2	NP-CCGW09T308FS2	.031	.079	●		●	●	●		●	●			●	
	NP-CCGW21.50.5-GS2	NP-CCGW060202GS2	.008	.067	●		●	●			★				●	
	NP-CCGW21.51-GS2	NP-CCGW060204GS2	.016	.071	●		●	●							●	
	NP-CCGW21.52-GS2	NP-CCGW060208GS2	.031	.079	●		●	●							●	
	NP-CCGW32.50.5-GS2	NP-CCGW09T302GS2	.008	.067	●		●	●							●	
	NP-CCGW32.51-GS2	NP-CCGW09T304GS2	.016	.071	●		●	●			●				●	
	NP-CCGW32.52-GS2	NP-CCGW09T308GS2	.031	.079	●		●	●			●				●	
	NP-CCGW21.50.5-GA2	NP-CCGW060202GA2	.008	.067		●			●				●			
	NP-CCGW21.51-GA2	NP-CCGW060204GA2	.016	.071		●			●	●			●			
	NP-CCGW21.52-GA2	NP-CCGW060208GA2	.031	.079		●			●	●			●			
	NP-CCGW32.50.5-GA2	NP-CCGW09T302GA2	.008	.067		●			●				●			
	NP-CCGW32.51-GA2	NP-CCGW09T304GA2	.016	.071		●			●	●			●			
	NP-CCGW32.52-GA2	NP-CCGW09T308GA2	.031	.079		●			●	●			●			
	NP-CCGW32.51-GH2	NP-CCGW09T304GH2	.016	.071				●	●	●						
	NP-CCGW32.52-GH2	NP-CCGW09T308GH2	.031	.079				●	●	●						
NEW	NP-CCGW32.51-VA2	NP-CCGW09T304VA2	.016	.071		●										
NEW	NP-CCGW32.52-VA2	NP-CCGW09T308VA2	.031	.079		●										
	NP-CCGW21.52-TS2	NP-CCGW060208TS2	.031	.079											●	
	NP-CCGW32.52-TS2	NP-CCGW09T308TS2	.031	.079											●	
	NP-CCGW21.51-TA2	NP-CCGW060204TA2	.016	.071						●				●		
	NP-CCGW21.52-TA2	NP-CCGW060208TA2	.031	.079						●				●		
	NP-CCGW32.51-TA2	NP-CCGW09T304TA2	.016	.071		★			●	●			●	●		
	NP-CCGW32.52-TA2	NP-CCGW09T308TA2	.031	.079		★			●	●			●	●		
	NP-CCGW32.51-TH2	NP-CCGW09T304TH2	.016	.071					●	●				●		
	NP-CCGW32.52-TH2	NP-CCGW09T308TH2	.031	.079					●	●				●		
	NP-CCGW21.50.5-SF2	NP-CCGW060202SF2	.008	.067											●	
	NP-CCGW21.51-SF2	NP-CCGW060204SF2	.016	.071											●	
	NP-CCGW21.52-SF2	NP-CCGW060208SF2	.031	.079											●	
	NP-CCGW32.50.5-SF2	NP-CCGW09T302SF2	.008	.067											●	
	NP-CCGW32.51-SF2	NP-CCGW09T304SF2	.016	.071											●	
	NP-CCGW32.52-SF2	NP-CCGW09T308SF2	.031	.079											●	

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

80° CC TYPE INSERTS WITH HOLE

NP-CCGW 2 1.5 0.5 SE2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
H	Hardened Materials	● ◐ ● ● ◐ ✲ ● ● ◐ ✲ ◐ ✲
K	Cast Iron	● ◐ ✲
S	Heat Resistant Alloy, Titanium Alloy	◐ ✲
	Sintered Alloy	◐

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	CBN MB8110	MB8120	MB8130	MB4120	Solid CBN MBS140
NEW PETIT CUT		**NP-CCGW21.50.5-SE2**	NP-CCGW060202SE2	.008	.067											●	
		NP-CCGW21.51-SE2	NP-CCGW060204SE2	.016	.071											●	
		NP-CCGW21.52-SE2	NP-CCGW060208SE2	.031	.079											●	
		NP-CCGW32.50.5-SE2	NP-CCGW09T302SE2	.008	.067											●	
		NP-CCGW32.51-SE2	NP-CCGW09T304SE2	.016	.071											●	
		NP-CCGW32.52-SE2	NP-CCGW09T308SE2	.031	.079											●	
NEW PETIT CUT (With Wiper) *1		**NP-CCGW32.51-FSWS2**	NP-CCGW09T304FSWS2	.016	.071	★		●	●	●			●				
		NP-CCGW32.52-FSWS2	NP-CCGW09T308FSWS2	.031	.079	●		●	●	●			●				
		NP-CCGW32.51-FBWL2	NP-CCGW09T304FBWL2	.016	.071			●	●	●			●				
		NP-CCGW32.52-FBWL2	NP-CCGW09T308FBWL2	.031	.079			●	●	●			●				
		NP-CCGW32.51-GSWS2	NP-CCGW09T304GSWS2	.016	.071	●		●	●								
		NP-CCGW32.52-GSWS2	NP-CCGW09T308GSWS2	.031	.079	★		●	●								
		NP-CCGW32.51-GAWS2	NP-CCGW09T304GAWS2	.016	.071		●			●	●			●			
		NP-CCGW32.52-GAWS2	NP-CCGW09T308GAWS2	.031	.079		●			●	●			●			
		NP-CCGW32.51-GBWL2	NP-CCGW09T304GBWL2	.016	.071			●	●	●				●			
		NP-CCGW32.52-GBWL2	NP-CCGW09T308GBWL2	.031	.079			●	●	●				●			
NEW PETIT CUT (With Breaker)		**BF-CCGT32.51-TS2**	BF-CCGT09T304TS2	.016	.071	●			★								
		BF-CCGT32.52-TS2	BF-CCGT09T308TS2	.031	.079	●			★								
NEW PETIT CUT (With Breaker)		**BM-CCGT32.51-TA2**	BM-CCGT09T304TA2	.016	.071		★			●							
		BM-CCGT32.52-TA2	BM-CCGT09T308TA2	.031	.079		★			●							
NEW PETIT CUT	*2	**NP-CCGW03S102FS**	NP-CCGW03S102FS	.008	.043	●			●				●				
	*2	**NP-CCGW03S104FS**	NP-CCGW03S104FS	.016	.039	●			●				●				
	*2	**NP-CCGW04T002FS**	NP-CCGW04T002FS	.008	.059	●			●				●				
	*2	**NP-CCGW04T004FS**	NP-CCGW04T004FS	.016	.055	●			●				●				
	*2	**NP-CCGW03S102GS**	NP-CCGW03S102GS	.008	.043			●									
	*2	**NP-CCGW03S104GS**	NP-CCGW03S104GS	.016	.039			●									
	*2	**NP-CCGW04T002GS**	NP-CCGW04T002GS	.008	.059			●									
	*2	**NP-CCGW04T004GS**	NP-CCGW04T004GS	.016	.055			●									

*1 Please refer to page B012 before using the wiper insert.
*2 Diameter of inscribed circle is special. (For SCLC type)

● = NEW

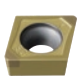
● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CP TYPE INSERTS WITH HOLE

NP-CPGB 2.5 1.5 0.5 FS2
Size · Thickness · Corner Radius · Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✤ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✤		●	◐	✤		
	K	Cast Iron							●				◐	✤
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN: BC8210 (NEW)	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110 (NEW)	CBN: MB8110	MB8120	MB8130	MB4120	Solid CBN: MBS140
NEW PETIT CUT	NP-CPGB2.51.50.5-FS2	NP-CPGB080202FS2	.008	.067											●	
	NP-CPGB2.51.51-FS2	NP-CPGB080204FS2	.016	.071				★							●	
	NP-CPGB2.51.52-FS2	NP-CPGB080208FS2	.031	.079				★								
	NP-CPGB320.5-FS2	NP-CPGB090302FS2	.008	.067			●	●							●	
	NP-CPGB321-FS2	NP-CPGB090304FS2	.016	.071			●		●						●	
	NP-CPGB322-FS2	NP-CPGB090308FS2	.031	.079			●		●						●	
	NP-CPGB323-FS2	NP-CPGB090312FS2	.047	.087					●							
	NP-CPGB2.51.51-GS2	NP-CPGB080204GS2	.016	.071	●		●	★								
	NP-CPGB2.51.52-GS2	NP-CPGB080208GS2	.031	.079	★		●	★								
	NP-CPGB320.5-GS2	NP-CPGB090302GS2	.008	.067	★		●	●								
	NP-CPGB321-GS2	NP-CPGB090304GS2	.016	.071	★		●	★								
	NP-CPGB322-GS2	NP-CPGB090308GS2	.031	.079	★		●	★								
	NP-CPGB2.51.51-GA2	NP-CPGB080204GA2	.016	.071		★			★	●						
	NP-CPGB2.51.52-GA2	NP-CPGB080208GA2	.031	.079		★			★	●						
	NP-CPGB2.51.53-GA2	NP-CPGB080212GA2	.047	.087		★			★	●						
	NP-CPGB320.5-GA2	NP-CPGB090302GA2	.008	.067		★			●							
	NP-CPGB321-GA2	NP-CPGB090304GA2	.016	.071		★			●	●						
	NP-CPGB322-GA2	NP-CPGB090308GA2	.031	.079		★			●	●						
	NP-CPGB323-GA2	NP-CPGB090312GA2	.047	.087		●			●	●						
	NEW NP-CPGB321-VA2	NP-CPGB090304VA2	.016	.071		★										
	NEW NP-CPGB322-VA2	NP-CPGB090308VA2	.031	.079		★										
	NEW NP-CPGB323-VA2	NP-CPGB090312VA2	.047	.087		★										
	NP-CPGB2.51.51-TA2	NP-CPGB080204TA2	.016	.071						●						
	NP-CPGB2.51.52-TA2	NP-CPGB080208TA2	.031	.079						●						
	NP-CPGB2.51.53-TA2	NP-CPGB080212TA2	.047	.087						●						
	NP-CPGB321-TA2	NP-CPGB090304TA2	.016	.071		★			●	●						
	NP-CPGB322-TA2	NP-CPGB090308TA2	.031	.079		★			●	●						
	NP-CPGB323-TA2	NP-CPGB090312TA2	.047	.087		★			●	●						
	NP-CPGB2.51.50.5-SE2	NP-CPGB080202SE2	.008	.067											●	
	NP-CPGB2.51.51-SE2	NP-CPGB080204SE2	.016	.071											●	
	NP-CPGB320.5-SE2	NP-CPGB090302SE2	.008	.067											●	
	NP-CPGB321-SE2	NP-CPGB090304SE2	.016	.071											●	
	NP-CPGB322-SE2	NP-CPGB090308SE2	.031	.079											●	

● (highlighted) = NEW

CBN
B
CBN TURNING INSERTS
POSI 11°
WITH HOLE
C D R S T V W

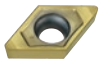
EXTERNAL TURNING ➢ C002
BORING ➢ E002
IDENTIFICATION ➢ B002
HONING ➢ B009

55° DC TYPE INSERTS WITH HOLE

NP-DCGW 2 1.5 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

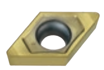
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-DCGW21.50.5-FS2	NP-DCGW070202FS2	.008	.087	★			●				●				
	NP-DCGW21.51-FS2	NP-DCGW070204FS2	.016	.083	●			●	●		★	●			●	
	NP-DCGW21.52-FS2	NP-DCGW070208FS2	.031	.079	●			●				●			●	
	NP-DCGW32.50.5-FS2	NP-DCGW11T302FS2	.008	.087	●		●	●				●			●	
	NP-DCGW32.51-FS2	NP-DCGW11T304FS2	.016	.083	●		●	●	●			●			●	
	NP-DCGW32.52-FS2	NP-DCGW11T308FS2	.031	.079	●		●	●	●		●	●			●	
	NP-DCGW21.50.5-GS2	NP-DCGW070202GS2	.008	.087	★		●	●								
	NP-DCGW21.51-GS2	NP-DCGW070204GS2	.016	.083	●		●	●			★				●	
	NP-DCGW21.52-GS2	NP-DCGW070208GS2	.031	.079	●		●	●							●	
	NP-DCGW32.50.5-GS2	NP-DCGW11T302GS2	.008	.087	●		●	●							●	
	NP-DCGW32.51-GS2	NP-DCGW11T304GS2	.016	.083	●		●	●			●				●	
	NP-DCGW32.52-GS2	NP-DCGW11T308GS2	.031	.079	●		●	●			★				●	
	NP-DCGW21.50.5-GA2	NP-DCGW070202GA2	.008	.087		★			●				●			
	NP-DCGW21.51-GA2	NP-DCGW070204GA2	.016	.083		★			●	●			●			
	NP-DCGW21.52-GA2	NP-DCGW070208GA2	.031	.079		★				●						
	NP-DCGW32.50.5-GA2	NP-DCGW11T302GA2	.008	.087		★			●				●			
	NP-DCGW32.51-GA2	NP-DCGW11T304GA2	.016	.083		●			●	●			●			
	NP-DCGW32.52-GA2	NP-DCGW11T308GA2	.031	.079		●			●	●			●			
	NP-DCGW32.51-GH2	NP-DCGW11T304GH2	.016	.083				●	●	●						
	NP-DCGW32.52-GH2	NP-DCGW11T308GH2	.031	.079				●	●	●						
	NEW NP-DCGW32.51-VA2	NP-DCGW11T304VA2	.016	.083		★										
	NEW NP-DCGW32.52-VA2	NP-DCGW11T308VA2	.031	.079		●										
	NP-DCGW21.51-TA2	NP-DCGW070204TA2	.016	.083					●	●			●	●		
	NP-DCGW21.52-TA2	NP-DCGW070208TA2	.031	.079						●				●		
	NP-DCGW32.51-TA2	NP-DCGW11T304TA2	.016	.083		★			●	●			●	●		
	NP-DCGW32.52-TA2	NP-DCGW11T308TA2	.031	.079		★			●	●			●	●		
	NP-DCGW32.51-TH2	NP-DCGW11T304TH2	.016	.083					●	●				●		
	NP-DCGW32.52-TH2	NP-DCGW11T308TH2	.031	.079					●	●				●		
	NP-DCGW21.51-SF2	NP-DCGW070204SF2	.016	.083											●	
	NP-DCGW21.52-SF2	NP-DCGW070208SF2	.031	.079											●	
	NP-DCGW32.50.5-SF2	NP-DCGW11T302SF2	.008	.087											●	
	NP-DCGW32.51-SF2	NP-DCGW11T304SF2	.016	.083											●	
	NP-DCGW32.52-SF2	NP-DCGW11T308SF2	.031	.079											●	
	NP-DCGW21.51-SE2	NP-DCGW070204SE2	.016	.083											●	
	NP-DCGW21.52-SE2	NP-DCGW070208SE2	.031	.079											●	
	NP-DCGW32.50.5-SE2	NP-DCGW11T302SE2	.008	.087											●	
	NP-DCGW32.51-SE2	NP-DCGW11T304SE2	.016	.083											●	
	NP-DCGW32.52-SE2	NP-DCGW11T308SE2	.031	.079											●	

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✤ Unstable Cutting

Workpiece Material			BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
	H	Hardened Materials	●	◐	●	●	◐	✤		●	◐	✤		
	K	Cast Iron							●				◐	✤
	S	Heat Resistant Alloy, Titanium Alloy												
		Sintered Alloy											◐	

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN BC8210 (NEW)	Coated CBN BC8220 (NEW)	Coated CBN BC8105	Coated CBN BC8110	Coated CBN BC8120	Coated CBN BC8130	Coated CBN BC5110 (NEW)	CBN MB8110	CBN MB8120	CBN MB8130	CBN MB4120	Solid CBN MBS140
NEW PETIT CUT  (With Breaker)	**BF-DCGT32.51-TS2**	BF-DCGT11T304TS2	.016	.083	★			★								
	BF-DCGT32.52-TS2	BF-DCGT11T308TS2	.031	.079	★			★								
NEW PETIT CUT (With Breaker)	**BM-DCGT32.51-TA2**	BM-DCGT11T304TA2	.016	.083		●			●							
	BM-DCGT32.52-TA2	BM-DCGT11T308TA2	.031	.079		●			●							

● = NEW

60° TC TYPE INSERTS WITH HOLE

NP-TCGW 2 1.5 1 FS3
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-TCGW21.51-FS3**	NP-TCGW110204FS3	.016	.063							●				●	
	NP-TCGW21.52-FS3	NP-TCGW110208FS3	.031	.067							●				●	
	NP-TCGW1.81.51-GS3	NP-TCGW090204GS3	.016	.063				★			★					
	NP-TCGW1.81.52-GS3	NP-TCGW090208GS3	.031	.067				★								
	NP-TCGW21.50.5-GS3	NP-TCGW110202GS3	.008	.059				●								
	NP-TCGW21.51-GS3	NP-TCGW110204GS3	.016	.063				●							●	
	NP-TCGW21.52-GS3	NP-TCGW110208GS3	.031	.067				●			★				●	
	NP-TCGW2.521-GS3	NP-TCGW130304GS3	.016	.063				★								
	NP-TCGW2.522-GS3	NP-TCGW130308GS3	.031	.067				★								
	NP-TCGW32.51-GS3	NP-TCGW16T304GS3	.016	.063				●								
	NP-TCGW32.52-GS3	NP-TCGW16T308GS3	.031	.067				●								
	NP-TCGW21.51-SF3	NP-TCGW110204SF3	.016	.063											●	
	NP-TCGW21.52-SF3	NP-TCGW110208SF3	.031	.067											●	
	NP-TCGW21.51-SE3	NP-TCGW110204SE3	.016	.063											●	
	NP-TCGW21.52-SE3	NP-TCGW110208SE3	.031	.067											●	

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

60° TP TYPE INSERTS WITH HOLE

NP-TPGB 1.8 1.5 0.5 FS3
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✲ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	NP-TPGB1.81.50.5-FS3	NP-TPGB090202FS3	.008	.059											●	
	NP-TPGB1.81.51-FS3	NP-TPGB090204FS3	.016	.063							★				●	
	NP-TPGB220.5-FS3	NP-TPGB110302FS3	.008	.059	★		●	●				●			●	
	NP-TPGB221-FS3	NP-TPGB110304FS3	.016	.063	★		●	★	★		★	●			●	
	NP-TPGB222-FS3	NP-TPGB110308FS3	.031	.067	★		●	★	★		●	●			●	
	NP-TPGB321-FS3	NP-TPGB160304FS3	.016	.063					★							
	NP-TPGB322-FS3	NP-TPGB160308FS3	.031	.067					★							
	NP-TPGB1.51.51-GS3	NP-TPGB080204GS3	.016	.063	★		●	★			★					
	NP-TPGB1.51.52-GS3	NP-TPGB080208GS3	.031	.067	★		●	★								
	NP-TPGB1.81.50.5-GS3	NP-TPGB090202GS3	.008	.059											●	
	NP-TPGB1.81.51-GS3	NP-TPGB090204GS3	.016	.063	●		●	★							●	
	NP-TPGB1.81.52-GS3	NP-TPGB090208GS3	.031	.067	★		●	★								
	NP-TPGB220.5-GS3	NP-TPGB110302GS3	.008	.059	●		●	●							●	
	NP-TPGB221-GS3	NP-TPGB110304GS3	.016	.063	★		●	★			★				●	
	NP-TPGB222-GS3	NP-TPGB110308GS3	.031	.067	★		●	★			★				●	
	NP-TPGB321-GS3	NP-TPGB160304GS3	.016	.063	●		●	★								
	NP-TPGB322-GS3	NP-TPGB160308GS3	.031	.067	★		●	★								
	NP-TPGB1.51.51-GA3	NP-TPGB080204GA3	.016	.063						●						
	NP-TPGB1.51.52-GA3	NP-TPGB080208GA3	.031	.067						●						
	NP-TPGB1.81.51-GA3	NP-TPGB090204GA3	.016	.063		★			★	●			●			
	NP-TPGB1.81.52-GA3	NP-TPGB090208GA3	.031	.067		★			★	●			●			
	NP-TPGB220.5-GA3	NP-TPGB110302GA3	.008	.059		★			★				●			
	NP-TPGB221-GA3	NP-TPGB110304GA3	.016	.063		●			★	●			●			
	NP-TPGB222-GA3	NP-TPGB110308GA3	.031	.067		●			★	●			●			
	NP-TPGB321-GA3	NP-TPGB160304GA3	.016	.063		●			★	●			●			
	NP-TPGB322-GA3	NP-TPGB160308GA3	.031	.067		★			★	●			●			
	NP-TPGB321-GH3	NP-TPGB160304GH3	.016	.063				●	●	●						
	NP-TPGB322-GH3	NP-TPGB160308GH3	.031	.067				●	●	●						
NEW	NP-TPGB221-VA3	NP-TPGB110304VA3	.016	.063		★										
NEW	NP-TPGB222-VA3	NP-TPGB110308VA3	.031	.067		●										
	NP-TPGB1.51.51-TA3	NP-TPGB080204TA3	.016	.063						●				●		
	NP-TPGB1.51.52-TA3	NP-TPGB080208TA3	.031	.067						●				●		
	NP-TPGB1.81.51-TA3	NP-TPGB090204TA3	.016	.063						●				●		
	NP-TPGB1.81.52-TA3	NP-TPGB090208TA3	.031	.067						●				●		
	NP-TPGB221-TA3	NP-TPGB110304TA3	.016	.063		★			★	●			●	●		
	NP-TPGB222-TA3	NP-TPGB110308TA3	.031	.067		●			★	●			●	●		

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

60° TP TYPE INSERTS WITH HOLE

NP-TPGB 3 2 1 TA3
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN							CBN				Solid CBN
					NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT	**NP-TPGB321-TA3**	NP-TPGB160304TA3	.016	.063					★	●			●	●		
	NP-TPGB322-TA3	NP-TPGB160308TA3	.031	.067					★	●			●	●		
	NP-TPGB321-TH3	NP-TPGB160304TH3	.016	.063					●	●				●		
	NP-TPGB322-TH3	NP-TPGB160308TH3	.031	.067					●	●				●		
NEW PETIT CUT	**NP-TPGB1.81.50.5-SF3**	NP-TPGB090202SF3	.008	.059											●	
	NP-TPGB1.81.51-SF3	NP-TPGB090204SF3	.016	.063											●	
	NP-TPGB220.5-SF3	NP-TPGB110302SF3	.008	.059											●	
	NP-TPGB221-SF3	NP-TPGB110304SF3	.016	.063											●	
	NP-TPGB222-SF3	NP-TPGB110308SF3	.031	.067											●	
	NP-TPGB1.81.50.5-SE3	NP-TPGB090202SE3	.008	.059											●	
	NP-TPGB1.81.51-SE3	NP-TPGB090204SE3	.016	.063											●	
	NP-TPGB220.5-SE3	NP-TPGB110302SE3	.008	.059											●	
	NP-TPGB221-SE3	NP-TPGB110304SE3	.016	.063											●	
	NP-TPGB222-SE3	NP-TPGB110308SE3	.031	.067											●	

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

35° VB TYPE INSERTS WITH HOLE

NP-VBGW 2 2 0.5 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Workpiece Material																		
	H	Hardened Materials	●	◐	●	●	◐	✣		●	◐	✣						
	K	Cast Iron							●					◐	✣			
	S	Heat Resistant Alloy, Titanium Alloy																
		Sintered Alloy												◐				

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
						NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		NP-VBGW220.5-FS2	NP-VBGW110302FS2	.008	.098	★			●				●				
		NP-VBGW221-FS2	NP-VBGW110304FS2	.016	.098	●			●				●			●	
		NP-VBGW222-FS2	NP-VBGW110308FS2	.031	.079	★			●				●			●	
		NP-VBGW330.5-FS2	NP-VBGW160402FS2	.008	.098	●			●				●				
		NP-VBGW331-FS2	NP-VBGW160404FS2	.016	.098					●						●	
		NP-VBGW332-FS2	NP-VBGW160408FS2	.031	.079					●						●	
		NP-VBGW220.5-GS2	NP-VBGW110302GS2	.008	.098	●		●	●								
		NP-VBGW221-GS2	NP-VBGW110304GS2	.016	.098	★		●	●							●	
		NP-VBGW222-GS2	NP-VBGW110308GS2	.031	.079	●		●	●							●	
		NP-VBGW330.5-GS2	NP-VBGW160402GS2	.008	.098	●		●	●								
		NP-VBGW331-GS2	NP-VBGW160404GS2	.016	.098	●		●	●			●				●	
		NP-VBGW332-GS2	NP-VBGW160408GS2	.031	.079	●		●	●			●				●	
		NP-VBGW220.5-GA2	NP-VBGW110302GA2	.008	.098		★			●			●				
		NP-VBGW221-GA2	NP-VBGW110304GA2	.016	.098		●			●	●		●				
		NP-VBGW222-GA2	NP-VBGW110308GA2	.031	.079		●			●	●		●				
		NP-VBGW330.5-GA2	NP-VBGW160402GA2	.008	.098		★			●			●				
		NP-VBGW331-GA2	NP-VBGW160404GA2	.016	.098		●			●	●		●				
		NP-VBGW332-GA2	NP-VBGW160408GA2	.031	.079		★			●	●		●				
		NP-VBGW331-GH2	NP-VBGW160404GH2	.016	.098				●	●	●						
		NP-VBGW332-GH2	NP-VBGW160408GH2	.031	.079				●	●	●						
	NEW	NP-VBGW331-VA2	NP-VBGW160404VA2	.016	.098		★										
	NEW	NP-VBGW332-VA2	NP-VBGW160408VA2	.031	.079		★										
		NP-VBGW221-TA2	NP-VBGW110304TA2	.016	.098						●						
		NP-VBGW222-TA2	NP-VBGW110308TA2	.031	.079						●						
		NP-VBGW331-TA2	NP-VBGW160404TA2	.016	.098		★			●	●		●				
		NP-VBGW332-TA2	NP-VBGW160408TA2	.031	.079		★			●	●		●				
		NP-VBGW331-TH2	NP-VBGW160404TH2	.016	.098					●	●						
		NP-VBGW332-TH2	NP-VBGW160408TH2	.031	.079					●	●						
		NP-VBGW221-SF2	NP-VBGW110304SF2	.016	.098											●	
		NP-VBGW222-SF2	NP-VBGW110308SF2	.031	.079											●	
		NP-VBGW331-SF2	NP-VBGW160404SF2	.016	.098											●	
		NP-VBGW332-SF2	NP-VBGW160408SF2	.031	.079											●	
		NP-VBGW221-SE2	NP-VBGW110304SE2	.016	.098											●	
		NP-VBGW222-SE2	NP-VBGW110308SE2	.031	.079											●	
		NP-VBGW331-SE2	NP-VBGW160404SE2	.016	.098											●	
		NP-VBGW332-SE2	NP-VBGW160408SE2	.031	.079											●	

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

35° VC TYPE INSERTS WITH HOLE

NP-VCGW 3 3 1 FS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material		
	H	Hardened Materials
	K	Cast Iron
	S	Heat Resistant Alloy, Titanium Alloy
		Sintered Alloy

Shape		Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	Coated CBN						CBN				Solid CBN
						NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT		NP-VCGW331-FS2	NP-VCGW160404FS2	.016	.098				●	●			●				
		NP-VCGW332-FS2	NP-VCGW160408FS2	.031	.079				●	●			●				
		NP-VCGW331-GS2	NP-VCGW160404GS2	.016	.098	★		●	●								
		NP-VCGW332-GS2	NP-VCGW160408GS2	.031	.079	★		●	●								
		NP-VCGW331-GA2	NP-VCGW160404GA2	.016	.098		●			●	●						
		NP-VCGW332-GA2	NP-VCGW160408GA2	.031	.079		★			●	●						
		NP-VCGW331-GH2	NP-VCGW160404GH2	.016	.098				●	●	●						
		NP-VCGW332-GH2	NP-VCGW160408GH2	.031	.079				●	●	●						
	NEW	NP-VCGW331-VA2	NP-VCGW160404VA2	.016	.098		★										
	NEW	NP-VCGW332-VA2	NP-VCGW160408VA2	.031	.079		★										
		NP-VCGW331-TS2	NP-VCGW160404TS2	.016	.098				●								
		NP-VCGW332-TS2	NP-VCGW160408TS2	.031	.079				●								
		NP-VCGW331-TA2	NP-VCGW160404TA2	.016	.098		★			●	●						
		NP-VCGW332-TA2	NP-VCGW160408TA2	.031	.079		★			●	●						
		NP-VCGW331-TH2	NP-VCGW160404TH2	.016	.098					●	●						
		NP-VCGW332-TH2	NP-VCGW160408TH2	.031	.079					●	●						

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

90° SP TYPE INSERTS WITHOUT HOLE

NP-SPGN 4 3 3 GS2
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material						Coated CBN							CBN				Solid CBN
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠			
	K	Cast Iron							●				◐	✠	
	S	Heat Resistant Alloy, Titanium Alloy													
		Sintered Alloy											◐		

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140
NEW PETIT CUT NEW	**NP-SPGN433-GS2**	NP-SPGN120412GS2	.047	.098							★					

● = NEW

EXTERNAL TURNING ➤ C002
BORING ➤ E002
IDENTIFICATION ➤ B002
HONING ➤ B009

GY TYPE INSERTS WITHOUT HOLE

GY1G 0200 D 020 N GFGS
Size Thickness Corner Radius Honing & Wiper
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Workpiece Material			Coated CBN							CBN					Solid CBN
			NEW BC8210	BC8220	BC8105	BC8110	BC8120	BC8130	NEW BC5110	MB8110	MB8120	MB8130	MB4120	MBS140	
	H	Hardened Materials	●	◐	●	●	◐	✠		●	◐	✠			
	K	Cast Iron							●				◐	✠	
	S	Heat Resistant Alloy, Titanium Alloy													
		Sintered Alloy											◐		

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)
	GY1G0200D020N-GFGS	GY1G0200D020N-GFGS	.008	.106
	GY1G0239E020N-GFGS	GY1G0239E020N-GFGS	.008	.106
	GY1G0250E020N-GFGS	GY1G0250E020N-GFGS	.008	.106
	GY1G0300F020N-GFGS	GY1G0300F020N-GFGS	.008	.106
	GY1G0318F020N-GFGS	GY1G0318F020N-GFGS	.008	.106
	GY1G0400G020N-GFGS	GY1G0400G020N-GFGS	.008	.106
	GY1G0475H020N-GFGS	GY1G0475H020N-GFGS	.008	.106
	GY1G0500H020N-GFGS	GY1G0500H020N-GFGS	.008	.106
	GY1G0600J020N-GFGS	GY1G0600J020N-GFGS	.008	.106

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CN TYPE INSERTS WITH HOLE

NP-CNMM 4 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-CNMM430.5RF**	NP-CNMM120402R-F	.008	.067	★
	NP-CNMM431RF	NP-CNMM120404R-F	.016	.071	★
	NP-CNMM432RF	NP-CNMM120408R-F	.031	.079	★
	CNMA431	CNMA120404	.016	.142	★
	CNMA432	CNMA120408	.031	.142	★

55° DN TYPE INSERTS WITH HOLE

NP-DNMM 4 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-DNMM430.5RF**	NP-DNMM150402R-F	.008	.087	★
	NP-DNMM431RF	NP-DNMM150404R-F	.016	.083	★
	NP-DNMM432RF	NP-DNMM150408R-F	.031	.079	★
	DNGA431	DNGA150404	.016	.114	★
	DNGA432	DNGA150408	.031	.094	★

90° SN TYPE INSERTS WITH HOLE

NP-SNMM 4 3 1 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-SNMM431RF**	NP-SNMM120404R-F	.016	.079	★
	NP-SNMM432RF	NP-SNMM120408R-F	.031	.087	★
	SNGA432	SNGA120408	.031	.150	★

60° TN TYPE INSERTS WITH HOLE

NP-TNMM 3 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-TNMM330.5RF**	NP-TNMM160402R-F	.008	.059	★
	NP-TNMM331RF	NP-TNMM160404R-F	.016	.063	★
	NP-TNMM332RF	NP-TNMM160408R-F	.031	.067	★
	TNGA330.5	TNGA160402	.008	.122	★
	TNGA331	TNGA160404	.016	.114	★
	TNGA332	TNGA160408	.031	.110	★

★ : Stocked in Japan
<1 insert in one case>

35° VN TYPE INSERTS WITH HOLE

NP-VNMM 3 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◔ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-VNMM330.5RF**	NP-VNMM160402R-F	.008	.098	★
	NP-VNMM331RF	NP-VNMM160404R-F	.016	.098	★
	NP-VNMM332RF	NP-VNMM160408R-F	.031	.079	★
	VNGA331	VNGA160404	.016	.102	★
	VNGA332	VNGA160408	.031	.071	★

90° SN TYPE INSERTS WITHOUT HOLE

SNG 4 3 2
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◕ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220	
	SNG432	SNGN120408	.031	.150	★	

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° CC TYPE INSERTS WITH HOLE

NP-CCMH 2 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-CCMH21.50.5**	NP-CCMH060202	.008	.067	●
	NP-CCMH21.51	NP-CCMH060204	.016	.071	●
NEW PETIT CUT	**NP-CCMW03S102**	NP-CCMW03S102	.008	.043	●
	NP-CCMW03S104	NP-CCMW03S104	.016	.039	●
	NP-CCMW04T002	NP-CCMW04T002	.008	.059	●
	NP-CCMW04T004	NP-CCMW04T004	.016	.055	●
	CCMW21.50.5	CCMW060202	.008	.114	●
	CCMW21.51	CCMW060204	.016	.114	●
	CCMW32.50.5	CCMW09T302	.008	.130	●
	CCMW32.51	CCMW09T304	.016	.130	●

80° CP TYPE INSERTS WITH HOLE

NP-CPMH 2.5 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT (With Breaker)	**NP-CPMH2.51.50.5**	NP-CPMH080202	.008	.067	●
	NP-CPMH2.51.51	NP-CPMH080204	.016	.071	●
	NP-CPMH320.5	NP-CPMH090302	.008	.067	●
	NP-CPMH321	NP-CPMH090304	.016	.071	●
	CPGT2.51.50.5	CPGT080202	.008	.146	●
	CPGT2.51.51	CPGT080204	.016	.142	●
	CPGT320.5	CPGT090302	.008	.130	●
	CPGT321	CPGT090304	.016	.130	●

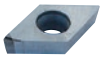
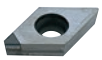
PCD
B
PCD TURNING INSERTS
POSI 7° 11°
WITH HOLE
C
D
R
S
T
V
W

55° DC TYPE INSERTS WITH HOLE

NP-DCMT 2 1.5 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT	**NP-DCMT21.50.5RF**	NP-DCMT070202R-F	.008	.055	●
	NP-DCMT21.50.5LF	NP-DCMT070202L-F	.008	.055	●
	NP-DCMT21.51RF	NP-DCMT070204R-F	.016	.059	●
	**NP-DCMT21.51LF**	NP-DCMT070204L-F	.016	.059	●
	NP-DCMT32.50.5RF	NP-DCMT11T302R-F	.008	.055	●
	NP-DCMT32.50.5LF	NP-DCMT11T302L-F	.008	.055	●
	NP-DCMT32.51RF	NP-DCMT11T304R-F	.016	.059	●
(With Breaker)	**NP-DCMT32.51LF**	NP-DCMT11T304L-F	.016	.059	●
	DCMW21.50.5	DCMW070202	.008	.106	★
	**DCMW21.51**	DCMW070204	.016	.098	●
	DCMW32.50.5	DCMW11T302	.008	.118	●
	DCMW32.51	DCMW11T304	.016	.114	●

90° SP TYPE INSERTS WITH HOLE

SPGX 3 2 1
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
	SPGX321	SPGX090304	.016	.146	★
	SPGX322	SPGX090308	.031	.150	★

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

60° TC TYPE INSERTS WITH HOLE

TCMW 2 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	PCD MD220
	TCMW21.50.5	TCMW110202	.008	.106	●
	TCMW21.51	TCMW110204	.016	.102	★
	TCGW1.210.5	TCGW060102	.008	.059	★
	TCGW1.211	TCGW060104	.016	.063	★

60° TP TYPE INSERTS WITH HOLE

NP-TPMX 1.8 1.5 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
NEW PETIT CUT	**NP-TPMX1.81.50.5RF**	NP-TPMX090202R-F	.008	.059	★
	NP-TPMX1.81.50.5LF	NP-TPMX090202L-F	.008	.059	★
	NP-TPMX1.81.51LF	NP-TPMX090204L-F	.016	.063	★
	NP-TPMX1.81.52LF	NP-TPMX090208L-F	.031	.067	★
	NP-TPMX220.5LF	NP-TPMX110302L-F	.008	.059	★
	NP-TPMX221LF	NP-TPMX110304L-F	.016	.063	★
	NP-TPMX222LF	NP-TPMX110308L-F	.031	.067	★
	NP-TPMX320.5LF	NP-TPMX160302L-F	.008	.059	★
	NP-TPMX321LF	NP-TPMX160304L-F	.016	.063	★
(With Breaker)	**NP-TPMX322LF**	NP-TPMX160308L-F	.031	.067	★
NEW PETIT CUT	**NP-TPMH1.51.50.5RF**	NP-TPMH080202R-F	.008	.059	●
	NP-TPMH1.51.50.5LF	NP-TPMH080202L-F	.008	.059	●
	NP-TPMH1.51.51RF	NP-TPMH080204R-F	.016	.063	●
	NP-TPMH1.51.51LF	NP-TPMH080204L-F	.016	.063	●
	NP-TPMH1.81.50.5RF	NP-TPMH090202R-F	.008	.059	●
	NP-TPMH1.81.50.5LF	NP-TPMH090202L-F	.008	.059	●
	NP-TPMH1.81.51RF	NP-TPMH090204R-F	.016	.063	●
	NP-TPMH1.81.51LF	NP-TPMH090204L-F	.016	.063	●
	NP-TPMH220.5RF	NP-TPMH110302R-F	.008	.059	●
	NP-TPMH220.5LF	NP-TPMH110302L-F	.008	.059	●
	NP-TPMH221RF	NP-TPMH110304R-F	.016	.063	●
	NP-TPMH221LF	NP-TPMH110304L-F	.016	.063	●
	NP-TPMH320.5RF	NP-TPMH160302R-F	.008	.059	★
	NP-TPMH320.5LF	NP-TPMH160302L-F	.008	.059	★
	NP-TPMH321RF	NP-TPMH160304R-F	.016	.063	★
(With Breaker)	**NP-TPMH321LF**	NP-TPMH160304L-F	.016	.063	★
	TPGT320.5RF	TPGT160302R-F	.008	.122	★
	TPGT320.5LF	TPGT160302L-F	.008	.122	★
	TPGT321RF	TPGT160304R-F	.016	.114	★
	TPGT321LF	TPGT160304L-F	.016	.114	★
(With Breaker)					

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●

Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	PCD MD220
(With Breaker)	**TPGV1.81.50.5RF**	TPGV090202R-F	.008	.106	★
	TPGV1.81.50.5LF	TPGV090202L-F	.008	.106	★
	TPGV1.81.51RF	TPGV090204R-F	.016	.102	★
	TPGV1.81.51LF	TPGV090204L-F	.016	.102	★
	TPGV220.5RF	TPGV110302R-F	.008	.106	★
	TPGV220.5LF	TPGV110302L-F	.008	.106	★
	TPGV221RF	TPGV110304R-F	.016	.102	★
	TPGV221LF	TPGV110304L-F	.016	.102	★
	TPGX1.51.50.5	TPGX080202	.008	.071	★
	TPGX1.51.51	TPGX080204	.016	.067	★
	TPGX1.51.52	TPGX080208	.031	.055	★
	TPGX1.81.50.5	TPGX090202	.008	.106	★
	TPGX1.81.51	TPGX090204	.016	.102	★
	TPGX1.81.52	TPGX090208	.031	.091	★
	TPGX220.5	TPGX110302	.008	.106	★
	TPGX221	TPGX110304	.016	.102	★
	TPGX222	TPGX110308	.031	.091	★
	TPGX321	TPGX160304	.016	.114	★
	TPGX322	TPGX160308	.031	.102	★

35° VB TYPE INSERTS WITH HOLE

NP-VBGT 2 2 V5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
(With Breaker)	**NP-VBGT22V5RF**	NP-VBGT1103V5R-F	.002	.098	★
	NP-VBGT220.2RF	NP-VBGT110301R-F	.004	.098	★
	NP-VBGT220.5RF	NP-VBGT110302R-F	.008	.098	★
	NP-VBGT221RF	NP-VBGT110304R-F	.016	.098	★

35° VC TYPE INSERTS WITH HOLE

NP-VCGT 1.5 1.5 V5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✠ Unstable Cutting

Work Material	N	Non ferrous Metal	●

Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
(With Breaker)	**NP-VCGT1.51.5V5RF**	NP-VCGT0802V5R-F	.002	.098	★
	NP-VCGT1.51.50.2RF	NP-VCGT080201R-F	.004	.098	★
	NP-VCGT1.51.50.5RF	NP-VCGT080202R-F	.008	.098	★
	NP-VCGT1.51.51RF	NP-VCGT080204R-F	.016	.098	★
	NP-VCGT22V5RF	NP-VCGT1103V5R-F	.002	.098	★
	NP-VCGT220.2RF	NP-VCGT110301R-F	.004	.098	★
	NP-VCGT220.5RF	NP-VCGT110302R-F	.008	.098	★
	NP-VCGT221RF	NP-VCGT110304R-F	.016	.098	★
NEW	**VCGW220.2**	VCGW110301	.004	.122	●
	VCGW220.5	VCGW110302	.008	.118	●
	VCGW221	VCGW110304	.016	.102	●

● = NEW

● : USA Stock ★ : Stocked in Japan
<1 insert in one case>

80° WC TYPE INSERTS WITH HOLE

WCMW 1.5 1.5 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220	
	WCMW1.51.50.5	WCMWL30202	.008	.063	★	
	WCMW21.50.5	WCMW040202	.008	.114	★	
	WCMW32.51	WCMW06T304	.016	.118	★	

80° WP TYPE INSERTS WITH HOLE

WPGT 2 1.5 0.5
Size Thickness Corner Raduis
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220	
(With Breaker)	**WPGT21.50.5**	WPGT040202	.008	.114	★	
	WPGT21.51	WPGT040204	.016	.114	★	
	WPGT320.5	WPGT060302	.008	.130	★	
	WPGT321	WPGT060304	.016	.130	★	

55° DE TYPE INSERTS WITH HOLE

DEGX 4 3 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
(With Breaker)	**DEGX430.5RF**	DEGX150402R-F	.008	.118	★
	DEGX430.5LF	DEGX150402L-F	.008	.118	★
	DEGX431RF	DEGX150404R-F	.016	.114	★
	DEGX431LF	DEGX150404L-F	.016	.114	★

60° TE TYPE INSERTS WITH HOLE

TEGX 3 2 0.5 R
Size Thickness Corner Raduis
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
(With Breaker)	**TEGX320.5R**	TEGX160302R	.008	.150	★
	TEGX320.5L	TEGX160302L	.008	.150	★
	TEGX321R	TEGX160304R	.016	.142	★
	TEGX321L	TEGX160304L	.016	.142	★
	TEGX320.5	TEGX160302	.008	.122	★
	TEGX321	TEGX160304	.016	.114	★

★ : Stocked in Japan
<1 insert in one case>

35° VD TYPE INSERTS WITH HOLE

VDGX 3 2 0.5 RF
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal				●
Shape	Order Number	(ISO) Number	Corner Radius **RE** (inch)	Cutting Edge Effective Length **LE** (inch)	PCD MD220	
(With Breaker)	**VDGX320.5RF**	VDGX160302R-F	.008	.122	★	
	VDGX320.5LF	VDGX160302L-F	.008	.122	★	
	VDGX321RF	VDGX160304R-F	.016	.106	★	
	VDGX321LF	VDGX160304L-F	.016	.106	★	

90° SP TYPE INSERTS WITHOUT HOLE

SPG 3 2 0.5
Size Thickness Corner Radius
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
	SPG320.5	SPGN090302	.008	.146	★
	SPG321	SPGN090304	.016	.146	★
	SPG322	SPGN090308	.031	.150	★
	SPG421	SPGN120304	.016	.146	★
	SPG422	SPGN120308	.031	.150	★
	SPG423	SPGN120312	.047	.146	★

60° TP TYPE INSERTS WITHOUT HOLE

TPG 2 2 0.5
Size Thickness Corner Raduis
*Please refer to page B002.

Cutting Conditions : ● Stable Cutting ◐ General Cutting ✣ Unstable Cutting

Work Material	N	Non ferrous Metal			●
Shape	Order Number	(ISO) Number	Corner Radius RE (inch)	Cutting Edge Effective Length LE (inch)	PCD MD220
	TPG220.5	TPGN110302	.008	.106	★
	TPG221	TPGN110304	.016	.102	★
	TPG222	TPGN110308	.031	.091	★
	TPG320.5	TPGN160302	.008	.122	★
	TPG321	TPGN160304	.016	.114	★
	TPG322	TPGN160308	.031	.102	★

★ : Stocked in Japan
<1 insert in one case>

EXTERNAL TURNING ➤ –
BORING ➤ E002
IDENTIFICATION ➤ B002

Memo

HOW TO READ THE STANDARD OF EXTERNAL TURNING TOOLS

●How this section page is organized

①Organized according to turning insert shape.
(Refer to the index on the next page.)

TYPE OF TOOL HOLDER
indicates the first four letters of the order number, as well as cutting applications.

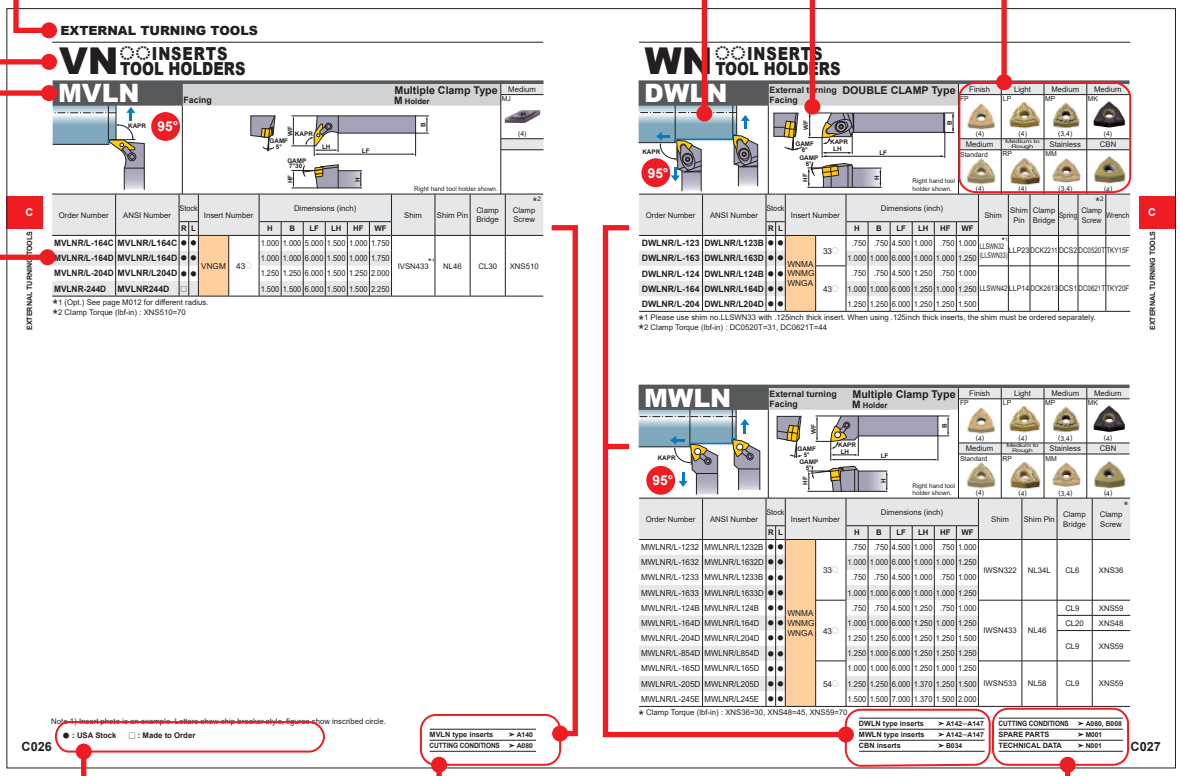
TITLE OF PRODUCT BY INSERT TYPE

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, and chamfering together with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages giving details of inserts that are applicable to the product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

●To Order : Please specify order number and hand of tool (right/left).

TURNING TOOLS

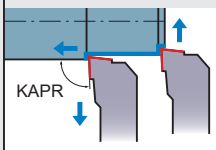
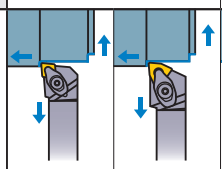
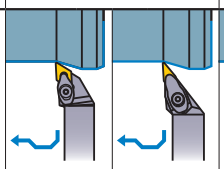
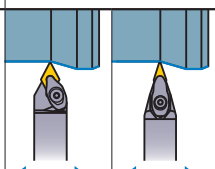
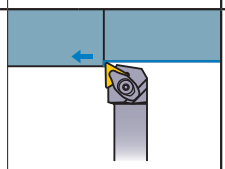
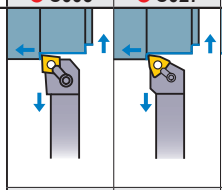
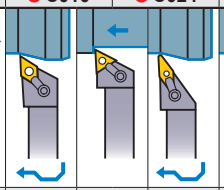
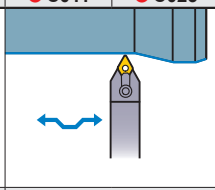
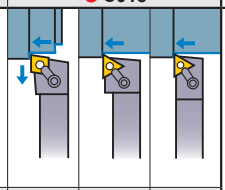
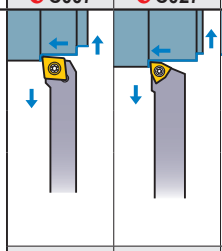
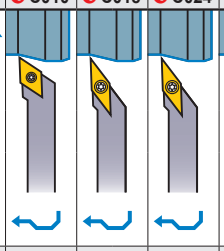
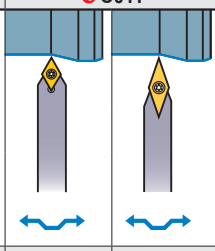
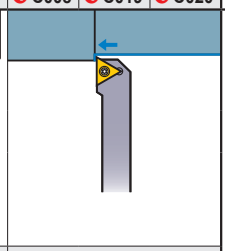
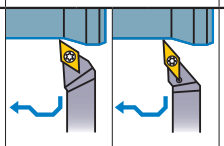
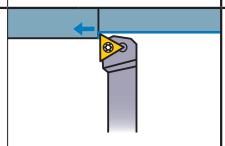
EXTERNAL TURNING TOOLS

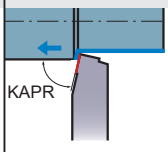
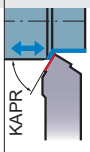
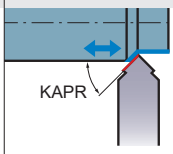
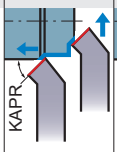
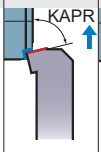
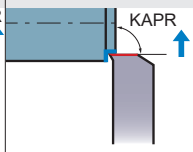
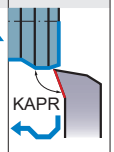
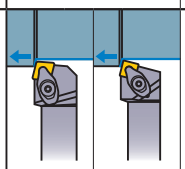
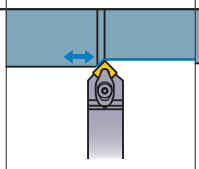
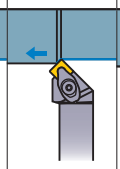
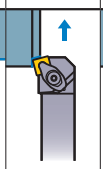
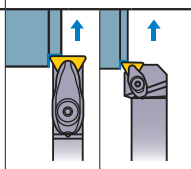
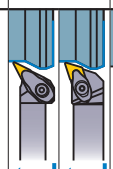
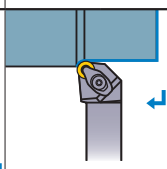
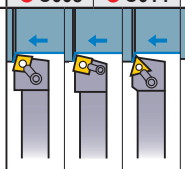
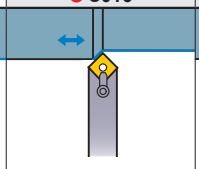
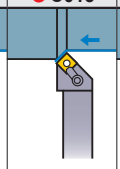
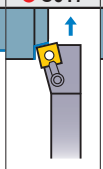
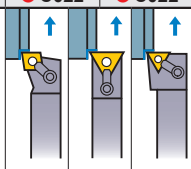
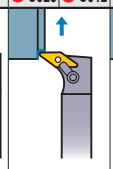
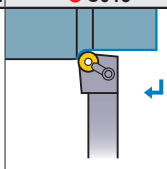
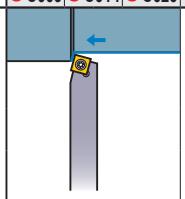
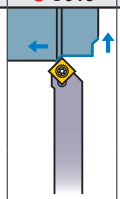
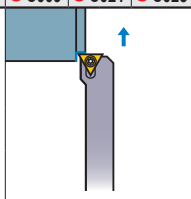
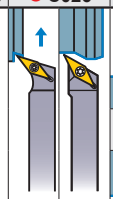
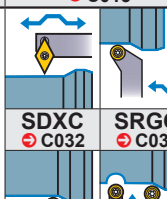
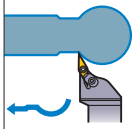
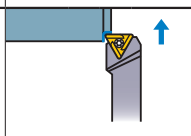
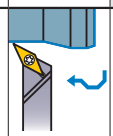
CLASSIFICATION ····· C002
IDENTIFICATION ····· C004
METHOD OF HOLDING ····· C005
STANDARD HOLDERS
CN◯◯ INSERTS TOOL HOLDERS ····· C006
DN◯◯ INSERTS TOOL HOLDERS ····· C010
RN◯◯ INSERTS TOOL HOLDERS ····· C013
SN◯◯ INSERTS TOOL HOLDERS ····· C014
TN◯◯ INSERTS TOOL HOLDERS ····· C018
VN◯◯ INSERTS TOOL HOLDERS ····· C024
WN◯◯ INSERTS TOOL HOLDERS ····· C027
VB◯◯ INSERTS TOOL HOLDERS ····· C028
CC◯◯ INSERTS TOOL HOLDERS ····· C030
DC◯◯ INSERTS TOOL HOLDERS ····· C031
RC◯◯ INSERTS TOOL HOLDERS ····· C033
SC◯◯ INSERTS TOOL HOLDERS ····· C034
TC◯◯ INSERTS TOOL HOLDERS ····· C035
VC◯◯ INSERTS TOOL HOLDERS ····· C036
WC◯◯ INSERTS TOOL HOLDERS ····· C037
XC◯◯ INSERTS TOOL HOLDERS ····· C038
RP◯◯ INSERTS TOOL HOLDERS ····· C040
●AL HOLDER (FOR ALUMINUM TURNING)
DE◯◯ INSERTS TOOL HOLDERS ····· C041
TE◯◯ INSERTS TOOL HOLDERS ····· C042
VD◯◯ INSERTS TOOL HOLDERS ····· C043

*Arranged by Alphabetical order

C006	**DCLN**	C010	**MDJN**	C032	**SDXC**
C008	**DCRN**	C011	**MDPN**	C033	**SRDC**
C010	**DDJN**	C013	**MRGN**	C040	**SRDP**
C011	**DDPN**	C016	**MSDN**	C033	**SRGC**
C012	**DDQN**	C017	**MSKN**	C034	**SSBC**
C013	**DRGN**	C014	**MSRN**	C034	**SSSC**
C016	**DSDN**	C015	**MSSN**	C035	**STFC**
C017	**DSKN**	C020	**MTAN**	C042	**STFE**
C014	**DSRN**	C021	**MTCN**	C035	**STGC**
C015	**DSSN**	C021	**MTEN**	C042	**STGE**
C022	**DTCN**	C023	**MTFN**	C029	**SVHB**
C022	**DTFN**	C019	**MTGN**	C028	**SVJB**
C018	**DTGN**	C018	**MTJN**	C036	**SVJC**
C024	**DVJN**	C020	**MTRN**	C043	**SVJD**
C025	**DVPN**	C024	**MVJN**	C036	**SVPC**
C025	**DVVN**	C026	**MVLN**	C043	**SVPD**
C027	**DWLN**	C027	**MWLN**	C028	**SVVB**
C009	**MCFN**	C030	**SCLC**	C037	**SWLC**
C008	**MCGN**	C031	**SDJC**	C038	**SXZC**
C007	**MCLN**	C041	**SDJE**		
C009	**MCRN**	C031	**SDNC**		

CLASSIFICATION

Tool Holder	Features	External Turning Facing	External Turning Copying		External Turning	
		KAPR= 95°	KAPR= 93°	KAPR= 62.5° 72.5°	KAPR= 90°—91°	
						
DOUBLE CLAMP Holder	● Double clamp type. ● Holds inserts securely. ● Excellent cutting edge tolerance. ● Economical negative insert. ● Recommended with CBN grade insert					
		DCLN ➲ C006	**DWLN** ➲ C027	**DDJN** ➲ C010	**DVJN** ➲ C024	**DDPN** ➲ C011	**DVVN** ➲ C025	**DTGN** ➲ C018
M Holder	● Negative rake clamp and locking pin tool holders. ● Insert is securely held by a shim pin and clamp bridge. ● Index operation is easy to perform. ● (Opt.) Single clamp available as clamp on or pin lock holder.					
		MCLN ➲ C007	**MWLN** ➲ C027	**MDJN** ➲ C010	**MTJN** ➲ C018	**MVJN** ➲ C024	**MDPN** ➲ C011	**MCGN** ➲ C008	**MTGN** ➲ C019	**MTAN** ➲ C020
SP Holder	● Small shank tool holder system using a 5°,7° and 11° positive inserts retained by screw-on system.					
		SCLC ➲ C030	**SWLC** ➲ C037	**SDJC** ➲ C031	**SVJC** ➲ C036	**SVJB** ➲ C028	**SDNC** ➲ C031	**SVVB** ➲ C028	**STGC** ➲ C035
PROFILE Holder	● 25° rhombic insert for profiling and face relief. ● Machine 300° of a sphere. ● Machine face relief to 60° angle. ● The cycle time can be reduced due to only one holder.					
AL Holder	● Shank size .625 square thru 1.000 square with screw-on method. ● Suitable for finishing aluminum or non-ferrous metals and for chatter control on small diameters.					
		SDJE ➲ C041	**SVJD** ➲ C043		**STGE** ➲ C042	

	External Turning	External Turning, Chamfering		External Turning, Facing, Chamfering	Facing		Facing Copying	External Turning, Copying	Selection Standard				
	KAPR= 75°	KAPR= 60°	KAPR= 45°	KAPR= 45°	KAPR= 75°	KAPR= 91°	KAPR= 107.5° 117.5°	Special Design	Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Operation Efficiency	Specialized
													
									◎		◎	◎	
	DCRN ➲ C008	DSRN ➲ C014		DSDN ➲ C016	DSSN ➲ C015	DSKN ➲ C017	DTCN ➲ C022	DTFN ➲ C022	DVPN ➲ C025	DDQN ➲ C012	DRGN ➲ C013		
											◎		○	◎	
	MCRN ➲ C009	MSRN ➲ C014	MTRN ➲ C020	MTEN ➲ C021	MSDN ➲ C016	MSSN ➲ C015	MSKN ➲ C017	MCFN ➲ C009	MTCN ➲ C021	MTFN ➲ C023	MVLN ➲ C026	MRGN ➲ C013	
													
	SSBC ➲ C034				SSSC ➲ C034			STFC ➲ C035	SVHB ➲ C029	SVPC ➲ C036	SDXC ➲ C032 SRDC ➲ C033	SRGC ➲ C033 SRDP ➲ C040	
													
											SXZC ➲ C038		
													
						STFE ➲ C042	SVPD ➲ C043						

Note 1) ◎ : 1st recommendation. ○ : 2nd recommendation.

IDENTIFICATION

■ DOUBLE CLAMP Holder, M Holder, SP Holder, PROFILE Holder, AL Holder

① Method of Holding

D	M	S
Double Clamp Type	Multiple Clamp Type	Screw Clamp Type

② Insert Shape

C	D	R	S	T	V	W	X
80°Rhombic	55°Rhombic	Round	Square	Triangluar	35°Rhombic	Trigon	Special Design

③ Tool Style

A	B	C	D	E	F
90°	75°	90°	45°	60°	90°

G	H	J	K	L	N
90°	107.5°	93°	75°	95° 95°	62.5°

P	Q	R	S	V	X Z
62.5°	107.5°	75°	45°	72.5°	Special Design

①	②	③	④	⑤		⑥	⑦	⑧
M	C	L	N	R	–	16	5	D

④ Insert Relief Angle

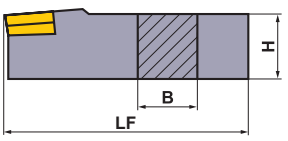
B	C	D	E	N	P
5°	7°	15°	20°	0°	11°

⑤ Hand of Tool

R	L	N

⑥ Tool Size [Height (H) and Width (B)] (inch)

	06	08	10	12	16	20	24	85
H	.375	.500	.625	.750	1.000	1.250	1.500	1.250
B	.375	.500	.625	.750	1.000	1.250	1.500	1.000



In case of B=H, the number will represent the number of sixteeths of B and H.
In case of B≠H, the first digit represents the number of eighths of B, and the second digit represents the number of quarters of H.

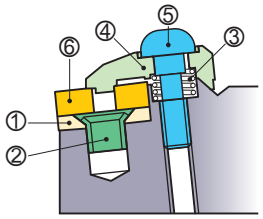
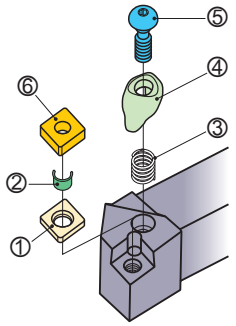
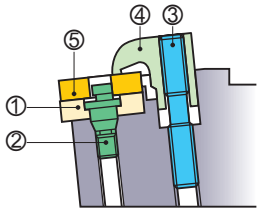
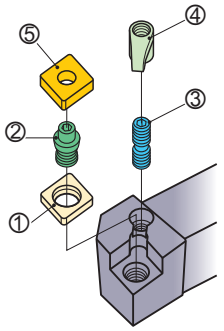
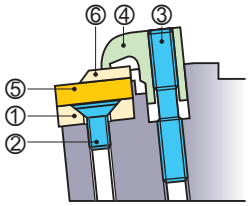
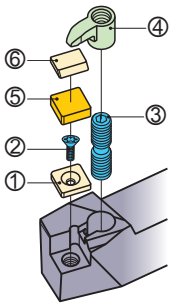
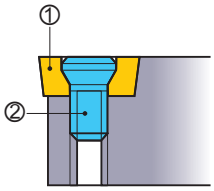
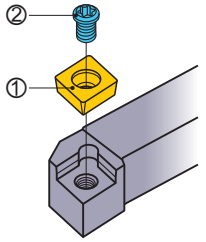
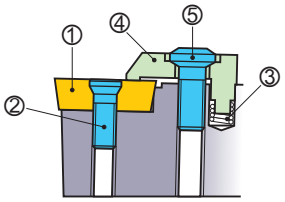
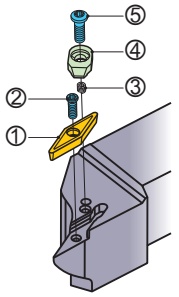
⑦ Insert Size

Inscribed Circle of Insert (inch)	.156	.187	.219	.250	.313	.375	.500	.625	.750	1.000
T	1.2	1.5	1.8	2	2.5	3	4	5	6	
S R						3	4	5	6	8
W	1.2	1.5		2		3	4	5		
80° C	1.2	1.5		2	2.5	3	4	5	6	
55° D				2		3	4	5		
35° V		1.5		2		3	4			

⑧ Tool Length (LF) (inch)

A	B	C	D	E	X
4.000	4.500	5.000	6.000	7.000	< 4.000

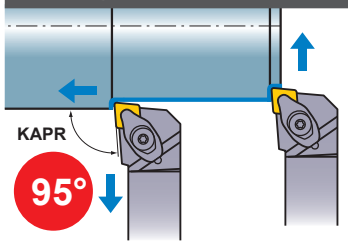
METHOD OF HOLDING

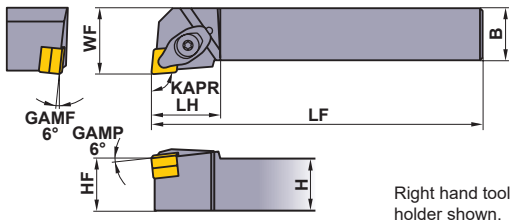
Type	Structure
Double Clamp **(DOUBLE CLAMP Holder)**	 ①Shim ②Shim Pin ③Spring ④Clamp Bridge ⑤Clamp Screw ⑥Insert 
Multiple Clamp **For insert with hole** **(M Holder)**	 ①Shim ②Shim Pin ③Clamp Screw ④Clamp Bridge ⑤Insert 
Multiple Clamp **For insert without hole** (Opt.) **(M Holder)**	 ①Shim ②Shim Screw ③Clamp Screw ④Clamp Bridge ⑤Insert ⑥Chipbreaker 
Screw Clamp **(SP Holder AL Holder SR Holder)**	 ①Insert ②Insert Screw 
Double Clamp with Screw and Clamp Bridge **(PROFILE Holder)**	 ①Insert ②Insert Screw ③Spring ④Clamp Bridge ⑤Clamp Screw 

CN INSERTS TOOL HOLDERS

DCLN

External turning DOUBLE CLAMP Type
Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4)	(4)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(3,4)	(4)	(4)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
DCLNR/L-123	**DCLNR/L123B**	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	32◌	.750	.750	4.500	1.000	.750	1.000	LLSCN33 (LLSCN32) *1	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DCLNR/L-163	**DCLNR/L163D**	●	●			1.000	1.000	6.000	1.000	1.000	1.250						
DCLNR/L-124	**DCLNR/L124B**	●	●		43◌	.750	.750	4.500	1.250	.750	1.000	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCLNR/L-164	**DCLNR/L164D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250						
DCLNR/L-204	**DCLNR/L204D**	●	●			1.250	1.250	6.000	1.250	1.250	1.500						
DCLNR/L-244	**DCLNR/L244D**	●	●			1.500	1.500	6.000	1.250	1.500	2.000						

*1 Please use shim no.LLSCN32 with .187inch thick insert. When using .187inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

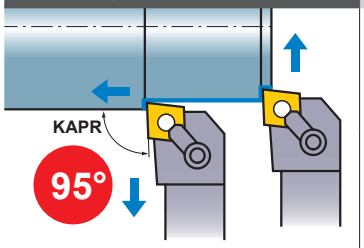
● : USA Stock

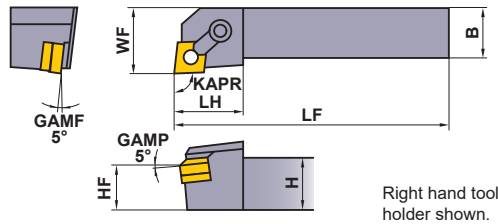
DCLN type inserts ➤ A106–A113
CBN & PCD inserts ➤ B022–B024, B049
CUTTING CONDITIONS ➤ A080, B008

MCLN

External turning
Facing

Multiple Clamp Type
M Holder





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(3,4,5,6)	(4)	(3,4,5,6)	(4)

Order Number	ANSI Number	Stock		Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
		R	L			H	B	LF	LH	HF	WF				
MCLNR/L-123	**MCLNR/L123B**	●	●	CNMA CNMG CNMM CNGA CNGG CNGM	32○	.750	.750	4.500	1.000	.750	1.000	ICSN332	NL34L	CL6	XNS37
MCLNR/L-163	**MCLNR/L163C**	●	●			1.000	1.000	5.000	1.000	1.000	1.250				
MCLNR/L-124B	**MCLNR/L124B**	●	●		43○ *2	.750	.750	4.500	1.250	.750	1.000	ICSN433 *1	NL46	CL20	XNS48
MCLNR/L-164C	**MCLNR/L164C**	●	●			1.000	1.000	5.000	1.250	1.000	1.250				
MCLNR/L-164D	**MCLNR/L164D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MCLNR/L-204D	**MCLNR/L204D**	●	●			1.250	1.250	6.000	1.250	1.250	1.500				
MCLNR/L-244D	**MCLNR/L244D**	●	●			1.500	1.500	6.000	1.250	1.500	2.000				
MCLNR/L-244E	**MCLNR/L244E**	●	●			1.500	1.500	7.000	1.250	1.500	2.000				
MCLNR/L-854D	**MCLNR/L854D**	●	●			1.250	1.000	6.000	1.250	1.250	1.250				
MCLNR/L-165C	**MCLNR/L165C**	●	●		54○	1.000	1.000	5.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCLNR/L-165D	**MCLNR/L165D**	●	●			1.000	1.000	6.000	1.375	1.000	1.250				
MCLNR/L-205D	**MCLNR/L205D**	●	●			1.250	1.250	6.000	1.375	1.250	1.500				
MCLNR/L-166C	**MCLNR/L166C**	●	●		64○	1.000	1.000	5.000	1.500	1.000	1.250	ICSN633	NL68	CL12	
MCLNR/L-166D	**MCLNR/L166D**	●	●			1.000	1.000	6.000	1.500	1.000	1.250				
MCLNR/L-206D	**MCLNR/L206D**	●	●			1.250	1.250	6.000	1.500	1.250	1.500				
MCLNR/L-246D	**MCLNR/L246D**	●	●			1.500	1.500	6.000	1.500	1.500	2.000				
MCLNR/L-246E	**MCLNR/L246E**	●	●			1.500	1.500	7.000	1.500	1.500	2.000				
MCLNR/L-856D	**MCLNR/L856D**	●	●			1.250	1.000	6.000	1.500	1.250	1.250				

*1 (Opt.) See page M012 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS510=70

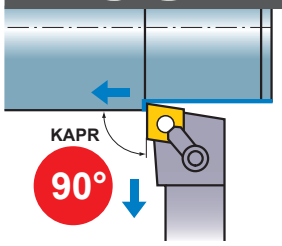
Shim Screw	Chipbreaker
S46	CBC4

MCLN type inserts	**➤ A106–A113**
CBN & PCD inserts	**➤ B022–B024, B049**
CUTTING CONDITIONS	**➤ A080, B008**

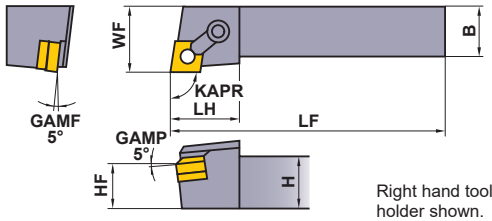
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

CN INSERTS TOOL HOLDERS

MCGN



External turning — **Multiple Clamp Type** **M Holder**



Right hand tool holder shown.

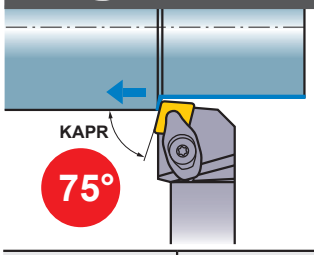
Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(4,5,6)	(4,5,6)	(4,5,6)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MCGNR/L-124	MCGNR/L124B	●	□	CNMA CNMG CNMM CNGA CNGG CNGM	43○ *2	.750	.750	4.500	1.250	.750	1.000	ICSN433 *1	NL46	CL20	XNS48
MCGNR/L-164C	MCGNR/L164C	□	●			1.000	1.000	5.000	1.250	1.000	1.250				
MCGNR/L-164D	MCGNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MCGNR/L-165D	MCGNR/L165D	●	●		54○	1.000	1.000	6.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCGNR/L-166D	MCGNR/L166D	●	●		64○	1.000	1.000	6.000	1.625	1.000	1.250	ICSN633	NL68	CL12	XNS510

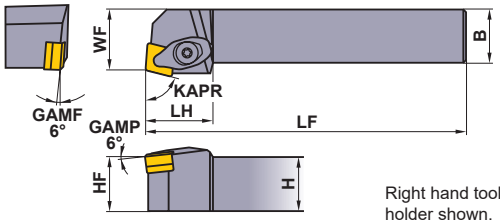
*1 (Opt.) See page M012 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

DCRN



External turning — **DOUBLE CLAMP Type**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4)	(4)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
(4)	(4)	(4)	

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
DCRNR/L-124	DCRNR/L124B	●	●	CNMA CNMG CNMM CNGA CNGG CNMG	43○	.750	.750	4.500	1.250	.750	.888	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DCRNR/L-164	DCRNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.128						

* Clamp Torque (lbf-in) : DC0621T=44

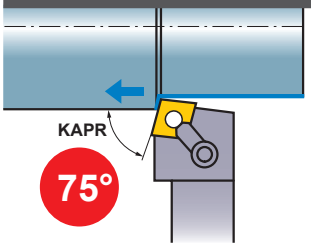
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

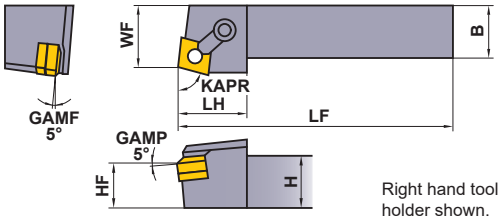
● : USA Stock □ : Made to Order

MCGN type inserts	➤ A106–A113
DCRN type inserts	➤ A106–A113
CBN & PCD inserts	➤ B022–B024, B049
CUTTING CONDITIONS	➤ A080, B008

MCRN

External turning — **Multiple Clamp Type** **M Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	
Standard	RP	MM	
(4,5,6)	(4)	(4,5)	

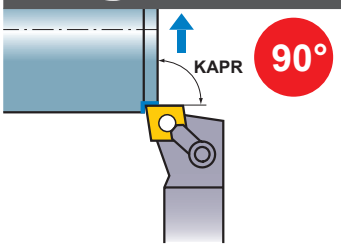
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MCRNR/L-124B	MCRNR/L124B	●	□	CNMA CNMG CNMM CNGG	43° *2	.750	.750	4.500	1.250	.750	.750	ICSN433 *1	NL46	CL9	XNS48
MCRNR/L-164C	MCRNR/L164C	●	●			1.000	1.000	5.000	1.250	1.000	1.250				
MCRNR/L-164D	MCRNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MCRNR/L-165D	MCRNR/L165D	●	□		54°	1.000	1.000	6.000	1.375	1.000	1.250	ICSN533	NL58	CL9	XNS510
MCRNR/L-166D	MCRNR/L166D	□	●		64°	1.000	1.000	6.000	1.500	1.000	1.250	ICSN633	NL68	CL12	

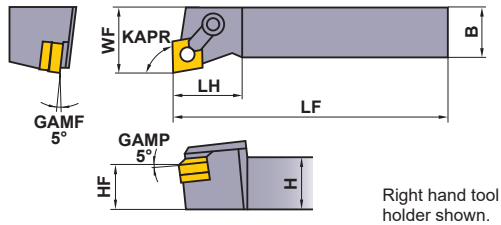
*1 (Opt.) See page M012 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

MCFN

Facing — **Multiple Clamp Type** **M Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4,5)	(4,5,6)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(4,5,6)	(4)	(4,5)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MCFNR/L-124	MCFNR/L124B	●	●	CNMA CNMG CNMM CNGG	43° *2	.750	.750	4.500	1.250	.750	1.000	ICSN433 *1	NL46	CL20	XNS48
MCFNR/L-164C	MCFNR/L164C	●	●			1.000	1.000	5.000	1.250	1.000	1.250				
MCFNR/L-164D	MCFNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MCFNR/L-165D	MCFNR/L165D	●	●		54°	1.000	1.000	6.000	1.375	1.000	1.250	ICSN533	NL58	CL12	XNS510
MCFNR/L-166D	MCFNR/L166D	●	●		64°	1.000	1.000	6.000	1.500	1.000	1.250	ICSN633	NL68	CL9	

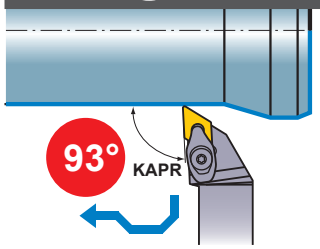
*1 (Opt.) See page M012 for different radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS48=45, XNS510=70

Shim Screw	Chipbreaker
S46	CBC4

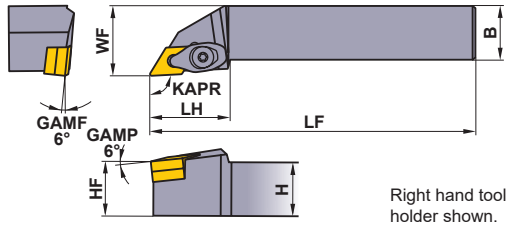
MCRN type inserts	➤ A106–A113	CUTTING CONDITIONS	➤ A080, B008
MCFN type inserts	➤ A106–A113	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B049	TECHNICAL DATA	➤ N001

DN INSERTS TOOL HOLDERS

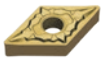
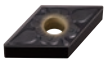
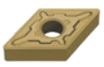
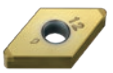
DDJN



External turning Copying **DOUBLE CLAMP Type**



Right hand tool holder shown.

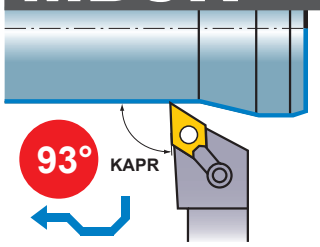
Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
			
(4)	(4)	(4)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	*2 Clamp Screw	Wrench
DDJNR/L-123	DDJNR/L123B	●	●	DNMA DNMG DNMM DNGA DNGG DNGM DNMX	33°	.750	.750	4.500	1.188	.750	1.000	LLSDN32	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DDJNR/L-163	DDJNR/L163D	●	●			1.000	1.000	6.000	1.188	1.000	1.250						
DDJNR/L-124	DDJNR/L124B	●	●		43°	.750	.750	4.500	1.375	.750	1.000	*1 LLSDN43 (LLSDN42)	*1 LLP24 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F
DDJNR/L-164	DDJNR/L164D	●	●			1.000	1.000	6.000	1.375	1.000	1.250						
DDJNR/L-204	DDJNR/L204D	●	●			1.250	1.250	6.000	1.375	1.250	1.500						
DDJNR/L-244	DDJNR/L244D	●	●			1.500	1.500	6.000	1.500	1.500	2.000						

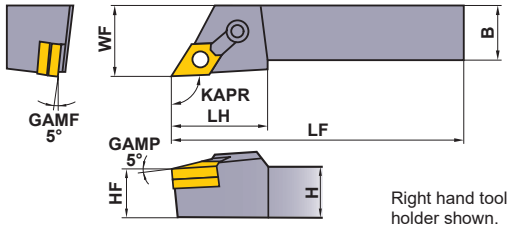
*1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.

*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

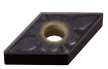
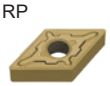
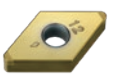
MDJN



External turning Copying **Multiple Clamp Type M Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
			
(4)	(4)	(4)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	*2 Clamp Screw
MDJNR/L-123	MDJNR/L123B	●	●	DNMA DNMG DNMM DNGA DNGG DNGM DNMX	33°	.750	.750	4.500	1.250	.750	1.000	IDSN322	NL34L	CL7	XNS36
MDJNR/L-163	MDJNR/L163C	●	●			1.000	1.000	5.000	1.250	1.000	1.250				
MDJNR/L-124B	MDJNR/L124B	●	●		43°	.750	.750	4.500	1.250	.750	1.000	IDSN433	NL46	CL7	XNS36
MDJNR/L-164C	MDJNR/L164C	●	●			1.000	1.000	5.000	1.250	1.000	1.250	IDSN433	NL46	CL20	XNS48
MDJNR/L-164D	MDJNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MDJNR/L-204D	MDJNR/L204D	●	●			1.250	1.250	6.000	1.250	1.250	1.500				
MDJNR/L-244D	MDJNR/L244D	●	●			1.500	1.500	6.000	1.250	1.500	2.000				
MDJNR/L-165D	MDJNR/L165D	●	●		54° *1	1.000	1.000	6.000	1.750	1.000	1.250	*1 IDSN533	NL58	CL12	XNS510
MDJNR/L-205D	MDJNR/L205D	●	●			1.250	1.250	6.000	1.750	1.250	1.500				

*1 (Opt.) See page M012 for different thickness.

*2 Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS510=70

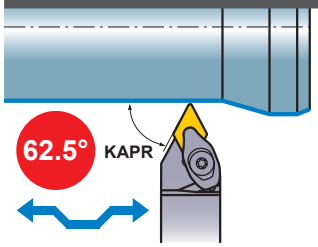
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

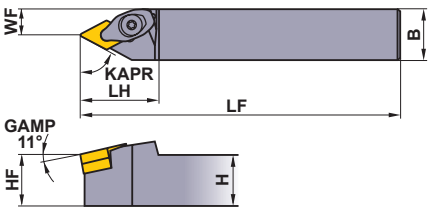
● : USA Stock

DDJN type inserts	➤ A114–A121	CUTTING CONDITIONS	➤ A080, B008
MDJN type inserts	➤ A114–A121	CBN & PCD inserts	➤ B025–B028, B049

DDPN

External turning DOUBLE CLAMP Type
Copying





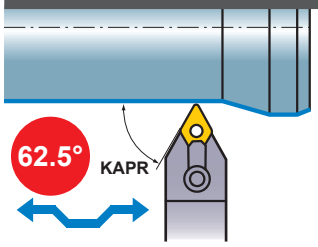
Finish	Light	Medium	Medium
FP (4)	LP (4)	MP (4)	MK (4)
Medium to Rough	Stainless	G Class	CBN
RP (4)	MM (4)	R/L (4)	(4)

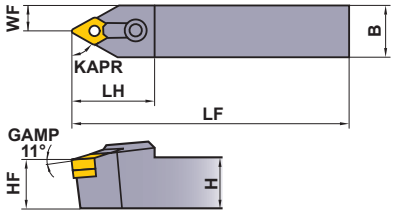
Order Number	ANSI Number	Stock	Insert Number	Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
				H	B	LF	LH	HF	WF						
DDPNN-164	**DDPNN164D**	●	DNMA DNMG DNMM DNGA DNGG DNGM 43○	1.000	1.000	6.000	1.500	1.000	.500	LLSDN43 (LLSDN42) *1	LLP24 (LLP14) *1	DCK2613	DCS1	DC0621T	TKY20F

*1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0621T=44

MDPN

External turning Multiple Clamp Type
Copying M Holder





Finish	Light	Medium	Medium
FP (4)	LP (4)	MP (4)	MK (4)
Medium to Rough	Stainless	G Class	CBN
RP (4)	MM (4)	R/L (4)	(4)

Order Number	ANSI Number	Stock	Insert Number	Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
				H	B	LF	LH	HF	WF				
MDPNN-164D	**MDPNN164D**	●	DNMA DNMG DNMM DNGA DNGG DNGM 43○	1.000	1.000	6.000	1.750	1.000	.500	IDSN433	NL46	CL12	XNS510
MDPNN-165D	**MDPNN165D**	●	DNMA DNMG DNMM DNGA DNGG DNGM 54○ *1	1.000	1.000	6.000	2.000	1.000	.500	IDSN533 *1	NL58		

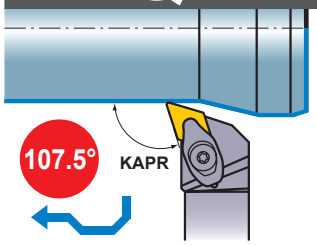
*1 (Opt.) See page M012 for different thickness.
*2 Clamp Torque (lbf-in) : XNS510=70

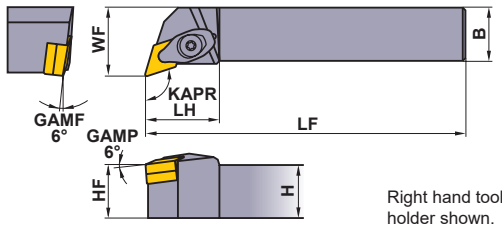
DDPN type inserts	➤ A114–A121	CUTTING CONDITIONS	➤ A080, B008
MDPN type inserts	➤ A114–A121	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B025–B028, B049	TECHNICAL DATA	➤ N001

DN INSERTS TOOL HOLDERS

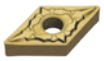
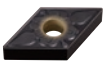
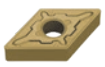
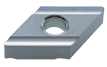
DDQN

External turning DOUBLE CLAMP Type
Copying





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
			
(4)	(4)	(4)	(4)

Order Number	ANSI Number	Stock		Insert Number	Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
		R	L		H	B	LF	LH	HF	WF						
DDQNR/L-164	**DDQNR/L164D**	●	●	DNMA DNMG DNMM DNGA DNGG DNGM 43○	1.000	1.000	6.000	1.375	1.000	1.250	LLSDN43 *1 (LLSDN42)	LLP24 *1 (LLP14)	DCK2613	DCS1	DC0621T	TKY20F

*1 Please use shim no.LLSDN42 and shim pin LLP14 with .25inch thick insert. When using .25inch thick inserts, the shim and shim pin must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0621T=44

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

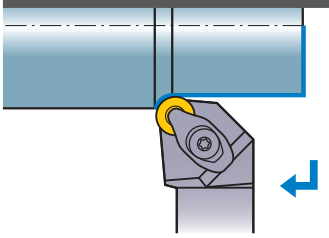
● : USA Stock □ : Made to Order

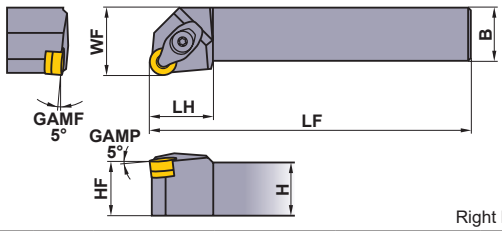
DDQN type inserts	➤ A114–A121
CBN & PCD inserts	➤ B025–B028, B049
CUTTING CONDITIONS	➤ A080, B008

DRGN

External turning
Copying

DOUBLE CLAMP Type





Right hand tool holder shown.

Medium
Standard

(4)

Medium
Flat Top

(4)

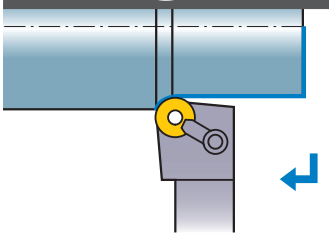
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
DRGNR/L-124	DRGNR/L124B	●	●	RNMG	43◌	.750	.750	4.500	1.188	.750	1.000	LLSRN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DRGNR/L-164	DRGNR/L164D	●	●			1.000	1.000	6.000	1.188	1.000	1.250						
DRGNR/L-204	DRGNR/L204D	●	●			1.250	1.250	6.000	1.188	1.250	1.500						

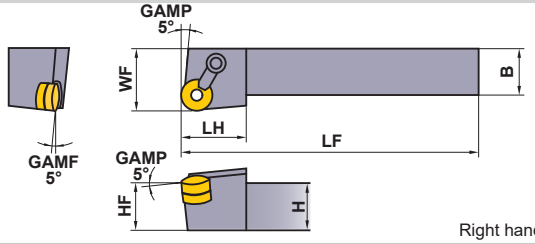
* Clamp Torque (lbf-in) : DC0621T=44

MRGN

External turning
Copying

Multiple Clamp Type
M Holder





Right hand tool holder shown.

Medium
Standard

(3,4,6)

Medium
Flat Top

(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MRGNR/L-123B	MRGNR/L123B	●	●	RNMG	32	.750	.750	4.500	.875	.750	1.000	IRSN32	NL34	CL6	XNS36
MRGNR/L-163	MRGNR/L163D	□	□			1.000	1.000	6.000	.875	1.000	1.250				
MRGNR/L-124B	MRGNR/L124B	●	●		43 *1*2	.750	.750	4.500	1.250	.750	1.000	IRSN43 *1	NL46	CL9	XNS59
MRGNR/L-164C	MRGNR/L164C	●	●			1.000	1.000	5.000	1.250	1.000	1.250				
MRGNR/L-164D	MRGNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MRGNR/L-204D	MRGNR/L204D	●	□			1.250	1.250	6.000	1.250	1.250	1.500				
MRGNR/L-206D	MRGNR/L206D	●	□		64	1.250	1.250	6.000	1.375	1.250	1.500	IRSN63	NL68	CL12	XNS58
MRGNR/L-246	MRGNR/L246E	□	□			1.500	1.500	7.000	1.375	1.500	2.000				

*1 (Opt.) See page M012 for different thickness.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS58=70, XNS59=70

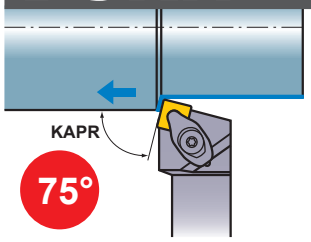
Shim Screw	Chipbreaker
S46	CBR4

DRGN type inserts	➢ A122
MRGN type inserts	➢ A122

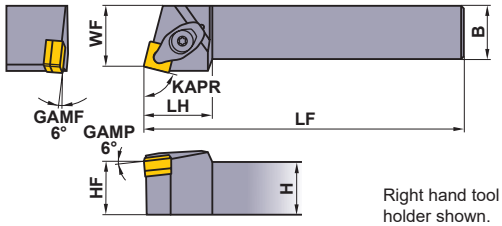
CUTTING CONDITIONS	➢ A080
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

SN□□ INSERTS TOOL HOLDERS

DSRN



DOUBLE CLAMP Type
External turning



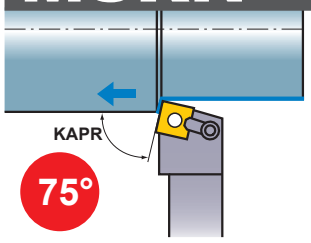
Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
(4)	(4)	(4)	(4)

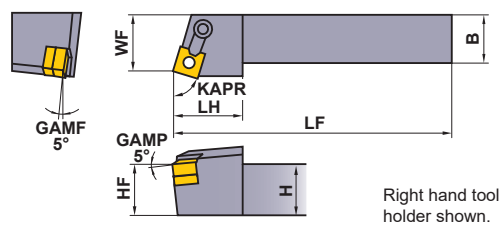
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
DSRNR/L-124	DSRNR/L124B	●	●	SNMA SNMG SNMM SNGA SNGG	43□	.750	.750	4.500	1.250	.750	.878	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSRNR/L-164	DSRNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.128						

* Clamp Torque (lbf-in) : DC0621T=44

MSRN



Multiple Clamp Type
M Holder
External turning



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(3,4)	(4)	(4)	(4,6)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
(4)	(4,5)	(4)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MSRNR/L-83	MSRNR/L083B	●	●	SNMA SNMG SNMM SNGA SNGG	32□ *1*2	.500	.500	4.500	1.000	.500	.660	ISSN322 *1	NL34	CL6	XNS36
MSRNR/L-103	MSRNR/L103B	●	●			.625	.625	4.500	1.000	.625	.785				
MSRNR/L-123	MSRNR/L123B	●	●			.750	.750	4.500	1.000	.750	.910				
MSRNR/L-124B	MSRNR/L124B	●	●		43□ *1*2	.750	.750	4.500	1.250	.750	.880	ISSN433 *1	NL46	CL9	XNS59
MSRNR/L-164C	MSRNR/L164C	●	●			1.000	1.000	5.000	1.250	1.000	1.130				
MSRNR/L-164D	MSRNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.130				
MSRNR/L-165C	MSRNR/L165C	●	●		54□	1.000	1.000	5.000	1.375	1.000	1.103	ISSN533	NL58	CL12	XNS510
MSRNR/L-165D	MSRNR/L165D	●	●			1.000	1.000	6.000	1.375	1.000	1.103				
MSRNR/L-205D	MSRNR/L205D	●	●			1.250	1.250	6.000	1.375	1.250	1.353				
MSRNR/L-166	MSRNR/L166D	●	●		64□ *1*2	1.000	1.000	6.000	1.500	1.000	1.071	ISSN633 *1	NL68	CL12	XNS510
MSRNR/L-206D	MSRNR/L206D	●	●			1.250	1.250	6.000	1.500	1.250	1.315				
MSRNR/L-246D	MSRNR/L246D	●	●			1.500	1.500	6.000	1.500	1.500	1.821				
MSRNR/L-246E	MSRNR/L246E	●	●			1.500	1.500	7.000	1.500	1.500	1.821				
MSRNR/L-248	MSRNR/L248E	●	●		86□	1.500	1.500	7.000	1.625	1.500	1.768	ISSN846	NL810	CL24	XNS610

*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70, XNS610=135

Insert	Shim Screw	Chipbreaker
SN□N3□□	S34	CBS3
SN□N4□□	S46	CBS4

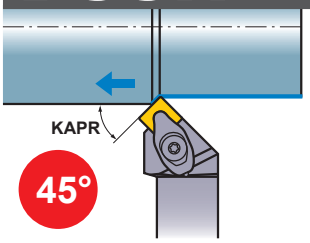
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

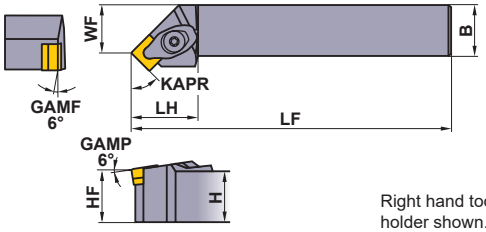
● : USA Stock □ : Made to Order

DSRN type inserts ➤ A123–A129
MSRN type inserts ➤ A123–A129
CBN & PCD inserts ➤ B029, B050
CUTTING CONDITIONS ➤ A080, B008

DSSN

External turning Chamfering **DOUBLE CLAMP Type**





Right hand tool holder shown.

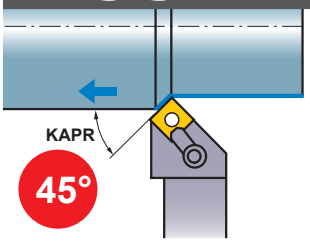
Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4)	(4)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(4)	(4)	(4)	(4)

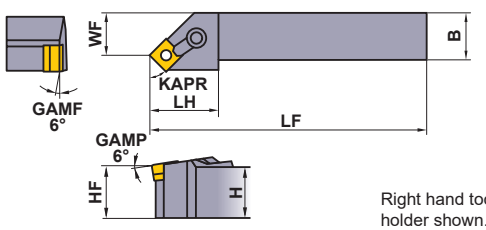
Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
DSSNR/L-124	**DSSNR/L124B**	●	●	SNMA SNMG SNMM SNGA SNGG	43◌	.750	.750	4.500	1.250	.750	.659	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSSNR/L-164	**DSSNR/L164D**	●	●			1.000	1.000	6.000	1.250	1.000	.909						

* Clamp Torque (lbf-in) : DC0621T=44

MSSN

External turning Chamfering **Multiple Clamp Type M Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
(3,4)	(4)	(4)	(4,6)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(4)	(4,5)	(4)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MSSNR/L-83	**MSSNR/L083B**	●	●	SNMA SNMG SNMM SNGA SNGG	32◌*1*2	.500	.500	4.500	1.000	.500	.404	ISSN322*1	NL34	CL6	XNS36
MSSNR/L-124B	**MSSNR/L124B**	●	●		43◌*1*2	.750	.750	4.500	1.250	.750	.675	ISSN433*1	NL46	CL9	XNS59
MSSNR/L-164C	**MSSNR/L164C**	□	□			1.000	1.000	5.000	1.250	1.000	.925				
MSSNR/L-164D	**MSSNR/L164D**	●	●			1.000	1.000	6.000	1.250	1.000	.925				
MSSNR/L-205D	**MSSNR/L205D**	□	□		54◌	1.250	1.250	6.000	1.375	1.250	1.097	ISSN533	NL58	CL12	XNS510
MSSNR/L-206D	**MSSNR/L206D**	□	●		64◌*1	1.250	1.250	6.000	1.500	1.250	1.011	ISSN633*1	NL68	CL12	XNS510

*1 (Opt.) See page M012 for different thickness or radius.

*2 For inserts without hole, remove shim pin and add below.

*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

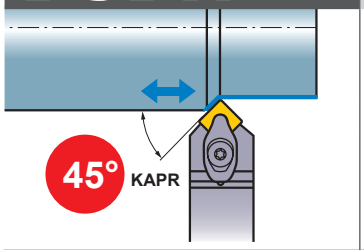
Insert	Shim Screw	Chipbreaker
SN◌N3◌◌	S34	CBS3D
SN◌N4◌◌	S46	CBS4D

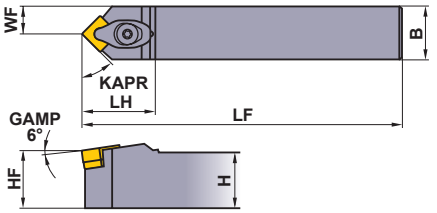
DSSN type inserts	**➤ A123–A129**	**CUTTING CONDITIONS**	**➤ A080, B008**
MSSN type inserts	**➤ A123–A129**	**SPARE PARTS**	**➤ M001**
CBN & PCD inserts	**➤ B029, B050**	**TECHNICAL DATA**	**➤ N001**

SN○○ INSERTS TOOL HOLDERS

DSDN

External turning DOUBLE CLAMP Type
Chamfering





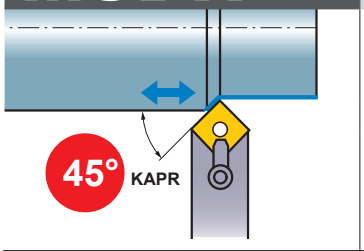
Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4)	(4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
(4)	(4)	(4)	(4)

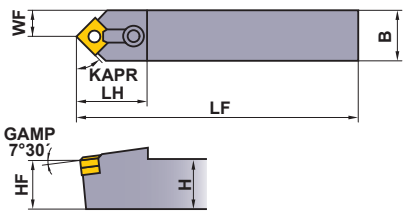
Order Number	ANSI Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
					H	B	LF	LH	HF	WF						
DSDNN-124	**DSDNN124B**	●	SNMA SNMG SNMM SNGA SNGG	43○	.750	.750	4.500	1.375	.750	.375	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSDNN-164	**DSDNN164D**	●			1.000	1.000	6.000	1.375	1.000	.500						

* Clamp Torque (lbf-in) : DC0621T=44

MSDN

External turning Multiple Clamp Type
Chamfering M Holder





Finish	Light	Medium	Medium
FP	LP	MP	MK
(3,4)	(4)	(4)	(4,5,6)
Medium to Rough	Stainless	G Class	CBN
GH	MM	R/L	
(4,5,6)	(3,4,5,6)	(4)	(4)

Order Number	ANSI Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
					H	B	LF	LH	HF	WF				
MSDNN-83	**MSDNN083B**	●	SNMA SNMG SNMM SNGA SNGG	32○ *1*2	.500	.500	4.500	1.000	.500	.250	ISSN322 *1	NL34	CL6	XNS36
MSDNN-103	**MSDNN103B**	□			.625	.625	4.500	1.000	.625	.313				
MSDNN-123	**MSDNN123B**	●			.750	.750	4.500	1.000	.750	.375				
MSDNN-124	**MSDNN124B**	●		43○ *1*2	.750	.750	4.500	1.375	.750	.375	ISSN433 *1	NL46	CL9	XNS59
MSDNN-164	**MSDNN164D**	●			1.000	1.000	6.000	1.375	1.000	.500				
MSDNN-165	**MSDNN165D**	●		54○	1.000	1.000	6.000	1.625	1.000	.500	ISSN533	NL58	CL12	XNS510
MSDNN-166	**MSDNN166D**	●		64○ *1	1.000	1.000	6.000	1.750	1.000	.500	ISSN633 *1	NL68	CL12	XNS510
MSDNN-206	**MSDNN206E**	●			1.250	1.250	7.000	1.750	1.250	.625				

*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Insert	Shim Screw	Chipbreaker
SN○N3○○	S34	CBS3D
SN○N4○○	S46	CBS4D

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

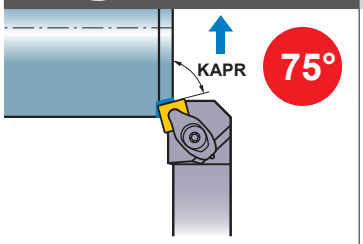
● : USA Stock □ : Made to Order

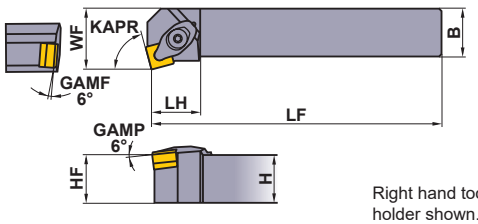
DSDN type inserts	➤ A123–A129	CBN & PCD inserts	➤ B029, B050
MSDN type inserts	➤ A123–A129	CUTTING CONDITIONS	➤ A080, B008

DSKN

DOUBLE CLAMP Type

Facing





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(4)	(4)	(4)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(4)	(4)	(4)	(4)

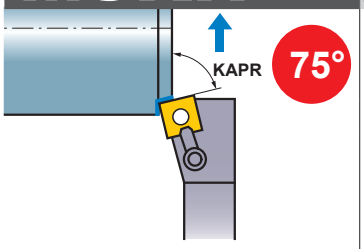
Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
DSKNR/L-124	**DSKNR/L124B**	●	●	SNMA SNMG SNMM SNGA SNGG	43◌	.750	.750	4.500	1.000	.750	1.000	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DSKNR/L-164	**DSKNR/L164D**	●	●			1.000	1.000	6.000	1.000	1.000	1.250						

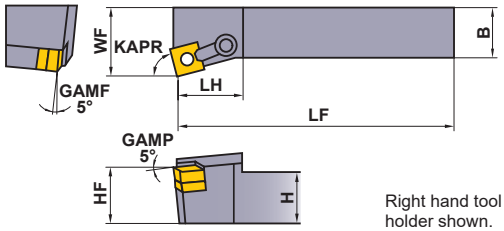
∗ Clamp Torque (lbf-in) : DC0621T=44

MSKN

Multiple Clamp Type

Facing **M Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(3,4)	(4)	(4)	(4,5,6)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(4)	(3,4,5,6)	(4)	(4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MSKNR/L-83	**MSKNR/L083B**	●	●	SNMA SNMG SNMM SNGA SNGG	32◌ *1*2	.500	.500	4.500	1.000	.500	.625	ISSN322 *1	NL34	CL6	XNS36
MSKNR/L-103	**MSKNR/L103B**	●	●			.625	.625	4.500	1.000	.625	.750				
MSKNR/L-123	**MSKNR/L123B**	●	●			.750	.750	4.500	1.000	.750	.875				
MSKNR/L-124B	**MSKNR/L124B**	●	●		43◌ *1*2	.750	.750	4.500	1.250	.750	1.000	ISSN433 *1	NL46	CL9	XNS59
MSKNR/L-164D	**MSKNR/L164D**	●	●			1.000	1.000	6.000	1.000	1.000	1.250				
MSKNR/L-165D	**MSKNR/L165D**	●	●		54◌	1.000	1.000	6.000	1.375	1.000	1.250	ISSN533	NL58	CL12	XNS510
MSKNR/L-205D	**MSKNR/L205D**	●	●			1.250	1.250	6.000	1.375	1.250	1.500				
MSKNR/L-206D	**MSKNR/L206D**	●	●		64◌ *1	1.250	1.250	6.000	1.500	1.250	1.500	ISSN633	NL68	CL12	XNS510

∗1 (Opt.) See page M012 for different thickness or radius.

∗2 For inserts without hole, remove shim pin and add below.

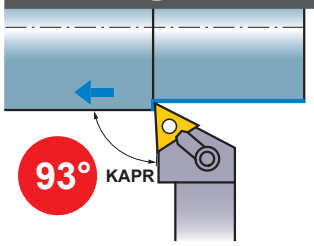
∗3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Insert	Shim Screw	Chipbreaker
SN◌N3◌◌	S34	CBS3
SN◌N4◌◌	S46	CBS4

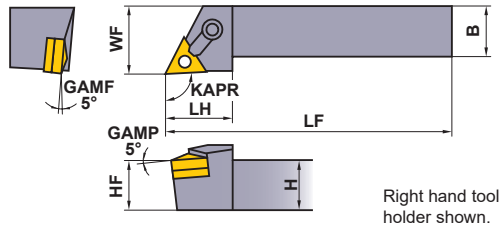
DSKN type inserts	**➤ A123–A129**	**CUTTING CONDITIONS**	**➤ A080, B008**
MSKN type inserts	**➤ A123–A129**	**SPARE PARTS**	**➤ M001**
CBN & PCD inserts	**➤ B029, B050**	**TECHNICAL DATA**	**➤ N001**

TN INSERTS TOOL HOLDERS

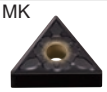
MTJN



External turning — **Multiple Clamp Type** **M Holder**



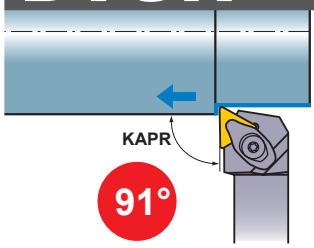
Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
(3)	(3,4)	(3,4)	(3)

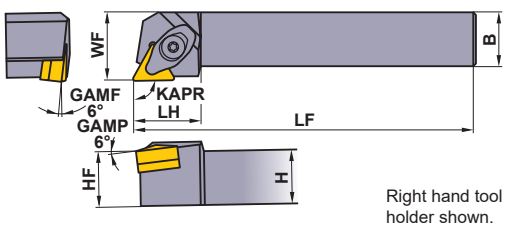
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MTJNR/L-123X	MTJNR/L123B	●	●	TNMA TNMG TNMX TNMM TNGA TNGG	33○ *1	.750	.750	4.500	1.000	.750	1.000	ITSN323 *1	NL34L	CL6	XNS36
MTJNR/L-163X	MTJNR/L163D	●	●			1.000	1.000	6.000	1.000	1.000	1.250				
MTJNR/L-164	MTJNR/L164D	●	●		43○ *1	1.000	1.000	6.000	1.250	1.000	1.250	ITSN433 *1	NL46	CL9	XNS510
MTJNR/L-204	MTJNR/L204D	●	●			1.250	1.250	6.000	1.250	1.250	1.500				
MTJNR/L-854	MTJNR/L854D	●	●			1.250	1.000	6.000	1.250	1.250	1.250				
MTJNR/L-165	MTJNR/L165D	●	●		54○ *1	1.000	1.000	6.000	1.500	1.000	1.250	ITSN533 *1	NL58	CL9	XNS510
MTJNR/L-205	MTJNR/L205D	●	●			1.250	1.250	6.000	1.500	1.250	1.500				
MTJNR/L-245	MTJNR/L245E	●	●			1.500	1.500	7.000	1.500	1.500	2.000				
MTJNR/L-246	MTJNR/L246E	●	□		66○ *1	1.500	1.500	7.000	1.625	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510

*1 (Opt.) See page M012 for different thickness or radius.
*2 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

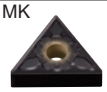
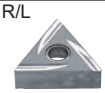
DTGN



External turning — **DOUBLE CLAMP Type**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
			
(3,4)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
DTGNR/L-123	DTGNR/L123B	●	●	TNMA TNMG TNMM TNGA TNGG	33○	.750	.750	4.500	1.000	.750	1.000	LLSTN32 (LLSTN33) *1	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTGNR/L-163	DTGNR/L163D	●	●			1.000	1.000	6.000	1.000	1.000	1.250						
DTGNR/L-164	DTGNR/L164D	●	●		43○	1.000	1.000	6.000	1.250	1.000	1.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DTGNR/L-204	DTGNR/L204D	●	●			1.250	1.250	6.000	1.250	1.250	1.500						
DTGNR/L-244	DTGNR/L244D	●	●			1.500	1.500	6.000	1.250	1.500	2.000						

*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

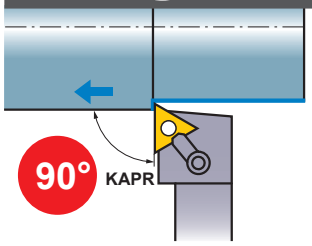
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

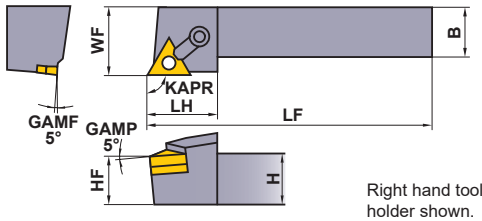
● : USA Stock □ : Made to Order

MTJN type inserts	➤ A130–A137	CBN & PCD inserts	➤ B030, B031, B050
DTGN type inserts	➤ A130–A137	CUTTING CONDITIONS	➤ A080, B008

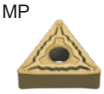
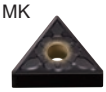
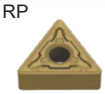
MTGN

External turning — **Multiple Clamp Type** **M Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(3)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MTGNR/L-123BX	**MTGNR/L123B**	●	●	TNMA TNMG TNMM TNGA TNGG	33 *1*2	.750	.750	4.500	1.000	.750	1.000	ITSN322 *1	NL34L	CL6	XNS36
MTGNR/L-163CX	**MTGNR/L163C**	●	●			1.000	1.000	5.000	1.000	1.000	1.250				
MTGNR/L-163DX	**MTGNR/L163D**	□	●			1.000	1.000	6.000	1.000	1.000	1.250				
MTGNR/L-164C	**MTGNR/L164C**	●	●		43 *1	1.000	1.000	5.000	1.375	1.000	1.250	ITSN433 *1	NL46	CL9	XNS510
MTGNR/L-164D	**MTGNR/L164D**	●	●			1.000	1.000	6.000	1.375	1.000	1.250				
MTGNR/L-204D	**MTGNR/L204D**	□	●			1.250	1.250	6.000	1.375	1.250	1.500				
MTGNR/L-244D	**MTGNR/L244D**	●	●			1.500	1.500	6.000	1.375	1.500	2.000				
MTGNR/L-244E	**MTGNR/L244E**	●	●			1.500	1.500	7.000	1.375	1.500	2.000				
MTGNR/L-854D	**MTGNR/L854D**	●	●			1.250	1.000	6.000	1.375	1.250	1.250				
MTGNR/L-165C	**MTGNR/L165C**	□	□		54 *1	1.000	1.000	5.000	1.500	1.000	1.250	ITSN533 *1	NL58	CL9	XNS510
MTGNR/L-165D	**MTGNR/L165D**	●	●			1.000	1.000	6.000	1.500	1.000	1.250				
MTGNR/L-205D	**MTGNR/L205D**	●	□			1.250	1.250	6.000	1.500	1.250	1.500				
MTGNR/L-245D	**MTGNR/L245D**	□	●			1.500	1.500	6.000	1.375	1.500	2.000				
MTGNR/L-245E	**MTGNR/L245E**	□	●			1.500	1.500	7.000	1.500	1.500	2.000				
MTGNR-855D	**MTGNR855D**	●				1.250	1.000	6.000	1.500	1.250	1.250				
MTGNR/L-246D	**MTGNR/L246D**	●	●		63 *1	1.500	1.500	6.000	1.500	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510
MTGNR/L-246E	**MTGNR/L246E**	●	●			1.500	1.500	7.000	1.750	1.500	2.000				

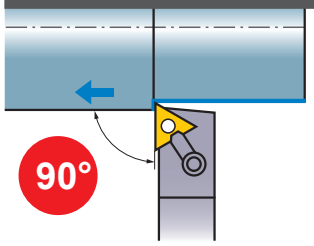
*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

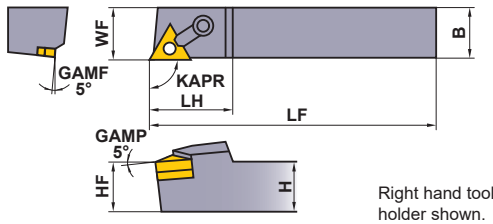
MTGN type inserts ➤ A130–A137
CBN & PCD inserts ➤ B030, B031, B050
CUTTING CONDITIONS ➤ A080, B008
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

TN INSERTS TOOL HOLDERS

MTAN



External turning — Multiple Clamp Type M Holder



Right hand tool holder shown.

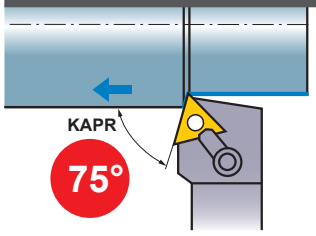
Finish	Light	Medium	Medium
FP	LP	MP	MK
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
(3)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MTANR-102	MTANR102B	●		TNMA TNMG TNMM TNGA TNGG	22○	.625	.625	4.500	.875	.625	.625	—	NL23	CL19	XNS36
MTANR/L-103X	MTANR/L103B	●	□		33○ *1*2	.625	.625	4.500	1.000	.625	.625	ITSN323 *1	NL34L	CL6	XNS36
MTANRL/-123X	MTANR/L123B	●	□			.750	.750	4.500	1.000	.750	.750				
MTANR/L-163X	MTANR/L163D	●	●			1.000	1.000	6.000	1.000	1.000	1.000				
MTANR/L-164	MTANR/L164D	●	●		43○ *1	1.000	1.000	6.000	1.375	1.000	1.000	ITSN433 *1	NL46	CL9	XNS59
MTANR/L-204	MTANR/L204E	●	●			1.250	1.250	7.000	1.375	1.250	1.250				
MTANR-864	MTANR864E	□				1.500	1.000	7.000	1.375	1.500	1.000				
MTANR-165	MTANR165D	●			54○ *1	1.000	1.000	6.000	1.500	1.000	1.000	ITSN533 *1	NL58	CL9	XNS510
MTANR-205	MTANR205E	●				1.250	1.250	7.000	1.500	1.250	1.250				
MTANR-246	MTANR246E	●			66○ *1	1.500	1.500	7.000	1.750	1.500	1.500	ITSN636 *1	NL68L	CL12	XNS510

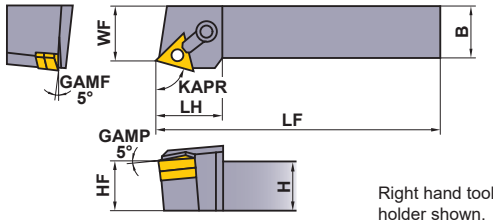
*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

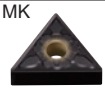
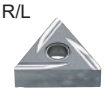
MTRN



External turning — Multiple Clamp Type M Holder



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
			
(3)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MTRNR/L-123X	MTRNR/L123B	□	□	TNMA TNMG TNMM TNGA TNGG	33○ *1*2	.750	.750	4.500	1.250	.750	.855	ITSN323 *1	NL34L	CL20	XNS47
MTRNR/L-164	MTRNR/L164D	●	□		43○ *1	1.000	1.000	6.000	1.375	1.000	1.048	ITSN433 *1	NL46	CL9	XNS510

*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS47=45, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

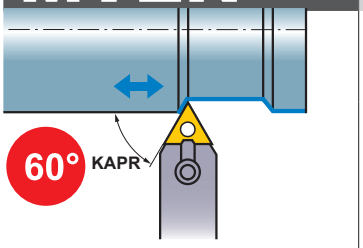
● : USA Stock □ : Made to Order

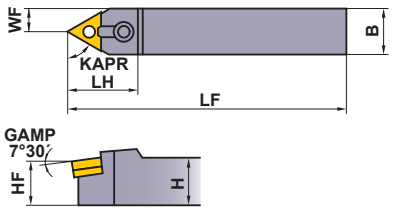
MTAN type inserts	➤ A130–A137	CBN & PCD inserts	➤ B030, B031, B050
MTRN type inserts	➤ A130–A137	CUTTING CONDITIONS	➤ A080, B008

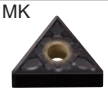
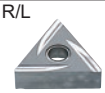
MTEN

External turning
Chamfering

Multiple Clamp Type
M Holder





Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(3)	(3,4)	(3,4)	(3)

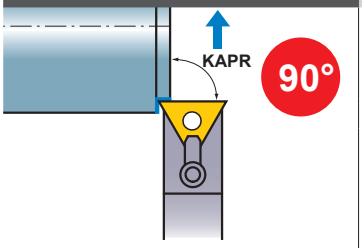
Order Number	ANSI Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
					H	B	LF	LH	HF	WF				
MTENN-82	**MTENN082B**	●	TNMA TNMG TNMM TNGA TNGG	22○	.500	.500	4.500	1.000	.500	.250	—	NL23	CL6	XNS36
MTENN-103X	**MTENN103B**	●		33○ *1	.625	.625	4.500	1.125	.625	.313	ITSN323 *1	NL34L	CL6	XNS36
MTENN-123X	**MTENN123B**	●			.750	.750	4.500	1.125	.750	.375				
MTENN-164	**MTENN164D**	●		43○ *1	1.000	1.000	6.000	1.500	1.000	.500	ITSN433 *1	NL46	CL9	XNS59
MTENN-854	**MTENN854D**	□			1.250	1.000	6.000	1.500	1.250	.500				
MTENN-864	**MTENN864E**	●			1.500	1.000	7.000	1.500	1.500	.500				
MTENN-205	**MTENN205E**	●		54○ *1	1.250	1.250	7.000	1.625	1.250	.625	ITSN533 *1	NL58	CL9	XNS510
MTENN-865	**MTENN865E**	●			1.500	1.000	7.000	1.625	1.500	.500				

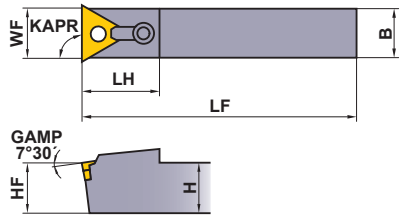
*1 (Opt.) See page M012 for different thickness or radius.
*2 Clamp Torque (lbf-in) : XNS36=30, XNS59=70, XNS510=70

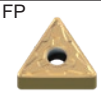
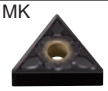
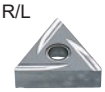
MTCN

Facing

Multiple Clamp Type
M Holder





Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
			
(3)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock	Insert Number		Dimensions (inch)						Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
					H	B	LF	LH	HF	WF				
MTCNN-83X	**MTCNN083B**	□	TNMA TNMG TNMM TNGA TNGG	33○ *1*2	.500	.500	4.500	1.000	.500	Central to "B"	ITSN323 *1	NL34L	CL7	XNS36
MTCNN-443X	**MTCNN443F**	□			1.000	.500	8.000	1.000	1.000					
MTCNN-124	**MTCNN124B**	●		43○ *1	.750	.750	4.500	1.375	.750		ITSN433 *1	NL46	CL12	XNS59
MTCNN-644	**MTCNN644F**	□			1.000	.750	8.000	1.375	1.000					
MTCNN-664	**MTCNN664F**	□			1.500	.750	8.000	1.375	1.500					

*1 (Opt.) See page M012 for different thickness or radius.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS59=70

*2 For inserts without hole, remove shim pin and add below.

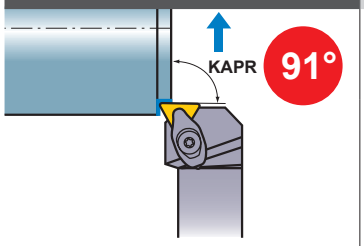
Shim Screw	S34	Chipbreaker	CBT3

MTEN type inserts	**➤ A130–A137**
MTCN type inserts	**➤ A130–A137**
CBN & PCD inserts	**➤ B030, B031, B050**
CUTTING CONDITIONS	**➤ A080, B008**

SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

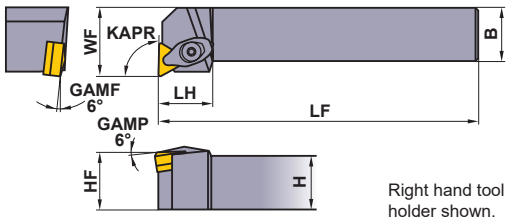
TN INSERTS TOOL HOLDERS

DTFN

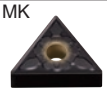


DOUBLE CLAMP Type

Facing



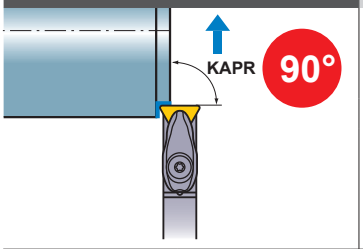
Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
(3)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	*2 Clamp Screw	Wrench
DTFNR/L -123	DTFNR/L123B	●	●	TNMA TNMG TNMM TNGA TNGG	33◌	.750	.750	4.500	1.000	.750	1.000	*1 LLSTN32 (LLSTN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DTFNR/L-163	DTFNR/L163D	●	●			1.000	1.000	6.000	1.000	1.000	1.250						
DTFNR/L-164	DTFNR/L164D	●	●		43◌	1.000	1.000	6.000	1.219	1.000	1.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DTFNR/L-204	DTFNR/L204D	●	●			1.250	1.250	6.000	1.219	1.250	1.500						

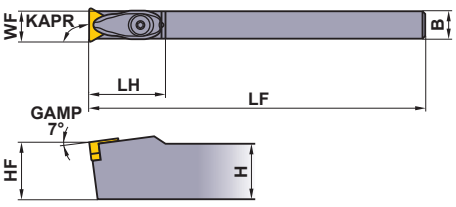
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

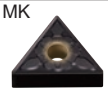
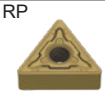
DTCN



DOUBLE CLAMP Type

Facing



Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3)	(3)
Medium to Rough	Stainless	G Class	CBN
RP	MM	R/L	
			
(3)	(3)	(3)	(3)

Order Number	ANSI Number	Stock	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	*2 Clamp Screw	Wrench
DTCNN-433	DTCNN433B	●	TNMA TNMG TNMM TNGA TNGG	33◌	.750	.500	4.500	1.375	.750	.539	*1 LLSTN32 (LLSTN33)	LLP23	DCK3113	DCS2	DC0520T	TKY15F
DTCNN-443	DTCNN443D	●			1.000	.500	6.000	1.375	1.000	.539						

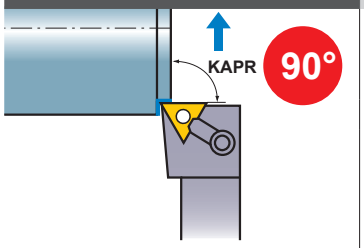
*1 Please use shim no.LLSTN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

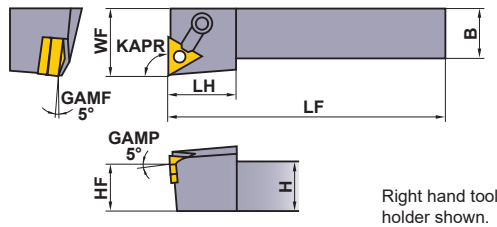
● : USA Stock □ : Made to Order

DTFN type inserts	➤ A130–A137
DTCN type inserts	➤ A130–A137
CBN & PCD inserts	➤ B030, B031, B050
CUTTING CONDITIONS	➤ A080, B008

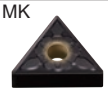
MTFN



Facing — **Multiple Clamp Type** **M Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(3)	(3)	(3,4)	(3,4)
Medium to Rough	**Stainless**	**G Class**	**CBN**
RP	MM	R/L	
(3)	(3,4)	(3,4)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *3
MTFNR/L-82	**MTFNR/L082B**	□	□	TNMA TNMG TNMM TNGA TNGG	22○	.500	.500	4.500	.875	.500	.750	—	NL23	CL19	XNS36
MTFNR/L-103X	**MTFNB/L103B**	□	□		33○ *1*2	.625	.625	4.500	1.000	.625	.875	ITSN323 *1	NL34L	CL6	XNS36
MTFNR/L-123BX	**MTFNR/L123B**	●	●			.750	.750	4.500	1.000	.750	1.000				
MTFNR/L-163CX	**MTFNR/L163C**	●	●			1.000	1.000	5.000	1.000	1.000	1.250				
MTFNR/L-163DX	**MTFNR/L163D**	□	□			1.000	1.000	6.000	1.000	1.000	1.250				
MTFNR/L-164C	**MTFNR/L164C**	●	●		43○ *1	1.000	1.000	5.000	1.250	1.000	1.250	ITSN433 *1	NL46	CL9	XNS510
MTFNR/L-164D	**MTFNR/L164D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250				
MTFNR/L-204D	**MTFNR/L204D**	●	●			1.250	1.250	6.000	1.250	1.250	1.500				
MTFNL-165C	**MTFNL165C**		●		54○ *1	1.000	1.000	5.000	1.375	1.000	1.250	ITSN533 *1	NL58	CL12	XNS510
MTFNR/L-165D	**MTFNR/L165D**	●	●			1.000	1.000	6.000	1.375	1.000	1.250				
MTFNR/L-205D	**MTFNR/L205D**	●	●			1.250	1.250	6.000	1.375	1.250	1.500				
MTFNR/L-855D	**MTFNR/L855D**	●	●			1.250	1.000	6.000	1.375	1.250	1.250				
MTFNR/L-246D	**MTFNR/L246D**	●	●		66○ *1	1.500	1.500	6.000	1.500	1.500	2.000	ITSN636 *1	NL68L	CL12	XNS510
MTFNR/L-246E	**MTFNR/L246E**	●	●			1.500	1.500	7.000	1.500	1.500	2.000				

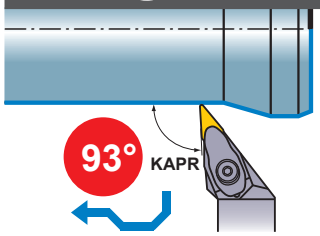
*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : XNS36=30, XNS510=70

Shim Screw	Chipbreaker
S34	CBT3

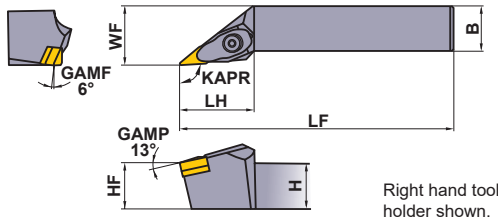
MTFN type inserts	**➢ A130–A137**	**SPARE PARTS**	**➢ M001**
CBN & PCD inserts	**➢ B030, B031, B050**	**TECHNICAL DATA**	**➢ N001**
CUTTING CONDITIONS	**➢ A080, B008**		

VN INSERTS TOOL HOLDERS

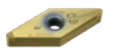
DVJN



External turning Copying **DOUBLE CLAMP Type**



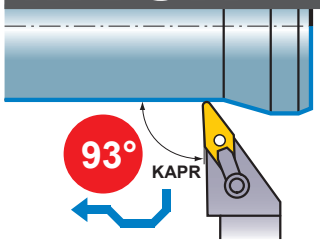
Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(3)	(3)	(3)	(3)

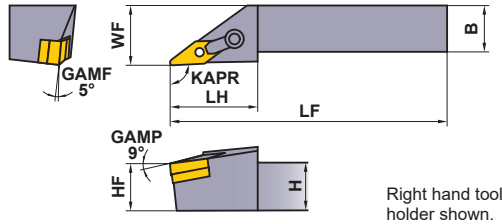
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *	Wrench
DVJNR/L-123	**DVJNR/L123B**	●	●	VNGA VNMG VNGM VNGG VNMM	33°	.750	.750	4.500	1.625	.750	1.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVJNR/L-163	**DVJNR/L163D**	●	●			1.000	1.000	6.000	1.625	1.000	1.250						
DVJNR/L-203	**DVJNR/L203D**	●	●			1.250	1.250	6.000	1.625	1.250	1.500						

* Clamp Torque (lbf-in) : DC0520T=31

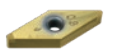
MVJN



External turning Copying **Multiple Clamp Type M Holder**



Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(3)	(3)	(3)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
MVJNR/L-123B	**MVJNR/L123B**	●	●	VNGA VNMG VNGM VNGG VNMM	33°	.750	.750	4.500	1.750	.750	1.000	IVSN322	NL34L	CL30	XNS510
MVJNR/L-163C	**MVJNR/L163C**	●	●			1.000	1.000	5.000	1.750	1.000	1.250				
MVJNR/L-163D	**MVJNR/L163D**	●	●			1.000	1.000	6.000	1.750	1.000	1.250				
MVJNR/L-203D	**MVJNR/L203D**	□	□			1.250	1.250	6.000	1.750	1.250	1.500				
MVJNR/L-164C	**MVJNR/L164C**	□	●		43°	1.000	1.000	5.000	2.125	1.000	1.250	IVSN433 *1	NL46	CL30	XNS510
MVJNR/L-164D	**MVJNR/L164D**	●	●			1.000	1.000	6.000	2.125	1.000	1.250				
MVJNR/L-204D	**MVJNR/L204D**	□	□			1.250	1.250	6.000	2.125	1.250	1.500				

*1 (Opt.) See page M012 for different radius.
*2 Clamp Torque (lbf-in) : XNS510=70

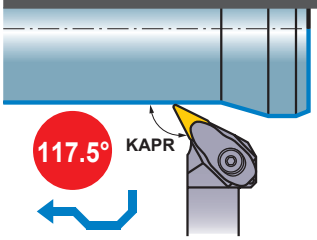
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

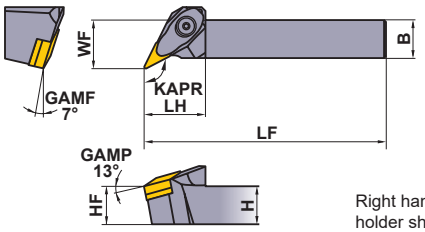
● : USA Stock □ : Made to Order

DVJN type inserts	➢ A138–A141	CBN & PCD inserts	➢ B032, B033, B051
MVJN type inserts	➢ A138–A141	CUTTING CONDITIONS	➢ A080, B008

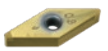
DVPN

Facing Copying **DOUBLE CLAMP Type**





Right hand tool holder shown.

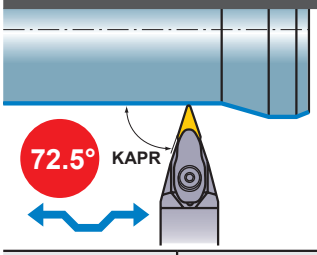
Finish	Light	Medium	Medium
FP	LP	MP	MK
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(3)	(3)	(3)	(3)

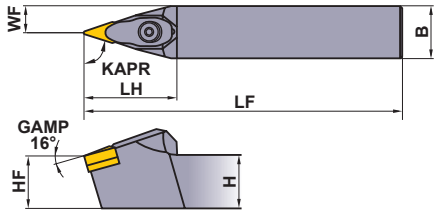
Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	* Clamp Screw	Wrench
DVPNR/L-123	**DVPNR/L123B**	●	●	VNGA VNMG VNGM VNGG VNMM	33°	.750	.750	4.500	1.250	.750	1.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVPNR/L-163	**DVPNR/L163D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250						

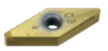
* Clamp Torque (lbf-in) : DC0520T=31

DVVN

External turning Copying **DOUBLE CLAMP Type**





Finish	Light	Medium	Medium
FP	LP	MP	MK
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN**
Standard	MM	R/L	
			
(3)	(3)	(3)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	* Clamp Screw	Wrench
DVVNN-123	**DVVNN123B**	●	●	VNGA VNMG VNGM VNGG VNMM	33°	.750	.750	4.500	1.750	.750	.375	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
DVVNN-163	**DVVNN163D**	●	●			1.000	1.000	6.000	1.750	1.000	.500						

* Clamp Torque (lbf-in) : DC0520T=31

DVPN type inserts	➤ A138–A141	CUTTING CONDITIONS	➤ A080, B008
DVVN type inserts	➤ A138–A141	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B032, B033, B051	TECHNICAL DATA	➤ N001

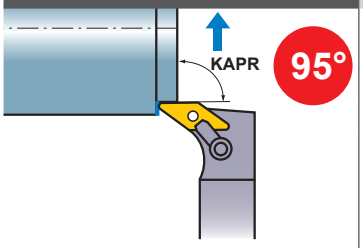
VN INSERTS TOOL HOLDERS

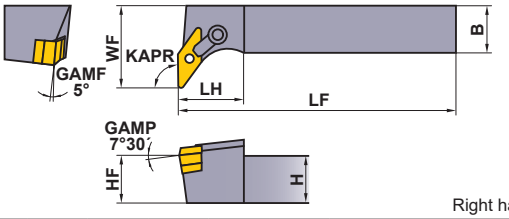
MVLN

Facing

Multiple Clamp Type
M Holder

Medium
MJ





(4)

Right hand tool holder shown.

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *2
MVLNR/L-164C	**MVLNR/L164C**	●	●	VNGM	43◌	1.000	1.000	5.000	1.500	1.000	1.750	IVSN433 *1	NL46	CL30	XNS510
MVLNR/L-164D	**MVLNR/L164D**	●	●			1.000	1.000	6.000	1.500	1.000	1.750				
MVLNR/L-204D	**MVLNR/L204D**	●	●			1.250	1.250	6.000	1.500	1.250	2.000				
MVLNR-244D	**MVLNR244D**	□				1.500	1.500	6.000	1.500	1.500	2.250				

*1 (Opt.) See page M012 for different radius.
*2 Clamp Torque (lbf-in) : XNS510=70

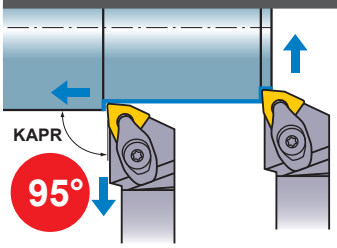
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

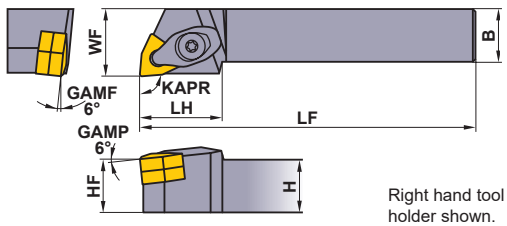
● : USA Stock □ : Made to Order

MVLN type inserts ➤ A140
CUTTING CONDITIONS ➤ A080

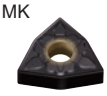
DWLN

External turning Facing **DOUBLE CLAMP Type**





Right hand tool holder shown.

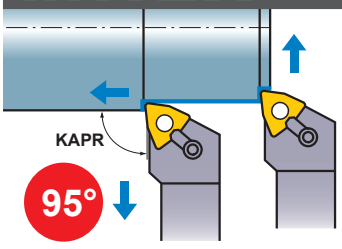
Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(4)	(3,4)	(4)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(4)	(4)	(3,4)	(4)

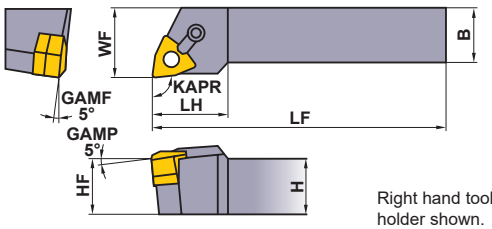
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw *2	Wrench
DWLNR/L-123	**DWLNR/L123B**	●	●	WNMA WNMG WNGA	33°	.750	.750	4.500	1.000	.750	1.000	LLSWN32 *1 (LLSWN33)	LLP23	DCK2211	DCS2	DC0520T	TKY15F
DWLNR/L-163	**DWLNR/L163D**	●	●			1.000	1.000	6.000	1.000	1.000	1.250						
DWLNR/L-124	**DWLNR/L124B**	●	●		43°	.750	.750	4.500	1.250	.750	1.000	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
DWLNR/L-164	**DWLNR/L164D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250						
DWLNR/L-204	**DWLNR/L204D**	●	●			1.250	1.250	6.000	1.250	1.250	1.500						

*1 Please use shim no.LLSWN33 with .125inch thick insert. When using .125inch thick inserts, the shim must be ordered separately.
*2 Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

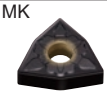
MWLN

External turning Facing **Multiple Clamp Type M Holder**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(4)	(3,4)	(4)
Medium	**Medium to Rough**	**Stainless**	**CBN**
Standard	RP	MM	
(4)	(4)	(3,4)	(4)

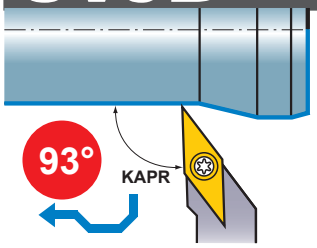
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Bridge	Clamp Screw *
MWLNR/L-1232	MWLNR/L1232B	●	●	WNMA WNMG WNGA	33°	.750	.750	4.500	1.000	.750	1.000	IWSN322	NL34L	CL6	XNS36
MWLNR/L-1632	MWLNR/L1632D	●	●			1.000	1.000	6.000	1.000	1.000	1.250				
MWLNR/L-1233	MWLNR/L1233B	●	●			.750	.750	4.500	1.000	.750	1.000				
MWLNR/L-1633	MWLNR/L1633D	●	●			1.000	1.000	6.000	1.000	1.000	1.250				
MWLNR/L-124B	MWLNR/L124B	●	●		43°	.750	.750	4.500	1.250	.750	1.000	IWSN433	NL46	CL9	XNS59
MWLNR/L-164D	MWLNR/L164D	●	●			1.000	1.000	6.000	1.250	1.000	1.250			CL20	XNS48
MWLNR/L-204D	MWLNR/L204D	●	●			1.250	1.250	6.000	1.250	1.250	1.500			CL9	XNS59
MWLNR/L-854D	MWLNR/L854D	●	●			1.250	1.000	6.000	1.250	1.250	1.250				
MWLNR/L-165D	MWLNR/L165D	●	●		54°	1.000	1.000	6.000	1.250	1.000	1.250	IWSN533	NL58	CL9	XNS59
MWLNR/L-205D	MWLNR/L205D	●	●			1.250	1.250	6.000	1.370	1.250	1.500				
MWLNR/L-245E	MWLNR/L245E	●	●			1.500	1.500	7.000	1.370	1.500	2.000				

* Clamp Torque (lbf-in) : XNS36=30, XNS48=45, XNS59=70

DWLN type inserts	➤ A142–A147	CUTTING CONDITIONS	➤ A080, B008
MWLN type inserts	➤ A142–A147	SPARE PARTS	➤ M001
CBN inserts	➤ B034	TECHNICAL DATA	➤ N001

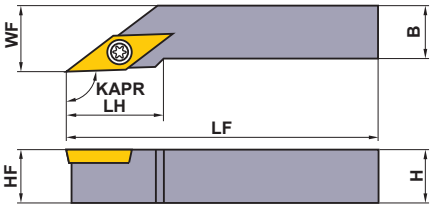
VB INSERTS TOOL HOLDERS

SVJB



External turning
Copying

Screw Clamp Type
SP Holder



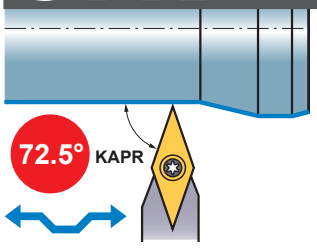
Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**CBN**
MP	MM	Standard	
(3)	(3)	(3)	(2,3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Clamp Screw *	Wrench
SVJBR/L-062	**SVJBR/L062X**	●	●	VBGT VBMT VBET VBGW	22◌	.375	.375	2.500	.875	.375	.500	TS25	TKY08F
SVJBR/L-082	**SVJBR/L082X**	●	●			.500	.500	3.500	.875	.500	.625		
SVJBR/L-102	**SVJBR/L102A**	●	●			.625	.625	4.000	.875	.625	.750		
SVJBR/L-123	**SVJBR/L123B**	●	●		33◌	.750	.750	4.500	1.250	.750	1.000	TS4	TKY15F
SVJBR/L-163	**SVJBR/L163D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250		

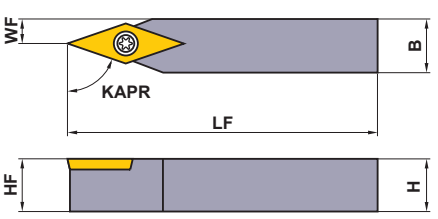
* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

SVVB



External turning
Copying

Screw Clamp Type
SP Holder



Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**CBN**
MP	MM	Standard	
(3)	(3)	(3)	(2,3)

Order Number	ANSI Number	Stock	Insert Number		H	B	LF	HF	WF	Clamp Screw *	Wrench
SVVBN-062	**SVVBN062X**	●	VBGT VBMT VBET VBGW	22◌	.375	.375	2.500	.375	.188	TS25	TKY08F
SVVBN-082	**SVVBN082X**	●			.500	.500	3.000	.500	.250		
SVVBN-102	**SVVBN102A**	●			.625	.625	4.000	.625	.313		
SVVBN-122	**SVVBN122B**	●			.750	.750	4.500	.750	.375		
SVVBN-123	**SVVBN123B**	●		33◌	.750	.750	4.500	.750	.375	TS4	TKY15F
SVVBN-163	**SVVBN163D**	●			1.000	1.000	6.000	1.000	.500		

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

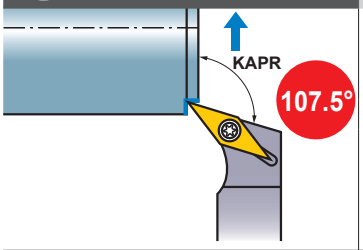
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

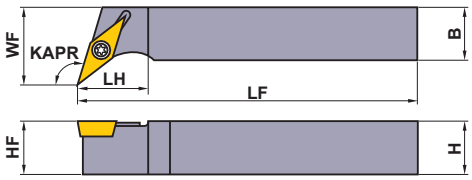
● : USA Stock

SVJB type inserts	➤ A186–A189	CBN & PCD inserts	➤ B045, B058
SVVB type inserts	➤ A186–A189	CUTTING CONDITIONS	➤ A093, B008

SVHB

Facing — **Screw Clamp Type** **SP Holder**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**CBN**
MP	MM	Standard	
(3)	(3)	(3)	(2,3)

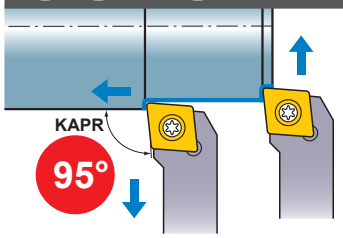
Order Number	ANSI Number	Stock		Insert Number		Dimensions (inch)						Clamp Screw *	Wrench
		R	L			H	B	LF	LH	HF	WF		
SVHBR/L-062	**SVHBR/L062X**	●	●	VBGT VBMT VBET VBGW	22◌	.375	.375	2.500	.875	.375	.500	TS25	TKY08F
SVHBR/L-082	**SVHBR/L082X**	●	●			.500	.500	3.500	.875	.500	.625		
SVHBR/L-102	**SVHBR/L102A**	●	●			.625	.625	4.000	.875	.625	.750		
SVHBR/L-123	**SVHBR/L123B**	●	●		33◌	.750	.750	4.500	1.250	.750	1.000	TS4	TKY15F
SVHBR/L-163	**SVHBR/L163D**	●	●			1.000	1.000	6.000	1.250	1.000	1.250		

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

SVHB type inserts ➤ A186–A189
CBN & PCD inserts ➤ B045, B058
CUTTING CONDITIONS ➤ A093, B008
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

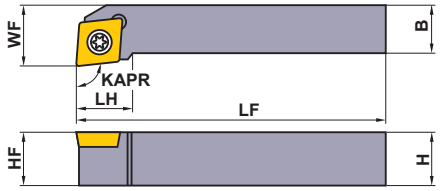
CC INSERTS TOOL HOLDERS

SCLC



External turning
Facing

Screw Clamp Type
SP Holder



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	**Stainless**	**Flat Top**	**PCD/CBN**
LM	MM		
(2,3,4)	(2,3,4)	(2,3,4)	(2,3,4)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
SCLCR/L-062	**SCLCR/L062X**	●	●	CCGB CCET CCGT CCMT CCMW CCGW CCMH	21.5°	.375	.375	2.500	.350	.375	.500	—	—	TS25	TKY08F
SCLCR/L-083	**SCLCR/L083X**	●	●		32.5°	.500	.500	3.500	.540	.500	.625			TS43	TKY15F
SCLCR/L-104	**SCLCR/L104A**	●	●		43°	.625	.625	4.000	.660	.625	.750			TS5	TKY25F
SCLCR/L-124	**SCLCR/L124B**	●	●			.750	.750	4.500	.660	.750	.875	SPSCN42	JSS7	TS53	
SCLCR/L-164	**SCLCR/L164D**	●	●			1.000	1.000	6.000	1.000	1.000	1.250				

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS5=66, TS53=66

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

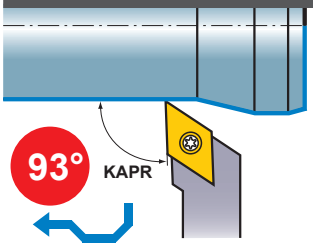
● : USA Stock

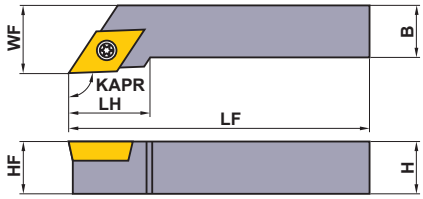
SCLC type inserts	➢ A152–A161
CBN & PCD inserts	➢ B037, B038, B053
CUTTING CONDITIONS	➢ A093, B008

SDJC

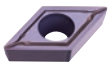
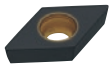
External turning
Copying

Screw Clamp Type
SP Holder





Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	**Stainless**	**Flat Top**	**PCD/CBN**
LM	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

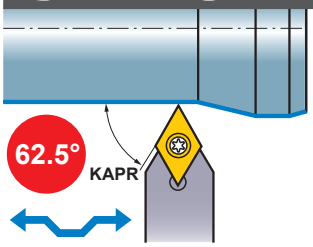
Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
SDJCR/L-062	**SDJCR/L062X**	●	●	DCET DCGT DCMT DCMW DCGW	21.5°	.375	.375	2.500	.500	.375	.500	—	—	TS25	TKY08F
SDJCR/L-083	**SDJCR/L083X**	●	●		32.5°	.500	.500	3.500	.700	.500	.625			TS43	TKY15F
SDJCR/L-103	**SDJCR/L103A**	●	●			.625	.625	4.000	.700	.625	.750				
SDJCR/L-123	**SDJCR/L123B**	●	●			.750	.750	4.500	.700	.750	.875	SPSDN32	JSS6	TS406	TKY15R
SDJCR/L-163	**SDJCR/L163D**	●	●			1.000	1.000	6.000	1.000	1.000	1.250				

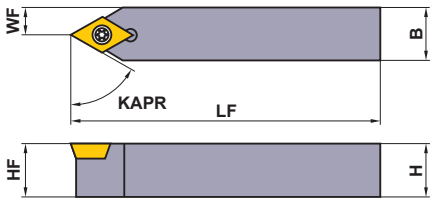
* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS406=31

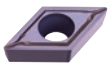
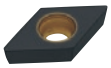
SDNC

External turning
Copying

Screw Clamp Type
SP Holder





Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	**Stainless**	**Flat Top**	**PCD/CBN**
LM	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	ANSI Number	Stock	Insert Number		Dimensions (inch) H	B	LF	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
SDNCN-062	**SDNCN062X**	●	DCET DCGT DCMT DCMW DCGW	21.5°	.375	.375	2.500	.375	.188	—	—	TS25	TKY08F
SDNCN-083	**SDNCN083X**	●		32.5°	.500	.500	3.500	.500	.250			TS43	TKY15F
SDNCN-103	**SDNCN103A**	●			.625	.625	4.000	.625	.313				
SDNCN-123	**SDNCN123B**	●			.750	.750	4.500	.750	.375	SPSDN32	JSS6	TS406	TKY15R
SDNCN-163	**SDNCN163D**	●			1.000	1.000	6.000	1.000	.500				

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS406=31

C
EXTERNAL TURNING TOOLS

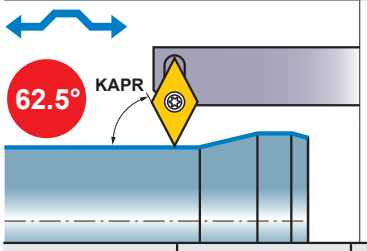
SDJC type inserts	➤ A164–A171	CUTTING CONDITIONS	➤ A093, B008
SDNC type inserts	➤ A164–A171	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B040, B041, B054	TECHNICAL DATA	➤ N001

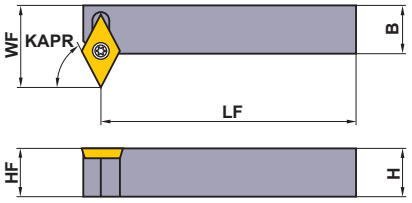
DC INSERTS TOOL HOLDERS

SDXC

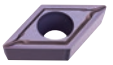
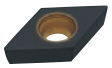
External turning
Copying

Screw Clamp Type
SP Holder





Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
			
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	**Stainless**	**Flat Top**	**PCD/CBN**
LM	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	ANSI Number	Stock		Insert Number		Dimensions (inch)					Clamp Screw *	Wrench
		R	L			H	B	LF	HF	WF		
SDXCR/L-062	**SDXCR/L062X**	●	●	DCET DCGT DCMT DCMW DCGW	21.5◌	.375	.375	2.500	.375	.625	TS25	TKY08F
SDXCR/L-082	**SDXCR/L082X**	●	●			.500	.500	3.500	.500	.750		
SDXCR/L-103	**SDXCR/L103A**	●	●		32.5◌	.625	.625	4.000	.625	1.000	TS43	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

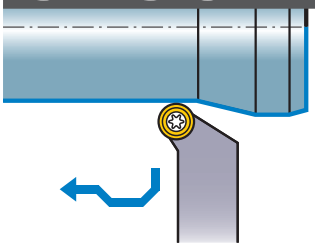
● : USA Stock

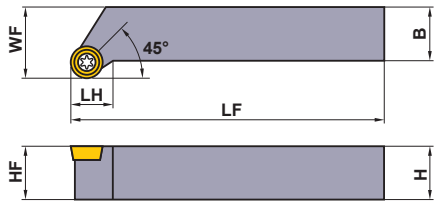
SDXC type inserts	➢ A164–A171
CBN & PCD inserts	➢ B040, B041, B054
CUTTING CONDITIONS	➢ A093, B008

SRGC

External turning
Copying

Screw Clamp Type
SP Holder





Right hand tool holder shown.

Medium — Finish Cutting
AZ

(08)

Medium
Standard

(08)

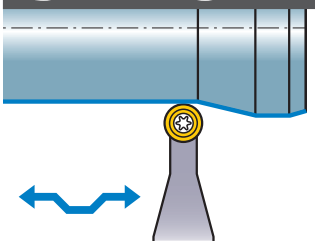
Order Number	ANSI Number	Stock		Insert Number		Dimensions (inch)						Clamp Screw *	Wrench
		R	L			H	B	LF	LH	HF	WF		
SRGCR/L-0608M	**SRGCR/L0608X**	●	●	RCGT RCMT	0803M0	.375	.375	2.500	.610	.375	.625	TS3	TKY08F
SRGCR/L-0808M	**SRGCR/L0808X**	●	●			.500	.500	3.500	.610	.500	.750		
SRGCR/L-1008M	**SRGCR/L1008A**	●	●			.625	.625	4.000	.610	.625	.875		

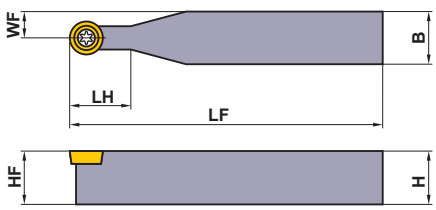
* Clamp Torque (lbf-in) : TS3=8.9

SRDC

External turning
Copying

Screw Clamp Type
SP Holder





Medium — Finish Cutting
AZ

(08)

Medium
Standard

(08)

Order Number	ANSI Number	Stock	Insert Number		Dimensions (inch)						Clamp Screw *	Wrench
					H	B	LF	LH	HF	WF		
SRDCN-0608M	**SRDCN0608X**	●	RCGT RCMT	0803M0	.375	.375	2.500	.375	.375	.188	TS3	TKY08F
SRDCN-0808M	**SRDCN0808X**	●			.500	.500	3.500	.500	.500	.250		
SRDCN-1008M	**SRDCN1008A**	●			.625	.625	4.000	.500	.625	.313		

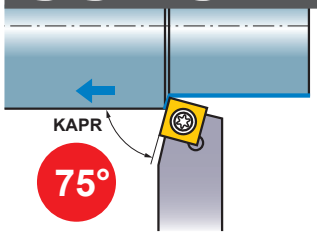
* Clamp Torque (lbf-in) : TS3=8.9

SRGC type inserts	➤ A173
SRDC type inserts	➤ A173
CUTTING CONDITIONS	➤ A093

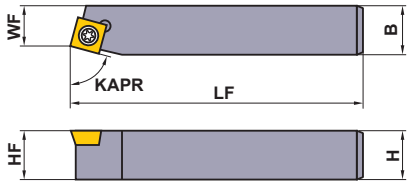
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

SC INSERTS TOOL HOLDERS

SSBC



External turning — Screw Clamp Type SP Holder



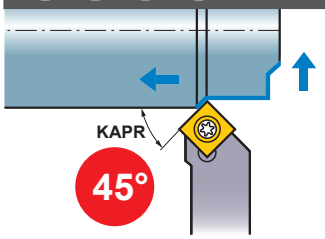
Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP (3)	LP (3)	MP (3)	FM (3)
Stainless	Stainless	Medium	Flat Top
LM (3,4)	MM (3,4)	Standard (3)	(3)

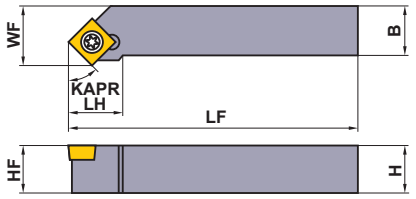
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
SSBCR/L-103	SSBCR/L103A	●	●	SCMT SCMW	32.5°	.625	.625	4.000	.625	.500	—	—	TS43	TKY15F
SSBCR/L-124	SSBCR/L124B	●	●	SCMT SCMW	43°	.750	.750	4.500	.750	.625	SPSSN42	JSS7	TS53	TKY25R
SSBCR/L-164	SSBCR/L164D	●	●	SCMT SCMW	43°	1.000	1.000	6.000	1.000	.875	SPSSN42	JSS7	TS53	TKY25R

* Clamp Torque (lbf-in) : TS43=31, TS53=66

SSSC



External turning
Facing, Chamfering — Screw Clamp Type SP Holder



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP (3)	LP (3)	MP (3)	FM (3)
Stainless	Stainless	Medium	Flat Top
LM (3,4)	MM (3,4)	Standard (3)	(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
SSSCR/L-083	SSSCR/L083X	●	●	SCMT SCMW	32.5°	.500	.500	3.500	.625	.500	.550	—	—	TS43	TKY15F
SSSCR/L-103	SSSCR/L103A	●	●	SCMT SCMW	32.5°	.625	.625	4.000	.625	.625	.680	—	—	TS43	TKY15F
SSSCR/L-124	SSSCR/L124B	●	●	SCMT SCMW	43°	.750	.750	4.500	1.000	.750	.850	SPSSN42	JSS7	TS53	TKY25R
SSSCR/L-164	SSSCR/L164D	●	●	SCMT SCMW	43°	1.000	1.000	6.000	1.000	1.000	1.110	SPSSN42	JSS7	TS53	TKY25R

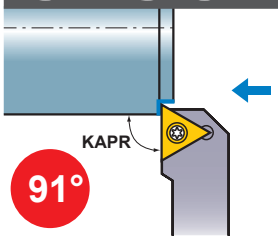
* Clamp Torque (lbf-in) : TS43=31, TS53=66

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

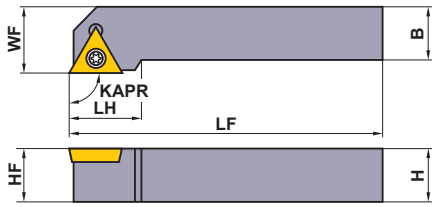
● : USA Stock

SSBC type inserts ➤ A174, A175
SSSC type inserts ➤ A174, A175
CUTTING CONDITIONS ➤ A093

STGC



External turning — **Screw Clamp Type** **SP Holder**



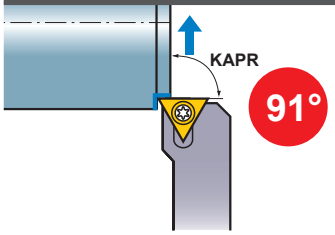
Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	**Stainless**	**Flat Top**	**PCD/CBN**
LM	MM		
(2,3)	(2,3)	(2,3)	(2,3)

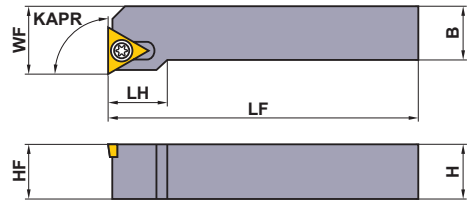
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
STGCR/L-062	**STGCR/L062X**	●	●	TCGT TCMT TCMW TCGW	21.5°	.375	.375	2.500	.550	.375	.500	—	—	TS25	TKY08F
STGCR/L-082.5	**STGCR/L082.5X**	●	●		2.52°	.500	.500	3.500	.700	.500	.625			TS3	
STGCR/L-103	**STGCR/L103A**	●	●		32.5°	.625	.625	4.000	.800	.625	.750			TS43	TKY15F
STGCR/L-123	**STGCR/L123B**	●	●			.750	.750	4.500	.800	.750	.875	SPSTN32	JSS6	TS406	TKY15R
STGCR/L-163	**STGCR/L163D**	●	●			1.000	1.000	6.000	.900	1.000	1.250				

* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9, TS43=31, TS406=31

STFC



Facing — **Screw Clamp Type** **SP Holder**



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	**Stainless**	**Flat Top**	**PCD/CBN**
LM	MM		
(2,3)	(2,3)	(2,3)	(2,3)

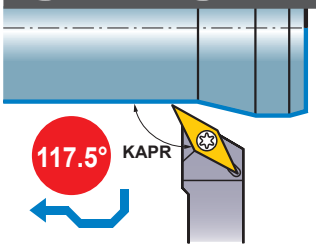
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Shim	Shim Screw	Clamp Screw *	Wrench
STFCR/L-062	**STFCR/L062X**	●	●	TCGT TCMT TCMW TCGW	21.5°	.375	.375	2.500	.500	.375	.500	—	—	TS25	TKY08F
STFCR/L-082.5	**STFCR/L082.5X**	●	●		2.52°	.500	.500	3.500	.571	.500	.625			TS3	
STFCR/L-102.5	**STFCR/L102.5A**	●	●			.625	.625	4.000	.571	.625	.750				
STFCR/L-123	**STFCR/L123B**	●	●		32.5°	.750	.750	4.500	.866	.750	.875	SPSTN32	JSS6	TS406	TKY15R
STFCR/L-163	**STFCR/L163D**	●	●			1.000	1.000	6.000	.866	1.000	1.250				

* Clamp Torque (lbf-in) : TS25=8.9, TS3=8.9, TS406=31

STGC type inserts	➤ A177–A180	CUTTING CONDITIONS	➤ A093, B008
STFC type inserts	➤ A177–A180	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B042, B055	TECHNICAL DATA	➤ N001

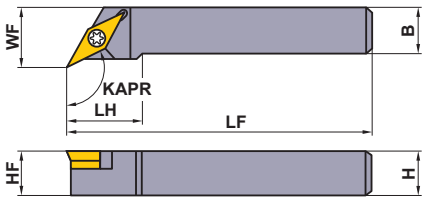
VC INSERTS TOOL HOLDERS

SVPC



External turning
Copying

Screw Clamp Type
SP Holder



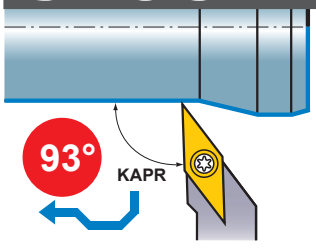
Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	Stainless	Medium	Flat Top
LM	MM	Standard	
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Screw *	Wrench
SVPCR/L-082	**SVPCR/L082X**	●	●	VCMT VCGT VCMW VCGW	22◌	.500	.500	3.500	1.000	.500	.750	—	—	TS25	TKY08F
SVPCR/L-102	**SVPCR/L102A**	●	●			.625	.625	4.000	1.000	.625	.875				
SVPCR/L-123	**SVPCR/L123B**	●	●		33◌	.750	.750	4.500	1.206	.750	1.000	SPSVN32	BCP141	TS44	TKY15R
SVPCR/L-163	**SVPCR/L163D**	●	●			1.000	1.000	6.000	1.206	1.000	1.250				

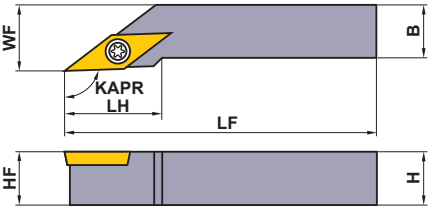
* Clamp Torque (lbf-in) : TS25=8.9, TS44=31

SVJC



External turning
Copying

Screw Clamp Type
SP Holder



Right hand tool holder shown.

Finish	Light	Medium	Stainless
FP	LP	MP	FM
(2,3)	(2,3)	(2,3)	(2,3)
Stainless	Stainless	Medium	Flat Top
LM	MM	Standard	
(3)	(3)	(2,3)	(2,3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Shim	Shim Pin	Clamp Screw *	Wrench
SVJCR/L-062	**SVJCR/L062X**	●	●	VCMT VCGT VCMW VCGW	22◌	.375	.375	2.500	.750	.375	.500	—	—	TS25	TKY08F
SVJCR/L-083	**SVJCR/L083X**	●	●		33◌	.500	.500	3.500	1.000	.500	.625			TS43	TKY15F
SVJCR/L-103	**SVJCR/L103A**	●	●			.625	.625	4.000	1.000	.625	.750				
SVJCR/L-123	**SVJCR/L123B**	●	●			.750	.750	4.500	1.000	.750	.875	SPSVN32	BCP141	TS44	TKY15R
SVJCR/L-163	**SVJCR/L163D**	●	●			1.000	1.000	6.000	1.500	1.000	1.250				

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31, TS44=31

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

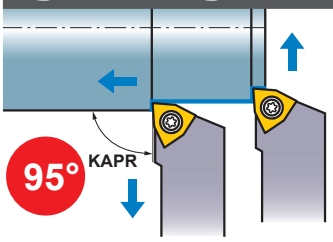
● : USA Stock

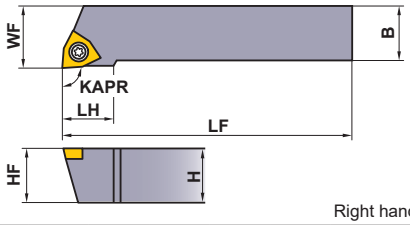
SVPC type inserts	➤ A190—A192
SVJC type inserts	➤ A190—A192
CBN & PCD inserts	➤ B046, B058
CUTTING CONDITIONS	➤ A093, B008

SWLC

External turning
Facing

Screw Clamp Type
SP Holder





Right hand tool holder shown.

Finish	Medium
FJ	MJ
(2,3)	(2,3)
Medium	**PCD/CBN**
Standard	
(2,3)	(2,3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Clamp Screw *	Wrench
SWLCR/L-052	**SWLCR/L052X**	●	●	WCGT WCMT WCGW	21.5°	.313	.313	2.500	.500	.313	.375	TS25	TKY08F
SWLCR/L-062	**SWLCR/L062X**	●	●			.375	.375	3.500	.500	.375	.500		
SWLCR/L-082	**SWLCR/L082X**	●	●			.500	.500	3.500	.500	.500	.625		
SWLCR/L-103	**SWLCR/L103A**	●	●		32.5°	.625	.625	4.000	.625	.625	.750	TS4	TKY15F
SWLCR/L-123	**SWLCR/L123B**	●	●			.750	.750	4.500	.625	.750	1.000		

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

SWLC type inserts ➤ A196, A197
CUTTING CONDITIONS ➤ A093, B008
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

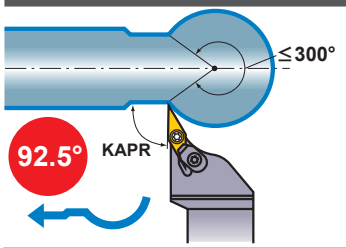
XC INSERTS TOOL HOLDERS

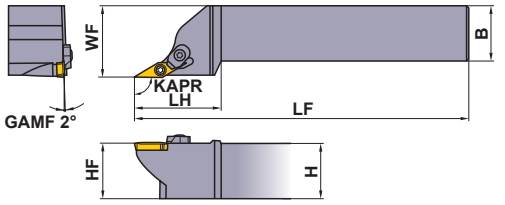
SXZC

External turning
Copying

DOUBLE CLAMP Type

Finish: SVX





(2)

Right hand tool holder shown.

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	* Clamp Screw	Clamp Bridge	* Clamp Bridge Screw	Spring	Wrench (Insert)	Wrench (Clamp Bridge)
SXZCR/L-102	SXZCR/L102A	●	●	XCMT	22□SVX	.625	.625	4.000	1.378	.625	.750	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L-122	SXZCR/L122B	●	●			.750	.750	4.500	1.378	.750	1.000						
SXZCR/L-162	SXZCR/L162D	●	●			1.000	1.000	6.000	1.575	1.000	1.250						

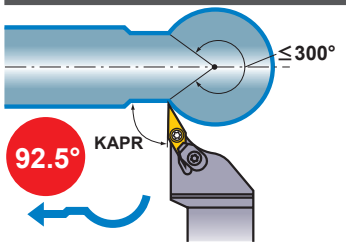
* Clamp Torque (lbf-in) : TS255=8.9, AJS3010T10=22

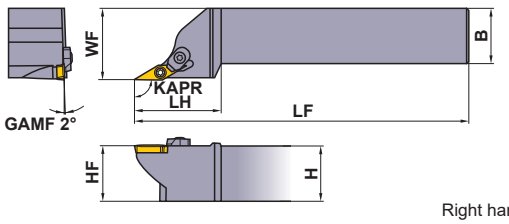
SXZC

External turning
Copying

DOUBLE CLAMP Type

Finish: SVX





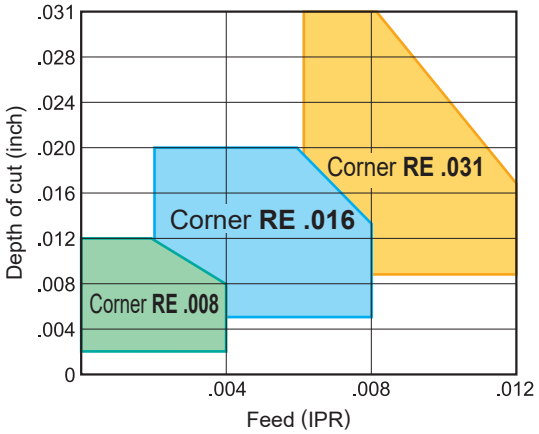
(2)

Right hand tool holder shown.

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	LF	LH	HF	WF	* Clamp Screw	Clamp Bridge	* Clamp Bridge Screw	Spring	Wrench (Insert)	Wrench (Clamp Bridge)
SXZCR/L1616H15	—	●	●	XCMT	22□SVX	16	16	100	35	16	20	TS255	AMS3	AJS3010T10	ASS2	TKY08F	TKY10F
SXZCR/L2020K15	—	●	●			20	20	125	35	20	25						
SXZCR/L2525M15	—	●	●			25	25	150	40	25	32						

* Clamp Torque (lbf-in) : TS255=8.9, AJS3010T10=22

APPLICATION RANGE



RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**MC6125**	1115 (785—1310)
	Carbon Steel, Alloy Steel	**150HB—250HB**	**MC6125**	720 (525—920)
M	Stainless Steel	≤200HB	**VP15TF**	330 (230—395)

Note 1) The above cutting conditions are general guidelines. Adjustments maybe necessary depending on machine rigidity, work material geometry and clamping.

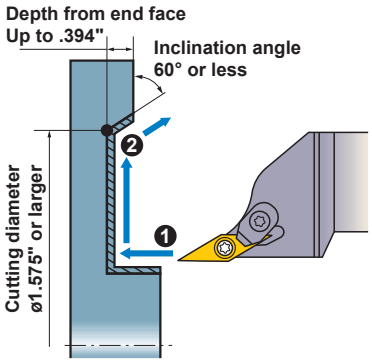
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : **USA Stock**

SXZC type inserts ➤ A199

OPERATIONAL GUIDANCE

Notes when end face profiling



Pay special attention to the following when face profiling.

Machining of an outer diameter (Step ①)

- To prevent burr formation, the depth of cut should be less than half the corner radius.

Machining of an inclination (Step ②)

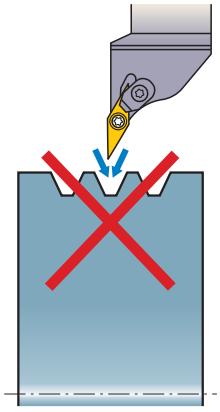
- To reduce the contact length of chips, the depth of cut should be less than half the corner radius.
- To prevent interference between the tool and the work material, the cutting diameter should be 1.575" or larger, inclination angle 60° or less and depth from the end face up to .394".

When changing inserts

- When indexing the inserts, it is recommended to preset the cutting edge position to maintain machining accuracy.

Not possible

Machining of V-pulleys



When machining V-pulleys, use a VNMG insert

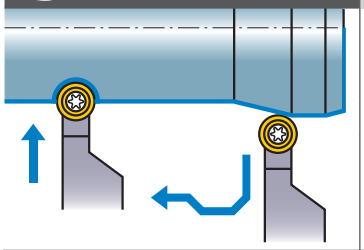
RP ○○ INSERTS TOOL HOLDERS

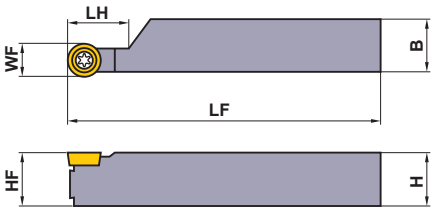
SRDP

External turning
Copying

Screw Clamp Type
SP Holder

Medium
JS
(12)





Right hand tool holder shown.

Order Number	ANSI Number	Stock		Insert Number	Dimensions (inch)						Clamp Screw *	Wrench
		R	L		H	B	LF	LH	HF	WF		
SRDPR/L-1612	**SRDPR/L1612D**	●	●	RPMT120400E-JS	1.000	1.000	6.000	1.000	1.000	.500	TS43	TKY15F

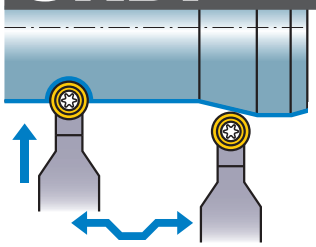
* Clamp Torque (lbf-in) : TS43=31

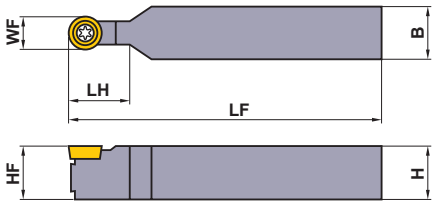
SRDP

External turning
Copying

Screw Clamp Type
SP Holder

Medium
JS
(12)





Order Number	ANSI Number	Stock	Insert Number	Dimensions (inch)						Clamp Screw *	Wrench
				H	B	LF	LH	HF	WF		
SRDPN-1612	**SRDPN1612D**	●	RPMT120400E-JS	1.000	1.000	6.000	1.000	1.000	.500	TS43	TKY15F

* Clamp Torque (lbf-in) : TS43=31

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

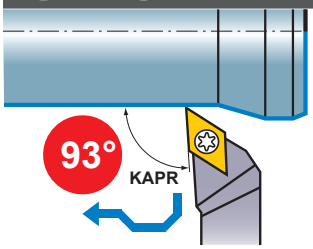
● : USA Stock

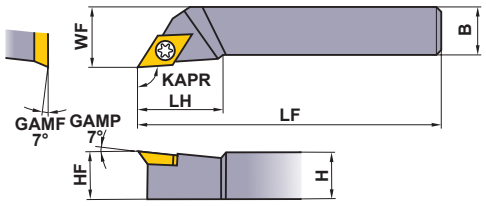
SRDPR/L type inserts ➢ K034
SRDPN type inserts ➢ K034
CUTTING CONDITIONS ➢ A102

SDJE

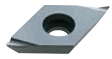
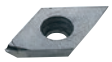
External turning
Copying

Screw Clamp Type for Aluminum
AL Holder





Right hand tool holder shown.

Finish	Medium
R/L-F	R/L
	
(4)	(4)
PCD	
R/L-F	
	
(4)	

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	Clamp Screw *	Wrench
SDJER/L-104	**SDJER/L104A**	●	●	DEGX	43◌R/L	.625	.625	4.000	1.000	.625	.750	CS451190T	TKY20F
SDJER/L-124	**SDJER/L124B**	●	●			.750	.750	4.500	1.000	.750	.875		
SDJER/L-164	**SDJER/L164D**	●	●			1.000	1.000	6.000	1.100	1.000	1.250		

* Clamp Torque (lbf-in) : CS451190T=44

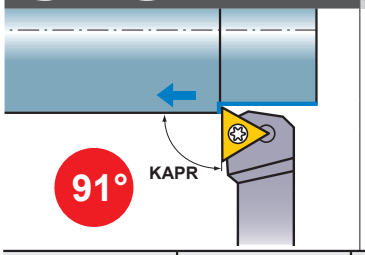
RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
N	Aluminum Alloy	**HTi10**	1310	.002—.012	.008—.118
		MD220	2620	.002—.012	.008—.020

SDJE type inserts ➤ **A172**
PCD inserts ➤ **B060**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

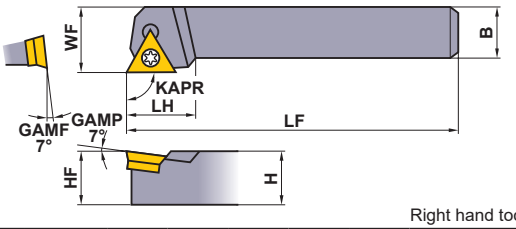
TE INSERTS TOOL HOLDERS

STGE



External turning

Screw Clamp Type for Aluminum AL Holder



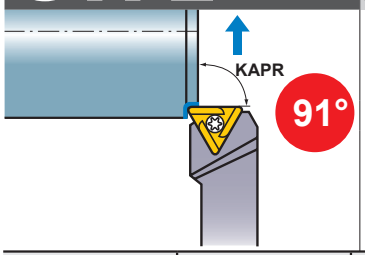
Right hand tool holder shown.

Medium	PCD
R/L	R/L
(3)	(3)
PCD	
(3)	

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	* Clamp Screw	Wrench
STGER/L-103	STGER/L103A	●	●	TEGX	32◌	.625	.625	4.000	.800	.625	.750	FC400890T	TKY10F
STGER/L-123	STGER/L123B	●	●			.750	.750	4.500	.800	.750	.875		
STGER/L-163	STGER/L163D	●	●			1.000	1.000	6.000	.900	1.000	1.250		

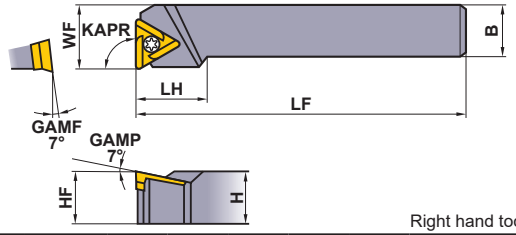
Note 1) Right hand tool holder uses right hand insert. Left hand tool holder uses left hand insert.
∗ Clamp Torque (lbf-in) : FC400890T=22

STFE



Facing

Screw Clamp Type for Aluminum AL Holder



Right hand tool holder shown.

Medium	PCD
R/L	R/L
(3)	(3)
PCD	
(3)	

Order Number	ANSI Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	LF	LH	HF	WF	* Clamp Screw	Wrench
STFER/L-103	STFER/L103A	●	●	TEGX	32◌	.625	.625	4.000	.866	.625	.750	FC400890T	TKY10F
STFER/L-123	STFER/L123B	●	●			.750	.750	4.500	.866	.750	1.000		
STFER/L-163	STFER/L163D	●	●			1.000	1.000	6.000	.866	1.000	1.250		

Note 1) Right hand tool holder uses left hand insert. Left hand tool holder uses right hand insert.
∗ Clamp Torque (lbf-in) : FC400890T=22

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

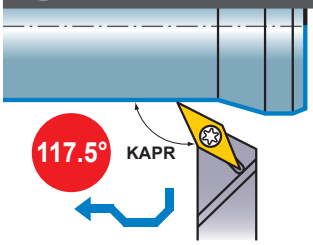
● : USA Stock

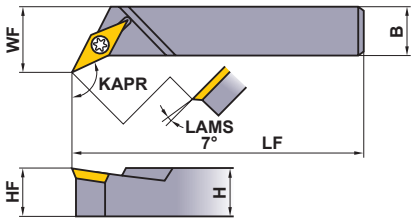
STGE type inserts	➢ A181
STFE type inserts	➢ A181
PCD inserts	➢ B060

SVPD

External turning
Copying

Screw Clamp Type for Aluminum
AL Holder





Right hand tool holder shown.

Finish
R/L

(3)
PCD
R/L-F

(3)

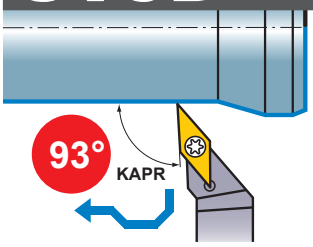
Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	HF	WF	Clamp Screw*	Wrench
SVPDR/L-123	**SVPDR/L123B**	●	●	VDGX	32◌R/L	.750	.750	4.500	.750	1.000	FC400890T	TKY10F
SVPDR/L-163	**SVPDR/L163D**	●	●			1.000	1.000	6.000	1.000	1.250		

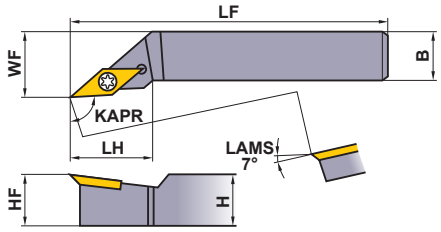
Note 1) Right hand tool holder uses right hand insert. Left hand tool holder uses left hand insert.
* Clamp Torque (lbf-in) : FC400890T=22

SVJD

External turning
Copying

Screw Clamp Type for Aluminum
AL Holder





Right hand tool holder shown.

Finish
R/L

(3)
PCD
R/L-F

(3)

Order Number	ANSI Number	Stock R	Stock L	Insert Number		H	B	LF	LH	HF	WF	Clamp Screw*	Wrench
SVJDR/L-103	**SVJDR/L103A**	●	●	VDGX	32◌R/L	.625	.625	4.000	1.100	.625	.750	FC400890T	TKY10F
SVJDR/L-123	**SVJDR/L123B**	●	●			.750	.750	4.500	1.100	.750	.875		
SVJDR/L-163	**SVJDR/L163D**	●	●			1.000	1.000	6.000	1.200	1.000	1.250		

Note 1) Right hand tool holder uses right hand insert. Left hand tool holder uses left hand insert.
* Clamp Torque (lbf-in) : FC400890T=22

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
N	Aluminum Alloy	**HTi10**	1310	.002—.012	.008—.118
		MD220	2620	.002—.012	.008—.020

SVPD type inserts ➤ A193
SVJD type inserts ➤ A193
PCD inserts ➤ B061
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

HOW TO READ THE STANDARD OF SMALL TOOLS

●How this section page is organized

①Organized according to the cutting mode of small tools.
(Refer to the inside title on the next page.)
②Shown as Turning → External Grooving → External Cutting Off → Threading → Boring.

TYPE OF TOOL HOLDER
indicates the first four letters of the order number, as well as cutting applications.

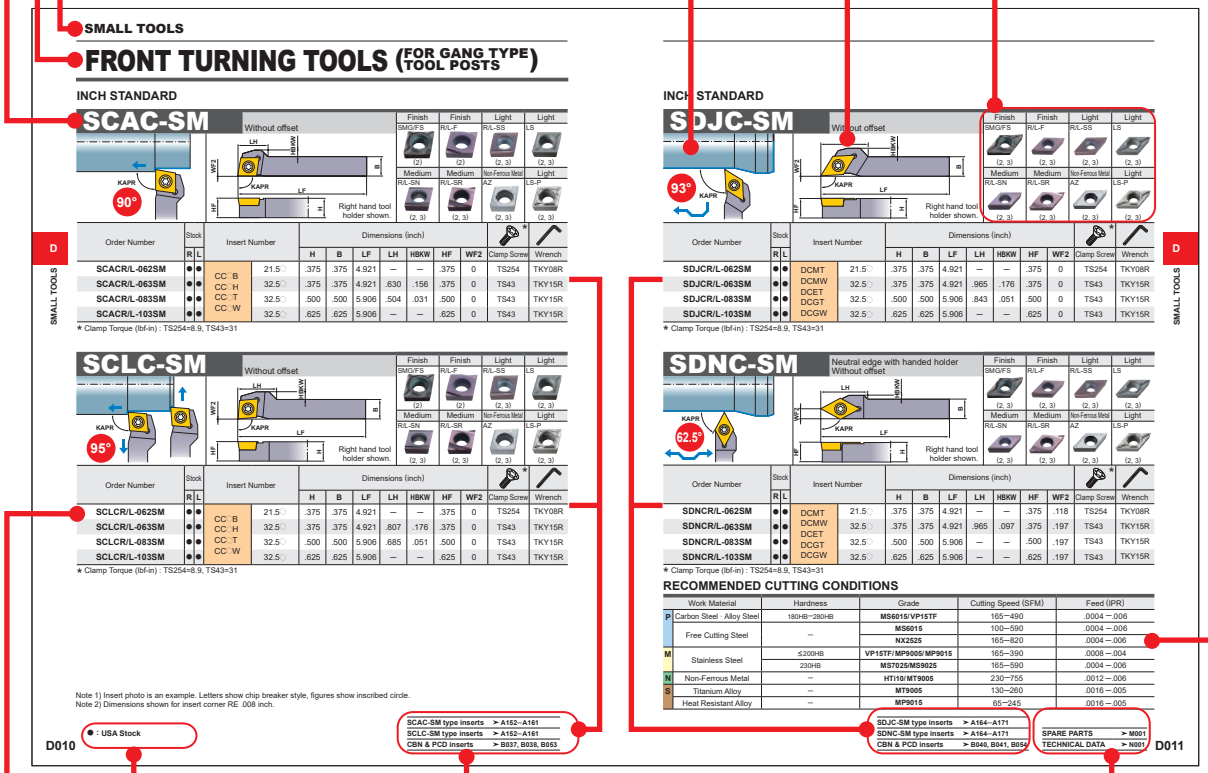
APPLICATION

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications such as external turning, copying, facing, chamfering, threading, and grooving together with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages giving details of inserts that are applicable to the product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

RECOMMENDED CUTTING CONDITIONS
for each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M and N.

●To Order : Please specify order number and hand of tool (right/left).

TURNING

SMALL TOOLS

*Arranged by Alphabetical order

D018 **BTAH** (INCH STANDARD)
D021 **BTAH** (METRIC STANDARD)
D018 **BTAT** INSERTS
D019 **BTBT** INSERTS
D020 **BTVH** (INCH STANDARD)
D023 **BTVH** (METRIC STANDARD)
D020 **BTVT** INSERTS
D040 **CSVH** (INCH STANDARD)
D043 **CSVH** (METRIC STANDARD)
D041 **CSVTB** INSERTS
D041 **CSVTBXL** INSERTS
D041 **CSVTC** INSERTS
D040 **CSVTF** INSERTS
D040 **CSVTFXL** INSERTS
D042 **CSVTG** INSERTS
D042 **CSVTT** INSERTS
D028 **CTAH** (INCH STANDARD)
D030 **CTAH** (METRIC STANDARD)
D028 **CTAH-S** (INCH STANDARD)
D030 **CTAH-S** (METRIC STANDARD)
D029 **CTAT** INSERTS
D019 **CTBH** (INCH STANDARD)
D032 **CTBH** (INCH STANDARD)
D022 **CTBH** (METRIC STANDARD)
D033 **CTBH** (METRIC STANDARD)
D032 **CTBT** INSERTS
D024 **GTAH/GTBH/GTCH** (INCH STANDARD)
D026 **GTAH/GTBH/GTCH** (METRIC STANDARD)
D024 **GTAT/GTBT/GTCT** INSERTS
D037 **MMTE** (INCH STANDARD)
D046 **SBAH** (METRIC STANDARD)
D046 **SBAT** INSERTS
D010 **SCAC-SM** (INCH STANDARD)
D014 **SCAC-SM** (METRIC STANDARD)
D010 **SCLC-SM** (INCH STANDARD)
D014 **SCLC-SM** (METRIC STANDARD)
D011 **SDJC-SM** (INCH STANDARD)
D015 **SDJC-SM** (METRIC STANDARD)
D011 **SDNC-SM** (INCH STANDARD)
D015 **SDNC-SM** (METRIC STANDARD)
D038 **SH** (INCH STANDARD)
D039 **SH** (METRIC STANDARD)
D012 **SVJB-SM** (INCH STANDARD)
D016 **SVJB-SM** (METRIC STANDARD)
D013 **SVJC-SM** (INCH STANDARD)
D017 **SVJC-SM** (METRIC STANDARD)
D012 **SVLP-SM** (INCH STANDARD)
D016 **SVLP-SM** (METRIC STANDARD)
D017 **SVPP-SM** (METRIC STANDARD)
D013 **SVVB-SM** (INCH STANDARD)
D017 **SVVB-SM** (METRIC STANDARD)
D034 **TTAH** (INCH STANDARD)
D035 **TTAH** (METRIC STANDARD)
D034 **TTAT** INSERTS

OUTLINE OF SMALL TOOLS ····· D002
CLASSIFICATION ····· D006

STANDARD

GANG TYPE TOOL POSTS

	INCH	METRIC
FRONT TURNING TOOLS		
SCAC-SM	D010	D014
SCLC-SM	D010	D014
SDJC-SM	D011	D015
SDNC-SM	D011	D015
SVLP-SM	D012	D016
SVJB-SM	D012	D016
SVJC-SM	D013	D017
SVVB-SM	D013	D017
SVPP-SM	—	D017
BACK TURNING TOOLS		
BTAH	D018	D021
CTBH	D019	D022
BTVH	D020	D023
GROOVING TOOLS		
GTAH / GTBH / GTCH	D024	D026
GYS (For Swiss-type lathes)	F016	F040
CUTTING OFF TOOLS		
CTAH / CTAH-S	D028	D030
CTBH	D032	D033
THREADING TOOLS		
TTAH	D034	D035
MMTE	D037	—
BORING TOOLS		
SBAH	—	D046

OPPOSITE TOOL POSTS

DIMPLE SLEEVE HOLDER		
SH	D038	D039

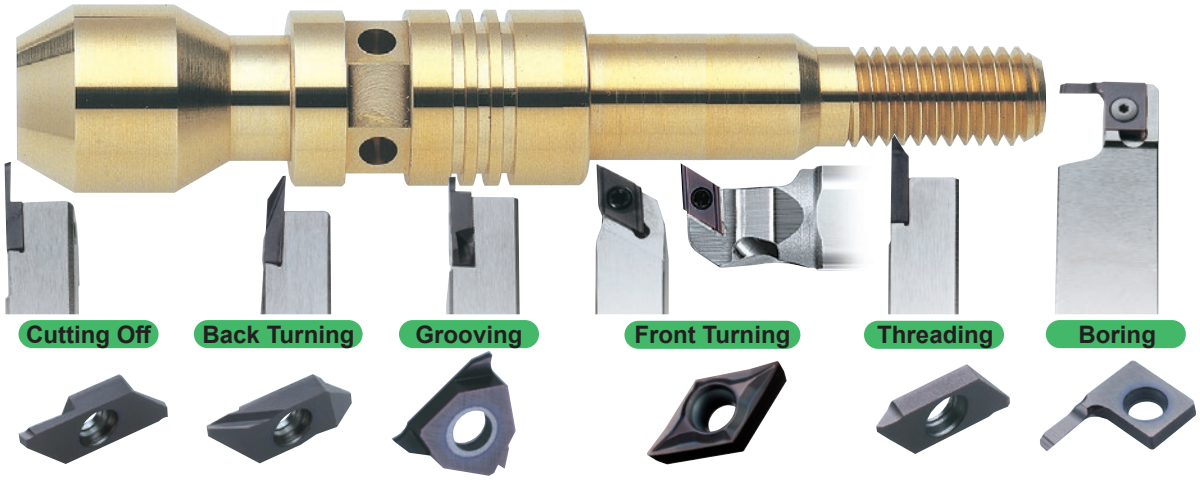
RADIAL TYPE TOOL POSTS

CSVH	D040	D043
CSVTF	D040	D043
CSVTFXL	D040	D043
CSVTC	D041	D044
CSVTB	D041	D044
CSVTBXL	D041	D044
CSVTG	D042	D045
CSVTT	D042	D045

*For GY Swiss please refer to section F Grooving tools.

OUTLINE OF SMALL TOOLS

TOOLS FOR GANG TYPE AUTOMATIC LATHES (FOR EXTERNAL TURNING AND BORING)



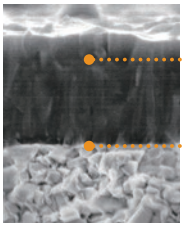
MS Series - PVD Coated Grades for High Precision and Small Parts Machining

MS6015

Skilled at pure iron, carbon steel and free cutting steel turning and achieving implemented stable finished surfaces and excellent dimensional accuracy.

	MS6015	Conventional
Coating	TiCN multilayer	TiAlN
Hardness (HV)	3,000	2,800
Wear Coefficient (Carbon Steel)	Low	High
Base Material Hardness (HRA)	92.0	92.0
T.R.S (GPa)	2.0	2.0

Ti-C-N Multilayer Coating



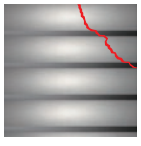
Superior wear and welding resistance and demonstrating the best possible results for carbon steel.

Minute multilayers remarkably improve welding.

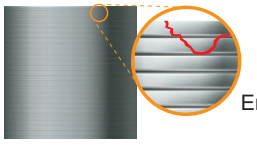
MS7025 NEW

Dramatically improved welding and wear resistance in low feed machining with a more precise nano-multilayer coating

By combining the high lubrication layer with excellent welding resistance, and the high hardness layer with a greater wear resistance that suppresses the progress of wear at the nano-level, the film damage is significantly reduced and the welding and wear resistance are dramatically improved.



Conventional Multilayer Coating



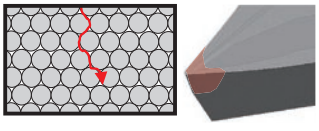
Nano-multilayer Coating

MS9025 NEW

Effective reduction of notch wear of stainless steel with a balance of wear and fracture resistance

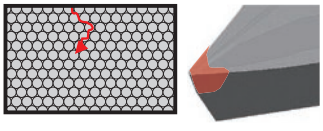
Thermal conductivity has been improved by optimizing the grain size and therefore reducing the boundary contact between the WC particles. This optimization reduces the temperature of the cutting edge during machining.

MS9025



Reducing the cutting edge temperature by improved thermal conductivity.

Conventional



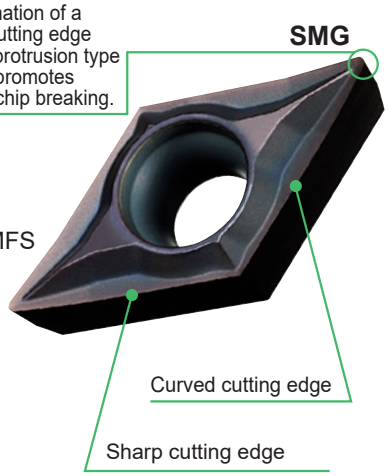
Higher cutting edge temperatures due to more particle boundary contact.

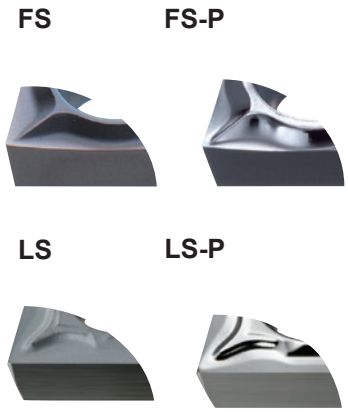
●Molded Breaker Insert

Nose radii designed with minus tolerance

- Suitable for small parts applications that often require minus tolerance dimensions.
- The order number is shown with the letter “M” that indicates minus tolerance. ex) DCGT32.50.2MFS
- The radius value is printed on the side of the insert label for easy recognition.

A combination of a curved cutting edge and the protrusion type breaker promotes efficient chip breaking.



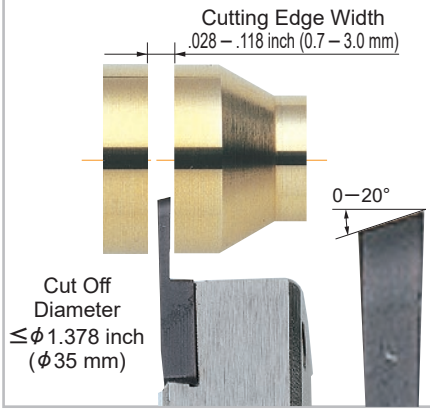


●Tolerance Corner R

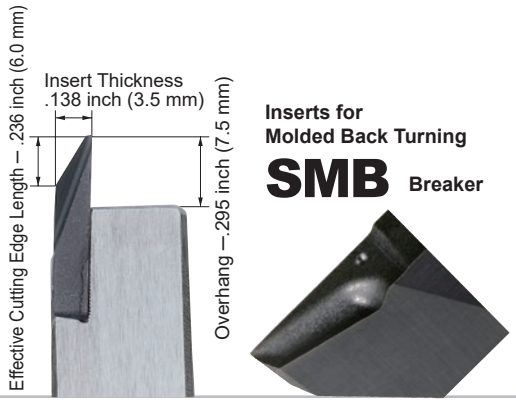
E class
RE $^{0}_{-.0008}$ inch

The letter “M” insert
RE $^{0}_{-.002}$ inch
(Conventional G-class insert
RE ± .004 inch)

●Cutting Off

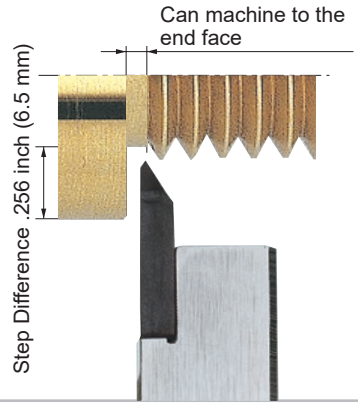


●Back Turning

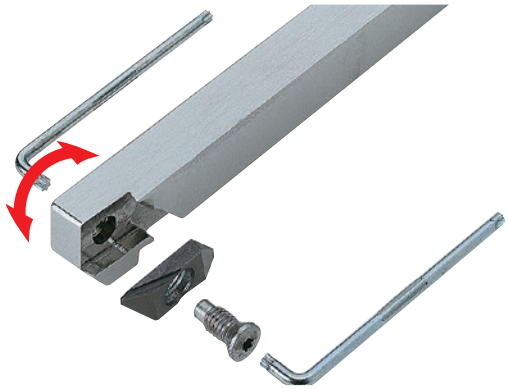


Inserts for Molded Back Turning
SMB Breaker

●Threading



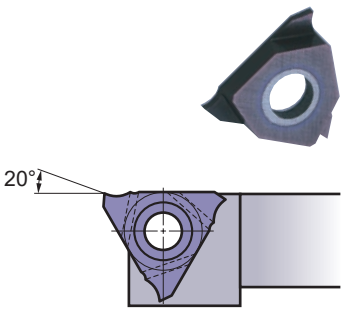
●Back Clamping Mechanism



Screw designed for front and back clamping.

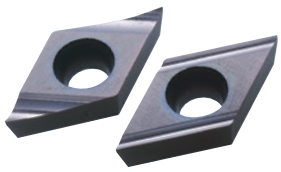
●Grooving

- 3-cornered
- Groove width .012– .118 inch (0.3-3.0 mm)
- Traversing possible



●Front Turning

- ISO E class accuracy inserts
- A wide variety of small corner R inserts
- Rake angle 30°



OUTLINE OF SMALL TOOLS

Grooving System

GY series

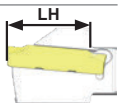
Max. Cut Off Diameter : 1.339 inch (34mm)

Monoblock Holder for Swiss-type Automatic Lathe

The new geometry with greatly improved rigidity suppresses vibrations and dimensional changes thereby solving problems during cut off.

Overhang Length Compatible with Swiss-type Automatic Lathes

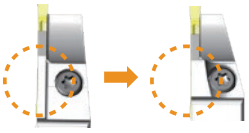
Head length corresponding to the maximum machining diameter of CNC Swiss-type automatic lathes and turret machines.



Features of High Rigidity Holder

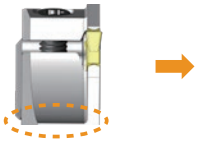
Strong Clamp Bridge

The strong design of the clamp bridge suppresses chatter and vibration.



Thicker Tool Base

Tool deflection caused by cutting resistance is greatly reduced.

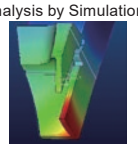


Analysis by Simulation

Deflection Measurement : .0017 inch (0.044 mm)

Analysis by Simulation

Deflection Measurement : .0005 inch (0.013 mm)



Analysis by Simulation

Tools for a very wide range of small parts machining

External Turning	Tools for front turning, back turning, grooving, threading, and cutting off
Internal Turning	Tools for boring, internal grooving and internal threading
Drilling	Drills
End Milling	End Mills

Tools for CNC automatic and small lathes

Types of Tool Posts	Gang type, turret type, cam type (radial pattern type)
Tool Sizes	Square shank: .375—.625 inch (8 — 16 mm) Round shank : less than ϕ1 inch (ϕ25.4 mm)

Indexable inserts developed under the concept of "high-quality, high efficiency and long tool life."

High-Quality	E class tolerance, sharp cutting edge, high accuracy small corner R, smooth surface finish
Long Tool Life	PVD coating MS6015 / MS7025 / MS9025 / VP15TF
High Efficiency	Regrinding not necessary due to the employment of indexable inserts. A wide variety of top cutting edge geometries

Cutting Off & Grooving System

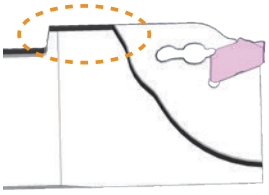
GW series

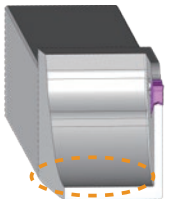
Monoblock Holder for Swiss-type Automatic Lathe

Max. Cut Off
2.992 inch (76mm)

High Rigidity Holder

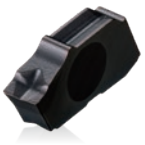
Tool deflection caused by cutting resistance and the remaining material pip in the center are greatly reduced.



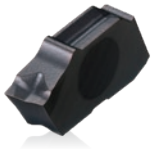


New Low Resistance and High Lead Angle Insert

New inserts with a lead angle of 8° have been added to the range to reduce burrs and the remaining material pip in the center.



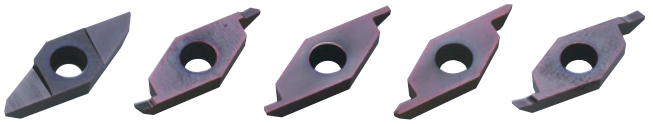
Lead Angle 5°



Lead Angle 8°

TOOLS FOR CAM TYPE AUTOMATIC LATHES

- The most suitable for the use with cam type automatic lathes (radial pattern tool posts)
- The most suitable for machining of small parts with work diameter .197 inch (5mm) or smaller
- Single holder for front turning, back turning, grooving, threading and cutting off operations



Front Turning | Back Turning | Grooving | Threading | Cutting Off

INTERNAL TURNING TOOLS

Solid type

MICRO-MINI TWIN Boring Bars

Boring
Grooving
Threading

Minimum cutting diameter
ϕ.087 inch
(2.2 mm) -

Round Shank

Square Shank

MICRO-DEX Boring Bars

Minimum cutting diameter
ϕ.197 inch (5.0 mm) -

Minimum cutting diameter
ϕ.39 inch (10mm) -

DIMPLE BAR

DRILLING TOOLS

Leading Drill Series
DLE

Leading Drill Series
GKCD NEW

Solid Carbide Drills for Swiss-type Automatic & Small CNC Lathes
WSTAR Drill Series
DWAE NEW

TRISTAR Drill Series
DVAS Mini Size

END MILLING TOOLS

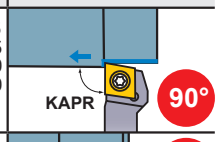
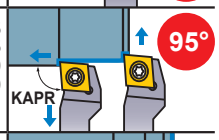
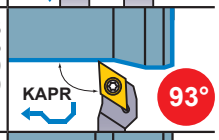
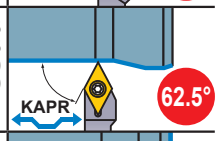
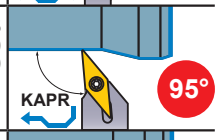
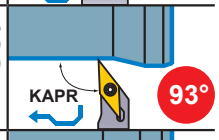
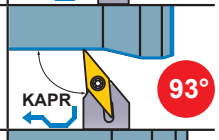
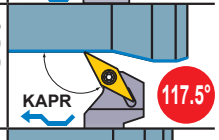
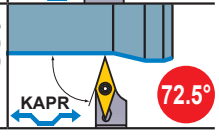
For Swiss-type Automatic Lathes

MS Plus End Mill Series
MP2ES/MP3ES/MP4EC NEW

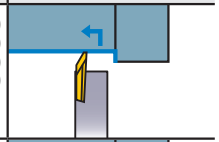
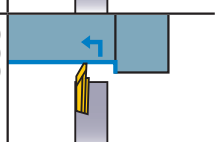
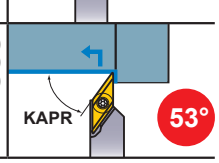
CLASSIFICATION (EXTERNAL TURNING)

GANG TYPE TOOL POSTS

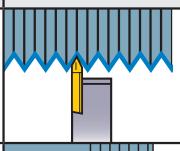
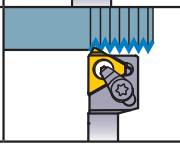
●FRONT TURNING

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
SCAC-SM Inch ➲ D010 Metric ➲ D014	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SCLC-SM Inch ➲ D010 Metric ➲ D014	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SDJC-SM Inch ➲ D011 Metric ➲ D015	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SDNC-SM Inch ➲ D011 Metric ➲ D015	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	8 x 8 x 125 10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVLP-SM Inch ➲ D012 Metric ➲ D016	.375 x .375 x 5.000 .500 x .500 x 6.000 .625 x .625 x 6.000	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVJB-SM Inch ➲ D012 Metric ➲ D016	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVJC-SM Inch ➲ D013 Metric ➲ D017	.375 x .375 x 4.500 .500 x .500 x 4.500 .625 x .625 x 4.500	10x10x120 12x12x120 16x16x120	
SVPP-SM Metric ➲ D017	—	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	
SVVB-SM Inch ➲ D013 Metric ➲ D017	.375 x .375 x 4.921 .500 x .500 x 5.906 .625 x .625 x 5.906	10 x 10 x 125 12 x 12 x 150 16 x 16 x 150	

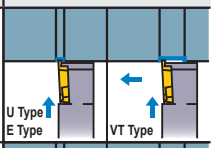
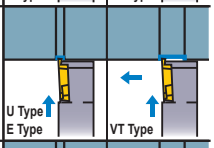
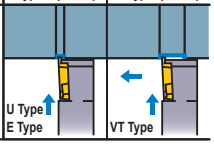
●BACK TURNING

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
BTAH (Edge Length) .110, .138, .197 inch 2.8, 3.5, 5.0 mm Inch ➲ D018 Metric ➲ D021	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTBH (Edge Length) .177, .236 inch 4.5, 6.0 mm Inch ➲ D019 Metric ➲ D022	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
BTVH (Edge Length) .295 inch 7.5 mm Inch ➲ D020 Metric ➲ D023	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

●THREADING

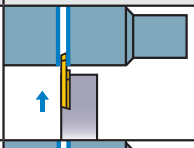
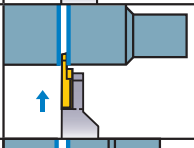
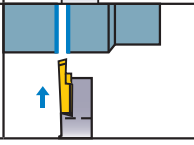
Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
TTAH Inch ➲ D034 Metric ➲ D035	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
MMTE Inch ➲ D037	.375 x .375 x 4.724 .500 x .500 x 4.724	—	

●GROOVING

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
GTAH (Grooving Width) .012-.055 inch 0.3-3.0 mm Inch ➲ D024 Metric ➲ D026	.375 x .375 x 3.150 .500 x .500 x 3.150 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 8 x 80 8 x 8 x 120 10 x 10 x 80 10 x 10 x 120 12 x 12 x 80 12 x 12 x 120 16 x 16 x 120	
GTBH (Grooving Width) .057-.089 inch 1.45-3.0 mm Inch ➲ D024 Metric ➲ D026	.375 x .375 x 3.150 .375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 80 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
GTCH (Grooving Width) .098-.118 inch 2.5-3.0 mm Inch ➲ D024 Metric ➲ D026	.375 x .375 x 3.150 .375 x .375 x 4.724	10 x 10 x 80 10 x 10 x 120	

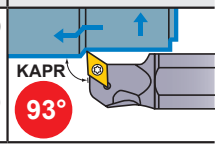
Note 1) For GY style lathes please refer page F016.

●CUTTING OFF

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
CTAH (Max.Cut Off Diameter) .472 inch 12 mm Inch ➲ D028 Metric ➲ D030	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	8 x 10 x 120 10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	
CTAH-S (Max.Cut Off Diameter) .472 inch 12 mm Inch ➲ D028 Metric ➲ D030	.375 x .375 x 3.150 .500 x .500 x 3.150	10 x 10 x 80	
CTBH (Max.Cut Off Diameter) .630 inch 16 mm Inch ➲ D032 Metric ➲ D033	.375 x .375 x 4.724 .500 x .500 x 4.724 .625 x .625 x 4.724	10 x 10 x 120 12 x 12 x 120 16 x 16 x 120	

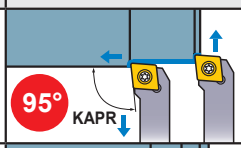
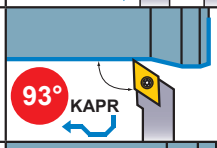
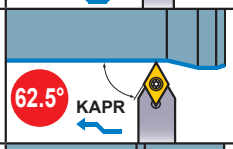
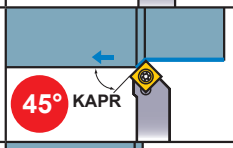
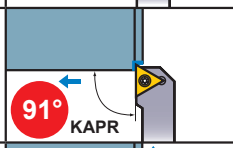
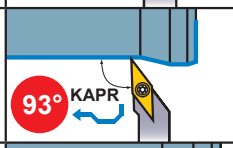
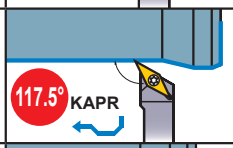
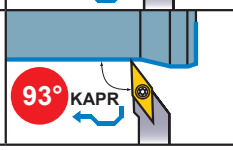
OPPOSITE TOOL POSTS

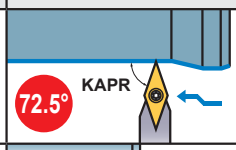
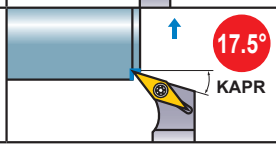
● DIMPLE SLEEVE HOLDER

Name of Tool Holder	Shank Size (DCON x LF) Inch	Shank Size (DCON x LF) Metric	Geometry
SH Inch ➔ **D038** Metric ➔ **D039**	.625 x 3.937 .750 x 4.921 .787 x 4.921 .866 x 4.921 1.000 x 5.906	ϕ15.875 x 100 ϕ19.05 x 125 ϕ20 x 125 ϕ22 x 125 ϕ25.4 x 150	

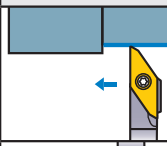
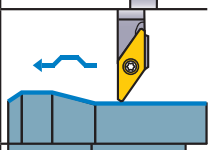
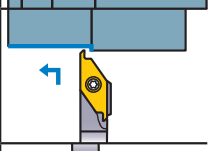
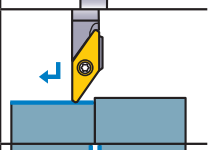
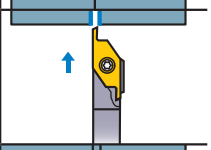
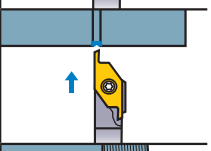
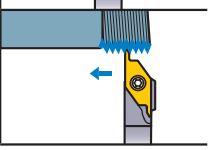
TURRET TYPE TOOL POSTS

● FRONT TURNING

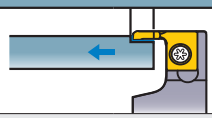
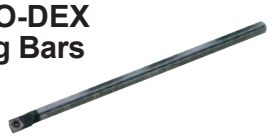
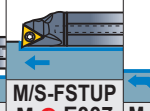
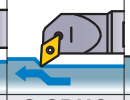
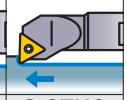
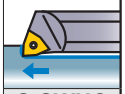
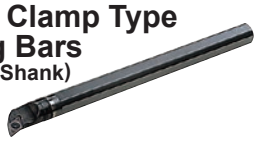
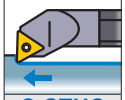
Name of Tool Holder	Shank Size (inch) (H x B x LF)	Geometry
SCLC Inch ➔ **C030**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SDJC Inch ➔ **C031**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SDNC Inch ➔ **C031**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SSSC Inch ➔ **C034**	.500 x .500 x 3.500 .625 x .625 x 4.000	
STGC Inch ➔ **C035**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
STFC Inch ➔ **C035**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SVJC Inch ➔ **C036**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	
SVPC Inch ➔ **C036**	.500 x .500 x 3.500 .625 x .625 x 4.000	
SVJB Inch ➔ **C028**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	

Name of Tool Holder	Shank Size (inch) (H x B x LF)	Geometry
SVVB Inch ➔ **C028**	.375 x .375 x 2.500 .500 x .500 x 3.000 .625 x .625 x 4.000	
SVHB Inch ➔ **C029**	.375 x .375 x 2.500 .500 x .500 x 3.500 .625 x .625 x 4.000	

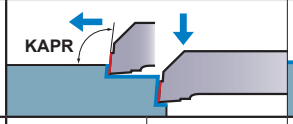
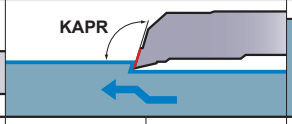
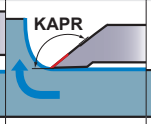
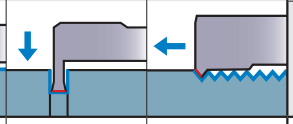
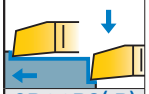
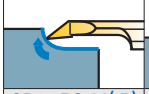
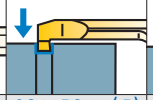
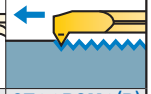
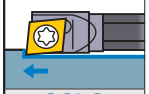
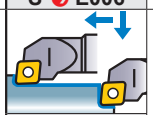
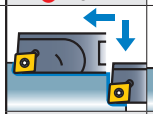
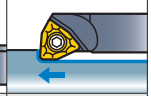
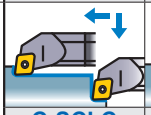
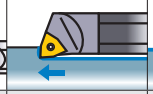
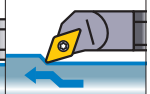
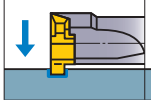
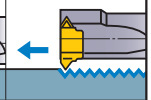
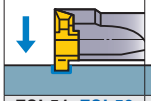
RADIAL TYPE TOOL POSTS

Name of Tool Holder	Tool Size (H x B x LF) Inch	Tool Size (H x B x LF) Metric	Geometry
CSVH (Front Turning) Inch ➔ **D040** Metric ➔ **D043**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	
CSVH (Front Turning Copying) Inch ➔ **D040** Metric ➔ **D043**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	
CSVH (Back Turning) Inch ➔ **D041** Metric ➔ **D044**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	
CSVH (Back Turning Copying) Inch ➔ **D041** Metric ➔ **D044**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	
CSVH (Cutting Off) Inch ➔ **D041** Metric ➔ **D044**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	
CSVH (Grooving) Inch ➔ **D042** Metric ➔ **D045**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	
CSVH (Threading) Inch ➔ **D042** Metric ➔ **D045**	.375 x .375 x 5.512 .500 x .500 x 5.512	7 x 7 x 140 8 x 8 x 140 9.5 x 9.5 x 140 10 x10 x 140 12 x12 x 140	

CLASSIFICATION (INTERNAL TURNING)

Min. Cutting Dia.	Name of Tool Holder	Features	KAPR = 75°	KAPR = 93°			
			KAPR	KAPR			
ϕ3.0 mm (ϕ.118 inch)	**For Gang Type Tool Posts SBAH**	● The minimum cutting diameter is ϕ3 mm (.118 inch). ● Tools for Gang type Swiss-type lathes.		 SBAH ➔ D046			
ϕ2.2 mm – ϕ7.2 mm (ϕ.087 – ϕ.283 inch)	**MICRO-MINI TWIN Boring Bars (Solid Carbide)**	● The minimum cutting diameter is ϕ2.2 mm (.087 inch). ● Two cutting edges type. ● Continuous cutting from boring to facing. ● With or without a chip breaker.					
ϕ3.2 mm – ϕ5.2 mm (ϕ.126 – ϕ.205 inch)	**MICRO-MINI Boring Bars (Solid Carbide)**	● The minimum cutting diameter is from ϕ3.2 mm (.126 inch). ● Single cutting edge type. ● l/d is 5 times the diameter. ● Cutting edge can be shaped according to the application. Thus, it covers a wide cutting range. (threading, grooving, copying, etc.)		C□□FR-BLS ➔ E031			
ϕ5.0 mm – ϕ8.0 mm (ϕ.197 – ϕ.315 inch)	**MICRO-DEX Boring Bars** 	● The minimum cutting diameter is from ϕ5 mm (.197 inch). ● 7°positive insert. ● Carbide shank type. ● Easy-to-use tool geometries. ● Suitable for small workpiece. ● l/d is 5 times the diameter.					SWUB ➔ E029
ϕ.390 inch – ϕ.977 inch	**SCREW CLAMP DIMPLE BAR (Heavy Metal Shank) (Steel Shank)**	● The minimum cutting diameter is ϕ.390 inch. ● 7°, 11° positive insert. ● Excellent vibration resistance due to light dimple head. ● Coolant thru type.		M-FSDUC ➔ E008	 M/S-FSTUP M ➔ E007 S ➔ E007	M-FSVUB/C ➔ E009	M-FSWUB/P ➔ E009
ϕ.228 inch – ϕ.937 inch	**Screw Clamp Type Boring Bars (Steel Shank)**	● Two wall pocket. ● 7° positive insert, low cutting force. ● Screw clamp type. ● Steel, heavy metal and carbide shanks are available in various diameters.	S-SSKC ➔ E015	 S-SDUC ➔ E014	 S-STUC ➔ E015		 S-SWUC ➔ E019
ϕ.200 inch – ϕ.750 inch	**Screw Clamp Type Boring Bars (Heavy Metal Shank)**						
ϕ.228 inch – ϕ.797 inch	**Screw Clamp Type Boring Bars (Carbide Shank)** 				 C-STUC ➔ E016		
ϕ.390 inch – ϕ.790 inch	**SL5 Type Boring Bars**	● Multi-functional bar for threading, grooving and boring. ● Minimum bore ϕ.390 inch. ● Rigid insert retention.					
ϕ10 mm – ϕ20 mm (ϕ.394 – ϕ.787 inch)	**F Type Boring Bars (FSL51,52)**	● The minimum cutting diameter is ϕ10 mm (.394 inch). ● Single holder can be equipped with grooving inserts and threading inserts.					

Note 1) Products with blue color symbol have carbide shank.

	KAPR = 95°		KAPR = 107.5°–117.5°		KAPR = 142°	Grooving	Threading	Selection Standard					
								Economical	Low Cutting Resistance	Vibration Resistance	Coolant Thru	Specialized	Small Diameter Cutting
												◎	◎
	 CB□□RS(-B) ➔ E032				 CR□□RS-01(-B) ➔ E033	 CG□□RS-□□(-B) ➔ F237	 CT□□RSM□(B) ➔ G034	◎	◎	◎			◎
									◎	◎			◎
	 SCLC ➔ E029								◎	◎			◎
	M/S-FSCLC/P M ➔ E006 S ➔ E006		M-FSDQC ➔ E008	M-FSVPB/C ➔ E010	M-FSVJC ➔ E010				◎	◎	◎		
	 S-SCLC ➔ E012		S-SDQC ➔ E013	S-SVQC ➔ E016				◎	○	○			
	 M-SCLC ➔ E012	 M-SWLO ➔ E020							○	○			
	 C-SCLC ➔ E013	 C-SWLO ➔ E019	 C-SDQC ➔ E014						○	◎			
						 S-SL5N ➔ F235	 S-SL5N ➔ G032		○	○			○
						 FSL51, FSL52 ➔ F234	FSL51, FSL52 ➔ G031		○	○			○

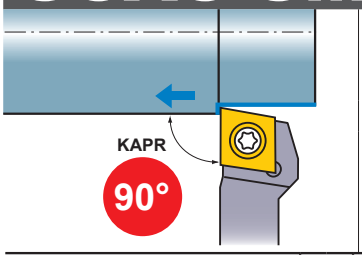
Note 2) ◎: 1st recommendation. ○: 2nd recommendation.

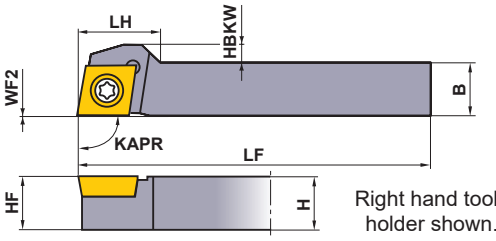
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

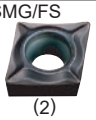
SCAC-SM

Without offset





Right hand tool holder shown.

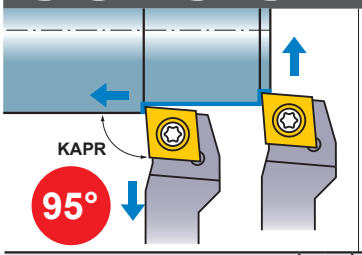
Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2)	(2)	(2, 3)	(2, 3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
(2, 3)	(2, 3)	(2, 3)	(2, 3)

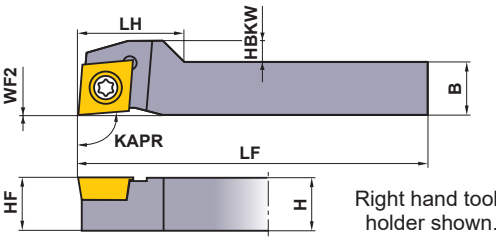
Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SCACR/L-062SM	●	●	CC○B	21.5○	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
SCACR/L-063SM	●	●	CC○H	32.5○	.375	.375	4.921	.630	.156	.375	0	TS43	TKY15R
SCACR/L-083SM	●	●	CC○T	32.5○	.500	.500	5.906	.504	.031	.500	0	TS43	TKY15R
SCACR/L-103SM	●	●	CC○W	32.5○	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

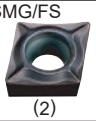
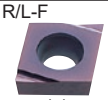
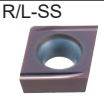
SCLC-SM

Without offset





Right hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2)	(2)	(2, 3)	(2, 3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
(2, 3)	(2, 3)	(2, 3)	(2, 3)

Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SCLCR/L-062SM	●	●	CC○B	21.5○	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
SCLCR/L-063SM	●	●	CC○H	32.5○	.375	.375	4.921	.807	.176	.375	0	TS43	TKY15R
SCLCR/L-083SM	●	●	CC○T	32.5○	.500	.500	5.906	.685	.051	.500	0	TS43	TKY15R
SCLCR/L-103SM	●	●	CC○W	32.5○	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
Note 2) Dimensions shown for insert corner RE .008 inch.

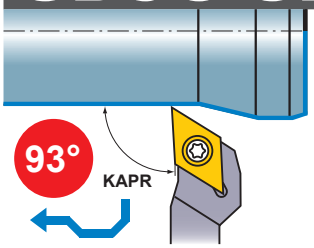
● : USA Stock

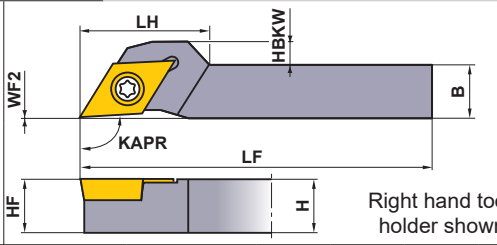
SCAC-SM type inserts	➤ A152–A161
SCLC-SM type inserts	➤ A152–A161
CBN & PCD inserts	➤ B037, B038, B053

INCH STANDARD

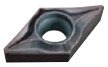
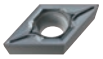
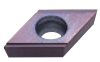
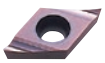
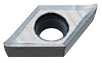
SDJC-SM

Without offset





Right hand tool holder shown.

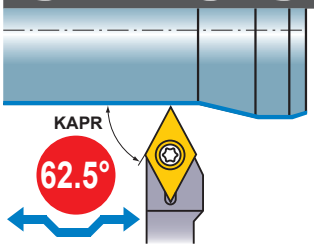
Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)

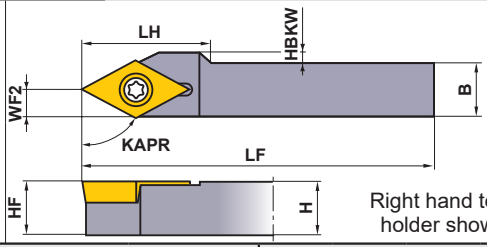
Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SDJCR/L-062SM	●	●	DCMT DCMW DCET DCGT DCGW	21.5°	.375	.375	4.921	—	—	.375	0	TS254	TKY08R
SDJCR/L-063SM	●	●		32.5°	.375	.375	4.921	.965	.176	.375	0	TS43	TKY15R
SDJCR/L-083SM	●	●		32.5°	.500	.500	5.906	.843	.051	.500	0	TS43	TKY15R
SDJCR/L-103SM	●	●		32.5°	.625	.625	5.906	—	—	.625	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

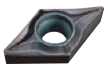
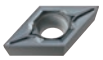
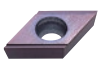
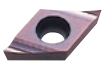
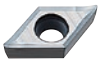
SDNC-SM

Neutral edge with handed holder
Without offset





Right hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)

Order Number	Stock		Insert Number		Dimensions (inch)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SDNCR/L-062SM	●	●	DCMT DCMW DCET DCGT DCGW	21.5°	.375	.375	4.921	—	—	.375	.118	TS254	TKY08R
SDNCR/L-063SM	●	●		32.5°	.375	.375	4.921	.965	.097	.375	.197	TS43	TKY15R
SDNCR/L-083SM	●	●		32.5°	.500	.500	5.906	—	—	.500	.197	TS43	TKY15R
SDNCR/L-103SM	●	●		32.5°	.625	.625	5.906	—	—	.625	.197	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/ VP15TF**	165–490	.0004 –.006
P	Free Cutting Steel	–	**MS6015**	100–590	.0004 –.006
P	Free Cutting Steel	–	**NX2525**	165–820	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF/ MP9005/ MP9015**	165–390	.0008 –.004
M	Stainless Steel	230HB	**MS7025/MS9025**	165–590	.0004 –.006
N	Non-Ferrous Metal	–	**HTi10/ MT9005**	230–755	.0012 –.006
S	Titanium Alloy	–	**MT9005**	130–260	.0016 –.005
S	Heat Resistant Alloy	–	**MP9015**	65–245	.0016 –.005

SDJC-SM type inserts ➤ **A164–A171**
SDNC-SM type inserts ➤ **A164–A171**
CBN & PCD inserts ➤ **B040, B041, B054**

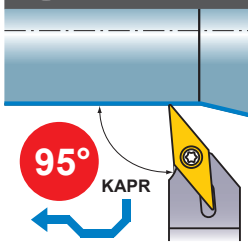
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

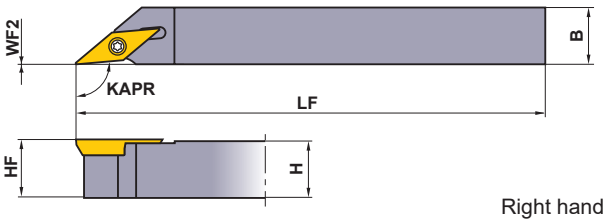
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

SVLP-SM

Without offset





Right hand tool holder shown.

Finish
R/L-SRF

(1.5, 2)

Finish
SMG

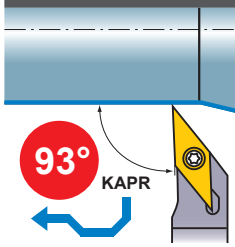
(1.5, 2)

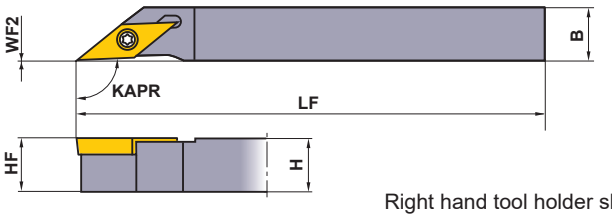
Order Number	Stock R	Stock L	Insert Number		H	B	LF	HF	WF2	* Clamp Screw	Wrench
SVLPR-061.5SM	●		VPET VPGT	1.51.5○	.375	.375	5.000	.375	0	TS202	TKY06R
SVLPR-081.5SM	●			1.51.5○	.500	.500	6.000	.500	0	TS202	TKY06R
SVLPR/L-062SM	●	●		22○	.375	.375	5.000	.375	0	TS255	TKY08R
SVLPR/L-082SM	●	●		22○	.500	.500	6.000	.500	0	TS255	TKY08R
SVLPR/L-102SM	●	●		22○	.625	.625	6.000	.625	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

SVJB-SM

Without offset





Right hand tool holder shown.

Finish
R/L-F

(2)

Medium
R/L-SN

(2)

Medium
R/L-SR

(2)

Order Number	Stock R	Stock L	Insert Number		H	B	LF	HF	WF2	* Clamp Screw	Wrench
SVJBR/L-062SM	●	●	VBMT VBET VBGT VBGW	22○	.375	.375	4.921	.375	0	TS255	TKY08R
SVJBR/L-082SM	●	●		22○	.500	.500	5.906	.500	0	TS255	TKY08R
SVJBR/L-102SM	●	●		22○	.625	.625	5.906	.625	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
Note 2) Dimensions shown for insert corner RE .008 inch.

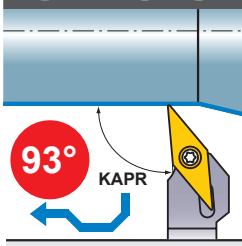
● : USA Stock

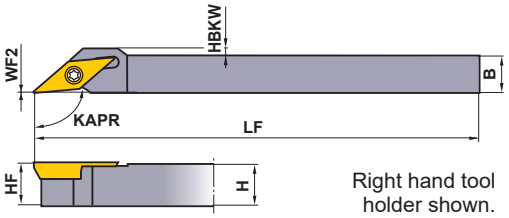
SVLP-SM type inserts	➢ A194
SVJB-SM type inserts	➢ A186–A189
CBN & PCD inserts	➢ B045, B058

INCH STANDARD

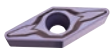
SVJC-SM

Without offset





Right hand tool holder shown.

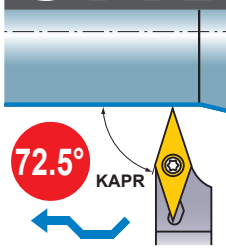
Finish	Finish	Light	Light
FP	FM	LS	LS-P
(2)	(2)	(2)	(2)
Light	**Light**	**Light**	
LP	LM	LS	
			
(2)	(2)	(2)	

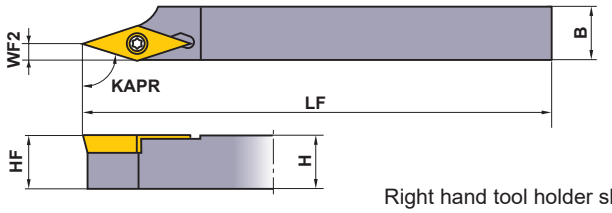
Order Number	Stock		Insert Number		Dimensions (inch)						*	
	R	L			H	B	LF	HBKW	HF	WF2	Clamp Screw	Wrench
SVJCR/L-062B-SM	●	●	VCMW VCMT VCGT	22◌	.375	.375	4.500	—	.375	0	TS255	TKY08R
SVJCR/L-062.5B-SM	●	●		2.52◌	.375	.375	4.500	.079	.375	0	TS32	TKY08R
SVJCR/L-082B-SM	●	●		22◌	.500	.500	4.500	—	.500	0	TS255	TKY08R
SVJCR/L-082.5B-SM	●	●		2.52◌	.500	.500	4.500	—	.500	0	TS32	TKY08R
SVJCR/L-102B-SM	●	●		22◌	.625	.625	4.500	—	.625	0	TS255	TKY08R
SVJCR/L-102.5B-SM	●	●		2.52◌	.625	.625	4.500	—	.625	0	TS32	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9, TS32=8.9

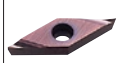
SVVB-SM

Neutral edge with handed holder





Right hand tool holder shown.

Finish	Medium
R/L-F	R/L-SN
(2)	(2)
Medium	
R/L-SR	
	
(2)	

Order Number	Stock		Insert Number		Dimensions (inch)					*	
	R	L			H	B	LF	HF	WF2	Clamp Screw	Wrench
SVVBR/L-062SM	●	●	VBET VBGT VBMT VBGW	22◌	.375	.375	4.921	.375	.118	TS255	TKY08R
SVVBR/L-082SM	●	●		22◌	.500	.500	5.906	.500	.118	TS255	TKY08R
SVVBR/L-102SM	●	●		22◌	.625	.625	5.906	.625	.118	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	165–490	.0004 –.006
	Free Cutting Steel	–	**MS6015**	100–590	.0004 –.006
			NX2525	165–820	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	165–390	.0008 –.004
		230HB	**MS7025/MS9025**	165–590	.0004 –.006
N	Non-Ferrous Metal	–	**HTi10/MT9005**	230–755	.0012 –.006
S	Titanium Alloy	–	**MT9005**	130–260	.0016 –.005
	Heat Resistant Alloy	–	**MP9015**	65–245	.0016 –.005

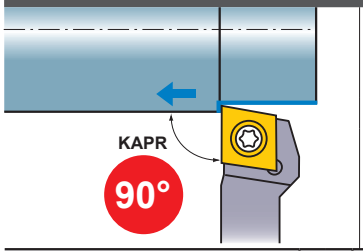
SVJC-SM type inserts ➤ **A190–A192**
SVVB-SM type inserts ➤ **A186–A189**
CBN & PCD inserts ➤ **B045, B058**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

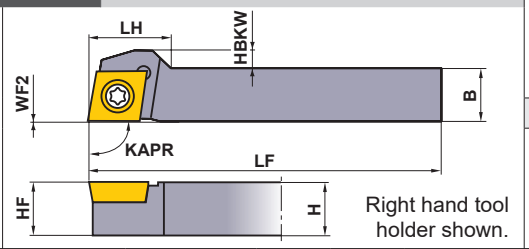
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

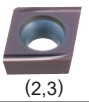
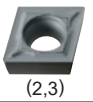
SCAC-SM

Without offset





Right hand tool holder shown.

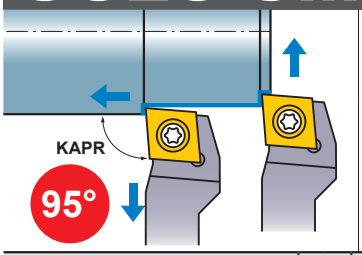
Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2)	(2)	(2,3)	(2,3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
(2,3)	(2,3)	(2,3)	(2,3)

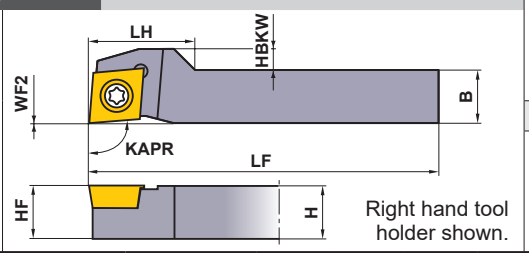
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SCACR/L0808K06-SM	●	●	CC□B CC□H CC□T CC□W	21.5□	8	8	125	11	1.6	8	0	TS254	TKY08R
SCACR/L1010K06-SM	●	●		21.5□	10	10	125	—	—	10	0	TS254	TKY08R
SCACR/L1010K09-SM	●	●		32.5□	10	10	125	16	3.5	10	0	TS43	TKY15R
SCACR/L1212M09-SM	●	●		32.5□	12	12	150	14	1.5	12	0	TS43	TKY15R
SCACR/L1616M09-SM	●	●		32.5□	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

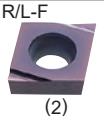
SCLC-SM

Without offset





Right hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2)	(2)	(2,3)	(2,3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SCLCR/L0808K06-SM	●	●	CC□B CC□H CC□T CC□W	21.5□	8	8	125	11	2.1	8	0	TS254	TKY08R
SCLCR/L1010K06-SM	●	●		21.5□	10	10	125	—	—	10	0	TS254	TKY08R
SCLCR/L1010K09-SM	●	●		32.5□	10	10	125	20	4	10	0	TS43	TKY15R
SCLCR/L1212M09-SM	●	●		32.5□	12	12	150	18	2	12	0	TS43	TKY15R
SCLCR/L1616M09-SM	●	●		32.5□	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
Note 2) Dimensions shown for insert corner RE .008 inch.

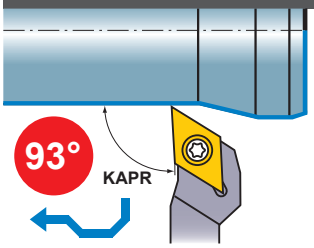
● : USA Stock

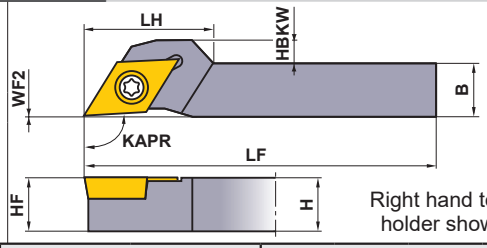
SCAC-SM type inserts	➤ A152–A161
SCLC-SM type inserts	➤ A152–A161
CBN & PCD inserts	➤ B037, B038, B053

METRIC STANDARD

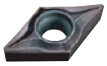
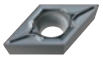
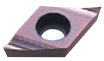
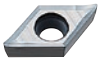
SDJC-SM

Without offset





Right hand tool holder shown.

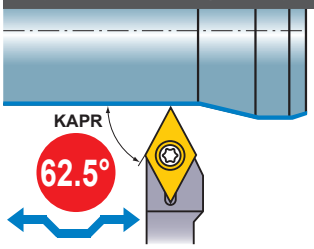
Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
			
(2,3)	(2,3)	(2,3)	(2,3)

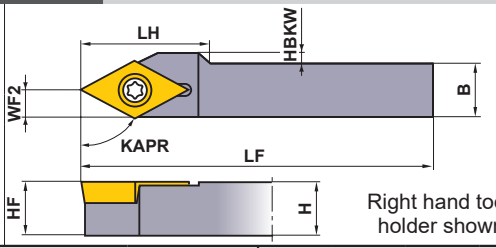
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SDJCR/L0808K07-SM	●	●	DCMT DCMW DCET DCGT DCGW	21.5○	8	8	125	15	2	8	0	TS254	TKY08R
SDJCR/L1010K07-SM	●	●		21.5○	10	10	125	—	—	10	0	TS254	TKY08R
SDJCR/L1010K11-SM	●	●		32.5○	10	10	125	24	4	10	0	TS43	TKY15R
SDJCR/L1212M11-SM	●	●		32.5○	12	12	150	22	2	12	0	TS43	TKY15R
SDJCR/L1616M11-SM	●	●		32.5○	16	16	150	—	—	16	0	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

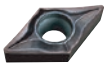
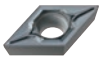
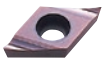
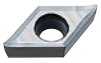
SDNC-SM

Neutral edge with handed holder
Without offset





Right hand tool holder shown.

Finish	Finish	Light	Light
SMG/FS	R/L-F	R/L-SS	LS
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R/L-SN	R/L-SR	AZ	LS-P
			
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SDNCR/L0808K07-SM	●	●	DCMT DCMW DCET DCGT DCGW	21.5○	8	8	125	—	—	8	3	TS254	TKY08R
SDNCR/L1010K07-SM	●	●		21.5○	10	10	125	—	—	10	3	TS254	TKY08R
SDNCR/L1010K11-SM	●	●		32.5○	10	10	125	24	2	10	5	TS43	TKY15R
SDNCR/L1212M11-SM	●	●		32.5○	12	12	150	—	—	12	5	TS43	TKY15R
SDNCR/L1616M11-SM	●	●		32.5○	16	16	150	—	—	16	5	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	165–490	.0004 –.006
P	Free Cutting Steel	–	**MS6015**	100–590	.0004 –.006
P			**NX2525**	165–820	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	165–390	.0008 –.004
M		230HB	**MS7025/MS9025**	165–590	.0004 –.006
N	Non-Ferrous Metal	–	**HTi10/MT9005**	230–755	.0012 –.006
S	Titanium Alloy	–	**MT9005**	130–260	.0016 –.005
S	Heat Resistant Alloy	–	**MP9015**	65–245	.0016 –.005

SDJC-SM type inserts ➤ **A164–A171**
SDNC-SM type inserts ➤ **A164–A171**
CBN & PCD inserts ➤ **B040, B041, B054**

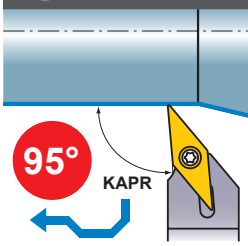
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

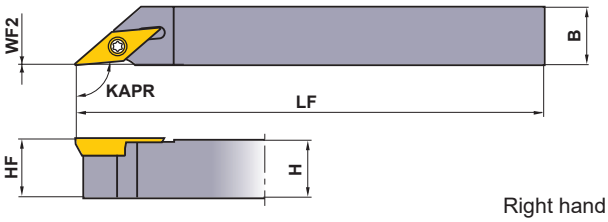
FRONT TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SVLP-SM

Without offset





Right hand tool holder shown.

Finish
R/L-SRF

(1.5,2)

Finish
SMG

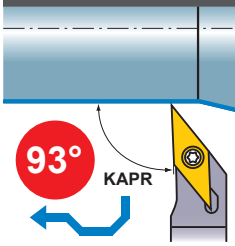
(1.5,2)

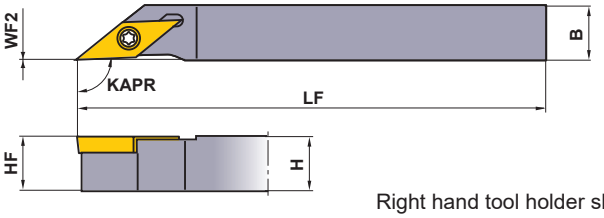
Order Number	Stock R	Stock L	Insert Number		H	B	LF	HF	WF2	Clamp Screw *	Wrench
SVLPR/L1010K08-SM	●	●	VPET VPGT	1.51.5○	10	10	125	10	0	TS202	TKY06R
SVLPR/L1212M08-SM	●	●		1.51.5○	12	12	150	12	0	TS202	TKY06R
SVLPR/L1010K11-SM	●	●		22○	10	10	125	10	0	TS255	TKY08R
SVLPR/L1212M11-SM	●	●		22○	12	12	150	12	0	TS255	TKY08R
SVLPR/L1616M11-SM	●	●		22○	16	16	150	16	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

SVJB-SM

Without offset





Right hand tool holder shown.

Finish
R/L-F

(2)

Medium
R/L-SN

(2)

Medium
R/L-SR

(2)

Order Number	Stock R	Stock L	Insert Number		H	B	LF	HF	WF2	Clamp Screw *	Wrench
SVJBR/L1010K11-SM	●	●	VBMT VBET VBGT VBGW	22○	10	10	125	10	0	TS255	TKY08R
SVJBR/L1212M11-SM	●	●		22○	12	12	150	12	0	TS255	TKY08R
SVJBR/L1616M11-SM	●	●		22○	16	16	150	16	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	165–490	.0004 –.006
P	Free Cutting Steel	–	**MS6015**	100–590	.0004 –.006
P			**NX2525**	165–820	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	165–390	.0008 –.004
M		230HB	**MS7025/MS9025**	165–590	.0004 –.006
N	Non-Ferrous Metal	–	**HTi10/MT9005**	230–755	.0012 –.006
S	Titanium Alloy	–	**MT9005**	130–260	.0016 –.005
S	Heat Resistant Alloy	–	**MP9015**	65–245	.0016 –.005

Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.
Note 2) Dimensions shown for insert corner RE .008 inch.

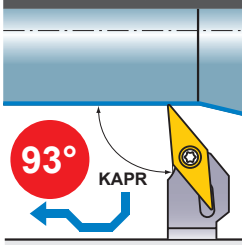
● : **USA Stock**

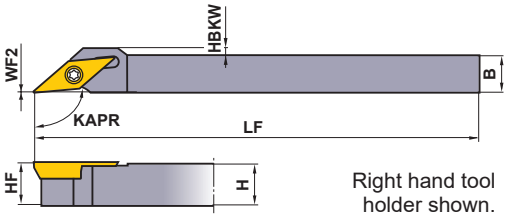
SVLP-SM type inserts ➤ **A194**
SVJB-SM type inserts ➤ **A186–A189**
CBN & PCD inserts ➤ **B045, B058**

METRIC STANDARD

SVJC-SM

Without offset





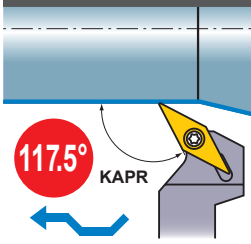
Right hand tool holder shown.

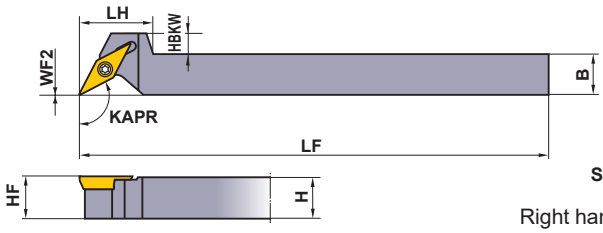
Finish	Finish	Light	Light
FP	FM	LS	LS-P
(2)	(2)	(2)	(2)
Light	**Light**	**Light**	
LP	LM	LS	
(2)	(2)	(2)	

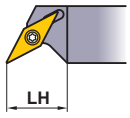
Order Number	Stock		Insert Number		Dimensions (mm)						*	
	R	L			H	B	LF	HBKW	HF	WF2	Clamp Screw	Wrench
SVJCR/L1010JX11-SM	●	●	VCMW VCMT VCGT	22○	10	10	120	–	10	0	TS255	TKY08R
SVJCR/L1010JX13-SM	●	●		2.52○	10	10	120	2	10	0	TS32	TKY08R
SVJCR/L1212JX11-SM	●	●		22○	12	12	120	–	12	0	TS255	TKY08R
SVJCR/L1212JX13-SM	●	●		2.52○	12	12	120	–	12	0	TS32	TKY08R
SVJCR/L1616JX11-SM	●	●		22○	16	16	120	–	16	0	TS255	TKY08R
SVJCR/L1616JX13-SM	●	●		2.52○	16	16	120	–	16	0	TS32	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9, TS32=8.9

SVPP-SM







SVPPR/L1616M11-SM

Right hand tool holder shown.

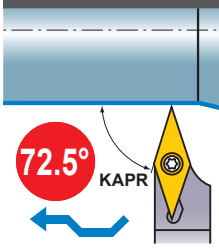
Finish
R/L-SRF
(2)
Finish
SMG
(2)

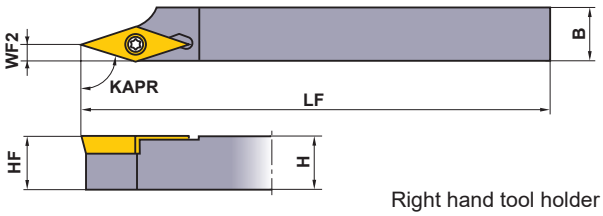
Order Number	Stock		Insert Number		Dimensions (mm)							*	
	R	L			H	B	LF	LH	HBKW	HF	WF2	Clamp Screw	Wrench
SVPPR/L1010K11-SM	●	●	VPET VPGT	22○	10	10	125	20	8	10	0	TS255	TKY08R
SVPPR/L1212M11-SM	●	●		22○	12	12	150	20	6	12	0	TS255	TKY08R
SVPPR/L1616M11-SM	●	●		22○	16	16	150	17	–	16	0	TS255	TKY08R

* Clamp Torque (lbf-in) : TS255=8.9

SVVB-SM

Neutral edge with handed holder





Right hand tool holder shown.

Finish	Medium
R/L-F	R/L-SN
(2)	(2)
Medium	
R/L-SR	
(2)	

Order Number	Stock		Insert Number		Dimensions (mm)					*	
	R	L			H	B	LF	HF	WF2	Clamp Screw	Wrench
SVVBR/L1010K11-SM	●	●	VBET VBGT VBMT VBGW	22○	10	10	125	10	3	TS255	TKY08R
SVVBR/L1212M11-SM	●	●		22○	12	12	150	12	3	TS255	TKY08R
SVVBR/L1616M11-SM	●	●		22○	16	16	150	16	3	TS255	TKY08R

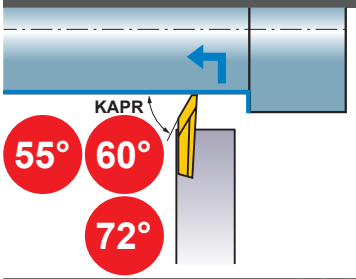
* Clamp Torque (lbf-in) : TS255=8.9

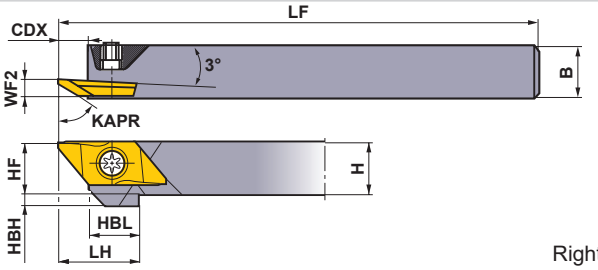
SVJC-SM type inserts	**➤ A190–A192**	**CBN & PCD inserts**	**➤ B045, B058**
SVVB-SM type inserts	**➤ A186–A189**	**SPARE PARTS**	**➤ M001**
SVPP-SM type inserts	**➤ A194**	**TECHNICAL DATA**	**➤ N001**

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTAH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
BTAHR/L-062	●	●	BTAT	5528□□R/L-B	.375	.375	4.724	.591	.375	.138	.125	.374	.217	NS402W	NKY15S
BTAHR/L-082	●	●		6035□□R/L-B 605000RX	.500	.500	4.724	.591	.500	.138	—	.374	.217	NS403W	NKY15S
BTAHR/L-102	●			7235□□R-SMB	.625	.625	4.724	.591	.625	.138	—	.374	.217	NS403W	NKY15S

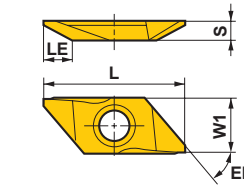
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

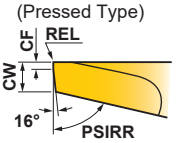
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

INSERTS

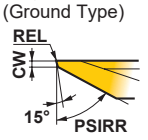
Order Number	Hand	Coated		Dimensions(inch)							LE* (inch)	Geometry
		VP15TF	MS6015	PSIRR/L*	REL	CF	L	W1	CW	S		
BTAT7235V5R-SMB	R	●		72°	.002	.012	.787	.315	.055	.098	.138	With Breaker
BTAT723501MR-SMB	R	●		72°	.003	.012	.787	.315	.055	.098	.138	
BTAT723502MR-SMB	R	●		72°	.007	.012	.787	.315	.055	.098	.138	
BTAT552800R-B	R	●	●	55°	.000	.000	.787	.315	.020	.098	.110	
BTAT552800L-B	L	●		55°	.000	.000	.787	.315	.020	.098	.110	
BTAT552801R-B	R	●	●	55°	.004	.000	.787	.315	.020	.098	.110	
BTAT552801L-B	L	●		55°	.004	.000	.787	.315	.020	.098	.110	
BTAT603500R-B	R	●	●	60°	.000	.000	.787	.315	.020	.098	.138	
BTAT603500L-B	L	●		60°	.000	.000	.787	.315	.020	.098	.138	
BTAT603501MR-B	R		●	60°	.003	.000	.787	.315	.020	.098	.138	
BTAT603501R-B	R	●	●	60°	.004	.000	.787	.315	.020	.098	.138	
BTAT603501L-B	L	●		60°	.004	.000	.787	.315	.020	.098	.138	
BTAT605000RX	R	●		60°	.000	.000	.787	.315	.049	.098	.197	Without Breaker



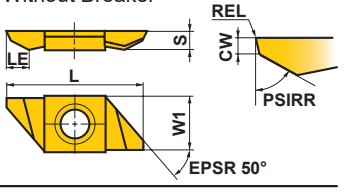
SMB Type (Pressed Type)



B Type (Ground Type)



Right hand insert shown.



* Numeric value set insert on holder.

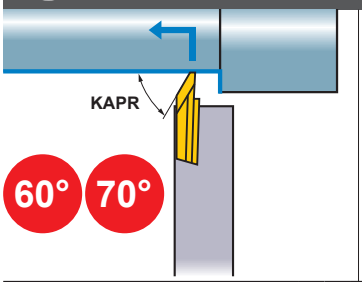
Note 1) REL, PSIRR dimensions for Right Hand Tool and RER,
PSIRL dimensions for Left Hand Tool.

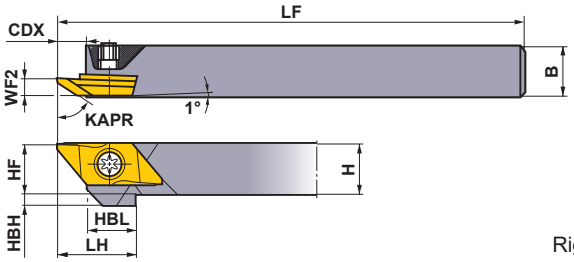
● : USA Stock

<5 inserts in one case>

INCH STANDARD

CTBH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
CTBHR/L-062	●	●	BTBT	60450○R/L-B	.375	.375	4.724	.768	.375	.133	.125	.472	.295	NS402W	NKY15S
CTBHR/L-082	●	●		606000R/L	.500	.500	4.724	.768	.500	.133	—	.472	.295	NS403W	NKY15S
CTBHR/L-102	●	●		7055○○R-SMB	.625	.625	4.724	.768	.625	.133	—	.472	.295	NS403W	NKY15S

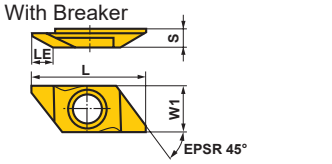
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

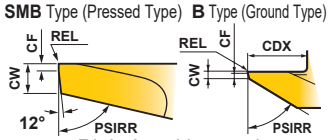
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

INSERTS

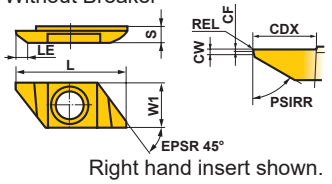
Order Number	Hand	Coated		Dimensions(inch)								LE*	Geometry
		VP15TF	MS6015	PSIRR/L*	REL	CF	L	W1	CW	S	CDX		
BTBT7055V5R-SMB	R	●		70°	.002	.012	.984	.370	.053	.138	.256	.217	With Breaker
BTBT705501MR-SMB	R	●		70°	.003	.012	.984	.370	.053	.138	.256	.217	
BTBT705502MR-SMB	R	●		70°	.007	.012	.984	.370	.053	.138	.256	.217	
BTBT604500R-B	R	●	●	60°	.000	.008	.984	.370	.028	.138	.217	.177	
BTBT604500L-B	L	●		60°	.000	.008	.984	.370	.028	.138	.217	.177	
BTBT604501MR-B	R		●	60°	.003	.012	.984	.370	.028	.138	.217	.177	
BTBT604501R-B	R	●	●	60°	.004	.012	.984	.370	.028	.138	.217	.177	
BTBT604501L-B	L	●		60°	.004	.012	.984	.370	.028	.138	.217	.177	
BTBT606000R	R	●		60°	.000	.008	.984	.370	.028	.138	.276	.236	Without Breaker
BTBT606000L	L	●		60°	.000	.008	.984	.370	.028	.138	.276	.236	



SMB Type (Pressed Type) **B** Type (Ground Type)



Right hand insert shown.



Right hand insert shown.

* Numeric value set insert on holder.

Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.

RECOMMENDED CUTTING CONDITIONS

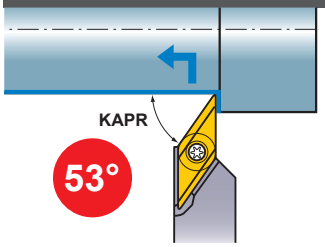
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	165–490	.0004–.006
	Free Cutting Steel	–	**MS6015**	100–590	.0004–.006
M	Stainless Steel	≤200HB	**VP15TF**	165–395	.0008–.004
N	Non-Ferrous Metal	–	**MS6015**	230–755	.0012–.006

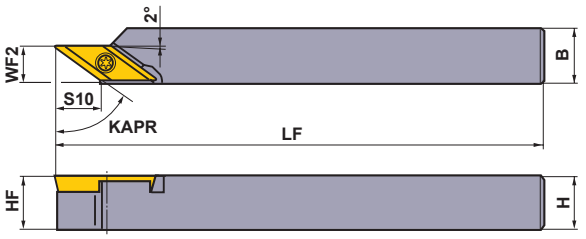
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

BTVH





Right hand tool holder only.

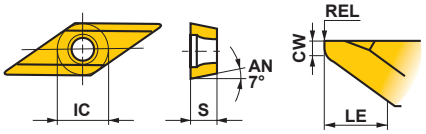
Order Number	Stock	Insert Number		Dimensions (inch)						*	
	R			H	B	LF	HF	WF2	S10	Clamp Screw	Wrench
BTVHR-062	●	BTVT	5375○○R-B	.375	.375	4.724	.375	.295	.335	NS251	NKY15R
BTVHR-082	●			.500	.500	4.724	.500	.295	.335	NS251	NKY15R
BTVHR-102	●			.625	.625	4.724	.625	.295	.335	NS251	NKY15R

* Clamp Torque (lbf-in) : NS251=6.2

Note 1) Set the maximum depth of cut at under 30% of the effective cutting edge length (LE).

INSERTS

Order Number	Hand	Coated	Dimensions (inch)				LE (inch) *	Geometry
		VP15TF	IC	S	REL	CW		
BTVT5375V5R-B	R	●	.250	.125	.002	.020	.295	With Breaker
BTVT537501R-B	R	●	.250	.125	.004	.020	.295	



* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

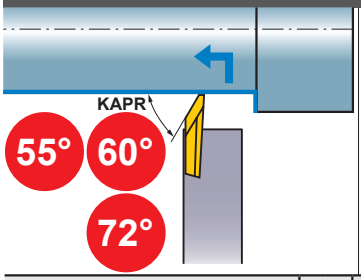
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**VP15TF**	165–490	.0004 –.006
	Free Cutting Steel	–	**VP15TF**	100–590	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF**	165–395	.0008 –.004
N	Non-Ferrous Metal	–	**VP15TF**	230–755	.0012 –.006

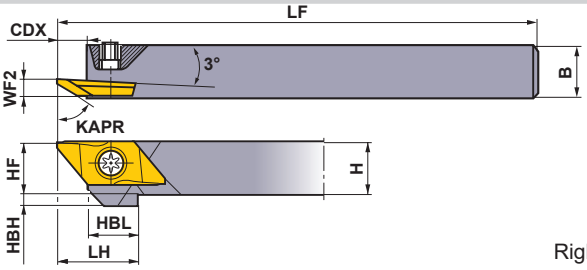
● : USA Stock

<5 inserts in one case>

METRIC STANDARD

BTAH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
BTAHR/L0810-50	●	●	BTAT	5528○○R/L-B	8	10	120	15	8	3.5	4	9.5	5.5	NS402W	NKY15S
BTAHR/L1010-50	●	●		6035○○R/L-B	10	10	120	15	10	3.5	2	9.5	5.5	NS402W	NKY15S
BTAHR/L1212-50	●	●		605000RX	12	12	120	15	12	3.5	—	9.5	5.5	NS403W	NKY15S
BTAHR/L1616-50	●			7235○○R-SMB	16	16	120	15	16	3.5	—	9.5	5.5	NS403W	NKY15S

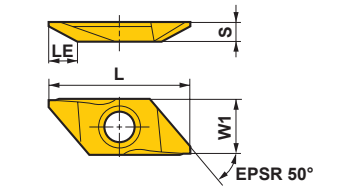
∗ Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

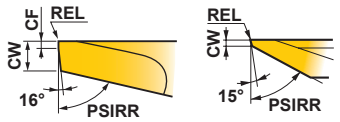
Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

INSERTS

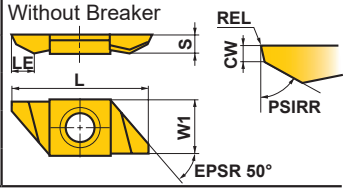
Order Number	Hand	Coated		Dimensions (mm)							LE* (mm)	Geometry
		VP15TF	MS6015	PSIRR/L*	RER/L	CF	L	W1	CW	S		
BTAT7235V5R-SMB	R	●		72°	0.05	0.3	20	8	1.4	2.5	3.5	With Breaker
BTAT723501MR-SMB	R	●		72°	0.08	0.3	20	8	1.4	2.5	3.5	
BTAT723502MR-SMB	R	●		72°	0.18	0.3	20	8	1.4	2.5	3.5	
BTAT552800R-B	R	●	●	55°	0	0	20	8	0.5	2.5	2.8	
BTAT552800L-B	L	●		55°	0	0	20	8	0.5	2.5	2.8	
BTAT552801R-B	R	●	●	55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT552801L-B	L	●		55°	0.1	0	20	8	0.5	2.5	2.8	
BTAT603500R-B	R	●	●	60°	0	0	20	8	0.5	2.5	3.5	
BTAT603500L-B	L	●		60°	0	0	20	8	0.5	2.5	3.5	
BTAT603501MR-B	R		●	60°	0.08	0	20	8	0.5	2.5	3.5	
BTAT603501R-B	R	●	●	60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT603501L-B	L	●		60°	0.1	0	20	8	0.5	2.5	3.5	
BTAT605000RX	R	●		60°	0	0	20	8	1.25	2.5	5.0	Without Breaker



SMB Type (Pressed Type) **B** Type (Ground Type)



Right hand insert shown.



∗ Numeric value set insert on holder.

Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.

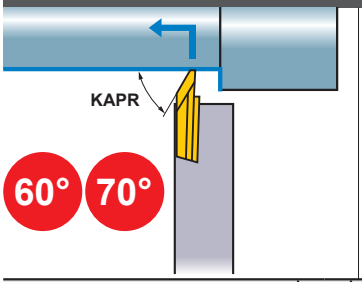
RECOMMENDED CUTTING CONDITIONS

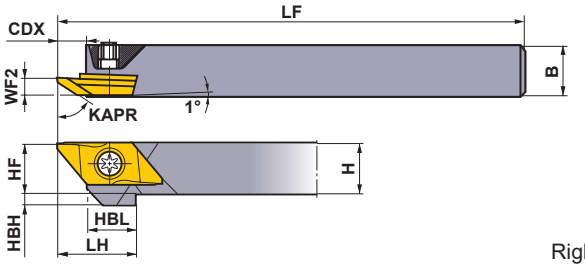
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB—280HB	**MS6015/VP15TF**	165—490	.0004 —.006
	Free Cutting Steel	—	**MS6015**	100—590	.0004 —.006
M	Stainless Steel	≤200HB	**VP15TF**	165—395	.0008 —.004
N	Non-Ferrous Metal	—	**MS6015**	230—755	.0012 —.006

BACK TURNING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTBH





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)									*	
	R	L			H	B	LF	LH	HF	WF2	HBH	HBL	CDX	Clamp Screw	Wrench
CTBHR/L1010-160	●	●	BTBT	60450○R/L-B	10	10	120	19.5	10	3.4	2	12	7.5	NS402W	NKY15S
CTBHR/L1212-160	●	●		606000R/L	12	12	120	19.5	12	3.4	—	12	7.5	NS403W	NKY15S
CTBHR/L1616-160	●	●		7055○○R-SMB	16	16	120	19.5	16	3.4	—	12	7.5	NS403W	NKY15S

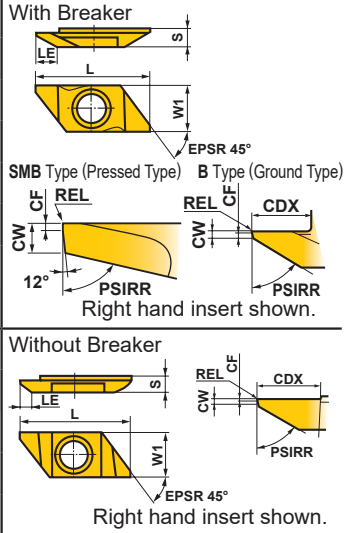
* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

Note 2) Set the maximum depth of cut at under 60% of the effective cutting edge length (LE).

INSERTS

Order Number	Hand	Coated		Dimensions (mm)								LE* (mm)	Geometry
		VP15TF	MS6015	PSIRR/L*	RER/L	CF	L	W1	CW	S	CDX		
BTBT7055V5R-SMB	R	●		70°	0.05	0.3	25	9.4	1.35	3.5	6.5	5.5	With Breaker
BTBT705501MR-SMB	R	●		70°	0.08	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT705502MR-SMB	R	●		70°	0.18	0.3	25	9.4	1.35	3.5	6.5	5.5	
BTBT604500R-B	R	●	●	60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
BTBT604500L-B	L	●		60°	0	0.2	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501MR-B	R		●	60°	0.08	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501R-B	R	●	●	60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT604501L-B	L	●		60°	0.1	0.3	25	9.4	0.7	3.5	5.5	4.5	
BTBT606000R	R	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	Without Breaker
BTBT606000L	L	●		60°	0	0.2	25	9.4	0.7	3.5	7	6.0	



* Numeric value set insert on holder.

Note 1) REL, PSIRR dimensions for Right Hand Tool and RER, PSIRL dimensions for Left Hand Tool.

RECOMMENDED CUTTING CONDITIONS

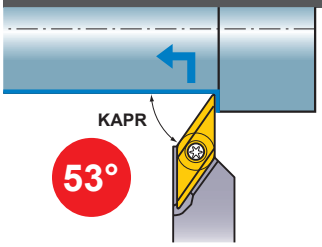
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB—280HB	**MS6015/VP15TF**	165—490	.0004 —.006
	Free Cutting Steel	—	**MS6015**	100—590	.0004 —.006
M	Stainless Steel	≤200HB	**VP15TF**	165—395	.0008 —.004
N	Non-Ferrous Metal	—	**MS6015**	230—755	.0012 —.006

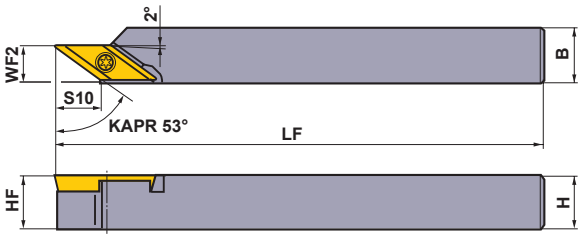
● : USA Stock

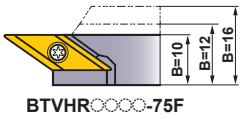
<5 inserts in one case>

METRIC STANDARD

BTVH







Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*	
	R			H	B	LF	HF	WF2	S10	Clamp Screw	Wrench
BTVHR1010-75	●	BTVT	5375○○R-B	10	10	120	10	7.5	8.5	NS251	NKY15S
BTVHR1212-75	●			12	12	120	12	7.5	8.5	NS251	NKY15S
BTVHR1616-75	●			16	16	120	16	7.5	8.5	NS251	NKY15S
BTVHR1010-75F	●			10	10	120	10	10.0	8.5	NS251	NKY15S
BTVHR1212-75F	●			12	12	120	12	10.0	8.5	NS251	NKY15S
BTVHR1616-75F	●			16	16	120	16	10.0	8.5	NS251	NKY15S

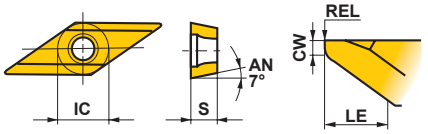
* Clamp Torque (lbf-in) : NS251=6.2

Note 1) Set the maximum depth of cut at under 30% of the effective cutting edge length (LE).

Note 2) For high load machining, F type is recommended.

INSERTS

Order Number	Hand	Coated	Dimensions (mm)				LE * (mm)	Geometry
		VP15TF	IC	S	REL	CW		
BTVT5375V5R-B	R	●	6.35	3.18	0.05	0.5	7.5	With Breaker
BTVT537501R-B	R	●	6.35	3.18	0.1	0.5	7.5	



* Numeric value set insert on holder.

RECOMMENDED CUTTING CONDITIONS

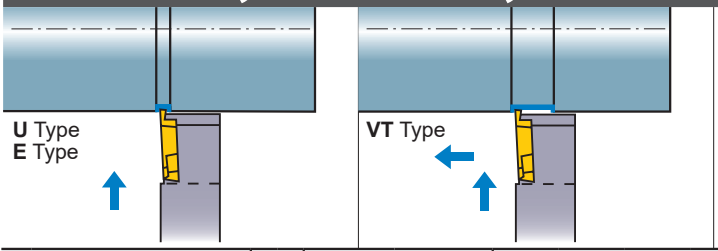
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**VP15TF**	165–490	.0004 –.006
	Free Cutting Steel	–	**VP15TF**	100–590	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF**	165–395	.0008 –.004
N	Non-Ferrous Metal	–	**VP15TF**	230–755	.0012 –.006

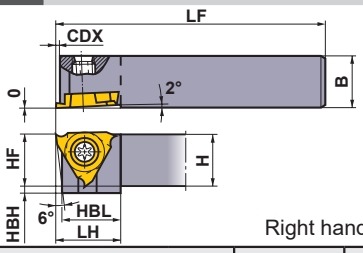
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GROOVING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

GTAH, GTBH, GTCH





Right hand tool holder shown.

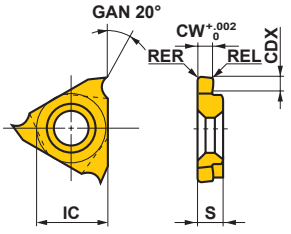
	Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	CDX*1	LH	HBH	HBL	Cutting Width (inch)	*2 Clamp Screw	Wrench
Long Shank	GTBHR/L-063	●	●	GTAT GTBT GTCT	○○○○	.375	.375	.375	4.724	.118	.591	.156	.528	.057–.118	NS404W	NKY158
Long Shank	GTBHR/L-083	●	●	GTAT GTBT GTCT	○○○○	.500	.500	.500	4.724	.118	.591	.020	.528	.057–.118	NS404W	NKY158
Long Shank	GTBHR/L-103	●	●	GTAT GTBT GTCT	○○○○	.625	.625	.625	4.724	.118	.591	—	.528	.057–.118	NS404W	NKY158

*1 It is not possible to machine depths over **CDX** dimensions(Max. Groove Depth).
For the actual maximum depth that can be machined, check the **CDX** of only the insert.
*2 Clamp Torque (lbf-in) : NS404W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (inch) CW	CDX*1	RER/L	IC	S	Geometry
GTAT03006V3R-U	R	●	.012	.011	.001	.375	.125	**U** Type Breaker (Grooving) For general use
GTAT03006V3L-U	L	●	.012	.011	.001	.375	.125	
GTAT05012V5R-U	R	●	.020	.035	.002	.375	.125	
GTAT05012V5L-U	L	●	.020	.035	.002	.375	.125	
GTAT07520V5R-U	R	●	.030	.071	.002	.375	.125	
GTAT07520V5L-U	L	●	.030	.071	.002	.375	.125	
GTAT09520V5R-U	R	●	.037	.071	.002	.375	.125	
GTAT09520V5L-U	L	●	.037	.071	.002	.375	.125	
GTAT10020V5R-U	R	●	.039	.071	.002	.375	.125	
GTAT10020V5L-U	L	●	.039	.071	.002	.375	.125	
GTAT10320V5R-U	R	●	.041	.071	.002	.375	.125	
GTAT12520V5R-U	R	●	.049	.071	.002	.375	.125	
GTAT12520V5L-U	L	●	.049	.071	.002	.375	.125	
GTBT14530V5R-U	R	●	.057	.110	.002	.375	.125	
GTBT14530V5L-U	L	●	.057	.110	.002	.375	.125	
GTBT15030V5R-U	R	●	.059	.110	.002	.375	.125	
GTBT15030V5L-U	L	●	.059	.110	.002	.375	.125	
GTBT17530V5R-U	R	●	.069	.110	.002	.375	.125	
GTBT17530V5L-U	L	●	.069	.110	.002	.375	.125	
GTBT20030V5R-U	R	●	.079	.110	.002	.375	.125	
GTBT20030V5L-U	L	●	.079	.110	.002	.375	.125	
GTCT25030V5R-U	R	●	.098	.110	.002	.375	.125	
GTCT25030V5L-U	L	●	.098	.110	.002	.375	.125	

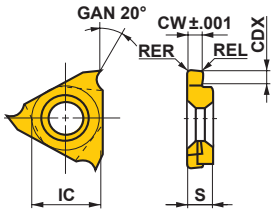


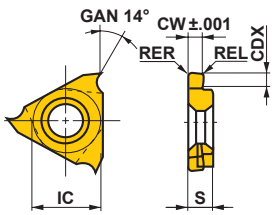
Right hand insert shown.

● : USA Stock
<5 inserts in one case>

INSERTS

Order Number	Hand	Coated		Dimensions (inch)					Geometry
		VP15TF	VP15KZ	CW	CDX	RER/L	IC	S	
GTAT03306V3R-E	R	●		.013	.011	.001	.375	.125	**E** Type Breaker (Grooving) For precision cutting
GTAT03306V3L-E	L	●		.013	.011	.001	.375	.125	
GTAT04312V3R-E	R	●		.017	.035	.001	.375	.125	
GTAT04312V3L-E	L	●		.017	.035	.001	.375	.125	
GTAT05312V5R-E	R	●		.021	.035	.002	.375	.125	
GTAT05312V5L-E	L	●		.021	.035	.002	.375	.125	
GTAT07520V5R-E	R	●		.030	.071	.002	.375	.125	
GTAT07520V5L-E	L	●		.030	.071	.002	.375	.125	
GTAT09520V5R-E	R	●		.037	.071	.002	.375	.125	
GTAT09520V5L-E	L	●		.037	.071	.002	.375	.125	
GTAT10020V5R-E	R	●		.039	.071	.002	.375	.125	
GTAT10020V5L-E	L	●		.039	.071	.002	.375	.125	
GTAT1002001R-E	R	●		.039	.071	.004	.375	.125	
GTAT1002001L-E	L	●		.039	.071	.004	.375	.125	
GTAT12020V5R-E	R	●		.047	.071	.002	.375	.125	
GTAT12020V5L-E	L	●		.047	.071	.002	.375	.125	
GTAT1202001R-E	R	●		.047	.071	.004	.375	.125	
GTAT1202001L-E	L	●		.047	.071	.004	.375	.125	
GTAT14020V5R-E	R	●		.055	.071	.002	.375	.125	
GTAT14020V5L-E	L	●		.055	.071	.002	.375	.125	
GTBT15030V5R-E	R	●		.059	.110	.002	.375	.125	
GTBT15030V5L-E	L	●		.059	.110	.002	.375	.125	
GTBT1503001R-E	R	●		.059	.110	.004	.375	.125	
GTBT1503001L-E	L	●		.059	.110	.004	.375	.125	
GTBT18030V5R-E	R	●		.071	.110	.002	.375	.125	
GTBT18030V5L-E	L	●		.071	.110	.002	.375	.125	
GTBT20030V5R-E	R	●		.079	.110	.002	.375	.125	
GTBT20030V5L-E	L	●		.079	.110	.002	.375	.125	
GTBT2003001R-E	R	●		.079	.110	.004	.375	.125	
GTBT2003001L-E	L	●		.079	.110	.004	.375	.125	
GTBT22530V5R-E	R	●		.089	.110	.002	.375	.125	
GTBT22530V5L-E	L	●		.089	.110	.002	.375	.125	
GTCT25030V5R-E	R	●		.098	.110	.002	.375	.125	
GTCT25030V5L-E	L	●		.098	.110	.002	.375	.125	
GTCT27530V5R-E	R	●		.108	.110	.002	.375	.125	
GTCT27530V5L-E	L	●		.108	.110	.002	.375	.125	
GTCT30030V5R-E	R	●		.118	.110	.002	.375	.125	
GTCT30030V5L-E	L	●		.118	.110	.002	.375	.125	Right hand insert shown.
GTAT0330600R-VT	R		●	.013	.010	0	.375	.125	**VT** Type Breaker (Grooving, Profiling)
GTAT0431200R-VT	R		●	.017	.035	0	.375	.125	
GTAT0532000R-VT	R		●	.021	.063	0	.375	.125	
GTAT0652000R-VT	R		●	.026	.063	0	.375	.125	
GTAT0752000R-VT	R		●	.030	.063	0	.375	.125	
GTAT0802000R-VT	R		●	.031	.063	0	.375	.125	
GTAT0852000R-VT	R		●	.033	.063	0	.375	.125	
GTAT0952000R-VT	R		●	.037	.063	0	.375	.125	
GTAT1002000R-VT	R		●	.039	.063	0	.375	.125	
GTAT1102000R-VT	R		●	.043	.063	0	.375	.125	
GTAT1202000R-VT	R		●	.047	.063	0	.375	.125	
GTAT1302000R-VT	R		●	.051	.063	0	.375	.125	
GTAT1402000R-VT	R		●	.055	.063	0	.375	.125	
GTBT1503000R-VT	R		●	.059	.106	0	.375	.125	
GTBT2003000R-VT	R		●	.079	.106	0	.375	.125	





RECOMMENDED CUTTING CONDITIONS

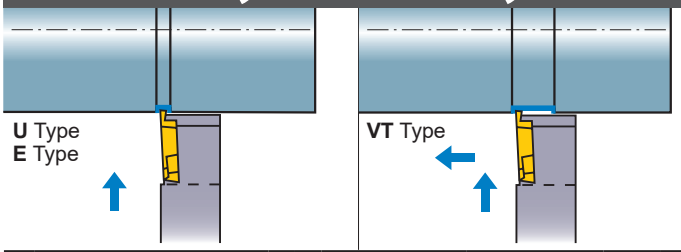
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**VP15TF/VP15KZ**	165–490	.0004–.0035
	Free Cutting Steel	–	**VP15TF/VP15KZ**	100–590	.0004–.0035
M	Stainless Steel	≤200HB	**VP15TF/VP15KZ**	165–395	.0008–.002
N	Non-Ferrous Metal	–	**VP15TF/VP15KZ**	230–755	.0012–.004

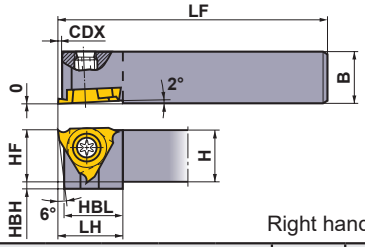
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

GROOVING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

GTAH, GTBH, GTCH





Right hand tool holder shown.

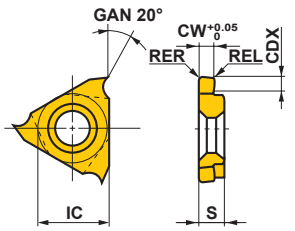
	Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	CDX*1	LH	HBH	HBL	Cutting Width (mm)	*2 Clamp Screw	Wrench
Standard Shank	GTAHR/L0808-20S	★	★	GTAT GTBT*1 GTCT*1	○○○○	8	8	8	80	2	15	5	12.9	0.3–3.0	NS404W	NKY15S
	GTAHR/L1010-20S	★	★		○○○○	10	10	10	80	2	15	3	12.9	0.3–3.0	NS404W	NKY15S
	GTAHR/L1212-20S	★	★		○○○○	12	12	12	80	2	15	1	12.9	0.3–3.0	NS404W	NKY15S
	GTBHR/L1010-30S	★	★	GTBT. GTCT	○○○○	10	10	10	80	3	15	3	13.4	1.45–3.0	NS404W	NKY15S
	GTCHR/L1010-30S	★	★	GTCT	○○○○	10	10	10	80	3	15	3	13.4	2.5–3.0	NS404W	NKY15S
Long Shank	GTAHR/L0808-20	★	★	GTAT GTBT*1 GTCT*1	○○○○	8	8	8	120	2	15	5	12.9	0.3–3.0	NS404W	NKY15S
	GTAHR/L1010-20	★	★		○○○○	10	10	10	120	2	15	3	12.9	0.3–3.0	NS404W	NKY15S
	GTAHR/L1212-20	★	★		○○○○	12	12	12	120	2	15	1	12.9	0.3–3.0	NS404W	NKY15S
	GTAHR/L1616-20	★	★		○○○○	16	16	16	120	2	15	—	12.9	0.3–3.0	NS404W	NKY15S
	GTBHR/L1010-30	●	●	GTBT. GTCT	○○○○	10	10	10	120	3	15	3	13.4	1.45–3.0	NS404W	NKY15S
	GTBHR/L1212-30	●	●		○○○○	12	12	12	120	3	15	1	13.4	1.45–3.0	NS404W	NKY15S
	GTBHR/L1616-30	●	●		○○○○	16	16	16	120	3	15	—	13.4	1.45–3.0	NS404W	NKY15S
	GTCHR/L1010-30	★	★	GTCT	○○○○	10	10	10	120	3	15	3	13.4	2.5–3.0	NS404W	NKY15S

*1 It is not possible to machine depths over **CDX** dimensions(Max. Groove Depth).
For the actual maximum depth that can be machined, check the **CDX** of only the insert.
*2 Clamp Torque (lbf-in) : NS404W=6.2

Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.

INSERTS

Order Number	Hand	Coated VP15TF	Dimensions (mm) CW	CDX*1	RER/L	IC	S	Geometry
GTAT03006V3R-U	R	●	0.3	0.27	0.03	9.525	3.18	**U** Type Breaker (Grooving) For general use
GTAT03006V3L-U	L	●	0.3	0.27	0.03	9.525	3.18	
GTAT05012V5R-U	R	●	0.5	0.9	0.05	9.525	3.18	
GTAT05012V5L-U	L	●	0.5	0.9	0.05	9.525	3.18	
GTAT07520V5R-U	R	●	0.75	1.8	0.05	9.525	3.18	
GTAT07520V5L-U	L	●	0.75	1.8	0.05	9.525	3.18	
GTAT09520V5R-U	R	●	0.95	1.8	0.05	9.525	3.18	
GTAT09520V5L-U	L	●	0.95	1.8	0.05	9.525	3.18	
GTAT10020V5R-U	R	●	1.0	1.8	0.05	9.525	3.18	
GTAT10020V5L-U	L	●	1.0	1.8	0.05	9.525	3.18	
GTAT10320V5R-U	R	●	1.03	1.8	0.05	9.525	3.18	
GTAT12520V5R-U	R	●	1.25	1.8	0.05	9.525	3.18	
GTAT12520V5L-U	L	●	1.25	1.8	0.05	9.525	3.18	
GTBT14530V5R-U	R	●	1.45	2.8	0.05	9.525	3.18	
GTBT14530V5L-U	L	●	1.45	2.8	0.05	9.525	3.18	
GTBT15030V5R-U	R	●	1.5	2.8	0.05	9.525	3.18	
GTBT15030V5L-U	L	●	1.5	2.8	0.05	9.525	3.18	
GTBT17530V5R-U	R	●	1.75	2.8	0.05	9.525	3.18	
GTBT17530V5L-U	L	●	1.75	2.8	0.05	9.525	3.18	
GTBT20030V5R-U	R	●	2.0	2.8	0.05	9.525	3.18	
GTBT20030V5L-U	L	●	2.0	2.8	0.05	9.525	3.18	
GTCT25030V5R-U	R	●	2.5	2.8	0.05	9.525	3.18	
GTCT25030V5L-U	L	●	2.5	2.8	0.05	9.525	3.18	

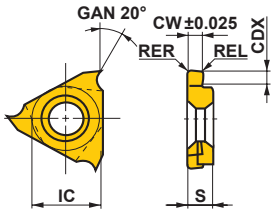


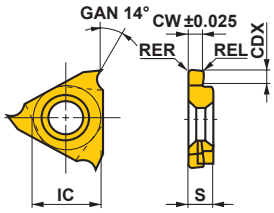
Right hand insert shown.

● : USA Stock ★ : Stocked in Japan
<5 inserts in one case>

INSERTS

Order Number	Hand	Coated		Dimensions (mm)					Geometry
		VP15TF	VP15KZ	CW	CDX	RER/L	IC	S	
GTAT03306V3R-E	R	●		0.33	0.27	0.03	9.525	3.18	**E** Type Breaker (Grooving) For precision cutting
GTAT03306V3L-E	L	●		0.33	0.27	0.03	9.525	3.18	
GTAT04312V3R-E	R	●		0.43	0.9	0.03	9.525	3.18	
GTAT04312V3L-E	L	●		0.43	0.9	0.03	9.525	3.18	
GTAT05312V5R-E	R	●		0.53	0.9	0.05	9.525	3.18	
GTAT05312V5L-E	L	●		0.53	0.9	0.05	9.525	3.18	
GTAT07520V5R-E	R	●		0.75	1.8	0.05	9.525	3.18	
GTAT07520V5L-E	L	●		0.75	1.8	0.05	9.525	3.18	
GTAT09520V5R-E	R	●		0.95	1.8	0.05	9.525	3.18	
GTAT09520V5L-E	L	●		0.95	1.8	0.05	9.525	3.18	
GTAT10020V5R-E	R	●		1.0	1.8	0.05	9.525	3.18	
GTAT10020V5L-E	L	●		1.0	1.8	0.05	9.525	3.18	
GTAT1002001R-E	R	●		1.0	1.8	0.1	9.525	3.18	
GTAT1002001L-E	L	●		1.0	1.8	0.1	9.525	3.18	
GTAT12020V5R-E	R	●		1.2	1.8	0.05	9.525	3.18	
GTAT12020V5L-E	L	●		1.2	1.8	0.05	9.525	3.18	
GTAT1202001R-E	R	●		1.2	1.8	0.1	9.525	3.18	
GTAT1202001L-E	L	●		1.2	1.8	0.1	9.525	3.18	
GTAT14020V5R-E	R	●		1.4	1.8	0.05	9.525	3.18	
GTAT14020V5L-E	L	●		1.4	1.8	0.05	9.525	3.18	
GTBT15030V5R-E	R	●		1.5	2.8	0.05	9.525	3.18	
GTBT15030V5L-E	L	●		1.5	2.8	0.05	9.525	3.18	
GTBT1503001R-E	R	●		1.5	2.8	0.1	9.525	3.18	
GTBT1503001L-E	L	●		1.5	2.8	0.1	9.525	3.18	
GTBT18030V5R-E	R	●		1.8	2.8	0.05	9.525	3.18	
GTBT18030V5L-E	L	●		1.8	2.8	0.05	9.525	3.18	
GTBT20030V5R-E	R	●		2.0	2.8	0.05	9.525	3.18	
GTBT20030V5L-E	L	●		2.0	2.8	0.05	9.525	3.18	
GTBT2003001R-E	R	●		2.0	2.8	0.1	9.525	3.18	
GTBT2003001L-E	L	●		2.0	2.8	0.1	9.525	3.18	
GTBT22530V5R-E	R	●		2.25	2.8	0.05	9.525	3.18	
GTBT22530V5L-E	L	●		2.25	2.8	0.05	9.525	3.18	
GTCT25030V5R-E	R	●		2.5	2.8	0.05	9.525	3.18	
GTCT25030V5L-E	L	●		2.5	2.8	0.05	9.525	3.18	
GTCT27530V5R-E	R	●		2.75	2.8	0.05	9.525	3.18	
GTCT27530V5L-E	L	●		2.75	2.8	0.05	9.525	3.18	
GTCT30030V5R-E	R	●		3.0	2.8	0.05	9.525	3.18	
GTCT30030V5L-E	L	●		3.0	2.8	0.05	9.525	3.18	Right hand insert shown.
GTAT0330600R-VT	R		●	0.33	0.25	0	9.525	3.18	**VT** Type Breaker (Grooving, Profiling)
GTAT0431200R-VT	R		●	0.43	0.9	0	9.525	3.18	
GTAT0532000R-VT	R		●	0.53	1.6	0	9.525	3.18	
GTAT0652000R-VT	R		●	0.65	1.6	0	9.525	3.18	
GTAT0752000R-VT	R		●	0.75	1.6	0	9.525	3.18	
GTAT0802000R-VT	R		●	0.8	1.6	0	9.525	3.18	
GTAT0852000R-VT	R		●	0.85	1.6	0	9.525	3.18	
GTAT0952000R-VT	R		●	0.95	1.6	0	9.525	3.18	
GTAT1002000R-VT	R		●	1.0	1.6	0	9.525	3.18	
GTAT1102000R-VT	R		●	1.1	1.6	0	9.525	3.18	
GTAT1202000R-VT	R		●	1.2	1.6	0	9.525	3.18	
GTAT1302000R-VT	R		●	1.3	1.6	0	9.525	3.18	
GTAT1402000R-VT	R		●	1.4	1.6	0	9.525	3.18	
GTBT1503000R-VT	R		●	1.5	2.7	0	9.525	3.18	
GTBT2003000R-VT	R		●	2.0	2.7	0	9.525	3.18	





RECOMMENDED CUTTING CONDITIONS

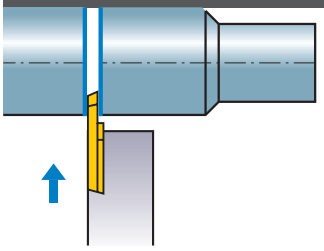
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**VP15TF/VP15KZ**	165–490	.0004–.0035
	Free Cutting Steel	–	**VP15TF/VP15KZ**	100–590	.0004–.0035
M	Stainless Steel	≤200HB	**VP15TF/VP15KZ**	165–395	.0008–.002
N	Non-Ferrous Metal	–	**VP15TF/VP15KZ**	230–755	.0012–.004

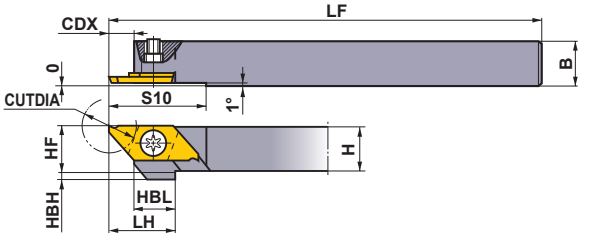
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTAH



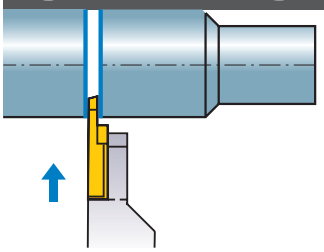


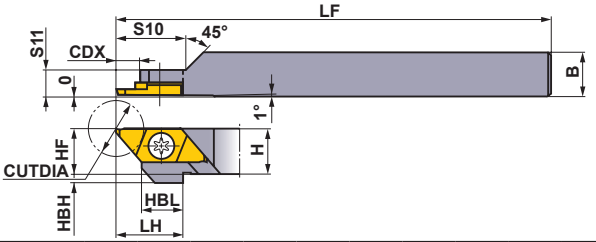
Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (inch)									CUTDIA (inch)	*2	
	R	L			H	B	HF	LF	LH	CDX	HBH	HBL	S10		Clamp Screw	Wrench
CTAHR/L-062	●	●	CTAT	○○○○	.375	.375	.375	4.724	.591	.217	.125	.374	.866	.472 (.315)*1	NS402W	NKY15S
CTAHR/L-082	●	●		○○○○	.500	.500	.500	4.724	.591	.217	—	.374	.866		NS402W	NKY15S
CTAHR/L-102	●	●		○○○○	.625	.625	.625	4.724	.591	.217	—	.374	.866		NS403W	NKY15S

*1 When the width of cutting off (CW) is .028 inch.
*2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

CTAH-S





Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)										CUTDIA (inch)	*2	
	R			H	B	HF	LF	LH	CDX	HBH	HBL	S10	S11		Clamp Screw	Wrench
CTAHR-062S	●	CTAT	○○○○	.375	.375	.375	3.150	.591	.217	.125	.374	.630	.217	.472 (.315)*1	NS401	NKY25R
CTAHR-082S	●		○○○○	.500	.500	.500	3.150	.591	.217	—	.374	.630	.217		NS401	NKY25R

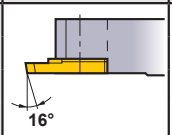
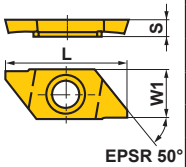
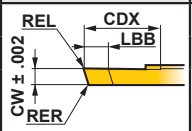
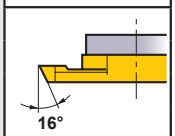
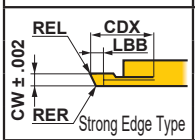
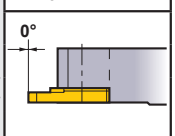
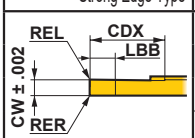
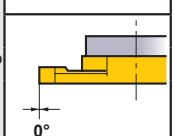
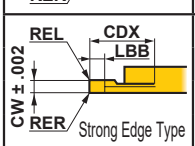
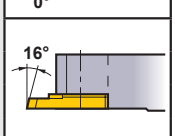
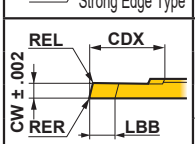
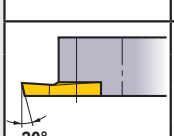
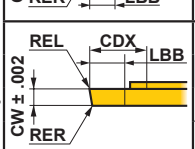
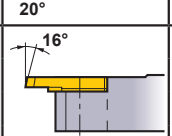
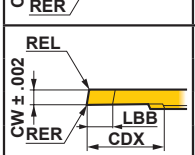
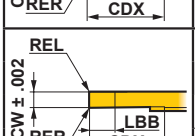
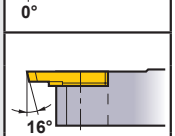
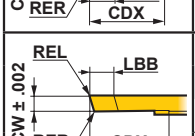
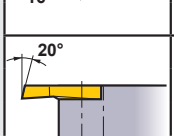
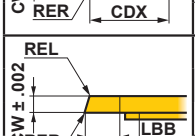
*1 When the width of cutting off (CW) is .028 inch.
*2 Clamp Torque (lbf-in) : NS401=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	165–490	.0008–.0035
	Free Cutting Steel	–	**MS6015**	100–590	.0004–.0035
M	Stainless Steel	≤200HB	**VP15TF**	165–395	.0008–.0019
N	Non-Ferrous Metal	–	**MS6015**	230–755	.0012–.0043

● : USA Stock
<5 inserts in one case>

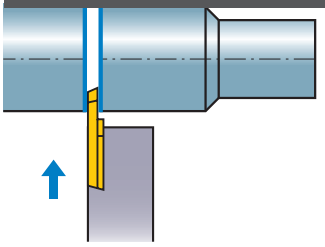
INSERTS

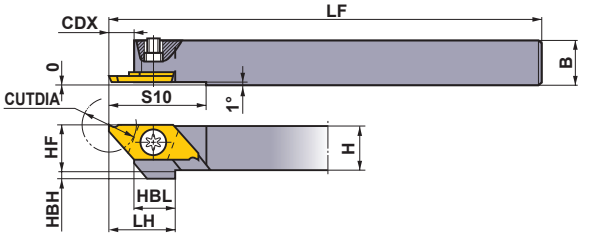
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (inch)							CUTDIA (inch)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S	LBB	
Right Hand (R)	 16°	With Breaker	 S L W1 EPSR 50°	 REL CDX LBB CW ± .002 RER	CTAT07080V5RR-B	R	●		.028	.177	.002	.787	.315	.098	.059	.315
					CTAT10120V5RR-B	R	●	●	.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5RR-B	R	●	●	.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RR-B	R	●	●	.079	.264	.002	.787	.315	.098	.059	.472
	 16°			 REL CDX LBB CW ± .002 RER Strong Edge Type	CTAT15120V5RR-BX	R	●		.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RR-BX	R	●		.079	.264	.002	.787	.315	.098	.059	.472
	 0°			 REL CDX LBB CW ± .002 RER	CTAT10120V5RN-B	N	●	●	.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5RN-B	N	●	●	.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RN-B	N	●	●	.079	.264	.002	.787	.315	.098	.059	.472
	 0°			 REL CDX LBB CW ± .002 RER Strong Edge Type	CTAT15120V5RN-BX	N	●		.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5RN-BX	N	●		.079	.264	.002	.787	.315	.098	.059	.472
	 16°			 REL CDX CW ± .002 RER LBB	CTAT10110V5RL-B	L	●		.039	.264	.002	.787	.315	.098	.059	.433
					CTAT15110V5RL-B	L	●		.059	.264	.002	.787	.315	.098	.059	.433
					CTAT20110V5RL-B	L	●		.079	.264	.002	.787	.315	.098	.059	.433
	 20°	Without Breaker		 REL CDX LBB CW ± .002 RER	CTAT1012000RR	R	●	●	.039	.264	.000	.787	.315	.098	.138	.472
					CTAT1512000RR	R	●	●	.059	.264	.000	.787	.315	.098	.138	.472
					CTAT2012000RR	R	●	●	.079	.264	.000	.787	.315	.098	.138	.472
Left Hand (L)	 16°	With Breaker		 REL CW ± .002 RER LBB CDX	CTAT07080V5LL-B	L	●		.028	.177	.002	.787	.315	.098	.059	.315
					CTAT10120V5LL-B	L	●		.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5LL-B	L	●		.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5LL-B	L	●		.079	.264	.002	.787	.315	.098	.059	.472
	0°			 REL CW ± .002 RER LBB CDX	CTAT10120V5LN-B	N	●	●	.039	.264	.002	.787	.315	.098	.059	.472
					CTAT15120V5LN-B	N	●	●	.059	.264	.002	.787	.315	.098	.059	.472
					CTAT20120V5LN-B	N	●	●	.079	.264	.002	.787	.315	.098	.059	.472
	 16°			 REL LBB CW ± .002 RER CDX	CTAT10110V5LR-B	R	●	●	.039	.264	.002	.787	.315	.098	.059	.433
					CTAT15110V5LR-B	R	●	●	.059	.264	.002	.787	.315	.098	.059	.433
					CTAT20110V5LR-B	R	●	●	.079	.264	.002	.787	.315	.098	.059	.433
	 20°	Without Breaker	Right hand insert shown.	 REL CW ± .002 RER LBB CDX	CTAT1012000LL	L	●		.039	.264	.000	.787	.315	.098	.138	.472
					CTAT1512000LL	L	●		.059	.264	.000	.787	.315	.098	.138	.472
					CTAT2012000LL	L	●		.079	.264	.000	.787	.315	.098	.138	.472

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

CTAH



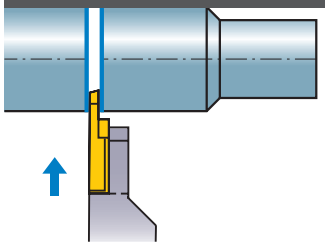


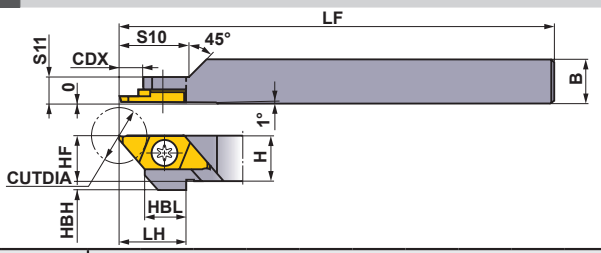
Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	CDX	HBH	HBL	S10	CUTDIA (mm)	✶2 Clamp Screw	Wrench
CTAHR/L0810-120	●	●	CTAT	○○○○	8	10	8	120	15	5.5	4	9.5	22	12 (8)✶1	NS402W	NKY15S
CTAHR/L1010-120	●	●		○○○○	10	10	10	120	15	5.5	2	9.5	22		NS402W	NKY15S
CTAHR/L1212-120	●	●		○○○○	12	12	12	120	15	5.5	—	9.5	22		NS403W	NKY15S
CTAHR/L1616-120	●	●		○○○○	16	16	16	120	15	5.5	—	9.5	22		NS403W	NKY15S

✶1 When the width of cutting off (CW) is 0.7 mm.
✶2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

CTAH-S





Right hand tool holder only.

Order Number	Stock R	Insert Number		Dimensions (mm) H	B	HF	LF	LH	CDX	HBH	HBL	S10	S11	CUTDIA (mm)	✶2 Clamp Screw	Wrench
CTAHR1010-120S	●	CTAT	○○○○	10	10	10	80	15	16	2	9.5	16	5.5	12 (8)✶1	NS401	NKY25R

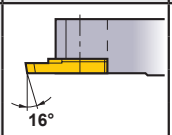
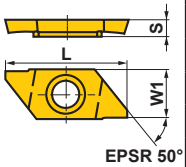
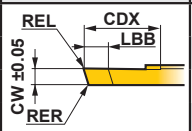
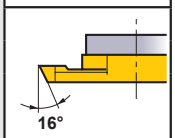
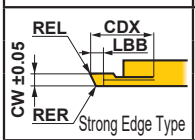
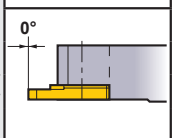
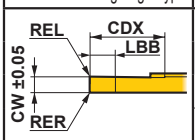
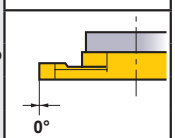
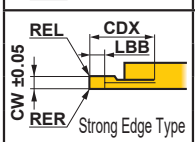
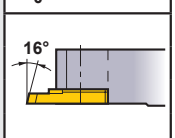
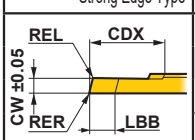
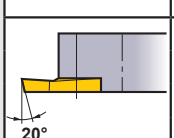
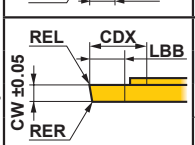
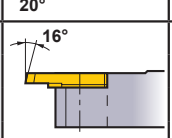
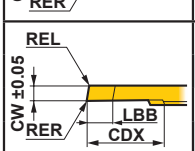
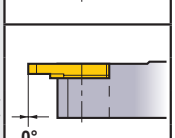
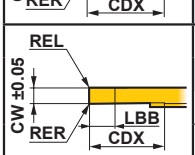
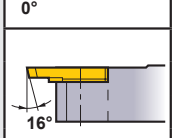
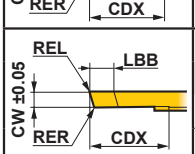
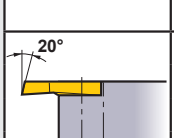
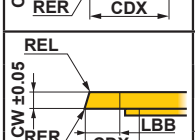
✶1 When the width of cutting off (CW) is 0.7 mm.
✶2 Clamp Torque (lbf-in) : NS401=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB—280HB	**MS6015/VP15TF**	165—490	.0008 —.0035
	Free Cutting Steel	—	**MS6015**	100—590	.0004 —.0035
M	Stainless Steel	≤200HB	**VP15TF**	165—395	.0008 —.0019
N	Non-Ferrous Metal	—	**MS6015**	230—755	.0012 —.0043

● : USA Stock
<5 inserts in one case>

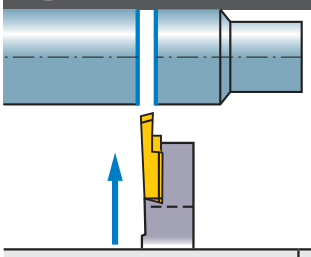
INSERTS

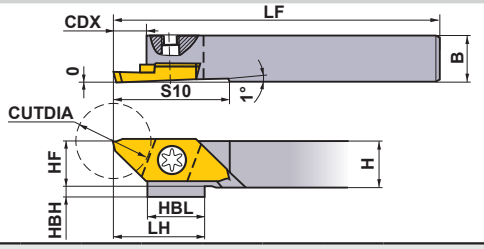
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated		Dimensions (mm)							CUTDIA (mm)
							VP15TF	MS6015	CW	CDX	RER/L	L	W1	S	LBB	
Right Hand (R)		With Breaker			**CTAT07080V5RR-B**	R	●		0.7	4.5	0.05	20	8	2.5	1.5	8
					CTAT10120V5RR-B	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5RR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT15120V5RR-BX**	R	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RR-BX	R	●		2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT10120V5RN-B**	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5RN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT15120V5RN-BX**	N	●		1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5RN-BX	N	●		2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT10110V5RL-B**	L	●		1.0	6.7	0.05	20	8	2.5	1.5	11
					CTAT15110V5RL-B	L	●		1.5	6.7	0.05	20	8	2.5	1.5	11
					CTAT20110V5RL-B	L	●		2.0	6.7	0.05	20	8	2.5	1.5	11
		Without Breaker			**CTAT1012000RR**	R	●	●	1.0	6.7	0	20	8	2.5	3.5	12
					CTAT1512000RR	R	●	●	1.5	6.7	0	20	8	2.5	3.5	12
					CTAT2012000RR	R	●	●	2.0	6.7	0	20	8	2.5	3.5	12
Left Hand (L)		With Breaker			**CTAT07080V5LL-B**	L	●		0.7	4.5	0.05	20	8	2.5	1.5	8
					CTAT10120V5LL-B	L	●		1.0	6.7	0	20	8	2.5	1.5	12
					CTAT15120V5LL-B	L	●		1.5	6.7	0	20	8	2.5	1.5	12
					CTAT20120V5LL-B	L	●		2.0	6.7	0	20	8	2.5	1.5	12
					**CTAT10120V5LN-B**	N	●	●	1.0	6.7	0.05	20	8	2.5	1.5	12
					CTAT15120V5LN-B	N	●	●	1.5	6.7	0.05	20	8	2.5	1.5	12
					CTAT20120V5LN-B	N	●	●	2.0	6.7	0.05	20	8	2.5	1.5	12
					**CTAT10110V5LR-B**	R	●	●	1.0	6.7	0.05	20	8	2.5	1.5	11
					CTAT15110V5LR-B	R	●	●	1.5	6.7	0.05	20	8	2.5	1.5	11
					CTAT20110V5LR-B	R	●	●	2.0	6.7	0.05	20	8	2.5	1.5	11
		Without Breaker	Right hand insert shown.		**CTAT1012000LL**	L	●		1.0	6.7	0	20	8	2.5	3.5	12
					CTAT1512000LL	L	●		1.5	6.7	0	20	8	2.5	3.5	12
					CTAT2012000LL	L	●		2.0	6.7	0	20	8	2.5	3.5	12

CUTTING OFF TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

CTBH



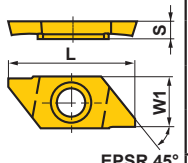
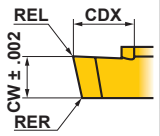
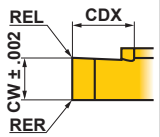
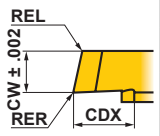
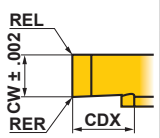
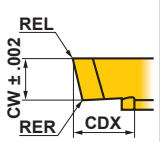


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	LH	CDX	HBH	HBL	S10	CUTDIA (inch)	* Clamp Screw	Wrench
CTBHR/L-062	●	●	CTBT	○○○○	.375	.375	.375	4.724	.768	.295	.125	.374	.984	.630	NS402W	NKY15S
CTBHR/L-082	●	●		○○○○	.500	.500	.500	4.724	.768	.295	—	.374	.984	.630	NS403W	NKY15S
CTBHR/L-102	●	●		○○○○	.625	.625	.625	4.724	.768	.295	—	.374	.984	.630	NS403W	NKY15S

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

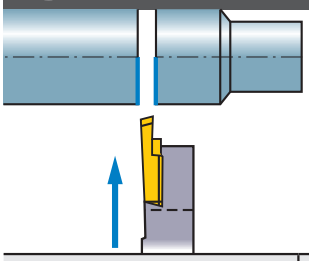
INSERTS

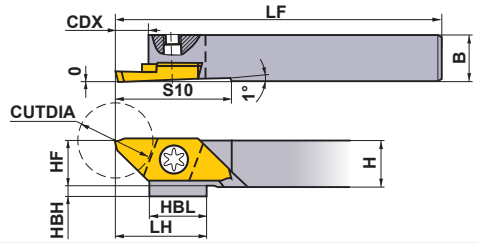
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Coated MS6015	Dimensions (inch) CW	CDX	RER/L	L	W1	S	CUTDIA (inch)
Right Hand (R)	16°	With Breaker			**CTBT15160V5RR-B**	R	●	●	.059	.362	.002	.984	.370	.138	.630
					CTBT20160V5RR-B	R	●	●	.079	.362	.002	.984	.370	.138	.630
	0°				**CTBT20160V5RN-B**	N	●	●	.079	.362	.002	.984	.370	.138	.630
Left Hand (L)	16°				**CTBT20160V5LL-B**	L	●		.079	.362	.002	.984	.370	.138	.630
	0°				**CTBT20160V5LN-B**	N	●	●	.079	.362	.002	.984	.370	.138	.630
	16°		Right hand insert shown.		**CTBT20145V5LR-B**	R	●	●	.079	.362	.002	.984	.370	.138	.571

● : USA Stock
<5 inserts in one case>

METRIC STANDARD

CTBH



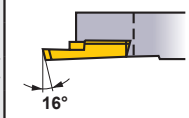
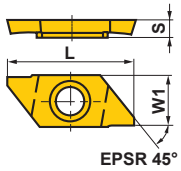
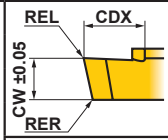
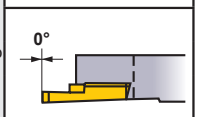
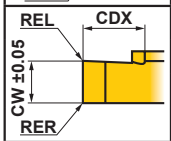
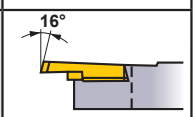
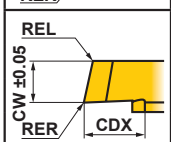
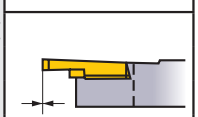
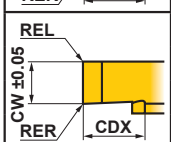
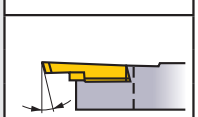
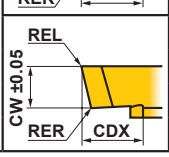


Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	CDX	HBH	HBL	S10	CUTDIA (mm)	* Clamp Screw	Wrench
CTBHR/L1010-160	●	●	CTBT	○○○○	10	10	10	120	19.5	7.5	2	9.5	25	16	NS402W	NKY15S
CTBHR/L1212-160	●	●		○○○○	12	12	12	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S
CTBHR/L1616-160	●	●		○○○○	16	16	16	120	19.5	7.5	—	9.5	25	16	NS403W	NKY15S

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Coated MS6015	CW	CDX	RER/L	L	W1	S	CUTDIA (mm)
Right Hand (R)		With Breaker			**CTBT15160V5RR-B**	R	●	●	1.5	9.2	0.05	25	9.4	3.5	16
					CTBT20160V5RR-B	R	●	●	2.0	9.2	0.05	25	9.4	3.5	16
					**CTBT20160V5RN-B**	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16
Left Hand (L)					**CTBT20160V5LL-B**	L	●		2.0	9.2	0.05	25	9.4	3.5	16
					**CTBT20160V5LN-B**	N	●	●	2.0	9.2	0.05	25	9.4	3.5	16
			Right hand insert shown.		**CTBT20145V5LR-B**	R	●	●	2.0	9.2	0.05	25	9.4	3.5	14.5

RECOMMENDED CUTTING CONDITIONS

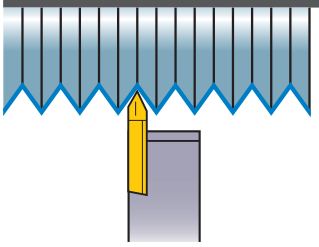
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB—280HB	**MS6015/VP15TF**	165—490	.0008 —.0035
	Free Cutting Steel	—	**MS6015**	100—590	.0004 —.0035
M	Stainless Steel	≤200HB	**VP15TF**	165—395	.0008 —.0019
N	Non-Ferrous Metal	—	**MS6015**	230—755	.0012 —.0043

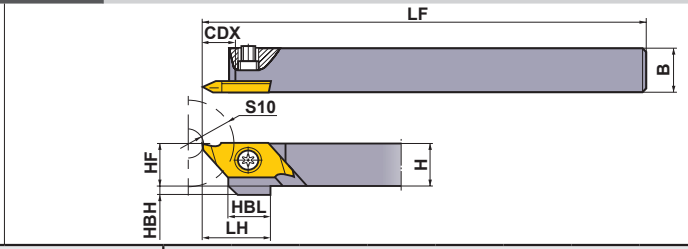
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

INCH STANDARD

TTAH





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) H	B	HF	LF	LH	HBH	HBL	CDX	S10	* Clamp Screw	Wrench
TTAHR/L-062	●	●	TTAT	○○○○	.375	.375	.375	4.724	.591	.125	.374	.276	.256	NS402W	NKY15S
TTAHR/L-082	●	●		○○○○	.500	.500	.500	4.724	.591	—	.374	.276	.256	NS402W	NKY15S
TTAHR/L-102	●	●		○○○○	.625	.625	.625	4.724	.591	—	.374	.276	.256	NS402W	NKY15S

* Clamp Torque (lbf-in) : NS402W=6.2

INSERTS

Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (inch) PDX	RE	L	W1	S	Pitch of Thread (inch) (thread/inch)
Right Hand (R)		With Breaker	General Purpose (60°)		TTAT60075F5RR-B	R	●	.016	.002 Flat	.787	.315	.098	.008—.030 (80—36)
					TTAT60125V5RR-B	R	●	.031	.002	.787	.315	.098	.020—.049 (40—16)
					TTAT60075F5RL-B	L	●	.016	.002 Flat	.787	.315	.098	.008—.030 (80—36)
					TTAT60125V5RL-B	L	●	.031	.002	.787	.315	.098	.020—.049 (40—16)
					TTAT6015001RN-B	N	●	.049	.004	.787	.315	.098	.039—.059 (24—18)
Left Hand (L)					TTAT60075F5LR-B	R	●	.016	.002 Flat	.787	.315	.098	.008—.030 (80—36)
					TTAT60125V5LR-B	R	●	.031	.002	.787	.315	.098	.020—.049 (40—16)
					TTAT60075F5LL-B	L	●	.016	.002 Flat	.787	.315	.098	.008—.030 (80—36)
					TTAT60125V5LL-B	L	●	.031	.002	.787	.315	.098	.020—.049 (40—16)
					TTAT6015001LN-B	N	●	.049	.004	.787	.315	.098	.039—.059 (24—18)
Right Hand (R)			General Purpose (55°)		TTAT55158V5RR-B	R	●	.031	.002	.787	.315	.098	(40—16)
					TTAT55158V5RL-B	L	●	.031	.002	.787	.315	.098	(40—16)
Left Hand (L)					TTAT55158V5LR-B	R	●	.031	.002	.787	.315	.098	(40—16)
					TTAT55158V5LL-B	L	●	.031	.002	.787	.315	.098	(40—16)

Right hand insert shown.

Right hand insert shown.

Refer to page D036 for the thread diameter range.

RECOMMENDED CUTTING CONDITIONS

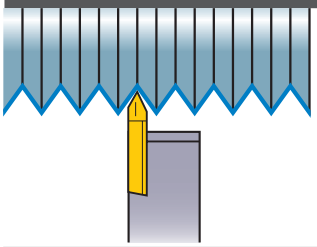
	Work Material	Hardness	Cutting Speed (SFM)
P	Carbon Steel · Alloy Steel	180HB—280HB	165—490
	Free Cutting Steel	—	100—590

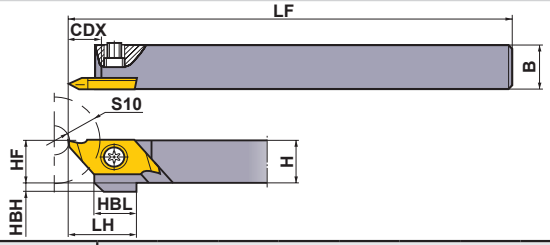
	Work Material	Hardness	Cutting Speed (SFM)
M	Stainless Steel	≤200HB	165—395
N	Non-Ferrous Metal	—	230—755

● : USA Stock
<5 inserts in one case>

METRIC STANDARD

TTAH





Right hand tool holder shown.

Order Number	Stock R	Stock L	Insert Number		Dimensions (mm) H	B	HF	LF	LH	HBH	HBL	CDX	S10	* Clamp Screw	Wrench
TTAHR/L0810	●	●	TTAT	○○○○	8	10	8	120	15	4	9.5	7	6.5	NS402W	NKY15S
TTAHR/L1010	●	●		○○○○	10	10	10	120	15	2	9.5	7	6.5	NS402W	NKY15S
TTAHR/L1212	●	●		○○○○	12	12	12	120	15	—	9.5	7	6.5	NS403W	NKY15S
TTAHR/L1616	●	●		○○○○	16	16	16	120	15	—	9.5	7	6.5	NS403W	NKY15S

* Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

INSERTS

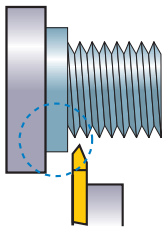
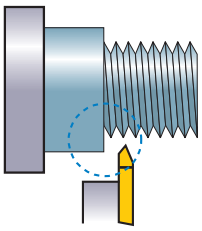
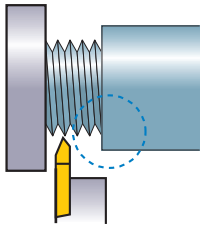
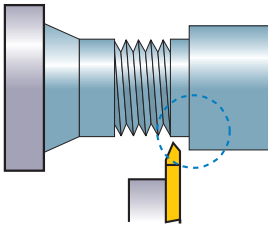
Holder	Setting Geometry	Breaker	Geometry	Insert Geometry	Order Number	Hand	Coated VP15TF	Dimensions (mm) PDX	RE	L	W1	S	Pitch of Thread (mm) (thread/inch)
Right Hand (R)		With Breaker	General Purpose (60°)	PDX PNA 60° RE	**TTAT60075F5RR-B**	R	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2–0.75 (80–36)
					TTAT60125V5RR-B	R	●	0.8	0.05	20.0	8.0	2.5	0.5–1.25 (40–16)
				PDX PNA 60° RE	**TTAT60075F5RL-B**	L	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2–0.75 (80–36)
					TTAT60125V5RL-B	L	●	0.8	0.05	20.0	8.0	2.5	0.5–1.25 (40–16)
			S	PDX PNA 60° RE	**TTAT6015001RN-B**	N	●	1.25	0.1	20.0	8.0	2.5	1.0–1.5 (24–18)
Left Hand (L)			L W1 EPSR 50°	PDX PNA 60° RE	**TTAT60075F5LR-B**	R	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2–0.75 (80–36)
					TTAT60125V5LR-B	R	●	0.8	0.05	20.0	8.0	2.5	0.5–1.25 (40–16)
				PDX PNA 60° RE	**TTAT60075F5LL-B**	L	●	0.4	0.05 Flat	20.0	8.0	2.5	0.2–0.75 (80–36)
					TTAT60125V5LL-B	L	●	0.8	0.05	20.0	8.0	2.5	0.5–1.25 (40–16)
			Right hand insert shown.	PDX PNA 60° RE	**TTAT6015001LN-B**	N	●	1.25	0.1	20.0	8.0	2.5	1.0–1.5 (24–18)
Right Hand (R)			General Purpose (55°)	RE PDX PNA 55°	**TTAT55158V5RR-B**	R	●	0.8	0.05	20.0	8.0	2.5	(40–16)
				PDX PNA 55° RE	**TTAT55158V5RL-B**	L	●	0.8	0.05	20.0	8.0	2.5	(40–16)
Left Hand (L)			S L W1 EPSR 50°	RE PDX PNA 55°	**TTAT55158V5LR-B**	R	●	0.8	0.05	20.0	8.0	2.5	(40–16)
			Right hand insert shown.	PDX PNA 55° RE	**TTAT55158V5LL-B**	L	●	0.8	0.05	20.0	8.0	2.5	(40–16)

Refer to page D036 for the thread diameter range.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

THREADING TOOLS (FOR GANG TYPE TOOL POSTS)

HOLDER APPLICATION

	Right Hand Holder + Right Hand Insert	Left Hand Holder + Left Hand Insert
Right Hand	RR 	LR 
Left Hand	RL 	LL 

* Above 4 combinations enable machining at the areas shown by ◌.

THREAD DIAMETER RANGE

Application Range

Pitch (mm)	Thread Diameter (mm) ≥ϕ1.0	≥ϕ1.2	≥ϕ1.6	≥ϕ2.0	≥ϕ2.5	≥ϕ3.0	≥ϕ4.0	≥ϕ5.0	≥ϕ6.0	≥ϕ7.0	Number of Passes
0.2											2 – 4
0.25											
0.3											3 – 5
0.35											
0.4											4 – 6
0.45											
0.5											5 – 7
0.6											
0.7			Machining Impossible								
0.75											
0.8											
1											
1.25											6 – 8
1.5											

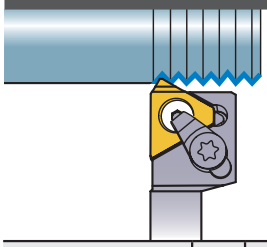
*Metric Thread (60°)

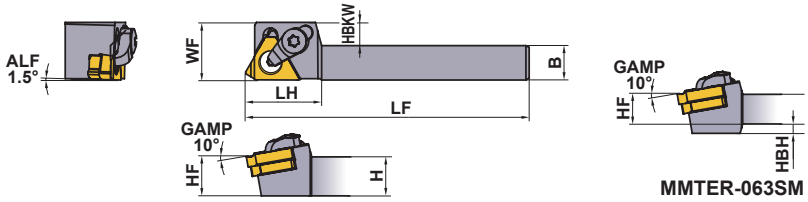
Pitch(thread/inch)	Thread Diameter									Number of Passes
Inch	≥ϕ.060	≥ϕ.073	≥ϕ.086	≥ϕ.099	≥ϕ.112	≥ϕ.164	≥ϕ.190	≥ϕ.250	≥ϕ.313	
mm	≥ϕ1.524	≥ϕ1.854	≥ϕ2.184	≥ϕ2.515	≥ϕ2.845	≥ϕ4.166	≥ϕ4.826	≥ϕ6.350	≥ϕ7.938	
80										3 – 5
72										
64										4 – 6
56										
48										5 – 7
44										
40										
32										
28			Machining Impossible							
26										
24										
20										6 – 8
18										
16										

*American UN, Whitworth Thread

INCH STANDARD

MMTE





MMTER-063SM

Order Number	Stock	Insert Number		Dimensions (inch)								Clamp Bridge	* Clamp Screw	Stop Ring	* Shim Screw	Shim	①② Wrench
	R			H	B	LF	LH	HBH	HF	HBKW	WF						
MMTER-063SM	●	TTAT	MMT16ER	.375	.375	4.724	.875	.118	.375	.250	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-083SM	●			.500	.500	4.724	.875	–	.500	.125	.625	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R

* Clamp Torque (lbf-in) : SETS51=31, HFC03008=18

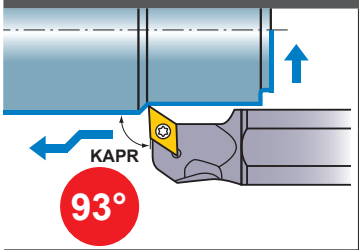
● : USA Stock

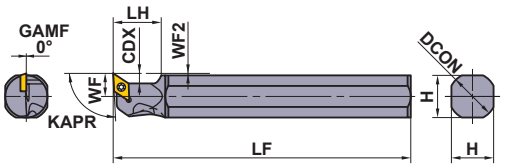
MMTE type inserts ➢ G022–G025
HOW TO SELECT A SHIM ➢ G012, G013

DIMPLE SLEEVE HOLDER (FOR OPPOSITE TOOL POSTS)

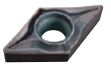
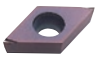
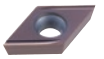
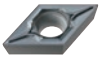
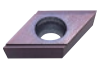
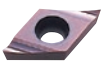
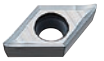
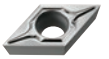
INCH STANDARD

SH





Left hand tool holder only.

Finish	Finish	Light	Light
SMG/FS	R-F	R-SS	LS
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R-SN	R-SR	AZ	LS-P
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)

Order Number	Stock	Insert Number		Dimensions (inch)							*	
	L			DCON	LF	LH	H	WF	WF2	CDX	Clamp Screw	Wrench
SH16H-FSDUCL07	●	DCMT DCMW DCET DCGT DCGW	21.5○○	.625	3.937	.787	.551	.305	.030	.165	TS254	TKY08R
SH19K-FSDUCL07	●			.750	4.921	.787	.669	.364	.030	.165	TS254	TKY08R
SH25M-FSDUCL07	●			1.000	5.906	.787	.906	.482	.030	.165	TS254	TKY08R
SH16H-FSDUCL11	●	DCMT DCMW DCET DCGT DCGW	32.5○○	.625	3.937	.787	.551	.305	.030	.252	TS43	TKY15R
SH19K-FSDUCL11	●			.750	4.921	.787	.669	.364	.030	.252	TS43	TKY15R
SH25M-FSDUCL11	●			1.000	5.906	.787	.906	.482	.030	.252	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

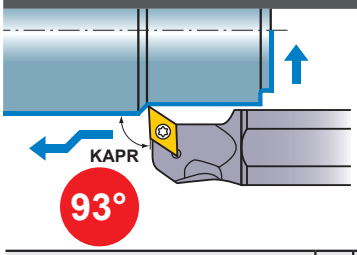
Note 1) When using insert with right and left hand chip breaker, please use right hand insert.

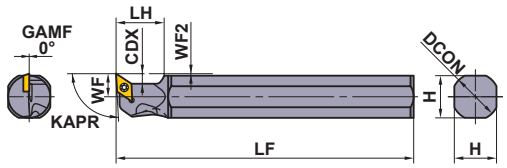
Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

● : USA Stock

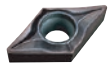
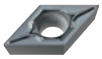
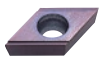
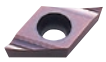
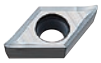
METRIC STANDARD

SH





Left hand tool holder only.

Finish	Finish	Light	Light
SMG/FS	R-F	R-SS	LS
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)
Medium	**Medium**	**Non-Ferrous Metal**	**Light**
R-SN	R-SR	AZ	LS-P
			
(2, 3)	(2, 3)	(2, 3)	(2, 3)

Order Number	Stock	Insert Number		Dimensions (mm)							*	
	L			DCON	LF	LH	H	WF	WF2	CDX	Clamp Screw	Wrench
SH20K-FSDUCL07	●	DCMT DCMW DCET DCGT DCGW	21.5○○	20	125	20	18	9.75	0.75	4.2	TS254	TKY08R
SH22K-FSDUCL07	●			22	125	20	20	10.75	0.75	4.2	TS254	TKY08R
SH20K-FSDUCL11	●	DCMT DCMW DCET DCGT DCGW	32.5○○	20	125	20	18	9.75	0.75	6.4	TS43	TKY15R
SH22K-FSDUCL11	●			22	125	20	20	10.75	0.75	6.4	TS43	TKY15R

* Clamp Torque (lbf-in) : TS254=8.9, TS43=31

Note 1) When using insert with right and left hand chip breaker, please use right hand insert.

Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

RECOMMENDED CUTTING CONDITIONS

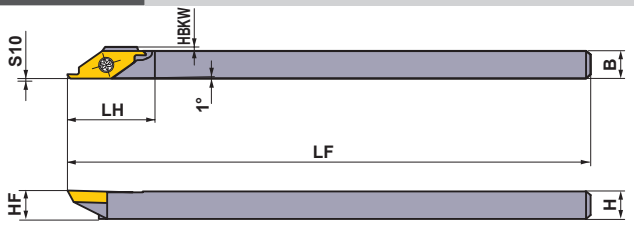
	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel · Alloy Steel	180HB–280HB	**MS6015/VP15TF**	165–490	.0004 –.006
P	Free Cutting Steel	–	**MS6015**	100–590	.0004 –.006
P	Free Cutting Steel	–	**NX2525**	165–820	.0004 –.006
M	Stainless Steel	≤200HB	**VP15TF/MP9005/MP9015**	165–395	.0008 –.004
N	Non-Ferrous Metal	–	**HTi10/MT9005**	230–755	.0012 –.006
S	Titanium Alloy	–	**MT9005**	130–260	.0016 –.005
S	Heat Resistant Alloy	–	**MP9015**	65–245	.0016 –.005

SH○○○ type inserts ➤ **A164–A171**
CBN & PCD inserts ➤ **B040, B041, B054**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

FOR RADIAL TYPE TOOL POSTS

INCH STANDARD

CSVH



Right hand tool holder shown.

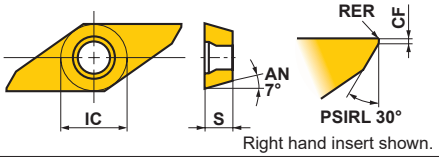
Order Number	Stock		Insert Number		Dimensions (inch)							*1 APMX (inch)	*2 Clamp Screw	Wrench
	R	L			H	B	HF	LF	HBKW	LH	S10			
CSVHR/L-062	●	●	CSVT	○○○○	.375	.375	.375	5.512	0	.787	.004	.118	NS251	NKY15S
CSVHR/L-082	●			○○○○	.500	.500	.500	5.512	0	.787	.004	.118	NS251	NKY15S

*1 APMX : Max. Depth of Cut
*2 Clamp Torque (lbf-in) : NS251=6.2
Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
Note 2) Each insert has own depth of cut.

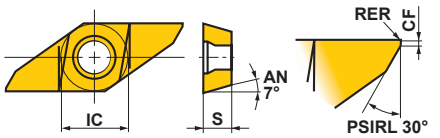
INSERTS

CSVTF — Front turning

Order Number	Hand	Coated	Dimensions (inch)				*APMX (inch)	Geometry
		VP15KZ	IC	S	RER/L	CF		
CSVTF30AR	R	●	.250	.094	0	.012	.118	Without Breaker
CSVTF30AL	L	●	.250	.094	0	.012	.118	
CSVTF30BR	R	●	.250	.094	0	.012	.118	
CSVTF30CR	R	●	.250	.094	0	.006	.118	
CSVTF30DR	R	●	.250	.094	0	.006	.118	
CSVTF30AR-B	R	●	.250	.094	0	.012	.118	With Breaker
CSVTF30AL-B	L	●	.250	.094	0	.012	.118	
CSVTF30BR-B	R	●	.250	.094	0	.012	.118	
CSVTF30CR-B	R	●	.250	.094	0	.006	.118	
CSVTF30DR-B	R	●	.250	.094	0	.006	.118	



Right hand insert shown.

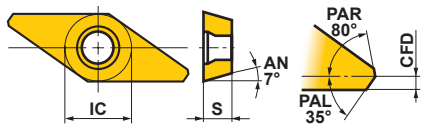


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTFXL — Front turning, Copying

Order Number	Hand	Coated	Dimensions (inch)			*APMX (inch)	Geometry
		VP15KZ	IC	S	CFD		
CSVTFXL	L	●	.250	.094	.028	.118	Without Breaker

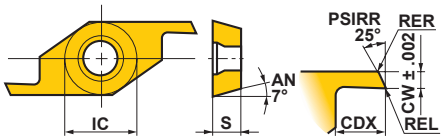


* APMX : Max. Depth of Cut

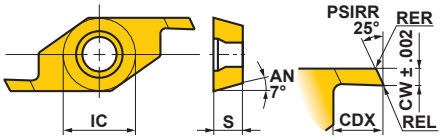
● : USA Stock
<5 inserts in one case>

CSVTC — Cutting off

Order Number	Hand	Coated VP15KZ	Dimensions (inch) IC	S	RER/L	CDX	CW	APMX* (inch)	Geometry
CSVTC0640R	R	●	.250	.094	0	.079	.024	.059	Without Breaker
CSVTC0750R	R	●	.250	.094	0	.098	.028	.079	
CSVTC0750L	L	●	.250	.094	0	.098	.028	.079	
CSVTC0850R	R	●	.250	.094	0	.098	.031	.079	
CSVTC0850L	L	●	.250	.094	0	.098	.031	.079	
CSVTC0950R	R	●	.250	.094	0	.098	.035	.079	
CSVTC1060R	R	●	.250	.094	0	.118	.039	.098	
CSVTC1060L	L	●	.250	.094	0	.118	.039	.098	
CSVTC1360R	R	●	.250	.094	0	.118	.051	.098	
CSVTC1360L	L	●	.250	.094	0	.118	.051	.098	
CSVTC1560R	R	●	.250	.094	0	.118	.059	.098	
CSVTC1560L	L	●	.250	.094	0	.118	.059	.098	
CSVTC0640R-B	R	●	.250	.094	0	.079	.024	.059	With Breaker
CSVTC0750R-B	R	●	.250	.094	0	.098	.028	.079	
CSVTC0850R-B	R	●	.250	.094	0	.098	.031	.079	
CSVTC0950R-B	R	●	.250	.094	0	.098	.035	.035	
CSVTC1060R-B	R	●	.250	.094	0	.118	.039	.098	
CSVTC1360R-B	R	●	.250	.094	0	.118	.051	.098	
CSVTC1560R-B	R	●	.250	.094	0	.118	.059	.098	



Right hand insert shown.

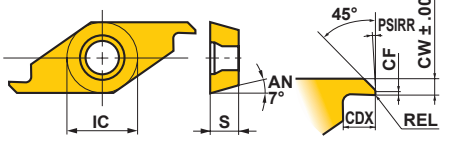


Right hand insert shown.

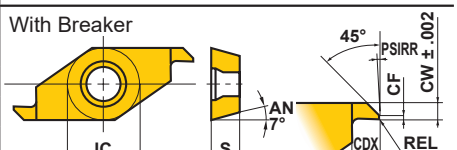
* APMX : Max. Depth of Cut

CSVTB — Back turning

Order Number	Hand	Coated VP15KZ	Dimensions (inch) IC	S	REL/L	CDX	CW	CF	PSIRR/L	APMX* (inch)	Geometry
CSVTB10AR	R	●	.250	.094	0	.098	.039	.012	5°	.079	Without Breaker
CSVTB10AL	L	●	.250	.094	0	.098	.039	.012	5°	.079	
CSVTB10BR	R	●	.250	.094	0	.098	.039	.012	2°	.079	
CSVTB10CR	R	●	.250	.094	0	.098	.039	.006	2°	.079	
CSVTB10DR	R	●	.250	.094	0	.098	.039	.006	5°	.079	
CSVTB12AR	R	●	.250	.094	0	.098	.047	.012	5°	.079	
CSVTB14AR	R	●	.250	.094	0	.098	.055	.012	5°	.079	
CSVTB10AR-B	R	●	.250	.094	0	.098	.039	.012	5°	.079	With Breaker
CSVTB10BR-B	R	●	.250	.094	0	.098	.039	.012	2°	.079	
CSVTB10CR-B	R	●	.250	.094	0	.098	.039	.006	2°	.079	
CSVTB10DR-B	R	●	.250	.094	0	.098	.039	.006	5°	.079	
CSVTB12AR-B	R	●	.250	.094	0	.098	.047	.012	5°	.079	
CSVTB14AR-B	R	●	.250	.094	0	.098	.055	.012	5°	.079	



Right hand insert shown.

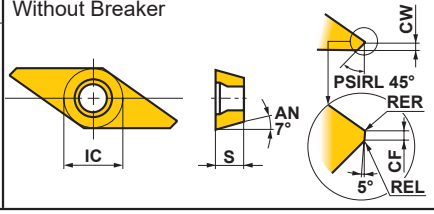


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTBXL — Back turning, Copying

Order Number	Hand	Coated VP15KZ	Dimensions (inch) IC	S	RER/L	CW	CF	APMX* (inch)	Geometry
CSVTBXL	L	●	.250	.094	0	.028	.0014	.118	Without Breaker



* APMX : Max. Depth of Cut

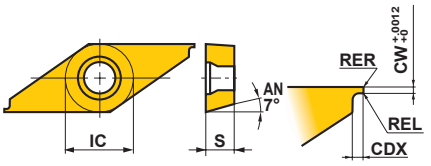
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR RADIAL TYPE TOOL POSTS

INSERTS

CSVTG — Grooving

Order Number	Hand	Coated VP15KZ	Dimensions (inch) IC	S	RER/L	CDX	CW	APMX* (inch)	Geometry
CSVTG02505R	R	●	.250	.094	0	.020	.010	.006	Without Breaker
CSVTG03005R	R	●	.250	.094	0	.020	.012	.006	
CSVTG03505R	R	●	.250	.094	0	.020	.014	.006	
CSVTG04005R	R	●	.250	.094	0	.020	.016	.006	
CSVTG04510R	R	●	.250	.094	0	.039	.018	.018	
CSVTG05010R	R	●	.250	.094	0	.039	.020	.018	
CSVTG05510R	R	●	.250	.094	0	.039	.022	.018	
CSVTG06010R	R	●	.250	.094	0	.039	.024	.018	
CSVTG06510R	R	●	.250	.094	0	.039	.026	.018	
CSVTG07010R	R	●	.250	.094	0	.039	.028	.018	
CSVTG07520R	R	●	.250	.094	0	.079	.030	.055	
CSVTG07520L	L	●	.250	.094	0	.079	.030	.055	
CSVTG08020R	R	●	.250	.094	0	.079	.031	.055	
CSVTG08520R	R	●	.250	.094	0	.079	.033	.055	
CSVTG09020R	R	●	.250	.094	0	.079	.035	.055	
CSVTG09520R	R	●	.250	.094	0	.079	.037	.055	
CSVTG09520L	L	●	.250	.094	0	.079	.037	.055	
CSVTG10020R	R	●	.250	.094	0	.079	.039	.055	
CSVTG11030R	R	●	.250	.094	0	.118	.043	.102	
CSVTG12030R	R	●	.250	.094	0	.118	.047	.102	
CSVTG12030L	L	●	.250	.094	0	.118	.047	.102	
CSVTG13030R	R	●	.250	.094	0	.118	.051	.102	
CSVTG14030R	R	●	.250	.094	0	.118	.055	.102	
CSVTG15030R	R	●	.250	.094	0	.118	.059	.102	

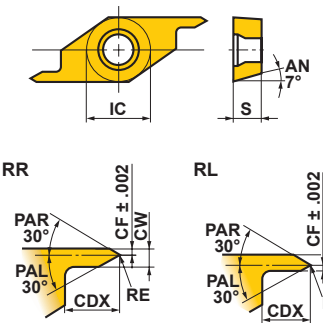


Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTT — Threading

Order Number	Hand	Coated VP15KZ	Pitch (inch)	Dimensions (inch) IC	S	RE	CDX	CW	CF	Geometry
CSVTT60050RR	R	●	.008–.020	.250	.094	.001	.118	.039	.014	Without Breaker General Purpose (60°)
CSVTT60050RL	R	●	.008–.020	.250	.094	.001	.118	.039	.014	

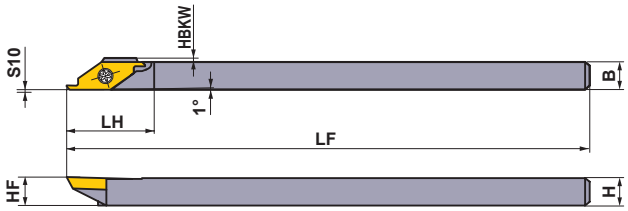


Right hand insert shown.

● : USA Stock
<5 inserts in one case>

METRIC STANDARD

CSVH



Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)							*1 APMX (mm)	*2 Clamp Screw	Wrench
	R	L			H	B	HF	LF	HBKW	LH	S10			
CSVHR/L0707	●	●	CSVT	○○○○	7	7	7	140	0.5	20	0.1	3.0	NS251	NKY15S
CSVHR/L0808	●	●		○○○○	8	8	8	140	0	20	0.1	3.0	NS251	NKY15S
CSVHR/L0909	●			○○○○	9.5	9.5	9.5	140	0	20	0.1	3.0	NS251	NKY15S
CSVHR/L1010	●	●		○○○○	10	10	10	140	0	20	0.1	3.0	NS251	NKY15S
CSVHR/L1212	●			○○○○	12	12	12	140	0	20	0.1	3.0	NS251	NKY15S

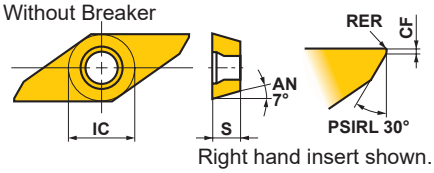
∗1 APMX : Max. Depth of Cut
∗2 Clamp Torque (lbf-in) : NS251=6.2
Note 1) Please use right hand insert for right hand holder and left hand insert for left hand holder.
Note 2) Each insert has own depth of cut.

INSERTS

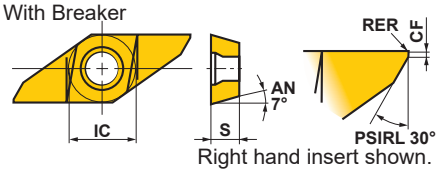
CSVTF

Front turning

Order Number	Hand	Coated	Dimensions (mm)				APMX * (mm)	Geometry
		VP15KZ	IC	S	RER/L	CF		
CSVTF30AR	R	●	6.35	2.38	0	0.3	3.0	Without Breaker
CSVTF30AL	L	●	6.35	2.38	0	0.3	3.0	
CSVTF30BR	R	●	6.35	2.38	0	0.3	3.0	
CSVTF30CR	R	●	6.35	2.38	0	0.15	3.0	
CSVTF30DR	R	●	6.35	2.38	0	0.15	3.0	
CSVTF30AR-B	R	●	6.35	2.38	0	0.3	3.0	With Breaker
CSVTF30AL-B	L	●	6.35	2.38	0	0.3	3.0	
CSVTF30BR-B	R	●	6.35	2.38	0	0.3	3.0	
CSVTF30CR-B	R	●	6.35	2.38	0	0.15	3.0	
CSVTF30DR-B	R	●	6.35	2.38	0	0.15	3.0	



Right hand insert shown.



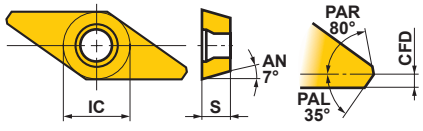
Right hand insert shown.

∗ APMX : Max. Depth of Cut

CSVTFXL

Front turning, Copying

Order Number	Hand	Coated	Dimensions (mm)			APMX * (mm)	Geometry
		VP15KZ	IC	S	CFD		
CSVTFXL	L	●	6.35	2.38	0.7	3.0	Without Breaker



∗ APMX : Max. Depth of Cut

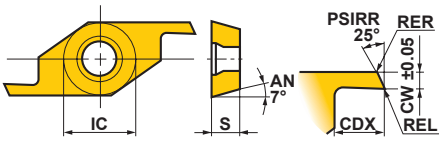
SPARE PARTS ➢ M001
TECHNICAL DATA ➢ N001

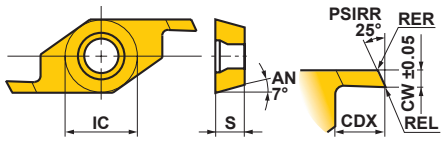
FOR RADIAL TYPE TOOL POSTS

INSERTS

CSVTC — Cutting off

Order Number	Hand	Coated	Dimensions (mm)					APMX* (mm)	Geometry
		VP15KZ	IC	S	RER/L	CDX	CW		
CSVTC0640R	R	●	6.35	2.38	0	2.0	0.6	1.5	Without Breaker
CSVTC0750R	R	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC0750L	L	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC0850R	R	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC0850L	L	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC0950R	R	●	6.35	2.38	0	2.5	0.9	2.0	
CSVTC1060R	R	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC1060L	L	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC1360R	R	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC1360L	L	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC1560R	R	●	6.35	2.38	0	3.0	1.5	2.5	
CSVTC1560L	L	●	6.35	2.38	0	3.0	1.5	2.5	Right hand insert shown.
CSVTC0640R-B	R	●	6.35	2.38	0	2.0	0.6	1.5	With Breaker
CSVTC0750R-B	R	●	6.35	2.38	0	2.5	0.7	2.0	
CSVTC0850R-B	R	●	6.35	2.38	0	2.5	0.8	2.0	
CSVTC0950R-B	R	●	6.35	2.38	0	2.5	0.9	2.0	
CSVTC1060R-B	R	●	6.35	2.38	0	3.0	1.0	2.5	
CSVTC1360R-B	R	●	6.35	2.38	0	3.0	1.3	2.5	
CSVTC1560R-B	R	●	6.35	2.38	0	3.0	1.5	2.5	Right hand insert shown.

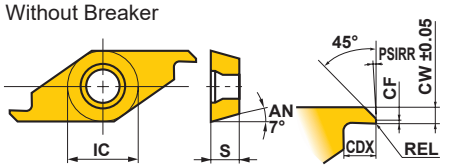


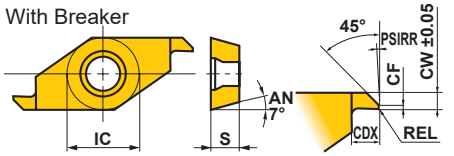


* APMX : Max. Depth of Cut

CSVTB — Back turning

Order Number	Hand	Coated	Dimensions (mm)							APMX* (mm)	Geometry
		VP15KZ	IC	S	RER/L	CDX	CW	CF	PSIRR/L		
CSVTB10AR	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	Without Breaker
CSVTB10AL	L	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	
CSVTB10BR	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
CSVTB10CR	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
CSVTB10DR	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
CSVTB12AR	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
CSVTB14AR	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	Right hand insert shown.
CSVTB10AR-B	R	●	6.35	2.38	0	2.5	1	0.3	5°	2.0	With Breaker
CSVTB10BR-B	R	●	6.35	2.38	0	2.5	1	0.3	2°	2.0	
CSVTB10CR-B	R	●	6.35	2.38	0	2.5	1	0.15	2°	2.0	
CSVTB10DR-B	R	●	6.35	2.38	0	2.5	1	0.15	5°	2.0	
CSVTB12AR-B	R	●	6.35	2.38	0	2.5	1.2	0.3	5°	2.0	
CSVTB14AR-B	R	●	6.35	2.38	0	2.5	1.4	0.3	5°	2.0	Right hand insert shown.

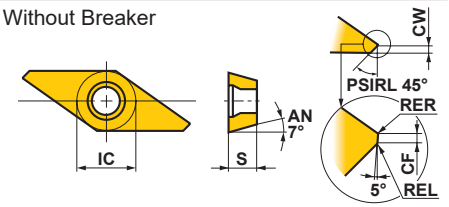




* APMX : Max. Depth of Cut

CSVTBXL — Back turning, Copying

Order Number	Hand	Coated	Dimensions (mm)					APMX* (mm)	Geometry
		VP15KZ	IC	S	RER/L	CW	CF		
CSVTBXL	L	●	6.35	2.38	0	0.7	0.035	3.0	Without Breaker



* APMX : Max. Depth of Cut

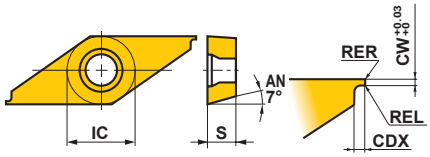
● : USA Stock

<5 inserts in one case>

CSVTG

Grooving

Order Number	Hand	Coated	Dimensions (mm)					APMX* (mm)	Geometry
		VP15KZ	IC	S	RER/L	CDX	CW		
CSVTG02505R	R	●	6.35	2.38	0	0.5	0.25	0.15	Without Breaker
CSVTG03005R	R	●	6.35	2.38	0	0.5	0.3	0.15	
CSVTG03505R	R	●	6.35	2.38	0	0.5	0.35	0.15	
CSVTG04005R	R	●	6.35	2.38	0	0.5	0.4	0.15	
CSVTG04510R	R	●	6.35	2.38	0	1.0	0.45	0.45	
CSVTG05010R	R	●	6.35	2.38	0	1.0	0.5	0.45	
CSVTG05510R	R	●	6.35	2.38	0	1.0	0.55	0.45	
CSVTG06010R	R	●	6.35	2.38	0	1.0	0.6	0.45	
CSVTG06510R	R	●	6.35	2.38	0	1.0	0.65	0.45	
CSVTG07010R	R	●	6.35	2.38	0	1.0	0.7	0.45	
CSVTG07520R	R	●	6.35	2.38	0	2.0	0.75	1.4	
CSVTG07520L	L	●	6.35	2.38	0	2.0	0.75	1.4	
CSVTG08020R	R	●	6.35	2.38	0	2.0	0.8	1.4	
CSVTG08520R	R	●	6.35	2.38	0	2.0	0.85	1.4	
CSVTG09020R	R	●	6.35	2.38	0	2.0	0.9	1.4	
CSVTG09520R	R	●	6.35	2.38	0	2.0	0.95	1.4	
CSVTG09520L	L	●	6.35	2.38	0	2.0	0.95	1.4	
CSVTG10020R	R	●	6.35	2.38	0	2.0	1.0	1.4	
CSVTG11030R	R	●	6.35	2.38	0	3.0	1.1	2.6	
CSVTG12030R	R	●	6.35	2.38	0	3.0	1.2	2.6	
CSVTG12030L	L	●	6.35	2.38	0	3.0	1.2	2.6	
CSVTG13030R	R	●	6.35	2.38	0	3.0	1.3	2.6	
CSVTG14030R	R	●	6.35	2.38	0	3.0	1.4	2.6	
CSVTG15030R	R	●	6.35	2.38	0	3.0	1.5	2.6	



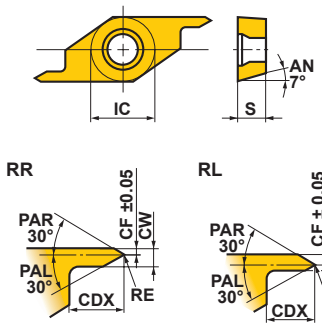
Right hand insert shown.

* APMX : Max. Depth of Cut

CSVTT

Threading

Order Number	Hand	Coated	Pitch (mm)	Dimensions (mm)						Geometry
		VP15KZ		IC	S	RE	CDX	CW	CF	
CSVTT60050RR	R	●	0.2—0.5	6.35	2.38	0.03	3.0	1.0	0.35	Without Breaker General Purpose (60°)
CSVTT60050RL	R	●	0.2—0.5	6.35	2.38	0.03	3.0	1.0	0.35	



Right hand insert shown.

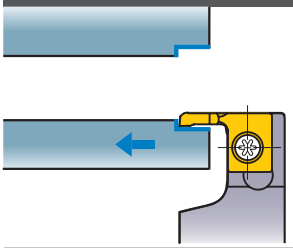
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

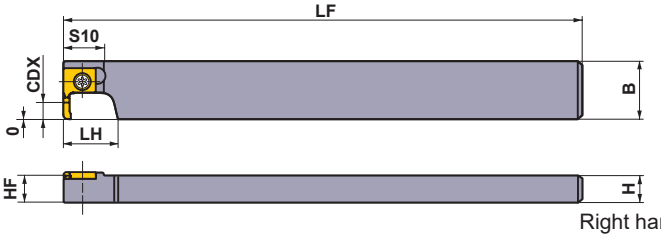
BORING TOOLS (FOR GANG TYPE TOOL POSTS)

METRIC STANDARD

SBAH

Without offset





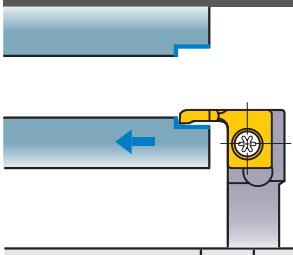
Right hand tool holder only.

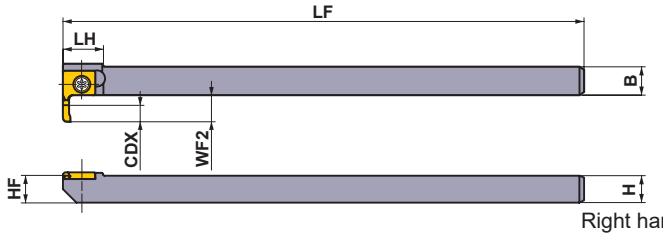
Order Number	Stock	Insert Number		Dimensions (mm)						CDX (mm)	*1 DMIN (mm)	*2 Clamp Screw	Wrench
	R			H	B	LF	HF	LH	S10				
SBAHR1022	●	SBAT	3080○○L/L-B	10	21.5	120	10	17.5	15	8	3	NS402W	NKY15S
SBAHR1222	●		3080○○L/L-B	12	21.5	120	12	17.5	15	8	3	NS403W	NKY15S

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (lbf-in) : NS402W=6.2, NS403W=6.2

SBAH

With offset





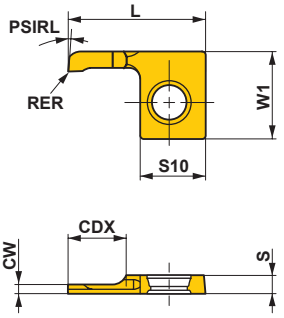
Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						CDX (mm)	*1 DMIN (mm)	*2 Clamp Screw	Wrench
	R			H	B	LF	HF	WF2	LH				
SBAHR1010	●	SBAT	3080○○L/L-B	10	10	120	10	10	15	8	3	NS402W	NKY15S

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (lbf-in) : NS402W=0.7

INSERTS

Breaker	Order Number	Coated	Dimensions (mm)								*DMIN (mm)	Geometry
		VP15KZ	PSIRL	RER	CDX	L	W1	S	CW	S10		
Without Breaker	SBAT308000L	●	5°	0	8.0	18.5	12.0	2.50	1.25	9.0	3	
	SBAT3080V5L	●	5°	0.05	8.0	18.5	12.0	2.50	1.25	9.0	3	
With Breaker	SBAT308000L-B	●	5°	0	8.0	18.5	12.0	2.50	1.25	9.0	3	
	SBAT3080V5L-B	●	5°	0.05	8.0	18.5	12.0	2.50	1.25	9.0	3	



* DMIN : Min. Cutting Diameter

● : USA Stock
<5 inserts in one case>

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Memo

HOW TO READ THE STANDARD OF BORING BARS

●How this section page is organized

①Organized by product series.
(Refer to the index on the next page.)

TYPE OF BORING BAR
indicates the initial letters for the order number, as well as applicable insert types.

TITLE OF PRODUCT SERIES

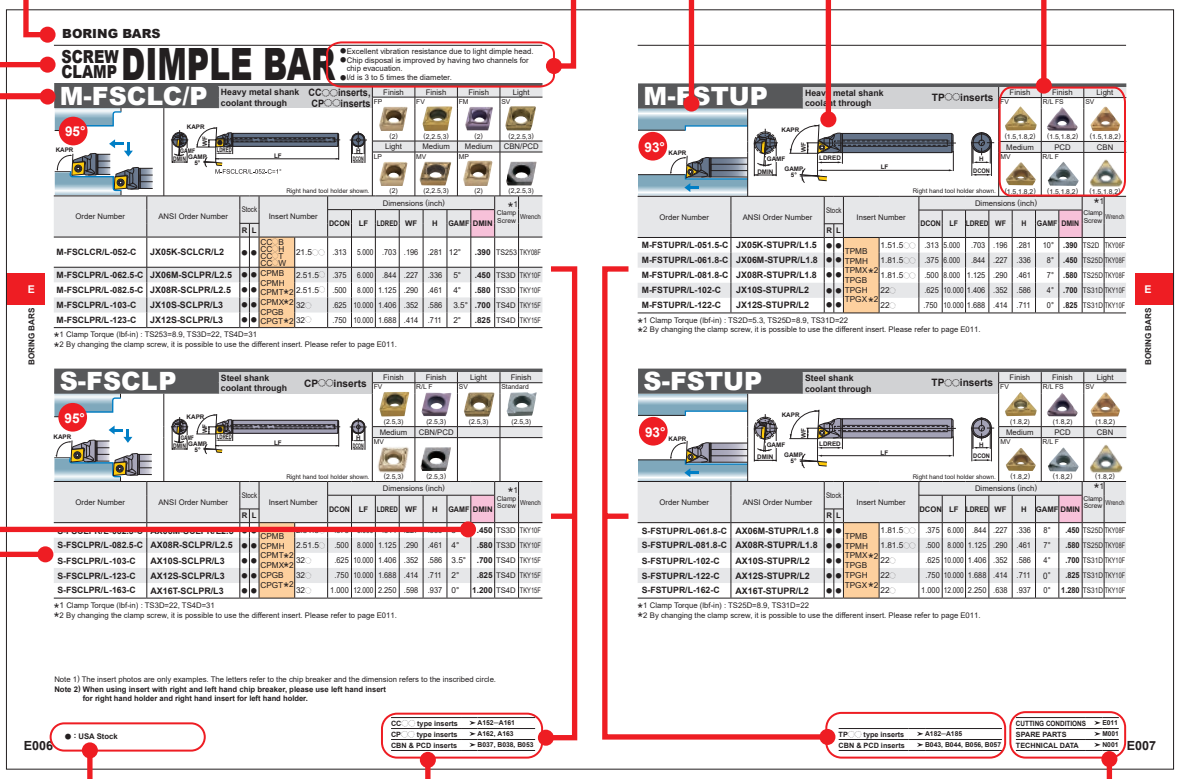
PRODUCT SECTION

PRODUCT FEATURES

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, minimum cutting diameters, standard corner radius, recommended l/d ratios, and spare parts.

MIN. CUTTING DIAMETER
is color-coded to let you find, at a glance, the maximum / minimum cutting diameters for internal machining.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages for details of inserts that are applicable to the title product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

●To Order : Please specify order number and hand of tool (right/left).

TURNING

BORING BARS

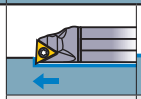
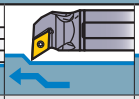
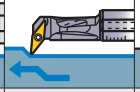
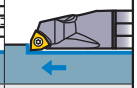
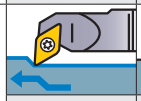
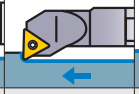
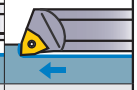
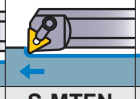
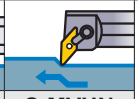
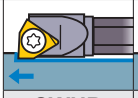
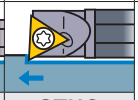
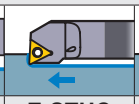
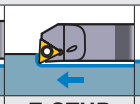
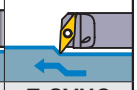
CLASSIFICATION ····· E002
IDENTIFICATION ····· E004

STANDARD BORING BARS
SCREW CLAMP DIMPLE BAR ····· E006
SCREW CLAMP TYPE BORING BARS ····· E012
DOUBLE CLAMP DIMPLE BAR ····· E021
MULTIPLE CLAMP TYPE BORING BARS ····· E024
AL TYPE BORING BARS ····· E028
MICRO-DEX BORING BARS ····· E029
MICRO-MINI BORING BARS ····· E031
MICRO-MINI TWIN BORING BARS ····· E032
RBH TYPE HOLDER (FOR MICRO-MINI AND MICRO-MINI TWIN) ····· E034
SBH TYPE HOLDER (FOR MICRO-MINI AND MICRO-MINI TWIN) ····· E037
COOLANT THROUGH CARBIDE BORING BARS ····· E040

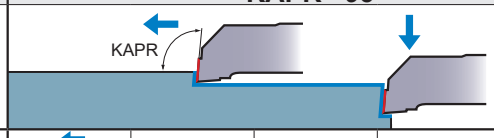
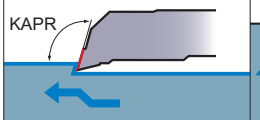
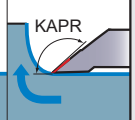
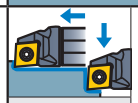
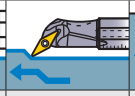
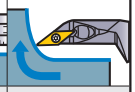
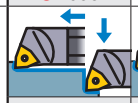
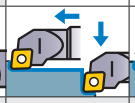
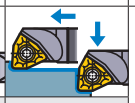
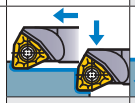
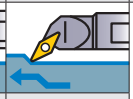
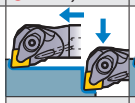
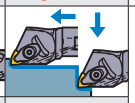
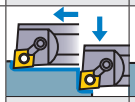
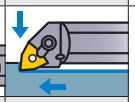
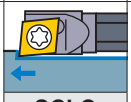
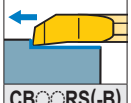
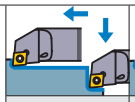
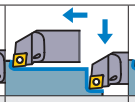
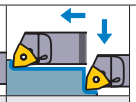
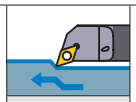
*Arranged by Alphabetical order

E032	**CB**	E010	**M-FSVJB/C**	E025	**S-MSKN**
E033	**CR**	E010	**M-FSVPB/C**	E025	**S-MTFN**
E031	**C○○○R-BLS**	E009	**M-FSVUB/C**	E026	**S-MVUN**
E013	**C-SCLC**	E009	**M-FSWUB/P**	E026	**S-MWLN**
E014	**C-SDQC**	E027	**M-MWLN**	E012	**S-SCLC**
E016	**C-STUC**	E012	**M-SCLC**	E013	**S-SDQC**
E017	**C-SWL**	E020	**M-SWLO**	E014	**S-SDUC**
E019	**C-SWLO**	E020	**M-SWLO**	E015	**S-SSKC**
E040	**E-SCLC**	E034	**RBH (INCH)**	E028	**S-STFE**
E041	**E-SCLP**	E036	**RBH (MM)**	E015	**S-STUC**
E042	**E-SDQC**	E037	**SBH**	E016	**S-SVQC**
E043	**E-SDUC**	E029	**SCLC**	E017	**S-SVUC**
E044	**E-STUC**	E021	**S-DCLN**	E019	**S-SWUC**
E045	**E-STUP**	E021	**S-DDUN**	E030	**STUC**
E046	**E-SVUC**	E022	**S-DSKN**	E029	**SWUB**
E047	**E-SWLO**	E022	**S-DTFN**		
E018	**FSWL1**	E023	**S-DVUN**		
E018	**FSWL2**	E023	**S-DWLN**		
E006	**M-FSCLC/P**	E006	**S-FSCLP**		
E008	**M-FSDQC**	E007	**S-FSTUP**		
E008	**M-FSDUC**	E024	**S-MCLN**		
E007	**M-FSTUP**	E024	**S-MDUN**		

CLASSIFICATION

Type of Tool	Features	KAPR= 75°	KAPR= 90°, 91°	KAPR= 93°			
		KAPR	KAPR	KAPR			
SCREW CLAMP DIMPLE BAR	● The minimum cutting diameter is ϕ.390 inch. ● 5°, 11° positive insert. ● Excellent vibration resistance due to light dimple head. ● Chip disposal is improved by having two channels for chip evacuation. ● l/d is 3 to 5 times the diameter.			 **M-FSTUP, S-FSTUP** ➲E007	 **M-FSDUC** ➲E008	 **M-FSVUB/C** ➲E009	 **M-FSWUB/P** ➲E009
S Type Boring Bars	● Two wall pocket. ● 7º positive insert, low cutting force. ● Screw-on type.	**S-SSKC** ➲E015		 **S-SDUC** ➲E014	 **S-STUC, C-STUC** ➲E015, E016	**S-SVUC** ➲E017	 **S-SWUC** ➲E019
DOUBLE CLAMP DIMPLE BAR	● Negative rake. ● New double clamp type. ● Holds inserts securely. ● Excellent cutting edge repeatability.	**S-DSKN** ➲E022	**S-DTFN** ➲E022	**S-DDUN** ➲E021	**S-DVUN** ➲E023		
M Type Boring Bars	● Negative rake. ● Two wall pocket. ● Pin lock and top clamp retention. ● (Opt.) Single clamp available as clamp on or pin lock holder.	**S-MSKN** ➲E025	 **S-MTFN** ➲E025	**S-MDUN** ➲E024	 **S-MVUN** ➲E026		
AL Type Boring Bars	● Shank sizes ϕ.625 inch thru ϕ1.000 inch. ● Screw-on type. ● Recommended for aluminum, nonferrous metals and plastics.		**S-STFE** ➲E028				
MICRO-DEX Boring Bars (Carbide Shank)	● The minimum cutting diameter is ϕ5 mm (.197 inch). ● 7°positive insert. ● Carbide shank type. ● Easy-to-use tool geometries. ● Suitable for small workpiece. ● l/d is 5 times the diameter.			 **SWUB** ➲E029	 **STUC** ➲E030		
MICRO-MINI TWIN Boring Bars	● The minimum cutting diameter is ϕ2.2 mm (.087 inch). ● Solid carbide type with two cutting edges. ● Continuous cutting from boring to facing. ● With or without a chip breaker.						
MICRO-MINI Boring Bars	● The minimum cutting diameter is ϕ3.2 mm (.126 inch). ● Solid carbide type (Single cutting edges). ● l/d is 5 times the diameter. ● Cutting edge can be shaped according to the application. Thus, it covers a wide cutting range (threading,grooving,copying, etc.).	**C○○F/HR-BLS** ➲E031					
Coolant Through Carbide Boring Bars	● Two wall pocket. ● 7° and 11° positive insert, low cutting force. ● Screw-on type. ● Carbide shanks are stocked in various diameters.			**E-SDUC** ➲E043	 **E-STUC** ➲E044	 **E-STUP** ➲E045	 **E-SVUC** ➲E046
RBH Type Holder	● Holder for MICRO-MINI TWIN and MICRO-MINI. ● Round shanks suitable for use with frontal gang type tool posts with sleeve.	**RBH** Inch➲E034, Metric➲E036					
SBH Type Holder	● Holder for MICRO-MINI TWIN and MICRO-MINI. ● Square shanks suitable for use with frontal gang type tool posts.	**SBH** ➲E037					

Note 1) **S** : Steel shank, **M** : Heavy metal shank, **C** : Carbide shank. (For Micro-dex boring bars, carbide shank only.)

KAPR= 95°					KAPR = 107.5° – 117.5°		KAPR= 142°	Selection Standard							
								Economical	Low Cutting Resistance (Sharpness)	Clamp Rigidity	Vibration Resisiance	Operation Efficiency	Coolant Thru	Specialized	Small Diameter Cutting
 M-FSCLC/P, S-FSCLP ➲E006					M-FSDQC ➲E008	 M-FSVPB/C ➲E010	 M-FSVJB/C ➲E010		◎		○	◎	◎		
 C-SWLO, M-SWLO ➲E019, E020	 S-SCLC, M-SCLC, C-SCLC ➲E012, E013	 C-SWL ➲E017		 FSWL1, 2 ➲E018	S-SDQC, C-SDQC ➲E013, E014	 S-SVQC ➲E016			○		○*			
	 S-DCLN ➲E021	 S-DWLN ➲E023								◎		◎	◎		
	 S-MCLN ➲E024	 S-MWLN, M-MWLN ➲E026, E027						◎		◎		○			
									◎		○			◎	
	 SCLC ➲E029										◎				◎
	 CB○○RS(-B) ➲E032						CR○○RS-01(B) ➲E033		◎		◎				◎
									◎						◎
	 E-SCLC ➲E040	 E-SCLP ➲E041	 E-SWLO ➲E047		 E-SDQC ➲E042				◎		◎	◎	◎		

Note 2) ◎: 1st recommendation. ○: 2nd recommendation.
Note 3) ∗ Indicates in case that shank material is carbide.

IDENTIFICATION

Boring Bar ANSI Designation Chart

A	Steel Bar w/Coolant Hole
AX	(A-type) Dimple Bar
B	Solid Steel Anti-vibration Bar
C	Carbide Bar (Steel Head)
D	Steel Anti-vibration Bar w/Coolant Hole
E	Carbide Bar (Steel Head) w/Coolant Hole
EX	(E-type) Dimple Bar
F	Carbide Anti-vibration Bar (Steel Head)
G	Carbide Anti-vibration Bar (Steel Head w/Coolant Hole)
H	Heavy Metal Bar
J	Heavy Metal Bar w/Coolant Hole
JX	(J-type) Dimple Bar
S	Solid Steel Bar

① Boring Bar Type

03	3/16"	16	1"
04	1/4"	20	1-1/4"
05	5/16"	24	1-1/2"
06	3/8"	28	1-3/4"
08	1/2"	32	2"
10	5/8"	36	2-1/4"
12	3/4"	40	2-1/2"

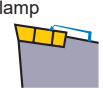
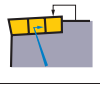
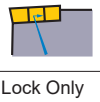
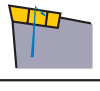
② Shank Diameter

F	3"	Q	7"
G	3-1/2"	R	8"
H	4"	S	10"
J	4-1/2"	T	12"
K	5"	U	14"
L	5-1/2"	V	16"
M	6"	W	18"
N	6-1/2"	Y	20"
P	6-3/4"	Z	Special

③ Length

E	12	M	–	S	C
①	②	③		④	⑤

④ Insert Holding

C	Top Clamp 
D	Double Clamp
M	Clamp and Lock Pin 
P	Hole Clamp 
S	Screw Lock Only 

⑤ Insert Shape

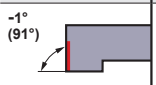
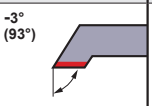
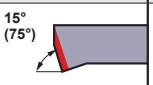
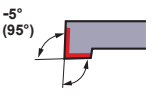
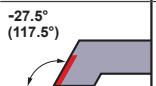
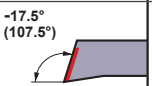
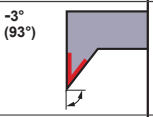
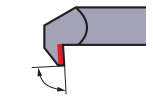
C	D	R	S
80°Rhombic	55°Rhombic	Round	Square
T	**V**	**W**	
Triangular	35°Rhombic	Trigon	

Inscribed Circle of Insert (inch)	.156	.187	.219	.250	.313	.375	.500	.625	.750	1.000
T	1.2	1.5	1.8	2	2.5	3	4	5	6	
S R						3	4	5	6	8
W	1.2	1.5		2		3	4	5		
80° C	1.2	1.5		2	2.5	3	4	5	6	
55° D				2		3	4	5		
35° V		1.5		2		3	4			

⑨ Insert Size

L ⑥	C ⑦	R ⑧	2 ⑨

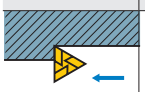
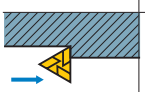
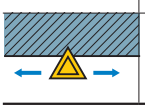
④ Boring Bar Style

F	J	K	L
			
End Cutting	Side Cutting	End Cutting	Side & End Cutting
P	**Q**	**U**	**X**
			
End Cutting	End Cutting	End Cutting	Back Boring

⑦ Insert Relief Angle

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other

⑧ Hand

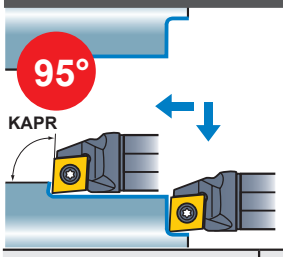
Figure	Hand	Symbol
	Right	R
	Left	L
	Neutral	N

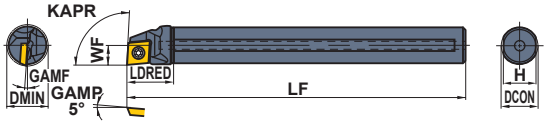
SCREW CLAMP DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- l/d is 3 to 5 times the diameter.

M-FSCLC/P

Heavy metal shank coolant through **CC○○inserts, CP○○inserts**





M-FSCLCR/L-052-C=1°

Right hand tool holder shown.

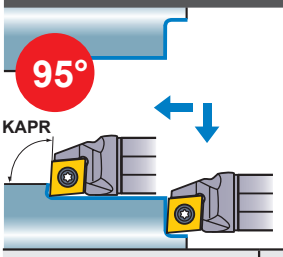
Finish	Finish	Finish	Light
FP	FV	FM	SV
(2)	(2,2.5,3)	(2)	(2,2.5,3)
Light	**Medium**	**Medium**	**CBN/PCD**
LP	MV	MP	
(2)	(2,2.5,3)	(2)	(2,2.5,3)

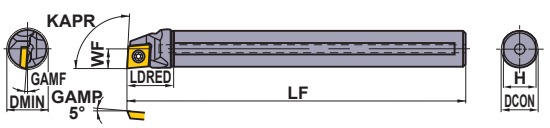
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	∗1 Clamp Screw	Wrench
M-FSCLCR/L-052-C	**JX05K-SCLCR/L2**	●	●	CC○B CC○H CC○T CC○W	21.5○○	.313	5.000	.703	.196	.281	12°	**.390**	TS253	TKY08F
M-FSCLPR/L-062.5-C	**JX06M-SCLPR/L2.5**	●	●	CPMB CPMH	2.51.5○	.375	6.000	.844	.227	.336	5°	**.450**	TS3D	TKY10F
M-FSCLPR/L-082.5-C	**JX08R-SCLPR/L2.5**	●	●	CPMT∗2	2.51.5○	.500	8.000	1.125	.290	.461	4°	**.580**	TS3D	TKY10F
M-FSCLPR/L-103-C	**JX10S-SCLPR/L3**	●	●	CPMX∗2 CPGB	32○	.625	10.000	1.406	.352	.586	3.5°	**.700**	TS4D	TKY15F
M-FSCLPR/L-123-C	**JX12S-SCLPR/L3**	●	●	CPGT∗2	32○	.750	10.000	1.688	.414	.711	2°	**.825**	TS4D	TKY15F

∗1 Clamp Torque (lbf-in) : TS253=8.9, TS3D=22, TS4D=31
∗2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E011.

S-FSCLP

Steel shank coolant through **CP○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Finish
FV	R/L F	SV	Standard
(2.5,3)	(2.5,3)	(2.5,3)	(2.5,3)
Medium	**CBN/PCD**		
MV			
(2.5,3)	(2.5,3)		

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	∗1 Clamp Screw	Wrench
S-FSCLPR/L-062.5-C	**AX06M-SCLPR/L2.5**	●	●	CPMB	2.51.5○	.375	6.000	.844	.227	.336	5°	**.450**	TS3D	TKY10F
S-FSCLPR/L-082.5-C	**AX08R-SCLPR/L2.5**	●	●	CPMH	2.51.5○	.500	8.000	1.125	.290	.461	4°	**.580**	TS3D	TKY10F
S-FSCLPR/L-103-C	**AX10S-SCLPR/L3**	●	●	CPMT∗2 CPMX∗2	32○	.625	10.000	1.406	.352	.586	3.5°	**.700**	TS4D	TKY15F
S-FSCLPR/L-123-C	**AX12S-SCLPR/L3**	●	●	CPGB	32○	.750	10.000	1.688	.414	.711	2°	**.825**	TS4D	TKY15F
S-FSCLPR/L-163-C	**AX16T-SCLPR/L3**	●	●	CPGT∗2	32○	1.000	12.000	2.250	.598	.937	0°	**1.200**	TS4D	TKY15F

∗1 Clamp Torque (lbf-in) : TS3D=22, TS4D=31
∗2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E011.

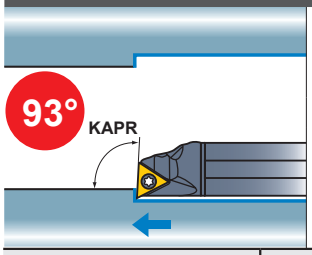
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

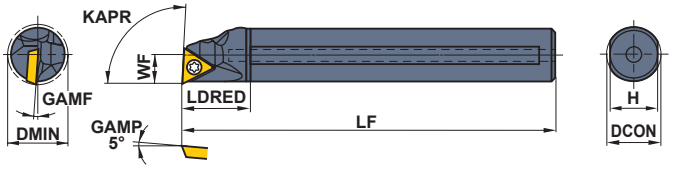
● : USA Stock

CC○○ type inserts	**➤ A152–A161**
CP○○ type inserts	**➤ A162, A163**
CBN & PCD inserts	**➤ B037, B038, B053**

M-FSTUP

Heavy metal shank coolant through — **TP○○inserts**





Right hand tool holder shown.

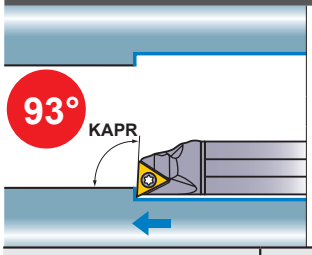
Finish	Finish	Light
FV	R/L FS	SV
(1.5,1.8,2)	(1.5,1.8,2)	(1.5,1.8,2)
Medium	**PCD**	**CBN**
MV	R/L F	
(1.5,1.8,2)	(1.5,1.8,2)	(1.5,1.8,2)

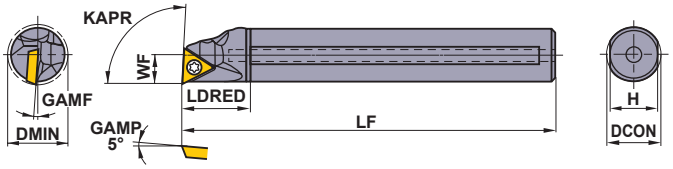
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	∗1 Clamp Screw	Wrench
M-FSTUPR/L-051.5-C	**JX05K-STUPR/L1.5**	●	●	TPMB	1.51.5○○	.313	5.000	.703	.196	.281	10°	**.390**	TS2D	TKY06F
M-FSTUPR/L-061.8-C	**JX06M-STUPR/L1.8**	●	●	TPMH	1.81.5○○	.375	6.000	.844	.227	.336	8°	**.450**	TS25D	TKY08F
M-FSTUPR/L-081.8-C	**JX08R-STUPR/L1.8**	●	●	TPMX∗2 TPGB	1.81.5○○	.500	8.000	1.125	.290	.461	7°	**.580**	TS25D	TKY08F
M-FSTUPR/L-102-C	**JX10S-STUPR/L2**	●	●	TPGH	22○	.625	10.000	1.406	.352	.586	4°	**.700**	TS31D	TKY10F
M-FSTUPR/L-122-C	**JX12S-STUPR/L2**	●	●	TPGX∗2	22○	.750	10.000	1.688	.414	.711	0°	**.825**	TS31D	TKY10F

∗1 Clamp Torque (lbf-in) : TS2D=5.3, TS25D=8.9, TS31D=22
∗2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E011.

S-FSTUP

Steel shank coolant through — **TP○○inserts**





Right hand tool holder shown.

Finish	Finish	Light
FV	R/L FS	SV
(1.8,2)	(1.8,2)	(1.8,2)
Medium	**PCD**	**CBN**
MV	R/L F	
(1.8,2)	(1.8,2)	(1.8,2)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	∗1 Clamp Screw	Wrench
S-FSTUPR/L-061.8-C	**AX06M-STUPR/L1.8**	●	●	TPMB	1.81.5○○	.375	6.000	.844	.227	.336	8°	**.450**	TS25D	TKY08F
S-FSTUPR/L-081.8-C	**AX08R-STUPR/L1.8**	●	●	TPMH	1.81.5○○	.500	8.000	1.125	.290	.461	7°	**.580**	TS25D	TKY08F
S-FSTUPR/L-102-C	**AX10S-STUPR/L2**	●	●	TPMX∗2 TPGB	22○	.625	10.000	1.406	.352	.586	4°	**.700**	TS31D	TKY10F
S-FSTUPR/L-122-C	**AX12S-STUPR/L2**	●	●	TPGH	22○	.750	10.000	1.688	.414	.711	0°	**.825**	TS31D	TKY10F
S-FSTUPR/L-162-C	**AX16T-STUPR/L2**	●	●	TPGX∗2	22○	1.000	12.000	2.250	.638	.937	0°	**1.280**	TS31D	TKY10F

∗1 Clamp Torque (lbf-in) : TS25D=8.9, TS31D=22
∗2 By changing the clamp screw, it is possible to use the different insert. Please refer to page E011.

TP○○ type inserts	**➤ A182–A185**
CBN & PCD inserts	**➤ B043, B044, B056, B057**

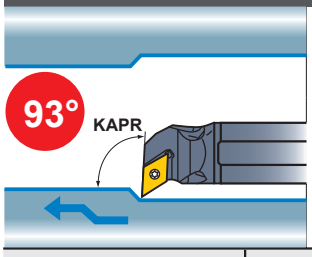
CUTTING CONDITIONS	**➤ E011**
SPARE PARTS	**➤ M001**
TECHNICAL DATA	**➤ N001**

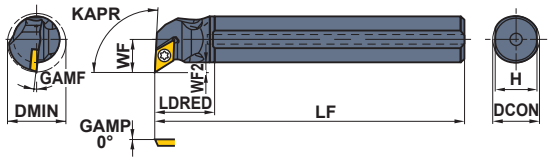
SCREW CLAMP DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- l/d is 3 to 5 times the diameter.

M-FSDUC

Heavy metal shank coolant through **DC○○inserts**





Right hand tool holder shown.

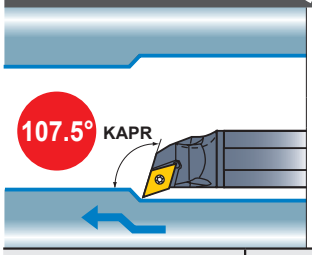
Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L F	
(2,3)	(2,3)	(2,3)	(2,3)

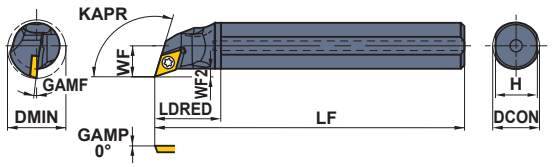
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	* Clamp Screw	Wrench
M-FSDUCR/L-062-C	**JX06M-SDUCR/L2**	●	●	DCMT DCMW DCGT DCGW	21.5○	.375	6.000	.675	.317	.130	.336	7.5°	**.525**	TS25	TKY08F
M-FSDUCR/L-082-C	**JX08R-SDUCR/L2**	●	●		21.5○	.500	8.000	.833	.380	.130	.461	6°	**.667**	TS25	TKY08F
M-FSDUCR/L-102-C	**JX10S-SDUCR/L2**	●	●		21.5○	.625	10.000	.781	.442	.130	.586	5°	**.781**	TS25	TKY08F
M-FSDUCR/L-123-C	**JX12S-SDUCR/L3**	●	●		32.5○	.750	10.000	.844	.615	.240	.711	5°	**1.200**	TS43	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31

M-FSDQC

Heavy metal shank coolant through **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L F	
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	* Clamp Screw	Wrench
M-FSDQCR/L-062-C	**JX06M-SDQCR/L2**	●	●	DCMT DCMW DCGT DCGW	21.5○	.375	6.000	.769	.290	.102	.336	8°	**.488**	TS25	TKY08F
M-FSDQCR/L-082-C	**JX08R-SDQCR/L2**	●	●		21.5○	.500	8.000	.938	.352	.102	.461	6°	**.667**	TS25	TKY08F
M-FSDQCR/L-102-C	**JX10S-SDQCR/L2**	●	●		21.5○	.625	10.000	.879	.415	.102	.586	5°	**.781**	TS25	TKY08F
M-FSDQCR/L-123-C	**JX12S-SDQCR/L3**	●	●		32.5○	.750	10.000	.975	.521	.146	.711	7°	**.938**	TS43	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS43=31

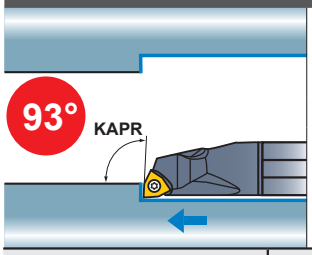
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

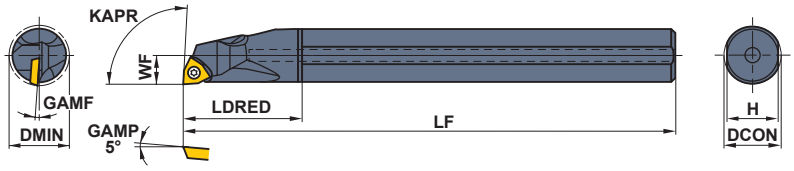
● : USA Stock

DC○○ type inserts ➤ A164–A171
CBN & PCD inserts ➤ B040, B041, B054

M-FSWUB/P

Heavy metal shank coolant through — **WB○○inserts, WP○○inserts**





The ϕ.313 and ϕ.375 shanks are 0°.

Right hand tool holder shown.

Finish
R/L F·FS

(1.5,2,3)

Medium
MV

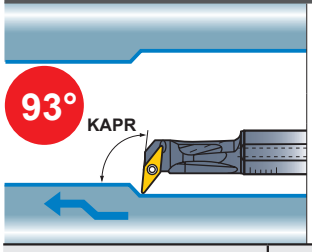
(1.5,2,3)

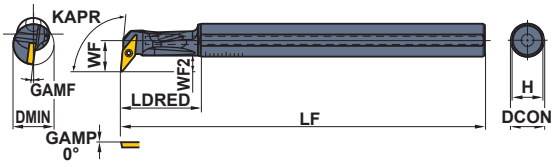
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
M-FSWUBR/L-051.5-C	JX05K-SWUBR/L1.5	●	●	WBMT WBGT	1.51.5○	.313	5.000	.703	.196	.281	14°	**.391**	TS2	TKY06F
M-FSWUBR/L-061.5-C	JX06M-SWUBR/L1.5	●	●		1.51.5○	.375	6.000	.844	.227	.336	11°	**.450**	TS2	TKY06F
M-FSWUPR/L-082-C	JX08R-SWUPR/L2	●	●	WPMT WPGT	21.5○	.500	8.000	1.125	.289	.461	4°	**.583**	TS253	TKY08F
M-FSWUPR/L-102-C	JX10S-SWUPR/L2	●	●		21.5○	.625	10.000	1.406	.352	.586	1°	**.703**	TS253	TKY08F
M-FSWUPR/L-123-C	JX12S-SWUPR/L3	●	●		32○	.750	10.000	1.688	.414	.711	2°	**.825**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS2=5.3, TS253=8.9, TS4=31

M-FSVUB/C

Heavy metal shank coolant through — **VC○○inserts, VB○○inserts**





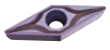
Right hand tool holder shown.

Finish
FV

(1.5)

Finish
FP

(2)

Finish
FM

(2)

Light
SV

(1.5,2)

Light
LP

(2)

Light
LM

(2)

Medium
MV

(1.5,2)

CBN

(2)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	* Clamp Screw	Wrench
M-FSVUCR/L-081.5-C	JX08R-SVUCR/L1.5	●	●	VCGT VCMT	1.51.5○	.500	8.000	1.042	.447	.197	.461	8°	**.667**	TS202	TKY06F
M-FSVUBR/L-102-C	JX10S-SVUBR/L2	●	●	VBET VBGT	22○	.625	10.000	1.269	.608	.295	.586	8°	**.781**	TS255	TKY08F
M-FSVUBR/L-122-C	JX12S-SVUBR/L2	●	●	VBMT VBGW	22○	.750	10.000	1.519	.670	.295	.711	7°	**.938**	TS255	TKY08F

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

WB○○ type inserts	➤ A195
WP○○ type inserts	➤ A198
VC○○ type inserts	➤ A190–A192
VB○○ type inserts	➤ A186–A189
CBN & PCD inserts	➤ B045, B058, B059

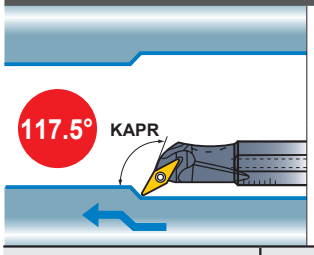
CUTTING CONDITIONS	➤ E011
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

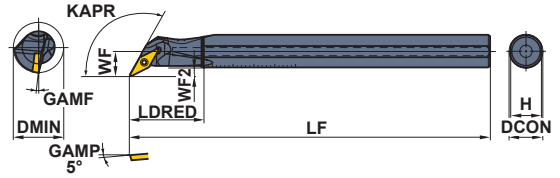
SCREW CLAMP DIMPLE BAR

- Excellent vibration resistance due to light dimple head.
- Chip disposal is improved by having two channels for chip evacuation.
- l/d is 3 to 5 times the diameter.

M-FSVPB/C

Heavy metal shank coolant through VC○○inserts, VB○○inserts





Right hand tool holder shown.

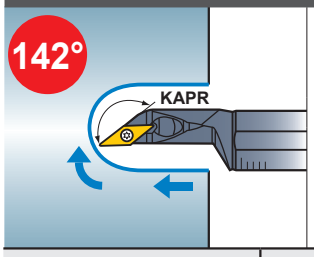
Finish	Finish	Finish	Light
FV	FP	FM	SV
(1.5)	(2)	(2)	(1.5,2)
Light	**Light**	**Medium**	**CBN**
LP	LM	MV	
(2)	(2)	(1.5,2)	(2)

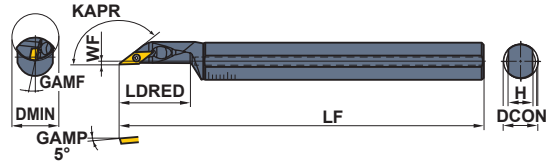
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	WF2	H	GAMF	DMIN	* Clamp Screw	Wrench
M-FSVPCR/L-061.5-C	**JX06M-SVPCR/L1.5**	●	●	VCGT VCMT	1.51.5○	.375	6.000	.938	.306	.118	.336	8°	**.600**	TS202	TKY06F
M-FSVPBR/L-082-C	**JX08R-SVPBR/L2**	●	●	VBET VBGT VBMT VBGW	22○	.500	8.000	1.167	.407	.157	.461	8°	**.833**	TS255	TKY08F
M-FSVPBR/L-102-C	**JX10S-SVPBR/L2**	●	●		22○	.625	10.000	1.367	.490	.177	.586	5°	**.977**	TS255	TKY08F
M-FSVPBR/L-122-C	**JX12S-SVPBR/L2**	●	●		22○	.750	10.000	1.500	.572	.197	.711	5°	**1.125**	TS255	TKY08F

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

M-FSVJB/C

Heavy metal shank coolant through VC○○inserts, VB○○inserts





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2)	(2)	(2)	(2)
Medium			
MV			
(1.5,2)			

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
M-FSVJCR/L-081.5-C	**JX08R-SVJCR/L1.5**	●	●	VCGT VCMT	1.51.5○	.500	8.000	1.083	.093	.461	5°	**.667**	TS202	TKY06F
M-FSVJCR/L-101.5-C	**JX10S-SVJCR/L1.5**	●	●		1.51.5○	.625	10.000	1.406	.076	.586	5°	**.781**	TS202	TKY06F
M-FSVJBR/L-122-C	**JX12S-SVJBR/L2**	●	●	VBET VBGT VBMT VBGW	22○	.750	10.000	1.406	.060	.711	5°	**.938**	TS255	TKY08F

* Clamp Torque (lbf-in) : TS202=5.3, TS255=8.9

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : USA Stock

VC○○ type inserts	**➤ A190–A192**
VB○○ type inserts	**➤ A186–A189**
CBN & PCD inserts	**➤ B045, B058**

RECOMMENDED CUTTING CONDITIONS

Steel Shank							l/d ≤ 3		3 < l/d ≤ 5	
Heavy Metal Shank							l/d ≤ 3		3 < l/d ≤ 6	
	Work Material	Cutting Mode	Breaker	Recom-mendation	Grade	Cutting Speed (SFM)	Feed (IPR)	D.O.C. (inch)	Feed (IPR)	D.O.C. (inch)
P	Mild Steel ≤180HB	Finish	FP	①	NX2525	555 (395—720)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
		Light	LP	①	MP3025	490 (330—655)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
				②	NX2525	525 (360—690)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
		Medium	MP	①	MP3025	460 (295—620)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
				②	NX2525	490 (330—655)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
	Carbon Steel Alloy Steel 180—350HB	Finish	FP	①	MC6115	560 (395—720)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
				②	NX2525	425 (260—590)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
		Light	LP	①	MC6125	525 (425—655)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
				②	MP3025	360 (195—525)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
		Medium	MP	①	MP3025	330 (195—490)	.010 (.006—.014)	—.080	.008 (.006—.010)	—.060
M	Stainless Steel ≤200HB	Finish	FM	①	VP15TF	490 (360—620)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
		Light	LM	①	MC7025	410 (280—540)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
				②	VP15TF	425 (295—555)	.008 (.004—.010)	—.040	.006 (.002—.008)	—.040
		Medium	MM	①	MC7025	345 (230—440)	.008 (.006—.010)	—.080	.008 (.006—.010)	—.040
				②	VP15TF	390 (260—525)	.008 (.006—.010)	—.080	.008 (.006—.010)	—.040
K	Gray Cast Iron Tensile Strength ≤350MPa	Finish	F, FS	①	HTi10	425 (295—525)	.006 (.004—.008)	—.020	.006 (.004—.008)	—.020
		Medium	MK	①	MC5115	395 (260—525)	.008 (.006—.010)	—.080	.008 (.006—.010)	—.060
N	Aluminum Alloy	Finish	F, FS	①	HTi10	985 (655—1310)	.004 (.002—.006)	—.020	.004 (.002—.006)	—.020
			Flat Top	①	MD220	655 (490—820)	.004 (.002—.006)	—.080	.004 (.002—.006)	—.040
H	Hardened Steel 35–65HRC	Finish	Flat Top	①	MB8120	330 (260—655)	.004 (.002—.006)	—.006	.004 (.002—.006)	—.004

When vibrations occur, reduce cutting speed to 70% of the above.
The depth of cut needs to be less than the corner diameter when using the FSVJ type.

■CCG/MT, CPGT, CPMX, TPGD/P, TPGA/M, TPMX inserts

- **By changing the insert screw, it is possible to use the inserts listed on the left hand side.**

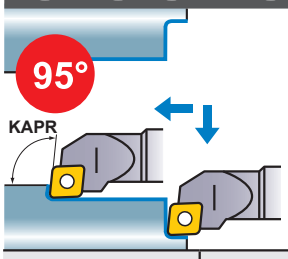
Order Number	Insert Screw	Remark
CCG/MT21.5○	Can be used as it is.	If the screw is too long then please grind away the unnecessary material.
CPGT2.51.5○	Change to TS3.	
CPGT32○	Change to TS4.	
CPMX2.51.5○	Can be used as it is.	
CPMX32○	Can be used as it is.	
TPGD/P1.51.5○	Change to CS200T.	
TPGD/P1.81.5○	Change to CS250T.	
TPGA/M22○	Change to CS300890T.	
TPMX1.51.5○	Change to CS200T.	
TPMX1.81.5○	Change to CS250T.	
TPMX22○	Change to CS300890T.	

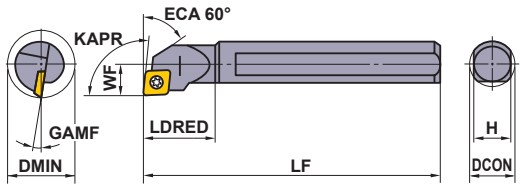
SCREW CLAMP TYPE

- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

S-SCLC

Steel shank — **CC○○inserts**





Right hand tool holder shown.

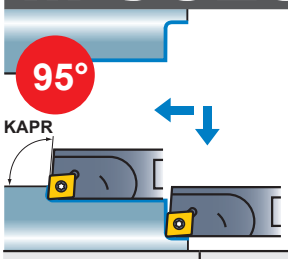
Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP	MM		
(2,3,4)	(2,3,4)	(2,3,4)	(2,3,4)

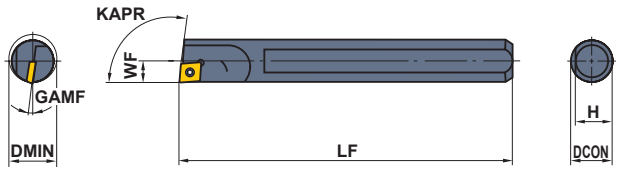
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SCLCR/L-062	**S06K-SCLCR/L2**	●	●	CCMT CCMW CCGB	21.5○	.375	6.000	.625	.250	.340	15°	**.477**	TS25	TKY08F
S-SCLCR/L-082	**S08K-SCLCR/L2**	●	●		21.5○	.500	6.000	.750	.313	.460	13°	**.602**	TS25	TKY08F
S-SCLCR/L-103	**S10M-SCLCR/L3**	●	●	CCGW CCGT CCGH	32.5○	.625	8.000	1.250	.406	.560	10°	**.797**	TS4	TKY15F
S-SCLCR/L-123	**S12S-SCLCR/L3**	●	●		32.5○	.750	10.000	1.875	.500	.700	8°	**.954**	TS4	TKY15F
S-SCLCR/L-164	**S16T-SCLCR/L4**	●	●	CCET CCMH CCGW	43○	1.000	12.000	2.500	.641	.910	7°	**1.219**	TS5	TKY25F
S-SCLCR/L-204	**S20T-SCLCR/L4**	●	●		43○	1.250	12.000	2.500	.875	1.160	5°	**1.579**	TS5	TKY25F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31, TS5=66

M-SCLC

Heavy metal shank — **CC○○inserts**





Right hand tool holder only.

Finish: L F

(03,04)

PCD/CBN

(03,04)

Order Number	ANSI Order Number	Stock R	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
M-SCLCR-063	**H03F-SCLCR3**	●	CCGT	03S1○○	.188	3.000	.100	.173	15°	**.200**	TS16	TKY06F
M-SCLCR-073	**H7/32G-SCLCR3**	●	CCMW	03S1○○	.219	3.500	.120	.199	14°	**.240**	TS16	TKY06F
M-SCLCR-064	**H04H-SCLCR4**	●	CCGW	04T0○○	.250	4.000	.140	.230	14°	**.280**	TS21	TKY06F

* Clamp Torque (lbf-in) : TS16=5.3, TS21=5.3

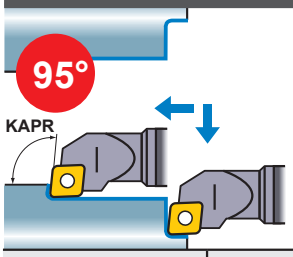
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

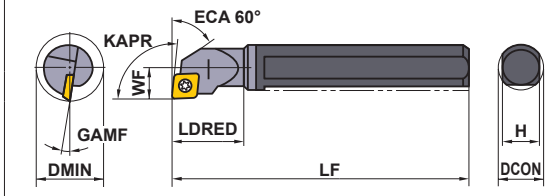
● : USA Stock

CC○○ type inserts	**➤ A152–A161**
CBN & PCD inserts	**➤ B037, B038, B053**

C-SCLC

Carbide shank — **CC○○inserts**





Right hand tool holder shown.

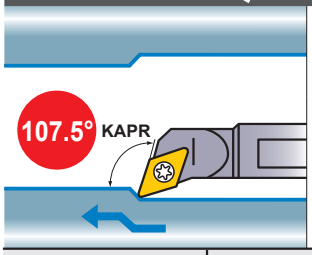
Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**CBN**
MP	MM		
(2,3)	(2,3)	(2,3)	(2,3)

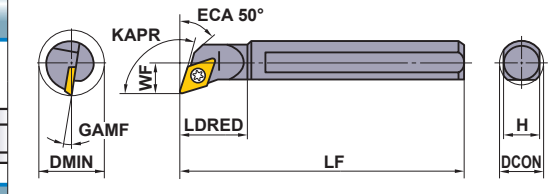
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C-SCLCR/L-062	**C06M-SCLCR/L2**	●	●	CCMT CCMW CCGB	21.5○	.375	6.000	.625	.250	.360	15°	**.477**	TS25	TKY08F
C-SCLCR/L-082	**C08M-SCLCR/L2**	●	●	CCGW CCGT CCGH	21.5○	.500	6.000	.750	.313	.485	13°	**.602**	TS25	TKY08F
C-SCLCR/L-103	**C10R-SCLCR/L3**	●	●	CCET CCMH	32.5○	.625	8.000	1.250	.406	.600	10°	**.797**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

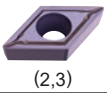
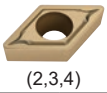
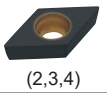
S-SDQC

Steel shank — **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP	MM		
			
(2,3,4)	(2,3,4)	(2,3,4)	(2,3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SDQCR/L-082	**S08M-SDQCR/L2**	●	●	DCMT DCMW DCGW DCGT DCET	21.5○	.500	6.000	.875	.375	.460	10°	**.665**	TS25	TKY08F
S-SDQCR/L-102	**S10R-SDQCR/L2**	●	●		21.5○	.625	8.000	1.000	.406	.560	7°	**.797**	TS25	TKY08F
S-SDQCR/L-123	**S12S-SDQCR/L3**	●	●		32.5○	.750	10.000	1.250	.500	.700	7°	**.954**	TS4	TKY15F
S-SDQCR/L-164	**S16T-SDQCR/L4**	●	●		43○	1.000	12.000	1.500	.641	.910	5°	**1.219**	TS5	TKY25F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31, TS5=66

RECOMMENDED CUTTING CONDITIONS

Steel Shank	l/d ≤ 3	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000 inch)
Heavy Metal Shank	l/d ≤ 3	3 < l/d ≤ 6
Carbide Shank	l/d ≤ 5	5 < l/d ≤ 7

	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180–280HB	Light Cutting	295–525	.002–.006	.008	260–490	.002–.006	.008
			Medium Cutting	195–395	.006–.014	–.118	165–360	.004–.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330–590	.002–.006	.008	330–590	.002–.006	.008
			Medium Cutting	165–295	.006–.010	–.079	130–260	.004–.008	.039
N	Aluminum Alloy	–	Light Cutting	655–1310	.002–.006	.008	655–1310	.002–.006	.008
			Medium Cutting	490–820	.002–.006	–.079	490–820	.002–.006	.059

CC○○ type inserts ➤ A152–A161
DC○○ type inserts ➤ A164–A171
CBN & PCD inserts ➤ B037, B038, B040, B041, B053, B054

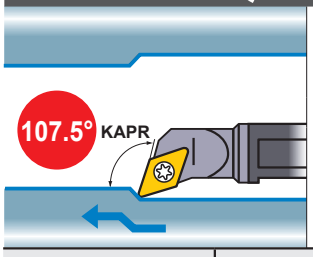
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

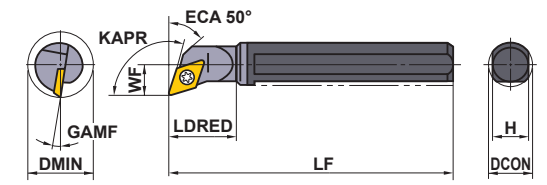
SCREW CLAMP TYPE

- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

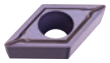
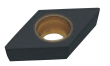
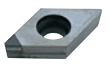
C-SDQC

Carbide shank — **DC○○inserts**





Right hand tool holder shown.

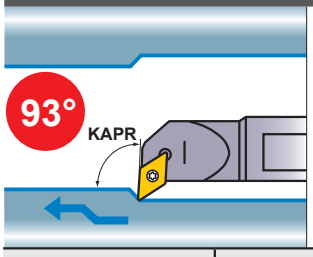
Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat Top**	**PCD/CBN**
MP	MM		
			
(2,3)	(2,3)	(2,3)	(2,3)

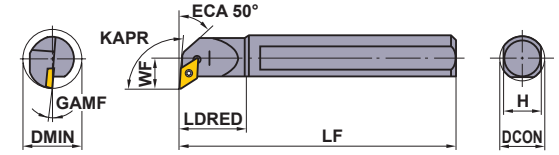
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C-SDQCR/L-082	**C08M-SDQCR/L2**	●	●	DCMT DCMW DCGW DCGT DCET	21.5○	.500	6.000	.875	.375	.485	10°	**.665**	TS25	TKY08F
C-SDQCR/L-102	**C10R-SDQCR/L2**	●	●		21.5○	.625	8.000	1.000	.406	.600	7°	**.797**	TS25	TKY08F
C-SDQCR/L-123	**C12S-SDQCR/L3**	●	●		32.5○	.750	10.000	1.250	.500	.725	7°	**.954**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

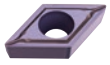
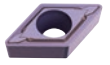
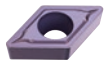
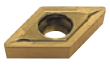
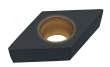
S-SDUC

Steel shank — **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
			
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**Flat top**
MP	MM	Standard	
			
(2,3,4)	(2,3,4)	(2,3,4)	(2,3,4)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SDUCR/L-062	**S06M-SDUCR/L2**	●	●	DCMT DCMW DCGW DCGT DCET	21.5○	.375	6.000	.625	.437	.340	7°	**.664**	TS25	TKY08F
S-SDUCR/L-082	**S08M-SDUCR/L2**	●	●		21.5○	.500	6.000	.750	.500	.460	7°	**.789**	TS25	TKY08F
S-SDUCR/L-102	**S10R-SDUCR/L2**	●	●		21.5○	.625	8.000	1.250	.563	.560	7°	**.954**	TS25	TKY08F
S-SDUCR/L-123	**S12S-SDUCR/L3**	●	●		32.5○	.750	10.000	1.875	.625	.700	7°	**1.079**	TS4	TKY15F
S-SDUCR/L-164	**S16T-SDUCR/L4**	●	●		43○	1.000	12.000	2.500	.750	.910	5°	**1.329**	TS5	TKY25F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31, TS5=66

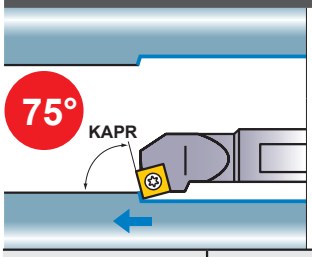
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

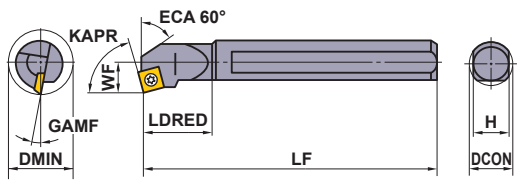
● : USA Stock

DC○○ type inserts	**➤ A164–A171**
CBN & PCD inserts	**➤ B040, B041, B054**

S-SSKC

Steel shank — **SC○○inserts**





Right hand tool holder shown.

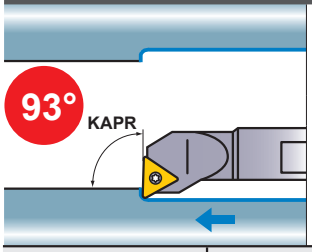
Finish	Finish	Light	Light
FP (3)	FM (3)	LP (3)	LM (3)
Medium	**Medium**	**Medium**	**Flat Top**
MP (3,4)	MM (3,4)	Standard (3,4)	(3,4)

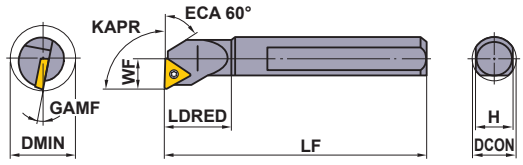
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SSKCR/L-103	**S10R-SSKCR/L3**	●	●	SCMT SCMW	32.5○	.625	8.000	1.250	.406	.560	10°	**.797**	TS4	TKY15F
S-SSKCR/L-123	**S12S-SSKCR/L3**	●	●		32.5○	.750	10.000	1.875	.500	.700	8°	**.954**	TS4	TKY15F
S-SSKCR/L-164	**S16T-SSKCR/L4**	●	●		43○	1.000	12.000	2.500	.641	.910	7°	**1.219**	TS5	TKY25F

* Clamp Torque (lbf-in) : TS4=31, TS5=66

S-STUC

Steel shank — **TC○○inserts**





Right hand tool holder shown.

Finish	Finish
FP (2,3)	FM (2,3)
Light	**Medium**
LP (2,3)	MP (2,3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-STUCR/L-062	**S06M-STUCR/L2**	●	●	TCMT TCMW TCGT TCGW	21.5○	.375	6.000	.625	.250	.360	15°	**.477**	TS25	TKY08F
S-STUCR/L-082	**S08M-STUCR/L2**	●	●		21.5○	.500	6.000	.750	.313	.485	13°	**.602**	TS25	TKY08F
S-STUCR/L-102	**S10R-STUCR/L2**	●	●		21.5○	.625	8.000	1.250	.406	.600	10°	**.797**	TS25	TKY08F
S-STUCR/L-123	**S12S-STUCR/L3**	●	●		32.5○	.750	10.000	1.875	.500	.725	8°	**.954**	TS4	TKY15F
S-STUCR/L-163	**S16T-STUCR/L3**	●	●		32.5○	1.000	12.000	2.500	.641	.910	7°	**1.219**	TS4	TKY15F
S-STUCR/L-203	**S20T-STUCR/L3**	●	●		32.5○	1.250	12.000	2.500	.875	1.160	5°	**1.579**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

RECOMMENDED CUTTING CONDITIONS

Steel Shank	l/d ≤ 3	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000 inch)
Heavy Metal Shank	l/d ≤ 3	3 < l/d ≤ 6
Carbide Shank	l/d ≤ 5	5 < l/d ≤ 7

	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180–280HB	Light Cutting	295–525	.002–.006	.008	260–490	.002–.006	.008
			Medium Cutting	195–395	.006–.014	–.118	165–360	.004–.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330–590	.002–.006	.008	330–590	.002–.006	.008
			Medium Cutting	165–295	.006–.010	–.079	130–260	.004–.008	.039
N	Aluminum Alloy	–	Light Cutting	655–1310	.002–.006	.008	655–1310	.002–.006	.008
			Medium Cutting	490–820	.002–.006	–.079	490–820	.002–.006	.059

SC○○ type inserts ➤ A174, A175
TC○○ type inserts ➤ A177–A180
CBN & PCD inserts ➤ B042, B055

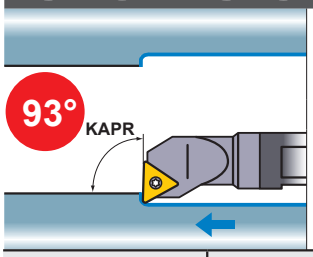
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

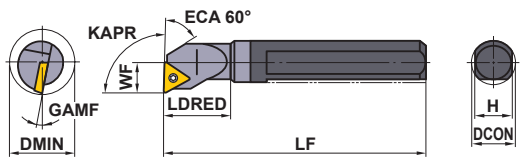
SCREW CLAMP TYPE

- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

C-STUC

Carbide shank — **TC○○inserts**





Right hand tool holder shown.

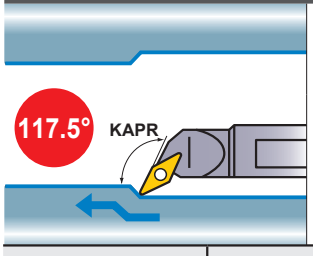
Finish	Finish
FP	FM
(2,3)	(2,3)
Light	**Medium**
LP	MP
(2,3)	(2,3)

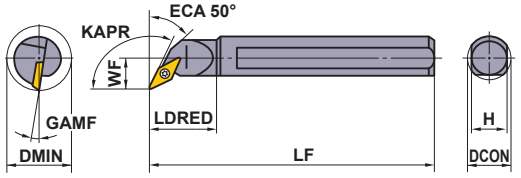
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C-STUCR/L-062	C06M-STUCR/L2	●	●	TCMT TCMW TCGT	21.5○	.375	6.000	.625	.250	.340	15°	**.477**	TS25	TKY08F
C-STUCR/L-082	C08M-STUCR/L2	●	●		21.5○	.500	6.000	.750	.313	.460	13°	**.602**	TS25	TKY08F
C-STUCR/L-102	C10R-STUCR/L2	●	●	TCGW	21.5○	.625	8.000	1.250	.406	.560	10°	**.797**	TS25	TKY08F

* Clamp Torque (lbf-in) : TS25=8.9

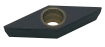
S-SVQC

Steel shank — **VC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3)	(3)	(2,3)	(2,3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SVQCR/L-102	S10R-SVQCR/L2	●	●	VCMT VCMW VCGT	22○	.625	8.000	1.000	.406	.560	8°	**.797**	TS25	TKY08F
S-SVQCR/L-122	S12S-SVQCR/L2	●	●		22○	.750	10.000	1.250	.500	.700	7°	**.954**	TS25	TKY08F
S-SVQCR/L-163	S16T-SVQCR/L3	●	●	VCGW	33○	1.000	12.000	1.500	.641	.910	6°	**1.219**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

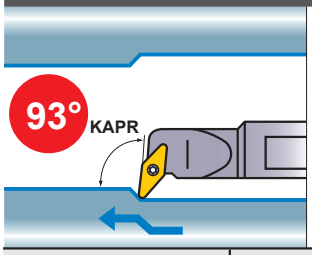
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

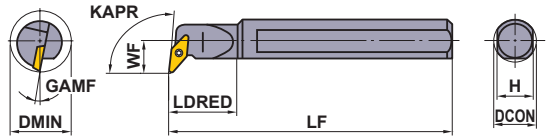
● : USA Stock

TC○○ type inserts	**➤ A177–A180**
VC○○ type inserts	**➤ A190–A192**
CBN & PCD inserts	**➤ B042, B046, B055, B058**

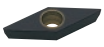
S-SVUC

Steel shank — **VC○○inserts**





Right hand tool holder shown.

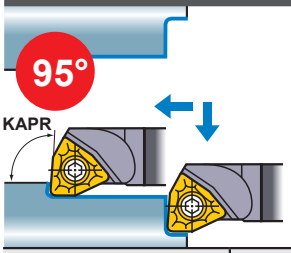
Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**Flat Top**
MP	MM	Standard	
			
(3)	(3)	(2,3)	(2,3)

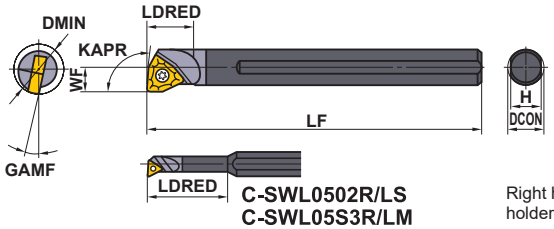
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SVUCR/L-122	**S12S-SVUCR/L2**	●	●	VCMT VCMW VCGT VCGW	22○	.750	10.000	1.250	.500	.700	7°	**1.000**	TS25	TKY08F
S-SVUCR/L-163	**S16T-SVUCR/L3**	●	●		33○	1.000	12.000	1.500	.641	.910	6°	**1.281**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25=8.9, TS4=31

C-SWL

Carbide shank — **WC○○inserts**





C-SWL0502R/LS
C-SWL05S3R/LM

Right hand tool holder shown.

Finish	Finish	Light
FJ-P	R/L	MJ
(2)	(1.2,1.5)	(2)
Light	**Medium**	**CBN**
MJ-P	Standard	
(2)	(1.2,1.5,2)	(1.5,2)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C-SWL0502R/LS	**C05K-SWLCR/L1.2**	●	●	WCMT WCGT WCMW WCGW	1.21○	.313	5.000	1.000	.114	.282	17°	**.228**	TS21	TKY06F
C-SWL05S3R/LM	**C05K-SWLCR/L1.5**	●	●		1.51.5○	.313	5.000	1.370	.156	.282	15°	**.312**	TS2	TKY06F
C-SWL0504R/L	**C05K-SWLCR/L2**	●	●		21.5○	.313	5.000	.598	.203	.282	15°	**.406**	TS25	TKY08F

* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9

RECOMMENDED CUTTING CONDITIONS

Steel Shank	l/d ≤ 3	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000 inch)
Heavy Metal Shank	l/d ≤ 3	3 < l/d ≤ 6
Carbide Shank	l/d ≤ 5	5 < l/d ≤ 7

	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180—280HB	Light Cutting	295—525	.002—.006	.008	260—490	.002—.006	.008
			Medium Cutting	195—395	.006—.014	—.118	165—360	.004—.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330—590	.002—.006	.008	330—590	.002—.006	.008
			Medium Cutting	165—295	.006—.010	—.079	130—260	.004—.008	.039
N	Aluminum Alloy	—	Light Cutting	655—1310	.002—.006	.008	655—1310	.002—.006	.008
			Medium Cutting	490—820	.002—.006	—.079	490—820	.002—.006	.059

VC○○ type inserts ➤ A190—A192
WC○○ type inserts ➤ A196, A197
CBN & PCD inserts ➤ B046, B058, B059

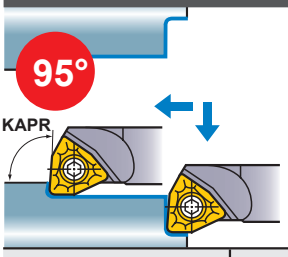
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

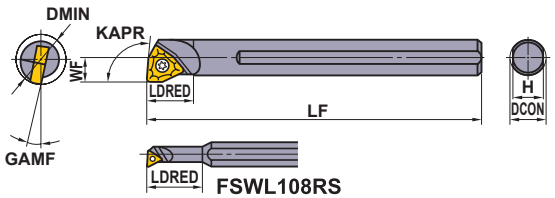
SCREW CLAMP TYPE

- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

FSWL1

Steel shank — **WC○○inserts**





Right hand tool holder only.

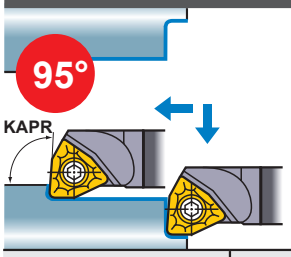
Finish	Finish	Light
FJ-P	R/L	MJ
(2,3)	(1.2,1.5)	(2,3)
Light	**Medium**	**CBN**
MJ-P	Standard	
(2,3)	(1.2,1.5,2,3)	(2,3)

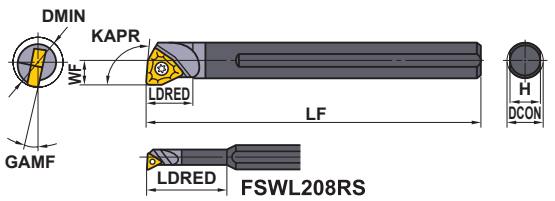
Order Number	ANSI Order Number	Stock R	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
FSWL108RS	**S08H-SWLCR1.2**	★	WCMT WCGT	1.21○	8	100	19	2.9	7	17°	**5.8**	TS21	TKY06F
FSWL108RM	**S08H-SWLCR1.5**	★	WCMT WCGT WCMW	1.51.5○	8	100	25	4	7	15°	**8**	TS2	TKY06F
FSWL108R	**S08K-SWLCR2**	★	WCMT WCGW	21.5○	8	125	10	5	7	15°	**10**	TS25	TKY08F
FSWL110R	**S10M-SWLCR2**	★		21.5○	10	150	12	6	9	13°	**12**	TS25	TKY08F
FSWL112R	**S12Q-SWLCR3**	★		32.5○	12	180	15	8	11	13°	**16**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS21=5.3, TS25=8.9, TS4=31

FSWL2

Carbide shank — **WC○○inserts**





Right hand tool holder only.

Finish	Finish	Light
FJ-P	R/L	MJ
(2,3)	(1.2,1.5)	(2,3)
Light	**Medium**	**CBN**
MJ-P	Standard	
(2,3)	(1.2,1.5,2,3)	(2,3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
FSWL208RS	**C08X-SWLCR1.2**	★		WCMT WCGT	1.21○	8	122	25	2.9	7	17°	**5.8**	TS21	TKY06F
FSWL208R/LM	**C08K-SWLCR/L1.5**	★	★		1.51.5○	8	125	33	4	7	15°	**8**	TS2	TKY06F
FSWL208R	**C08K-SWLCR2**	★			21.5○	8	125	10	5	7	15°	**10**	TS25	TKY08F
FSWL210R/L	**C10M-SWLCR/L2**	★	★	WCMT	21.5○	10	150	12	6	9	13°	**12**	TS25	TKY08F
FSWL212R/L	**C10Q-SWLCR/L3**	★	★	WCGW	32.5○	12	180	15	8	11	13°	**16**	TS4	TKY15F
FSWL216R/L	**C16R-SWLCR/L3**	★	★	WCMT	32.5○	16	200	20	11	14	7°	**22**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9, TS4=31

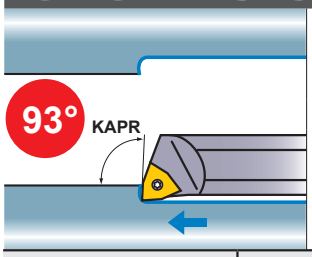
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

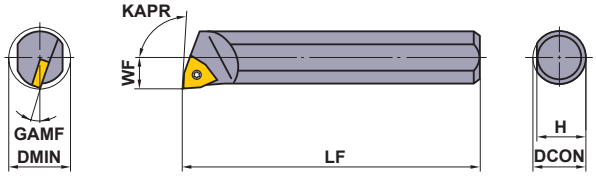
● : USA Stock ★ : Stocked in Japan □ : Made to Order

WC○○ type inserts	**➢ A196, A197**
CBN & PCD inserts	**➢ B059**

S-SWUC

Steel shank — **WC○○inserts**





Right hand tool holder shown.

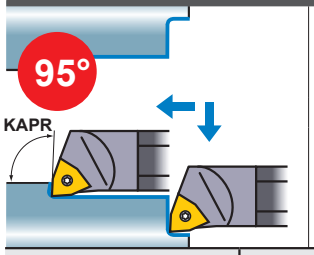
Finish	Finish	Light
FJ-P	R/L	MJ
(2,3)	(1.2,1.5)	(2,3)
Light	**Medium**	**CBN**
MJ-P	Standard	
(2,3)	(1.2,1.5,2,3)	(2,3)

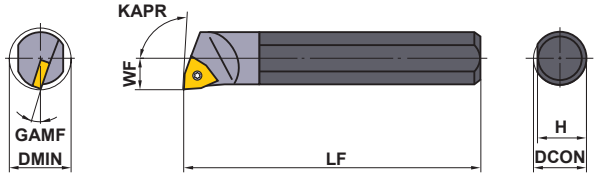
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-SWUCR/L-055	S03H-SWUCR/L1.2	●	●	WCMT WCMW WCGT WCGW	1.21○	.188	4.000	.114	.172	17°	**.228**	TS21	TKY06F
S-SWUCR/L-065	S04H-SWUCR/L1.2	●	●		1.21○	.250	4.000	.156	.235	17°	**.312**	TS2	TKY06F
S-SWUCR/L-066	S05M-SWUCR/L1.5	●	●		1.51.5○	.313	6.000	.188	.295	15°	**.375**	TS2	TKY06F
S-SWUCR/L-062	S06M-SWUCR/L2	●	●		21.5○	.375	6.000	.250	.358	11°	**.500**	TS25	TKY08F
S-SWUCR/L-082	S08M-SWUCR/L2	●	●		21.5○	.500	6.000	.312	.480	9°	**.625**	TS25	TKY08F
S-SWUCR/L-103	S10R-SWUCR/L3	●	●		32.5○	.625	8.000	.406	.593	7°	**.750**	TS4	TKY15F
S-SWUCR/L-123	S12S-SWUCR/L3	●	●		32.5○	.750	10.000	.500	.725	10°	**1.000**	TS4	TKY15F
S-SWUCR/L-163	S16T-SWUCR/L3	●	●		32.5○	1.000	12.000	.640	.975	7°	**1.250**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9, TS4=31

C-SWLO

Carbide shank — **WC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light
FJ-P	R/L	MJ
(2)	(1.2,1.5)	(2)
Light	**Medium**	**CBN**
MJ-P	Standard	
(2)	(1.2,1.5,2)	(1.5,2)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C-SWLOR/L-055	C03H-SWLOR/L1.2	●	□	WCMT WCMW WCGT WCGW	1.21○	.188	4.000	.114	.172	17°	**.228**	TS21	TKY06F
C-SWLOR/L-065	C04H-SWLOR/L1.2	●	□		1.21○	.250	4.000	.156	.235	17°	**.313**	TS2	TKY06F
C-SWLOR/L-066	C05M-SWLOR/L1.5	●	□		1.51.5○	.313	6.000	.188	.295	15°	**.375**	TS2	TKY06F
C-SWLOR/L-070	C06M-SWLOR/L2	●	□		21.5○	.375	6.000	.218	.358	15°	**.438**	TS25	TKY08F
C-SWLOR/L-062	C06M-SWLOR/L2-D	●	□		21.5○	.375	6.000	.250	.358	15°	**.500**	TS25	TKY08F

* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9

RECOMMENDED CUTTING CONDITIONS

Steel Shank	l/d ≤ 3	3 < l/d ≤ 4 (Shank Diameter ≥ 1.000 inch)
Heavy Metal Shank	l/d ≤ 3	3 < l/d ≤ 6
Carbide Shank	l/d ≤ 5	5 < l/d ≤ 7

	Work Material	Hardness	Cutting Mode	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)
P	Carbon Steel Alloy Steel	180–280HB	Light Cutting	295–525	.002–.006	.008	260–490	.002–.006	.008
			Medium Cutting	195–395	.006–.014	–.118	165–360	.004–.008	.059
M	Stainless Steel	≤200HB	Light Cutting	330–590	.002–.006	.008	330–590	.002–.006	.008
			Medium Cutting	165–295	.006–.010	–.079	130–260	.004–.008	.039
N	Aluminum Alloy	–	Light Cutting	655–1310	.002–.006	.008	655–1310	.002–.006	.008
			Medium Cutting	490–820	.002–.006	–.079	490–820	.002–.006	.059

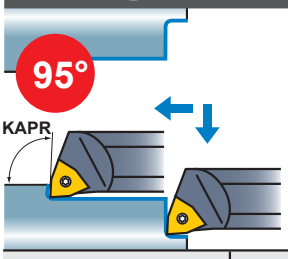
WC○○ type inserts ➤ A196, A197
CBN & PCD inserts ➤ B059
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

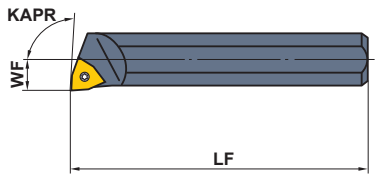
SCREW CLAMP TYPE

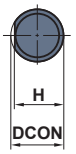
- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Steel and carbide shanks are stocked in various diameters.

M-SWLO

Heavy metal shank — **WC○○inserts**







Right hand tool holder shown.

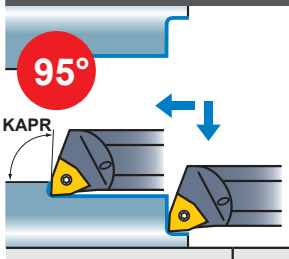
Finish	Finish	Light
FJ-P (2,3)	R/L (1.2,1.5)	MJ (2,3)
Light	**Medium**	**CBN**
MJ-P (2,3)	Standard (1.2,1.5,2,3)	(2,3)

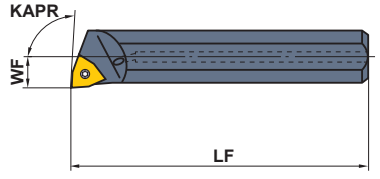
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
M-SWLOR/L-055	**H03H-SWLOR/L1.2**	●	●	WCMT WCGT WCMW WCGW	1.21○	.188	4.000	.114	.172	17°	**.228**	TS21	TKY06F
M-SWLOR/L-065	**H04H-SWLOR/L1.2**	●	●		1.21○	.250	4.000	.156	.235	17°	**.313**	TS2	TKY06F
M-SWLOR/L-066	**H05M-SWLOR/L1.5**	●	●		1.51.5○	.313	6.000	.188	.295	15°	**.375**	TS2	TKY06F
M-SWLOR/L-070	**H05M-SWLOR/L2**	●	●		21.5○	.375	6.000	.218	.358	15°	**.438**	TS25	TKY08F
M-SWLOR/L-062	**H06M-SWLOR/L2**	●	●		21.5○	.375	6.000	.250	.358	15°	**.500**	TS25	TKY08F
M-SWLOR/L-082	**H08M-SWLOR/L2**	●	●		21.5○	.500	6.000	.312	.480	13°	**.625**	TS25	TKY08F
M-SWLOR/L-103	**H10R-SWLOR/L3**	●	●		32.5○	.625	8.000	.375	.600	10°	**.750**	TS4	TKY15F
M-SWLOR/L-123	**H12S-SWLOR/L3**	●	●		32.5○	.750	10.000	.500	.725	8°	**1.000**	TS4	TKY15F
M-SWLOR/L-163	**H16T-SWLOR3**	●			32.5○	1.000	12.000	.640	.975	7°	**1.250**	TS4	TKY15F

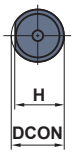
* Clamp Torque (lbf-in) : TS21=5.3, TS2=5.3, TS25=8.9, TS4=31

M-SWLO

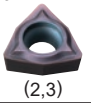
Heavy metal shank coolant through — **WC○○inserts**







Right hand tool holder shown.

Finish	Finish	Light
FJ-P (2,3)	R/L (1.2,1.5)	MJ  (2,3)
Light	**Medium**	**CBN**
MJ-P (2,3)	Standard (1.5,2,3)	(2,3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
M-SWLOR/L-066-C	**J05M-SWLOR/L1.5**	●	●	WCMT WCGT WCMW WCGW	1.51.5○	.313	6.000	.188	.295	15°	**.375**	TS2	TKY06F
M-SWLOR/L-070-C	**J05M-SWLOR/L2**	●	●		21.5○	.375	6.000	.218	.358	15°	**.438**	TS25	TKY08F
M-SWLOR/L-062-C	**J06M-SWLOR/L2**	●	●		21.5○	.375	6.000	.250	.358	15°	**.500**	TS25	TKY08F
M-SWLOR/L-082-C	**J08M-SWLOR/L2**	●	●		21.5○	.500	6.000	.312	.480	13°	**.625**	TS25	TKY08F
M-SWLOR/L-103-C	**J10R-SWLOR/L3**	●	●		32.5○	.625	8.000	.375	.600	10°	**.750**	TS4	TKY15F
M-SWLOR/L-123-C	**J12S-SWLOR/L3**	●	●		32.5○	.750	10.000	.500	.725	8°	**1.000**	TS4	TKY15F
M-SWLOR/L-163-C	**J16T-SWLOR/L3**	●	●		32.5○	1.000	12.000	.640	.975	7°	**1.250**	TS4	TKY15F

* Clamp Torque (lbf-in) : TS2=5.3, TS25=8.9, TS4=31

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : USA Stock

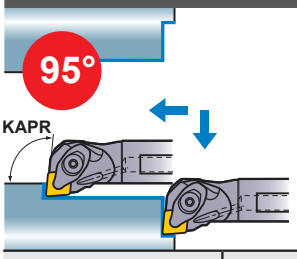
CUTTING CONDITIONS	➤ E019
WC○○ type inserts	➤ A196, A197
CBN & PCD inserts	➤ B059

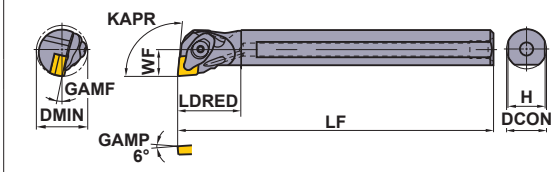
DOUBLE CLAMP DIMPLE BAR

- Negative rake.
- New double clamp type.
- Holds inserts securely.
- Excellent cutting edge repeatability.

S-DCLN

Steel shank coolant through — **CN○○inserts**





Right hand tool holder shown.

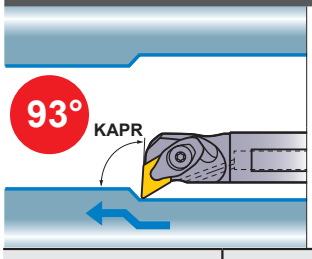
Finish	Light	Light	Light
FP	SA	LP	LM
(4)	(4)	(4)	(4)
Medium	**Medium**	**Stainless**	**CBN/PCD**
MP	Standard	MM	
(4)	(3,4)	(4)	(4)

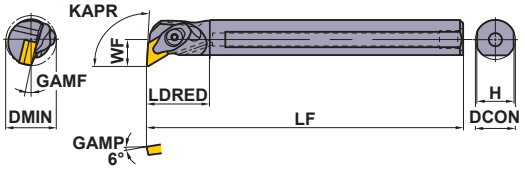
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	* Clamp Screw	Wrench
S-DCLNR/L-123-C	AX12S-DCLNR/L3	●	●	CNMA CNMG	32○	.750	10.000	1.219	.500	.711	12°	1.000	LLSCP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DCLNR/L-163-C	AX16T-DCLNR/L3	●	●		32○	1.000	12.000	1.625	.641	.922	11°	1.281	LLSCP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DCLNR/L-164-C	AX16T-DCLNR/L4	●	●	CNMA CNMG	43○	1.000	12.000	1.625	.641	.922	11°	1.281	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L-204-C	AX20U-DCLNR/L4	●	●		43○	1.250	14.000	2.000	.766	1.171	13°	1.532	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L-244-C	AX24U-DCLNR/L4	●	●	CNMM CNGA CNGG	43○	1.500	14.000	2.000	.891	1.382	12°	1.782	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L-284-C	AX28U-DCLNR/L4	●	●		43○	1.750	14.000	2.500	1.016	1.632	10°	2.032	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DCLNR/L-324-C	AX32U-DCLNR/L4	●	●		43○	2.000	14.000	2.500	1.281	1.882	10°	2.562	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

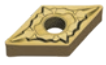
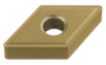
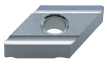
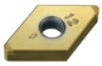
S-DDUN

Steel shank coolant through — **DN○○inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
			
(4)	(4)	(4)	(4)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	* Clamp Screw	Wrench
S-DDUNR/L-164-C	AX16T-DDUNR/L4	●	●	DNMA DNMG	43○	1.000	12.000	1.625	.657	.922	13°	1.314	LLSDP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L-204-C	AX20U-DDUNR/L4	●	●		43○	1.250	14.000	2.000	1.000	1.171	11°	2.000	LLSDN43	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L-244-C	AX24U-DDUNR/L4	●	●	DNMX DNGA DNGG	43○	1.500	14.000	2.000	1.125	1.382	10°	2.250	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L-284-C	AX28U-DDUNR/L4	●	●		43○	1.750	14.000	2.500	1.250	1.632	9°	2.500	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F
S-DDUNR/L-324-C	AX32U-DDUNR/L4	●	●		43○	2.000	14.000	2.500	1.375	1.882	8°	2.750	LLSDN43	LLP24	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180—280HB	Medium Cutting	360 (260—460)	.010 (.004—.016)	—.197	360 (260—460)	.008 (.004—.012)	—.157
M	Stainless Steel	≤200HB	Medium Cutting	260 (195—330)	.008 (.004—.012)	—.157	230 (165—330)	.006 (.004—.015)	—.118
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	260 (195—330)	.010 (.004—.016)	—.197	260 (195—330)	.008 (.004—.012)	—.157

CN○○ type inserts ➤ A106—A113
DN○○ type inserts ➤ A114—A121
CBN & PCD inserts ➤ B022—B028, B049

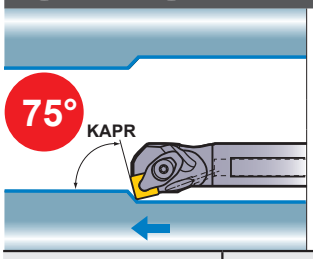
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

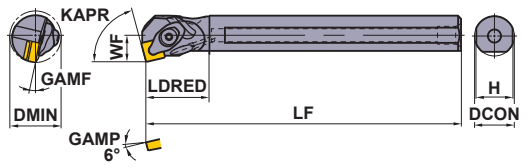
DOUBLE CLAMP DIMPLE BAR

- Negative rake.
- New double clamp type.
- Holds inserts securely.
- Excellent cutting edge repeatability.

S-DSKN

Steel shank coolant through — **SN○○ inserts**





Right hand tool holder shown.

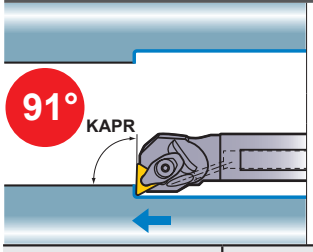
Finish	Light	Medium	Medium
FP	LP	MP	MH
(4)	(4)	(4)	(4)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
(4)	(4)	(4)	(4)

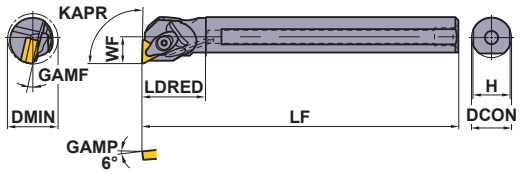
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	* Clamp Screw	Wrench
S-DSKNR/L-164-C	**AX16T-DSKNR/L4**	●	●	SNMA SNMG SNMM SNGA SNGG	43○	1.000	12.000	1.625	.641	.922	13°	1.282	LLSSP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-204-C	**AX20U-DSKNR/L4**	●	●		43○	1.250	14.000	2.000	.766	1.171	13°	1.532	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-244-C	**AX24U-DSKNR/L4**	●	●		43○	1.500	14.000	2.000	.891	1.382	11°	1.782	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-284-C	**AX28U-DSKNR/L4**	●	●		43○	1.750	14.000	2.500	1.016	1.632	10°	2.032	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DSKNR/L-324-C	**AX32U-DSKNR/L4**	●	●		43○	2.000	14.000	2.500	1.281	1.882	9°	2.562	LLSSN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0621T=44

S-DTFN

Steel shank coolant through — **TN○○ inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
(3)	(3,4)	(3,4)	(3,4)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
(3,4)	(3,4)	(3,4)	(3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	* Clamp Screw	Wrench
S-DTFNR/L-123-C	**AX12S-DTFNR/L3**	●	●	TNMA TNMG TNMM TNGA TNGG	33○	.750	10.000	1.250	.500	.711	13°	1.000	—	—	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-163-C	**AX16T-DTFNR/L3**	●	●		33○	1.000	12.000	1.625	.641	.922	13°	1.282	LLSTP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-203-C	**AX20U-DTFNR/L3**	●	●		33○	1.250	14.000	2.000	.766	1.171	13°	1.532	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-243-C	**AX24U-DTFNR/L3**	●	●		33○	1.500	14.000	2.000	.891	1.382	12°	1.782	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-244-C	**AX24U-DTFNR/L4**	●	●		43○	1.500	14.000	2.000	.891	1.382	12°	1.782	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DTFNR/L-283-C	**AX28U-DTFNR/L3**	●	●		33○	1.750	14.000	2.500	1.016	1.632	11°	2.032	LLSTN32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DTFNR/L-284-C	**AX28U-DTFNR/L4**	●	●		43○	1.750	14.000	2.500	1.016	1.632	11°	2.032	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DTFNR/L-324-C	**AX32U-DTFNR/L4**	●	●		43○	2.000	14.000	2.500	1.125	1.882	10°	2.250	LLSTN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

* Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

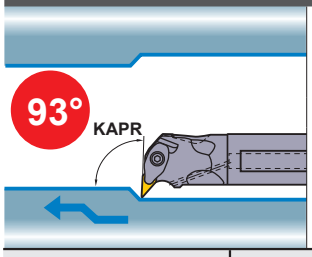
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

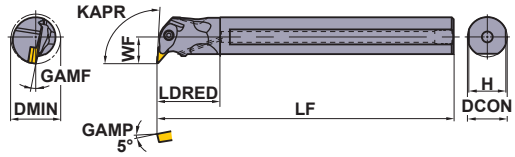
● : USA Stock

SN○○ type inserts	**➤ A123–A129**
TN○○ type inserts	**➤ A130–A137**
CBN & PCD inserts	**➤ B029–B031, B050**

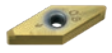
S-DVUN

Steel shank coolant through — **VN○○inserts**





Right hand tool holder shown.

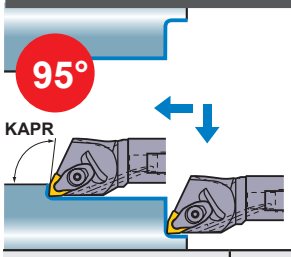
Finish	Light	Medium	Medium
FP	LP	MP	MH
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
			
(3)	(3)	(3)	(3)

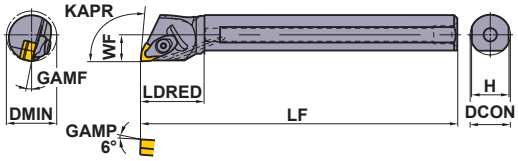
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	✱ Clamp Screw	Wrench
S-DVUNR/L-203-C	**AX20U-DVUNR/L3**	●	●	VNMA VNMG VNMM VNGA VNGM	33○	1.250	14.000	2.000	1.000	1.171	10°	2.000	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F
S-DVUNR/L-243-C	**AX24U-DVUNR/L3**	●	●		33○	1.500	14.000	2.500	1.125	1.382	9°	2.250	DCSVN32	LLP13	DCK3113	DCS2	DC0520T	TKY15F

✱ Clamp Torque (lbf-in) : DC0520T=31

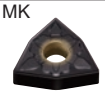
S-DWLN

Steel shank coolant through — **WN○○inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(3,4)	(3,4)	(4)
Medium	**Medium — Rough**	**Stainless**	
Standard	RP	MM	
(4)	(4)	(3,4)	

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		DCON	LF	LDRED	WF	H	GAMF	DMIN	Shim	Shim Pin	Clamp Bridge	Spring	✱ Clamp Screw	Wrench
S-DWLNR/L-123-C	**AX12S-DWLNR/L3**	●	●	WNMA WNMG	33○	.750	10.000	1.250	.500	.711	12°	1.000	—	—	DCK2211	DCS2	DC0520T	TKY15F
S-DWLNR/L-163-C	**AX16T-DWLNR/L3**	●	●		33○	1.000	12.000	1.750	.641	.922	13°	1.282	LLSWP32	LLP13	DCK2211	DCS2	DC0520T	TKY15F
S-DWLNR/L-164-C	**AX16T-DWLNR/L4**	●	●	WNMA WNMG WNGA	43○	1.000	12.000	2.000	.641	.922	13°	1.282	LLSWP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-204-C	**AX20U-DWLNR/L4**	●	●		43○	1.250	14.000	2.000	.766	1.171	13°	1.532	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-244-C	**AX24U-DWLNR/L4**	●	●		43○	1.500	14.000	2.500	.891	1.382	12°	1.782	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-284-C	**AX28U-DWLNR/L4**	●	●		43○	1.750	14.000	2.500	1.125	1.632	11°	2.250	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
S-DWLNR/L-324-C	**AX32U-DWLNR/L4**	●	●		43○	2.000	14.000	2.500	1.281	1.882	10°	2.562	LLSWN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

✱ Clamp Torque (lbf-in) : DC0520T=31, DC0621T=44

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180—280HB	Medium Cutting	360 (260—460)	.010 (.004—.016)	—.197	360 (260—460)	.008 (.004—.012)	—.157
M	Stainless Steel	≤200HB	Medium Cutting	260 (195—330)	.008 (.004—.012)	—.157	230 (165—330)	.006 (.004—.015)	—.118
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	260 (195—330)	.010 (.004—.016)	—.197	260 (195—330)	.008 (.004—.012)	—.157

VN○○ type inserts ➤ A138—A141
WN○○ type inserts ➤ A142—A147
CBN & PCD inserts ➤ B032—B034, B051

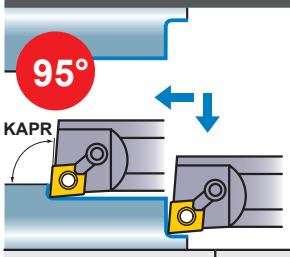
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

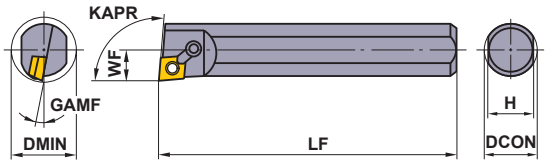
MULTIPLE CLAMP TYPE

- Negative rake.
- Two wall pocket.
- Pin lock and top clamp retention.

S-MCLN

Steel shank — **CN○○inserts**





Right hand tool holder shown.

Finish	Light	Light	Light
FP	SA	LP	LM
(4)	(4)	(4)	(4)
Medium	**Medium**	**Stainless**	**CBN/PCD**
MP	Standard	MM	
(4)	(3,4,6)	(4,6)	(4)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	*3 Shim Pin	Clamp Bridge	*3 Clamp Screw
S-MCLNR/L-123	**S12S-MCLNR/L3**	●	●	CNMA CNMG CNMM CNGA CNGG	32○	.750	10.000	.500	.700	10°	**1.000**	—	NL33	CL6	XNS36
S-MCLNR/L-163	**S16T-MCLNR/L3**	●	●		32○	1.000	12.000	.640	.910	10°	**1.280**	—	NL33	CL6	XNS36
S-MCLNR/L-164	**S16T-MCLNR/L4**	●	●		43○ *2	1.000	12.000	.640	.910	14°	**1.280**	—	NL44	CL20	XNS48
S-MCLNR/L-204	**S20U-MCLNR/L4**	●	●		43○ *2	1.250	12.000	.765	1.160	14°	**1.530**	ICSN433 *1	NL46	CL20	XNS48
S-MCLNR/L-244	**S24U-MCLNR/L4**	●	●		43○ *2	1.500	14.000	.890	1.410	11°	**1.780**	ICSN433 *1	NL46	CL20	XNS48
S-MCLNR/L-284	**S28U-MCLNR/L4**	●	●		43○ *2	1.750	14.000	1.015	1.660	11°	**2.030**	ICSN433 *1	NL46	CL20	XNS48
S-MCLNR/L-326	**S32V-MCLNR/L6**	●	●		64○	2.000	16.000	1.281	1.910	11°	**2.562**	ICSN633	NL68	CL12	XNS510

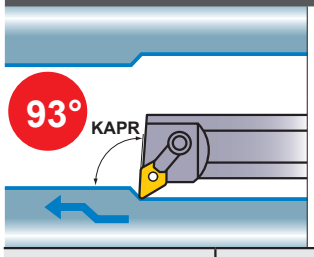
*1 (Opt.) See page M012 for different radius.
*2 For inserts without hole, remove shim pin and add below.

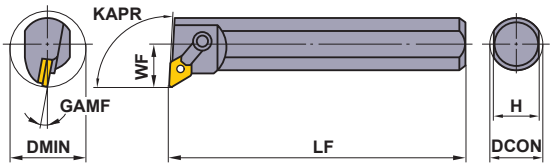
Shim Screw	S46	Chip Breaker	CBC4

*3 Clamp Torque (lbf-in) : NL33=13, NL44=19, NL46=19, NL68=43, XNS36=30, XNS48=45, XNS510=70

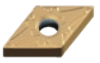
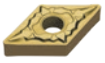
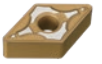
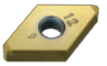
S-MDUN

Steel shank — **DN○○inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
			
(4)	(4)	(4)	(4)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
			
(4)	(4)	(4)	(4)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	*2 Shim Pin	Clamp Bridge	*2 Clamp Screw
S-MDUNR/L-204	**S20U-MDUNR/L4**	●	●	DNMA DNMG DNMM DNGA DNGG DNGM	43○	1.250	14.000	1.000	1.160	11°	**2.000**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L-244	**S24U-MDUNR/L4**	●	●		43○	1.500	14.000	1.125	1.410	11°	**2.250**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L-284	**S28U-MDUNR/L4**	●	●		43○	1.750	14.000	1.250	1.660	11°	**2.500**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L-285	**S28U-MDUNR5**	●			54○ *1	1.750	14.000	1.375	1.660	11°	**2.750**	IDSN533 *1	NL58	CL30	XNS510
S-MDUNR/L-324	**S32V-MDUNR/L4**	●	●		43○	2.000	16.000	1.375	1.910	11°	**2.750**	IDSN433	NL46	CL12	XNS59
S-MDUNR/L-325	**S32V-MDUNR5**	●			54○ *1	2.000	16.000	1.500	1.910	11°	**3.000**	IDSN533 *1	NL58	CL30	XNS510

*1 (Opt.) See page M012 for different thickness.
*2 Clamp Torque (lbf-in) : NL46=19, NL58=29, XNS59=70, XNS510=70

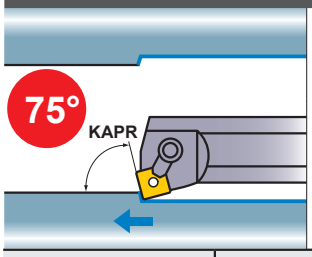
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

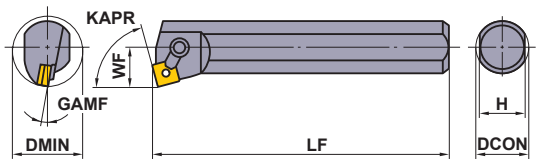
● : USA Stock □ : Made to Order

CN○○ type inserts	**➤ A106–A113**
DN○○ type inserts	**➤ A114–A121**
CBN & PCD inserts	**➤ B022–B028, B049**

S-MSKN

Steel shank — **SN○○inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
(4)	(4)	(4)	(4,6)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
(4,6)	(4,6)	(4,6)	(4)

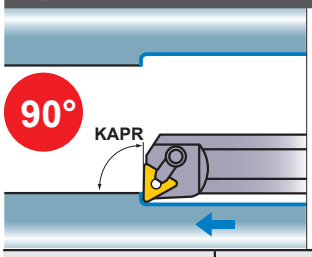
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	*3 Shim Pin	Clamp Bridge	*3 Clamp Screw
S-MSKNR/L-204	**S20T-MSKNR/L4**	●	●	SNMA SNMG SNMM SNGA	43○ *1 *2	1.250	12.000	.765	1.160	14°	**1.470**	—	NL44	CL20	XNS47
S-MSKNR/L-244	**S24U-MSKNR/L4**	●	●		43○ *1 *2	1.500	14.000	.890	1.410	10°	**1.760**	ISSN433 *1	NL46	CL20	XNS47
S-MSKNR/L-284	**S28U-MSKNR/L4**	●	●		43○ *1 *2	1.750	14.000	1.015	1.660	10°	**2.010**	ISSN433 *1	NL46	CL20	XNS47
S-MSKNR/L-326	**S32V-MSKNR/L6**	●	●	SNGG	64○ *1	2.000	16.000	1.281	1.910	12°	**2.400**	ISSN633 *1	NL68	CL12	XNS510

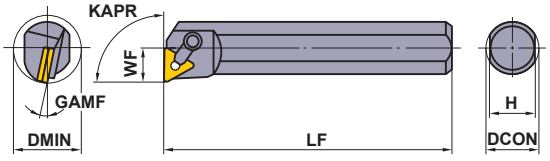
*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : NL44=19, NL46=19, NL68=43, XNS47=45, XNS510=70

Shim Screw	S34	Chip Breaker	CBS4

S-MTFN

Steel shank — **TN○○inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MH
(3)	(3,4)	(3,4)	(3,4)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
(3,4)	(3,4)	(3,4)	(3)

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	*3 Shim Pin	Clamp Bridge	*3 Clamp Screw
S-MTFNR/L-163X	**S16T-MTFNR/L3**	●	●	TNMA TNMG TNMM TNGA TNGG	33○ *1 *2	1.000	12.000	.640	.910	14°	**1.280**	ITSN323 *1	NL34L	CL7	XNS36
S-MTFNR/L-203X	**S20U-MTFNR/L3**	●	●		33○ *1 *2	1.250	14.000	.765	1.160	14°	**1.530**	ITSN323 *1	NL34L	CL7	XNS36
S-MTFNR/L-243X	**S24U-MTFNR/L3**	●	●		33○ *1 *2	1.500	14.000	.890	1.410	11°	**1.780**	ITSN323 *1	NL34L	CL7	XNS36
S-MTFNR/L-244	**S24U-MTFNR/L4**	●	●		43○ *1	1.500	14.000	.890	1.410	11°	**2.060**	ITSN433 *1	NL46	CL9	XNS59
S-MTFNR/L-283X	**S28U-MTFNR3**	□			33○ *1 *2	1.750	14.000	1.015	1.660	11°	**2.030**	ITSN323 *1	NL34L	CL7	XNS36
S-MTFNR/L-284	**S28U-MTFNR/L4**	●	●		43○ *1	1.750	14.000	1.156	1.660	11°	**2.312**	ITSN433 *1	NL46	CL9	XNS59
S-MTFNR/L-324	**S32V-MTFNR/L4**	●	●		43○ *1	2.000	16.000	1.281	1.910	11°	**2.562**	ITSN433 *1	NL46	CL9	XNS59

*1 (Opt.) See page M012 for different thickness or radius.
*2 For inserts without hole, remove shim pin and add below.
*3 Clamp Torque (lbf-in) : NL34L=13, NL46=19, XNS36=30, XNS59=70

Shim Screw	S34	Chip Breaker	CBT3

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180—280HB	Medium Cutting	260—460	.004—.016	—.20	260—460	.004—.012	—.16
M	Stainless Steel	≤200HB	Medium Cutting	200—330	.008—.012	—.16	165—330	.004—.015	—.12
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	200—330	.004—.016	—.20	200—330	.004—.012	—.16

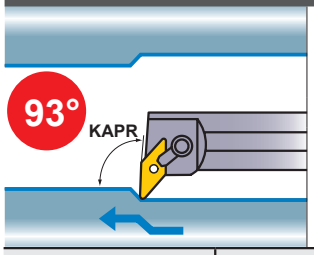
SN○○ type inserts ➤ A123—A129
TN○○ type inserts ➤ A130—A137
CBN & PCD inserts ➤ B029—B031, B050
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

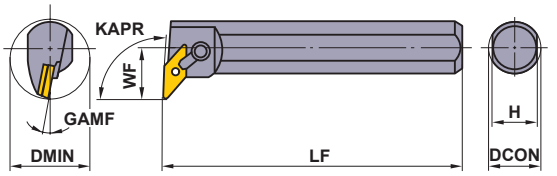
MULTIPLE CLAMP TYPE

- Negative rake.
- Two wall pocket.
- Pin lock and top clamp retension.

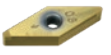
S-MVUN

Steel shank — VN○○inserts





Right hand tool holder shown.

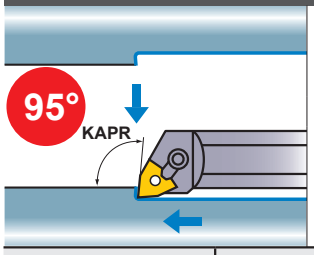
Finish	Light	Medium	Medium
FP	LP	MP	MH
(3)	(3)	(3)	(3)
Medium	**Stainless**	**G Class**	**CBN/PCD**
Standard	MM	R/L	
			
(3)	(3)	(3)	(3)

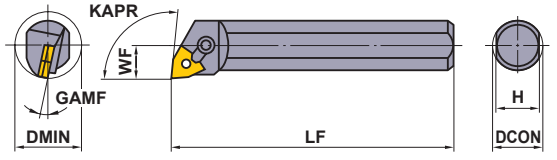
Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin *2	Clamp Bridge	Clamp Screw *2
S-MVUNR/L-203	**S20U-MVUNR/L3**	●	□	VNMG VNMM VNGA VNGG VNGM	33○	1.250	14.000	1.125	1.16	14°	**2.250**	IVSN322	NL34L	CL30	XNS59
S-MVUNR/L-243	**S24U-MVUNR/L3**	●	●		33○	1.500	14.000	1.250	1.41	11°	**2.500**	IVSN322	NL34L	CL30	XNS510
S-MVUNR/L-284	**S28U-MVUNR4**	●			43○ *1	1.750	14.000	1.500	1.66	11°	**3.000**	IVSN433 *1	NL46	CL30	XNS510
S-MVUNR/L-324	**S32V-MVUNR4**	●			43○ *1	2.000	16.000	1.625	1.91	11°	**3.250**	IVSN433 *1	NL46	CL30	XNS510

*1 (Opt.) See page M012 for different radius.
*2 Clamp Torque (lbf-in) : NL34L=13, NL46=19, XNS59=70, XNS510=70

S-MWLN

Steel shank — WN○○inserts





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
(4)	(3,4)	(3,4)	(4)
Medium	**Medium — Rough**	**Stainless**	
Standard	RP	MM	
(4)	(4)	(3,4)	

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	Shim Pin *	Clamp Bridge	Clamp Screw *
S-MWLNR/L-123	**S12S-MWLNR/L3**	●	●	WNMA WNMG WNGA	32○	.750	10.000	.500	.700	14°	**1.000**	—	NL33L	HC7	SHC7
S-MWLNR/L-163	**S16T-MWLNR/L3**	●	●		32○	1.000	12.000	.640	.910	14°	**1.280**	—	NL33L	HC7	SHC7
S-MWLNR/L-164	**S16T-MWLNR/L4**	●	●		43○	1.000	12.000	.640	.910	14°	**1.280**	—	NL44	CL20	XNS47
S-MWLNR/L-204	**S20U-MWLNR/L4**	●	●		43○	1.250	14.000	.765	1.160	14°	**1.530**	IWSN433	NL46	CL20	XNS47
S-MWLNR/L-244	**S24U-MWLNR/L4**	●	●		43○	1.500	14.000	.890	1.410	11°	**1.780**	IWSN433	NL46	CL20	XNS47

* Clamp Torque (lbf-in) : NL33L=13, NL44=19, NL46=19, SHC7=48, XNS47=45

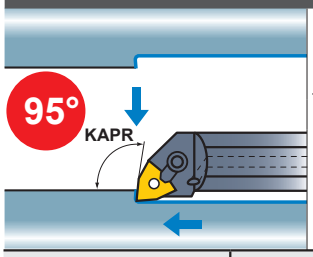
Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

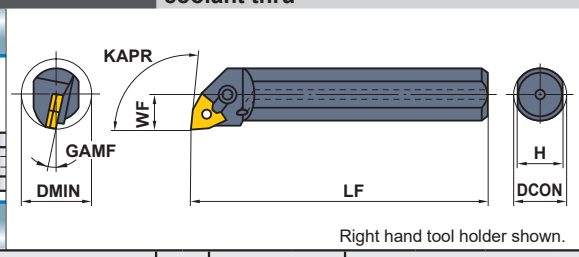
● : USA Stock □ : Made to Order

VN○○ type inserts	**➤ A138–A141**
WN○○ type inserts	**➤ A142–A147**
CBN & PCD inserts	**➤ B032–B034, B051**

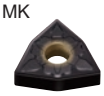
M-MWLN

Heavy metal shank coolant thru **WN○○ inserts**





Right hand tool holder shown.

Finish	Light	Medium	Medium
FP	LP	MP	MK
			
(4)	(4)	(4)	(4)
Medium	**Medium — Rough**	**Stainless**	
Standard	RP	MM	
(4)	(4)	(4)	

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	Shim	* Shim Pin	Clamp Bridge	* Clamp Screw
M-MWLNR/L-164-C	**J16T-MWLNR/L4**	●	●	WNMA	43○	1.000	12.000	.640	.955	14°	**1.280**	—	NL44	CL20	XNS47
M-MWLNR/L-204-C	**J20T-MWLNR/L4**	●	●	WNMG	43○	1.250	12.000	.765	1.205	14°	**1.530**	IWSN432	NL46	CL20	XNS48
M-MWLNR/L-244-C	**J24U-MWLNR/L4**	●	●	WNGA	43○	1.500	14.000	.890	1.455	14°	**1.780**	IWSN432	NL46	CL20	XNS48

* Clamp Torque (lbf-in) : NL44=19, NL46=19, XNS47=45, XNS48=45

E

BORING BARS

RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Cutting Mode	l/d≤3 Cutting Speed (SFM)	l/d≤3 Feed (IPR)	l/d≤3 Depth of Cut (inch)	3<l/d≤4 Cutting Speed (SFM)	3<l/d≤4 Feed (IPR)	3<l/d≤4 Depth of Cut (inch)
P	Carbon Steel, Alloy Steel	180—280HB	Medium Cutting	260—460	.004—.016	—.20	260—460	.004—.012	—.16
M	Stainless Steel	≤200HB	Medium Cutting	200—330	.008—.012	—.16	165—330	.004—.010	—.12
K	Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	200—330	.004—.016	—.20	200—330	.004—.012	—.16

WN○○ type inserts ➤ A142—A147
CBN inserts ➤ B034
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

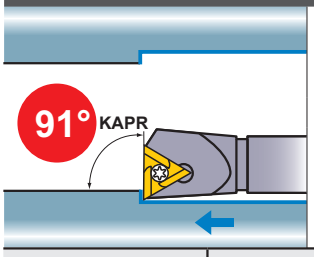
AL TYPE BORING BARS

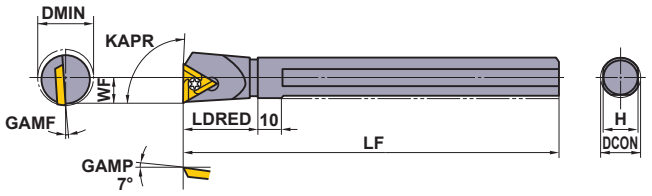
- Shank sizes ϕ.625 inch thru ϕ1.000 inch.
- Screw-on type.
- Recommended for aluminum, nonferrous metals and plastics.

S-STFE

Steel shank

TE○○inserts





Right hand tool holder shown.

Medium	PCD
R/L (3)	R/L (3)
PCD (3)	

Order Number	ANSI Order Number	Stock R	Stock L	Insert Number		Dimensions (inch) DCON	LF	LDRED	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
S-STFER/L-103	**S10R-STFER/L3**	●	●	TEGX	32○	.625	8.000	1.250	.406	.560	3°	**.813**	FC400890T	TKY10F
S-STFER/L-123	**S12S-STFER/L3**	●	●		32○	.750	10.000	1.500	.500	.700	3°	**1.000**	FC400890T	TKY10F
S-STFER/L-163	**S16T-STFEL/R3**	●	●		32○	1.000	12.000	1.625	.641	.910	3°	**1.281**	FC400890T	TKY10F

* Clamp Torque (lbf-in) : FC400890T=22

RECOMMENDED CUTTING CONDITIONS

Work Material		Grade	Cutting Speed (SFM)	l/d=3 Feed (IPR)	l/d=3 D.O.C (inch)	l/d=4 Feed (IPR)	l/d=4 D.O.C (inch)	l/d=5 Feed (IPR)	l/d=5 D.O.C (inch)	l/d=6 Feed (IPR)	l/d=6 D.O.C (inch)
N	Aluminum Alloy	**HTi10**	655—1970	.002—.010	—.118	.002—.010	—.118	.002—.008	—.098	.002—.008	—.039
		MD220	655—4920	.002—.010	—.118	.002—.010	—.118	.002—.008	—.098	.002—.008	—.039

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : USA Stock

TE○○ type inserts ➤ A181
PCD inserts ➤ B060

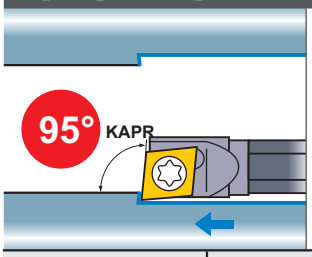
MICRO-DEX

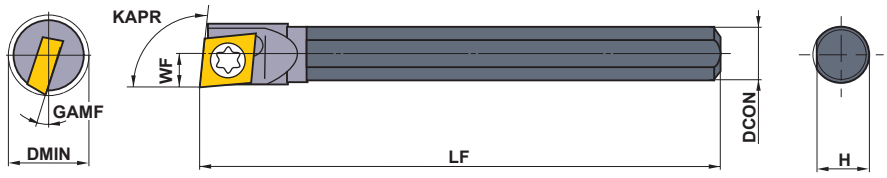
- The minimum cutting diameter is ϕ5 mm (.197 inch).
- 7°positive insert.
- Carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpiece.
- l/d is 5 times the diameter.

SCLC

Carbide shank — **CC○○inserts**

Finish: L-F (03,04) / CBN/PCD (03,04)





Right hand tool holder only.

Order Number	ANSI Order Number	Stock R	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C04GSCLCR03	**C04G-SCLCR03**	●	*1 CCGT CCGW CCMW	03S1○○	4	90	2.5	3.7	15°	**5**	TS16	TKY06F
C05HSCLCR03	**C05H-SCLCR03**	●		03S1○○	5	100	3.0	4.7	13°	**6**	TS16	TKY06F
C06JSCLCR04	**C06J-SCLCR04**	●		04T0○○	6	110	3.5	5.7	13°	**7**	TS21	TKY06F
C07KSCLCR04	**C07K-SCLCR04**	●		04T0○○	7	125	4.0	6.7	11°	**8**	TS21	TKY06F

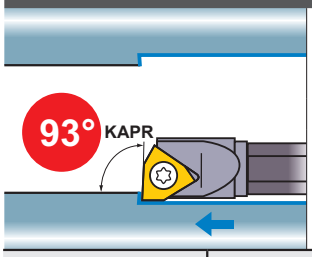
* Clamp Torque (lbf-in) : TS16=5.3, TS21=5.3

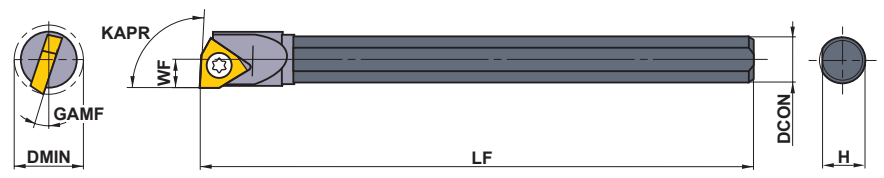
Note 1) Diameter of inscribed circle is non-ISO standard. (For SCLC type)

SWUB

Carbide shank — **WB○○ inserts**

Finish: L-F (1.2,1.5)





Right hand tool holder only.

Order Number	ANSI Order Number	Stock R	Insert Number		Dimensions (inch) DCON	LF	WF	H	GAMF	DMIN	* Clamp Screw	Wrench
C05HSWUBR02	**C05H-SWUBR02**	●	WBGT WBMT	1.21○○LF	5	100	3.0	4.7	15°	**6**	TS21	TKY06F
C06JSWUBR02	**C06J-SWUBR02**	●		1.21○○LF	6	110	3.5	5.7	13°	**7**	TS2C	TKY06F
C07KSWUBRL3	**C07K-SWUBRL3**	●		1.51.5○○LF	7	125	4.0	6.7	15°	**8**	TS2	TKY06F

* Clamp Torque (lbf-in) : TS21=5.3, TS2C=5.3, TS2=5.3

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	l/d
P	General Steel	**NX2525**	130—395	.0004—.002	.004—.012	3—5
M	Stainless Steel	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
K	Cast Iron	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
N	Non-Ferrous Material	**VP15TF**	260—525	.0004—.002	.004—.024	3—5
		MD220	260—525	.0004—.002	.004—.024	3—5
H	Hardened Steel 35—65HRC	**MB8110**	130—395	.0004—.002	.001—.008	3—5

CCGT type inserts ➤ A153
CCGW type inserts ➤ A161
CCMW type inserts ➤ A161
WBGT type inserts ➤ A195
WBMT type inserts ➤ A195
CBN inserts ➤ B038
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MICRO-DEX

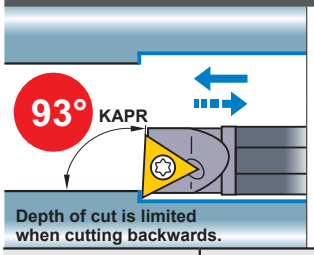
- The minimum cutting diameter is ϕ8 mm (.315 inch).
- 7°positive insert.
- Carbide shank type.
- Easy-to-use tool geometries.
- Suitable for small workpiece.
- l/d is 5 times the diameter.

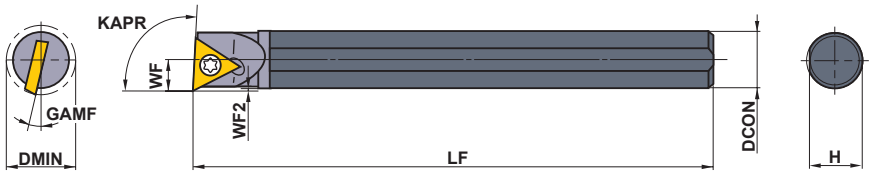
STUC

Carbide shank — **TCGT inserts**

Finish R/L-F

(1.2)





Right hand tool holder only.

Order Number	ANSI Order Number	Stock R	Insert Number		Dimensions (inch) DCON	LF	WF	WF2	H	GAMF	DMIN	* Clamp Screw	Wrench
C07KSTUCR06	**C07K-STUCR06**	●	TCGT	1.21○○LF	7	125	4.0	0.35	6.7	12°	**8**	TS2C	TKY06F

* Clamp Torque (lbf-in) : TS2C=5.3

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.

Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Grade	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	l/d
P	General Steel	**NX2525**	130—395	.0004—.002	.004—.012	3—5
M	Stainless Steel	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
K	Cast Iron	**VP15TF**	130—395	.0004—.002	.004—.012	3—5
N	Non-Ferrous Material	**VP15TF**	260—525	.0004—.003	.004—.024	3—5
		MD220	260—525	.0004—.003	.004—.024	3—5
H	Hardened Steel 35—65HRC	**MB8110**	130—395	.0004—.002	.001—.008	3—5

● : **USA Stock**
<1 MICRO-MINI in one case>

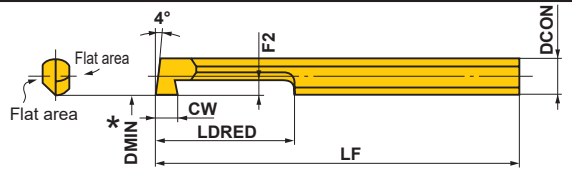
TCGT type inserts ➤ **A178**

MICRO-MINI

- Solid carbide type (Single cutting edges).
- l/d is 5 times the diameter.
- Cutting edge can be shaped according to the application.
  Thus, it covers a wide cutting range (threading, grooving, copying, etc.).

STANDARD MICRO-MINI BORING BARS (Solid carbide boring bar)

Order Number	Stock	Dimensions(mm)						Geometry
	TF15	CW	DCON	LF	LDRED	DMIN *	F2	
C03FR-BLS	●	2.0	3	80	15	**3.2**	1.0	
C04FR-BLS	●	2.5	4	80	20	**4.2**	1.5	
C05HR-BLS	●	3.0	5	100	25	**5.2**	2.0	



Right hand tool only.

* DMIN : Min. Cutting Diameter

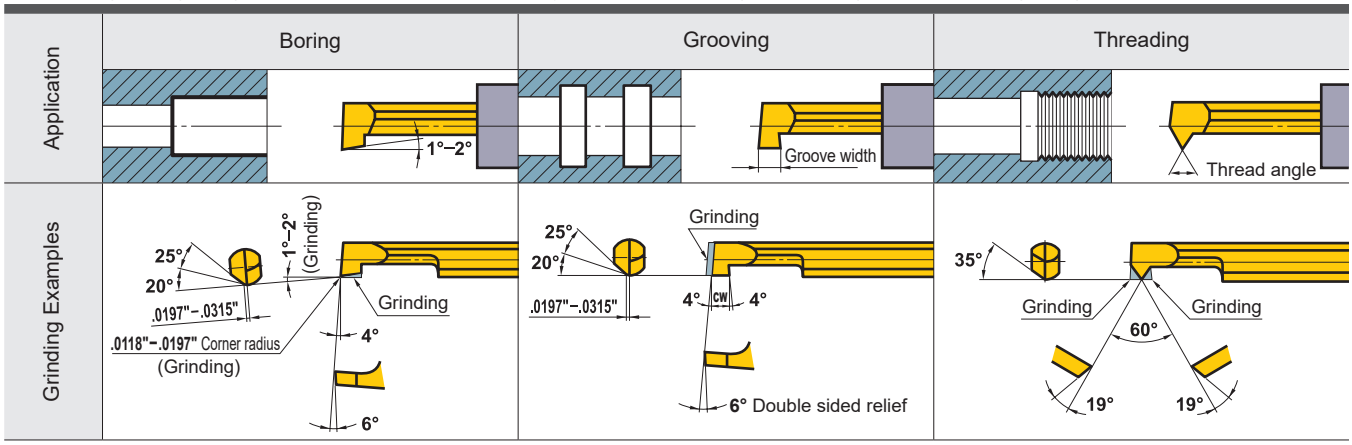
RECOMMENDED CUTTING CONDITIONS

	Work Material	Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	l/d	Cutting Edge Preparation	
						* Corner Radius or BCH	* Honing
P	Carbon Steel, Alloy Steel 180–350HB	100–165	–.004	.004–.012	5	.004–.020	.0004–.002
M	Stainless Steel ≤200HB	100–165	–.004	.004–.012	5	≤.016	≤.001 (Honing not required)
K	Gray Cast Iron ≤350MPa	100–165	–.002	.004–.012	5	.004–.020	.0004–.002
N	Non-Ferrous Meterial	200–330	–.004	.004–.020	5	.004–.020	≤.001 (Honing not required)

* Cutting edge is not honed. Please hone according to the workpiece before machining.

GRINDING THE CUTTING EDGE OF MICRO-MINI BORING BAR

●MICRO-MINI boring bar can be applied to boring and grooving without any modifications. It can also be reground as shown below.
●For shaping and regrinding, use diamond wet stone approximately #250 - #400. Please grind according to application using the figure below as a reference.



E

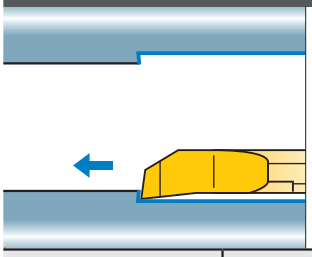
BORING BARS

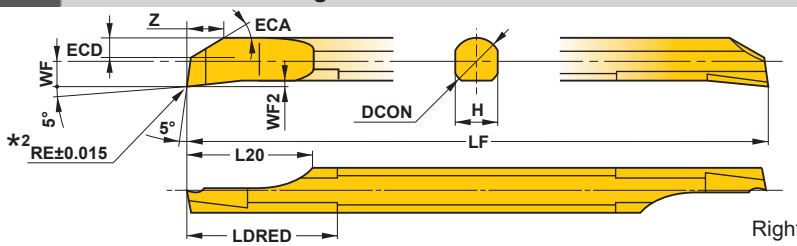
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MICRO-MINI TWIN

CB

For internal machining





Right hand tool only.

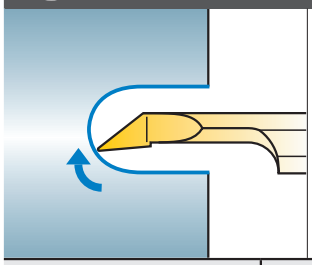
Order Number	Stock		Breaker	Dimensions(mm)									
	Micro Grain	Coated		DMIN*1		RE	DCON	LF	L20	LDRED	WF	WF2	H	Z
	TF15	VP15TF		l/d ≤ 3	l/d > 3									
CB02RS	●	●	without	2.2	3.6	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-B	●	●	with	2.2	3.9	0.05	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01	●	●	without	2.2	3.6	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-01B	●	●	with	2.2	4.2	0.1	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02	●	●	without	2.2	3.6	0.2	2	50	5	6	1	0.25	1.8	1.4
CB02RS-02B	●	●	with	2.2	4.9	0.2	2	50	5	6	1	0.25	1.8	1.4
CB03RS	●	●	without	3.2	4.2	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-B	●	●	with	3.2	4.4	0.05	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01	●	●	without	3.2	4.2	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-01B	●	●	with	3.2	4.5	0.1	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02	●	●	without	3.2	4.2	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB03RS-02B	●	●	with	3.2	4.8	0.2	3	50	7.5	9	1.5	0.35	2.7	2.3
CB04RS	●	●	without	4.2	5.1	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-B	●	●	with	4.2	5.2	0.05	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01	●	●	without	4.2	5.1	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-01B	●	●	with	4.2	5.3	0.1	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02	●	●	without	4.2	5.1	0.2	4	60	10	12	2	0.45	3.6	3.1
CB04RS-02B	●	●	with	4.2	5.5	0.2	4	60	10	12	2	0.45	3.6	3.1
CB05RS	●	●	without	5.2	6.0	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-B	●	●	with	5.2	6.1	0.05	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02	●	●	without	5.2	6.0	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB05RS-02B	●	●	with	5.2	6.4	0.2	5	70	12.5	15	2.5	0.55	4.5	3.9
CB06RS	●	●	without	6.2	7.2	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-B	●	●	with	6.2	7.3	0.05	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02	●	●	without	6.2	7.2	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB06RS-02B	●	●	with	6.2	7.8	0.2	6	75	12.5	18	3	0.65	5.4	4.7
CB07RS	●	●	without	7.2	8.6	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-B	●	●	with	7.2	8.8	0.05	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02	●	●	without	7.2	8.6	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB07RS-02B	●	●	with	7.2	9.2	0.2	7	85	12.5	21	3.5	0.75	6.3	5.5
CB08RS	★	★	without	8.2	9.5	0.05	8	95	15	24	4	0.85	7.2	6.3
CB08RS-B	★	★	with	8.2	9.6	0.05	8	95	15	24	4	0.85	7.2	6.3
CB08RS-02	★	★	without	8.2	9.5	0.2	8	95	15	24	4	0.85	7.2	6.3
CB08RS-02B	★	★	with	8.2	9.8	0.2	8	95	15	24	4	0.85	7.2	6.3

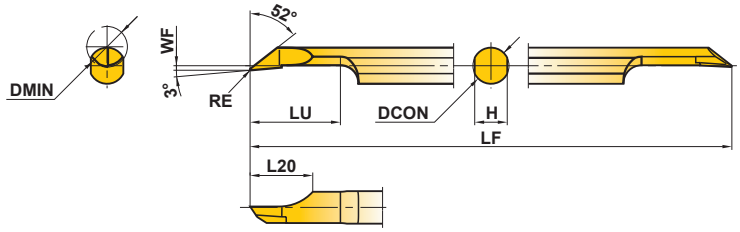
*1 DMIN : Min. Cutting Diameter
*2 The Re dimension represents the size before grinding a chip breaker.

● : USA Stock ★ : Stocked in Japan
<1 MICRO-MINI TWIN in one case>

CR

For internal copying

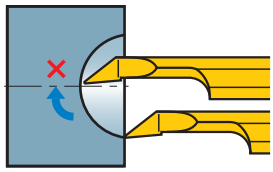
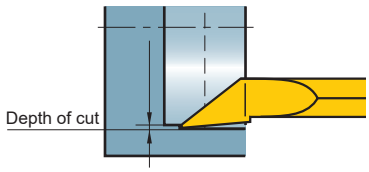




Right hand tool only.

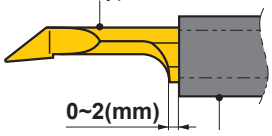
Order Number	Stock		Breaker	Dimensions(mm)							
	Micro Grain	Coated		DMIN	RE	DCON	LF	LU	L20	WF	H
	TF15	VP15TF									
CR03RS-01	●	●	without	**3.5**	0.1	3	50	8	6	0.15	2.7
CR03RS-01B	●	●	with	**3.5**	0.1	3	50	8	6	0.15	2.7
CR04RS-01	●	●	without	**4.5**	0.1	4	60	10	7	0.15	3.6
CR04RS-01B	●	●	with	**4.5**	0.1	4	60	10	7	0.15	3.6
CR05RS-01	●	●	without	**5.5**	0.1	5	70	12	8	0.15	4.5
CR05RS-01B	●	●	with	**5.5**	0.1	5	70	12	8	0.15	4.5

NOTES

Profile turning, Inner end facing	Copying
The cutting edge should not cross the center line of the workpiece. 	**The depth of cut should be smaller than the corner radius value.** 
If the cutting edge crosses the center line of a workpiece, the cutting edge can fracture.	With depths of cut larger than the corner radius value, burrs will be formed.

RECOMMENDED TOOL OVERHANG

MICRO-MINI TWIN
CR type



RECOMMENDED CUTTING CONDITIONS

	Work Material	CB Type				CR Type		
		Cutting Speed (SFM)	Feed (IPR)	Depth of Cut (inch)	Overhang (l/d)	Cutting Speed (SFM)	Feed (IPR) 03RS/04RS	Feed (IPR) 05RS
P	Carbon Steel Alloy Steel 180–350HB	130–395	.0004–.002	.004–.012	3–5	130–395	.0004–.001	.0004–.002
M	Stainless Steel ≤200HB	130–395	.0004–.002	.004–.012	3–5	130–395	.0004–.001	.0004–.002
K	Gray Cast Iron ≤350MPa	130–395	.0004–.002	.004–.012	3–5	130–395	.0004–.002	.0004–.002
N	Non-Ferrous Meterial	260–525	.0004–.003	.004–.020	3–5	260–525	.0004–.002	.0004–.003

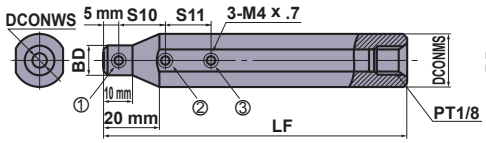
Note 1) Recommend wet machining.
Note 2) The recommended tool overhang of CR type is LU+2 mm.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

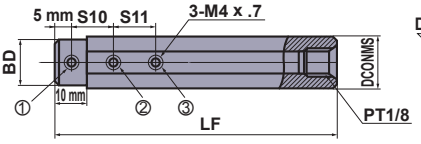
HOLDER (INCH SHANK STANDARD)

RBH

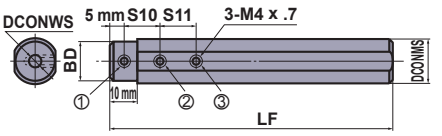
Round type holder



RBH16□□□A
(Coolant thru)



RBH10□□□A, RBH12□□□A
(Coolant thru)



RBH190□□N

■ID (DCONWS) : INCH TYPE

Order Number	Stock	Dimensions						Clamp Screw *			Wrench	Torque (lbf-in)
		DCONMS (inch)	DCONWS (inch)	BD (mm)	LF (mm)	S10 (mm)	S11 (mm)	①	②	③		
RBH10300A	●	.625	.187	15	100	15	15	A	A	A	HKY20F	18 (2.0 N·m)
RBH10350A	●	.625	.219	15	100	15	15	A	A	A	HKY20F	18 (2.0 N·m)
RBH10400A	●	.625	.250	15	100	20	20	A	A	A	HKY20F	18 (2.0 N·m)
RBH10500A	●	.625	.313	15	100	20	20	D	D	D	HKY20F	18 (2.0 N·m)
RBH12300A	●	.750	.187	18	125	15	15	B	B	B	HKY20F	18 (2.0 N·m)
RBH12350A	●	.750	.219	18	125	15	15	B	B	B	HKY20F	18 (2.0 N·m)
RBH12400A	●	.750	.250	18	125	20	20	B	B	B	HKY20F	18 (2.0 N·m)
RBH12500A	●	.750	.313	18	125	20	20	A	A	A	HKY20F	18 (2.0 N·m)
RBH16300A	●	1.000	.187	14	150	15	15	A	C	C	HKY20F	18 (2.0 N·m)
RBH16350A	●	1.000	.219	15	150	15	15	A	C	C	HKY20F	18 (2.0 N·m)
RBH16400A	●	1.000	.250	16	150	20	20	A	C	C	HKY20F	18 (2.0 N·m)
RBH16500A	●	1.000	.313	17	150	20	20	A	C	C	HKY20F	18 (2.0 N·m)

■ID (DCONWS) : METRIC TYPE

Order Number	Stock	Dimensions						Clamp Screw *			Wrench	Torque (lbf-in)
		DCONMS (inch)	DCONWS (mm)	BD (mm)	LF (mm)	S10 (mm)	S11 (mm)	①	②	③		
RBH10126A	●	.625	2	15	100	10	—	B	B	—	HKY20F	18 (2.0 N·m)
RBH10189A	●	.625	3	15	100	10	10	A	A	A	HKY20F	18 (2.0 N·m)
RBH10252A	●	.625	4	15	100	15	15	A	A	A	HKY20F	18 (2.0 N·m)
RBH10315A	●	.625	5	15	100	15	15	A	A	A	HKY20F	18 (2.0 N·m)
RBH10378A	●	.625	6	15	100	20	20	A	A	A	HKY20F	18 (2.0 N·m)
RBH10441A	●	.625	7	15	100	20	20	A	A	A	HKY20F	18 (2.0 N·m)
RBH19020N	●	.750	2	18	125	10	—	C	C	—	HKY20F	18 (2.0 N·m)
RBH19030N	●	.750	3	18	125	10	10	B	B	B	HKY20F	18 (2.0 N·m)
RBH19040N	●	.750	4	18	125	15	15	B	B	B	HKY20F	18 (2.0 N·m)
RBH19050N	●	.750	5	18	125	15	15	B	B	B	HKY20F	18 (2.0 N·m)
RBH19060N	●	.750	6	18	125	15	15	B	B	B	HKY20F	18 (2.0 N·m)
RBH19070N	●	.750	7	18	125	20	20	B	B	B	HKY20F	18 (2.0 N·m)
RBH19080N	★	.750	8	18	125	20	20	A	A	A	HKY20F	18 (2.0 N·m)
RBH16126A	●	1.000	2	11	150	10	—	A	B	—	HKY20F	18 (2.0 N·m)
RBH16189A	●	1.000	3	12	150	10	10	A	B	C	HKY20F	18 (2.0 N·m)
RBH16252A	●	1.000	4	13	150	15	15	A	C	C	HKY20F	18 (2.0 N·m)
RBH16315A	●	1.000	5	14	150	15	15	A	C	C	HKY20F	18 (2.0 N·m)
RBH16378A	●	1.000	6	15	150	20	20	A	C	C	HKY20F	18 (2.0 N·m)
RBH16441A	●	1.000	7	16	150	20	20	A	C	C	HKY20F	18 (2.0 N·m)

* Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008, D=HSS04003

● : USA Stock ★ : Stocked in Japan

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

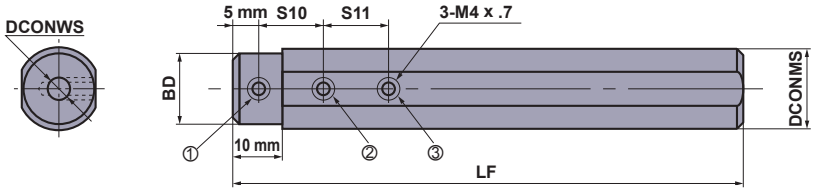
Holder			MICRO-MINI TWIN		MICRO-DEX	MICRO-MINI	Machine Makers
Type	Order Number		CB	CR		C	
Round Type Holder ϕ.625 inch	ID : Metric Type	**RBH10126A**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH10189A	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		RBH10252A	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		RBH10315A	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		RBH10378A	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		RBH10441A	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH10300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		RBH10350A					
		RBH10400A					
		RBH10500A					
Round Type Holder ϕ.750 inch	ID : Metric Type	**RBH19020N**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd.
		RBH19030N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		RBH19040N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		RBH19050N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		RBH19060N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		RBH19070N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
		RBH19080N	08RS(-B) 08RS-0□(B)	–	–	–	
	ID : Inch Type	**RBH12300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		RBH12350A					
		RBH12400A					
		RBH12500A					
Round Type Holder ϕ1.000 inch	ID : Metric Type	**RBH16126A**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH16189A	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
		RBH16252A	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
		RBH16315A	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
		RBH16378A	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
		RBH16441A	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
	ID : Inch Type	**RBH16300A**	For DIMPLE BAR and SCREW CLAMP TYPE				
		RBH16350A					
		RBH16400A					
		RBH16500A					

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

HOLDER (METRIC SHANK STANDARD)

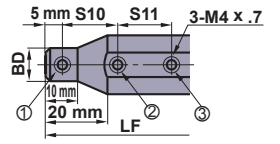
RBH

Round type holder

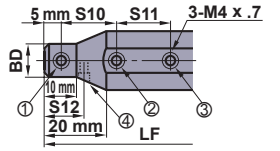


RBH16○○N

RBH20○○N
RBH25○○N



RBH22○○N



Order Number	Stock	Dimensions (mm)							Clamp Screw *				Wrench	Torque (lbf-in)
		DCONMS	DCONWS	BD	LF	S10	S11	S12	①	②	③	④		
RBH1620N	●	16	2	15	100	10	—	—	B	B	—	—	HKY20F	18 (2.0 N·m)
RBH1630N	●	16	3	15	100	10	10	—	A	A	A	—	HKY20F	18 (2.0 N·m)
RBH1640N	●	16	4	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0 N·m)
RBH1650N	●	16	5	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0 N·m)
RBH1660N	●	16	6	15	100	15	15	—	A	A	A	—	HKY20F	18 (2.0 N·m)
RBH1670N	●	16	7	15	100	20	20	—	A	A	A	—	HKY20F	18 (2.0 N·m)
RBH2020N	●	20	2	11	125	10	—	—	A	A	—	—	HKY20F	18 (2.0 N·m)
RBH2030N	●	20	3	12	125	10	10	—	A	A	B	—	HKY20F	18 (2.0 N·m)
RBH2040N	●	20	4	13	125	15	15	—	A	B	B	—	HKY20F	18 (2.0 N·m)
RBH2050N	●	20	5	14	125	15	15	—	A	B	B	—	HKY20F	18 (2.0 N·m)
RBH2060N	●	20	6	15	125	15	15	—	A	B	B	—	HKY20F	18 (2.0 N·m)
RBH2070N	●	20	7	16	125	20	20	—	A	B	B	—	HKY20F	18 (2.0 N·m)
RBH2220N	●	22	2	11	125	10	—	10	A	B	—	A	HKY20F	18 (2.0 N·m)
RBH2230N	●	22	3	12	125	10	10	10	A	B	C	A	HKY20F	18 (2.0 N·m)
RBH2240N	●	22	4	13	125	15	15	12.5	A	B	B	A	HKY20F	18 (2.0 N·m)
RBH2250N	●	22	5	14	125	15	15	12.5	A	B	B	A	HKY20F	18 (2.0 N·m)
RBH2260N	●	22	6	15	125	15	15	15	A	B	B	A	HKY20F	18 (2.0 N·m)
RBH2270N	●	22	7	16	125	20	20	15	A	B	B	A	HKY20F	18 (2.0 N·m)
RBH2520N	●	25	2	11	150	10	—	—	A	B	—	—	HKY20F	18 (2.0 N·m)
RBH2530N	●	25	3	12	150	10	10	—	A	B	C	—	HKY20F	18 (2.0 N·m)
RBH2540N	●	25	4	13	150	15	15	—	A	C	C	—	HKY20F	18 (2.0 N·m)
RBH2550N	●	25	5	14	150	15	15	—	A	C	C	—	HKY20F	18 (2.0 N·m)
RBH2560N	●	25	6	15	150	15	15	—	A	C	C	—	HKY20F	18 (2.0 N·m)
RBH2570N	●	25	7	16	150	20	20	—	A	C	C	—	HKY20F	18 (2.0 N·m)

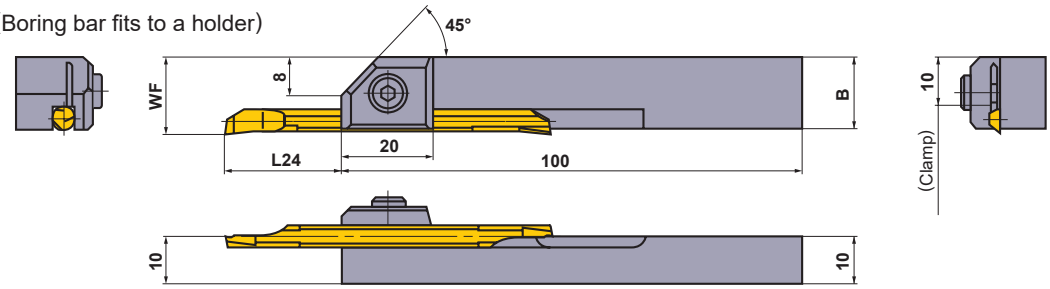
* Order number of clamp screw A=HSS04004, B=HSS04006, C=HSS04008

● : USA Stock ★ : Stocked in Japan

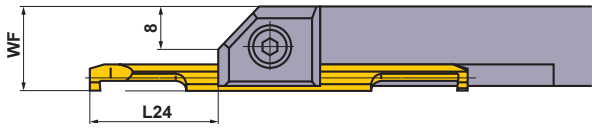
SBH

Square type holder

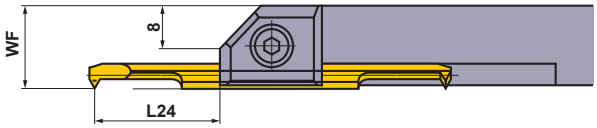
CB type (Boring bar fits to a holder)



CG type (Boring bar fits to a holder)



CT type (Boring bar fits to a holder)



Order Number	Stock	Dimensions (mm) WF			Maximum Tool Overhang **L24** (Recommended tool overhang when machining general steel)					B		MICRO-MINI TWIN				Clamp Screw	Wrench	Torque (lbf-in)
		CB type	CG type	CT type	CB type	CG..RS-10 CG..RS-10B	CG..RS-20 CG..RS-20B	CT type	CR type	CG CT·CR type	CB·CG CT·CR type	CB type	CG type	CT type	CR type			
SBH1020R	★	13	—	—	6—24 (6—10)	—	—	—	—	—	12.9	02RS(-B) 02RS-0□(B)	—	—	—	HSC 04010	HKY30R	42 (4.8N·m)
SBH1030R	★	14	13.8	13.8	8.5—22 (9—15)	13—17.5 (14)	14—16.5 (15)	13—17.5 (14)	11—19.5 (12)	14	13.8	03RS(-B) 03RS-0□(B)	030□RS-□□(B) 03RS-□□(B)	0305RS-M4 03RS-M4(B)	03RS-01 03RS-01B	HSC 05012	HKY40R	84 (9.5N·m)
SBH1040R	★	15	14.8	14.8	11—29.5 (12—20)	18—22.5 (19)	19—21.5 (20)	18.5—22 (19.5)	13—27.5 (14)	15	14.7	04RS(-B) 04RS-0□(B)	040□RS-□□(B) 04RS-□□(B)	0407RS-M6 04RS-M6(B)	04RS-01 04RS-01B	HSC 05012	HKY40R	84 (9.5N·m)
SBH1050R	★	16	15.8	15.8	13.5—37 (15—25)	23—27.5 (24)	24—26.5 (25)	24—26.5 (25)	15—35.5 (16)	16	15.6	05RS(-B) 05RS-0□(B)	051□RS-□□(B) 05RS-□□(B)	0510RS-M8 05RS-M8(B)	05RS-01 05RS-01B	HSC 05012	HKY40R	84 (9.5N·m)
SBH1060R	★	17	16.8	16.8	13.5—42 (18—30)	23—32.5 (24)	24—31.5 (25)	24—31.5 (25)	—	17	16.5	06RS(-B) 06RS-0□(B)	061□RS-□□(B) 06RS-□□(B)	0610RS-M10 06RS-M10(B)	—	HSC 05012	HKY40R	84 (9.5N·m)
SBH1070R	★	18	17.8	—	13.5—52 (21—35)	28—38 (29)	29—37 (30)	—	—	18	17.4	07RS(-B) 07RS-0□(B)	071□RS-□□(B) 07RS-□□(B)	—	—	HSC 05012	HKY40R	84 (9.5N·m)

★ The MICRO-DEX and the MICRO-MINI cannot be fit to square holders.

HOLDER

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

Holder		MICRO-MINI TWIN		MICRO-DEX	MICRO-MINI	Machine Makers
Type	Order Number	CB	CR		C	
Round Type Holder ϕ16 mm	**RBH1620N**	02RS(-B) 02RS-0□(B)	–	–	–	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH1630N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH1640N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH1650N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH1660N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH1670N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ20 mm	**RBH2020N**	02RS(-B) 02RS-0□(B)	–	–	–	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH2030N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH2040N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH2050N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH2060N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH2070N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ22 mm	**RBH2220N**	02RS(-B) 02RS-0□(B)	–	–	–	STAR MICRONICS CO., LTD.
	RBH2230N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH2240N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH2250N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH2260N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH2270N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Round Type Holder ϕ25 mm	**RBH2520N**	02RS(-B) 02RS-0□(B)	–	–	–	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH2530N	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	03FR-BLS	
	RBH2540N	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	C04GS□□□R□□	04FR-BLS	
	RBH2550N	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	C05GS□□□R□□	05FR-BLS	
	RBH2560N	06RS(-B) 06RS-0□(B)	–	C06GS□□□R□□	–	
	RBH2570N	07RS(-B) 07RS-0□(B)	–	C07GS□□□R□□	–	
Square Type Holder □10 mm	**SBH1020R**	02RS(-B) 02RS-0□(B)	–	–	–	NC lathes
	SBH1030R	03RS(-B) 03RS-0□(B)	03RS-01 03RS-01B	–	–	
	SBH1040R	04RS(-B) 04RS-0□(B)	04RS-01 04RS-01B	–	–	
	SBH1050R	05RS(-B) 05RS-0□(B)	05RS-01 05RS-01B	–	–	
	SBH1060R	06RS(-B) 06RS-0□(B)	–	–	–	
	SBH1070R	07RS(-B) 07RS-0□(B)	–	–	–	

* Mitsubishi Materials obtained the makers' approval before entering their names in the list.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

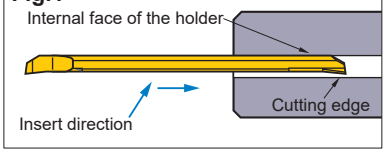
PRECAUTION IN USING THE MICRO-MINI TWIN

■PRECAUTIONS IN USING THE MICRO-MINI TWIN

●When using a holder for general purpose/small automatic lathe

1 To avoid chipping of the 2nd cutting edge take care when inserting the boring bar into the holder. Refer to fig.1 if the 2nd edge contacts the internal face of the holder there is a possibility that it may chip.

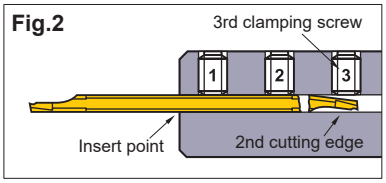
Fig.1



2 When clamping the boring bar into the holder, there is a possibility that damage to the shank and the 2nd cutting edge can occur. Make sure that the clamping screws are tightened to the set torque value. Additionally make sure that there is no clamping screw near the 2nd cutting edge as this can break the boring bar.

◎When using Mitsubishi holders with a tool overhang of 5 lxd, ensure that the 3rd clamping screw is removed prior to machining. (For RBH1620N, RBH19020N there are no 3rd clamping screws). The set torque value for clamping screw is 18 lbf-in. (2.0 N • m)

Fig.2



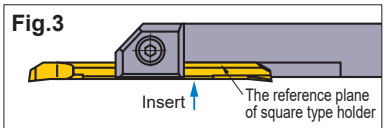
●When using a square type holder

1 When installing the boring bar into the holder, tighten the clamping screw making the micro-mini twin boring bars in contact with the reference plane of square type holder.

2 Make sure that the clamp screw is tightened. The recommended set torque value is shown in the table of holder.

3 Don't tighten the clamp screw without a micro-mini twin boring bar, otherwise the clamp bridge can be deformed.

Fig.3



Tighten the clamping screw ensuring making the micro-mini twin boring bars in contact with the reference plane of square type holder.

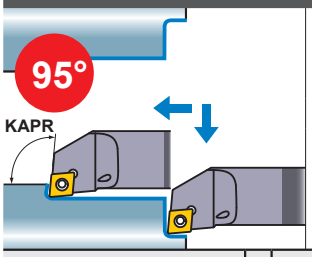
COOLANT THROUGH CARBIDE

- Two wall pocket.
- 7° and 11° positive insert, low cutting force.
- Screw-on type.
- Carbide shanks are stocked in various diameters.

(inch)

E-SCLC

Carbide Shank Coolant Through **CC○○inserts**



Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Flat top**	**CBN/PCD**
MP	MM		
(2,3,4)	(2,3,4)	(2,3,4)	(2,3,4)

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E05K-SCLCL2	●	CCMT CCGB CCGT CCMH CCGH CCET CCMW CCGW	21.5○	.313	5.00	.385	.219	.295	15°	.094	.21	TS253	TKY08F
E05K-SCLCR2	●		21.5○	.313	5.00	.385	.219	.295	15°	.094	.21	TS253	TKY08F
E06M-SCLCL2	●		21.5○	.375	6.00	.477	.250	.360	15°	.109	.31	TS25	TKY08F
E06M-SCLCR2	●		21.5○	.375	6.00	.477	.250	.360	15°	.109	.31	TS25	TKY08F
E08M-SCLCL2	●		21.5○	.500	6.00	.602	.313	.485	13°	.188	.51	TS25	TKY08F
E08M-SCLCR2	●		21.5○	.500	6.00	.602	.313	.485	13°	.188	.51	TS25	TKY08F
E10R-SCLCL2	●		21.5○	.625	8.00	.797	.406	.600	10°	.219	1.2	TS25	TKY08F
E10R-SCLCR2	●		21.5○	.625	8.00	.797	.406	.600	10°	.219	1.2	TS25	TKY08F
E12S-SCLCL2	●		21.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS25	TKY08F
E12S-SCLCR2	●		21.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS25	TKY08F
E08M-SCLCL3	●		32.5○	.500	6.00	.602	.313	.485	13°	.188	.51	TS4	TKY15F
E08M-SCLCR3	●		32.5○	.500	6.00	.602	.313	.485	13°	.188	.51	TS4	TKY15F
E10R-SCLCL3	●		32.5○	.625	8.00	.797	.406	.600	10°	.219	1.2	TS4	TKY15F
E10R-SCLCR3	●		32.5○	.625	8.00	.797	.406	.600	10°	.219	1.2	TS4	TKY15F
E12S-SCLCL3	●		32.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS4	TKY15F
E12S-SCLCR3	●		32.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS4	TKY15F
E16T-SCLCL3	●		32.5○	1.000	12.00	1.219	.641	.975	7°	.313	5.0	TS4	TKY15F
E16T-SCLCR3	●		32.5○	1.000	12.00	1.219	.641	.975	7°	.313	5.0	TS4	TKY15F
E16T-SCLCL4	●		43○	1.000	12.00	1.219	.641	.975	7°	.313	5.0	TS5	TKY25F
E16T-SCLCR4	●		43○	1.000	12.00	1.219	.641	.975	7°	.313	5.0	TS5	TKY25F

* Clamp Torque (lbf-in) : TS25 = 8.9, TS253 = 8.9, TS4 = 31, TS5 = 66

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

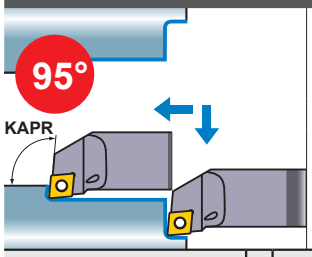
● : USA Stock

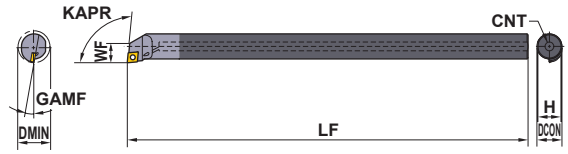
CC○○ type inserts	**➢ A152–A161**
CBN & PCD inserts	**➢ B037, B038, B053**

(inch)

E-SCLP

Carbide Shank Coolant Through **CP○○inserts**





Right hand tool holder shown.

Finish	Finish	Finish	Light
FV	R/L F	Standard	SV
(2.5,3)	(2.5,3)	(2.5,3)	(2.5,3)
Medium	CBN/PCD		
MV			
(2.5,3)	(2.5,3)		

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E06M-SCLPL2	●	CPMT CPGB CPGT CPMH	21.5○	.375	6.00	.477	.250	.360	15°	.109	.31	TS25	TKY08F
E06M-SCLPR2	●		21.5○	.375	6.00	.477	.250	.360	15°	.109	.31	TS25	TKY08F
E08R-SCLPL2	●		21.5○	.500	8.00	.602	.313	.485	6°	.188	.71	TS25	TKY08F
E08R-SCLPR2	●		21.5○	.500	8.00	.602	.313	.485	6°	.188	.71	TS25	TKY08F
E10S-SCLPL2	●		21.5○	.625	10.00	.797	.406	.600	10°	.219	1.3	TS25	TKY08F
E10S-SCLPR2	●		21.5○	.625	10.00	.797	.406	.600	10°	.219	1.3	TS25	TKY08F
E12S-SCLPL2	●		21.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS25	TKY08F
E12S-SCLPR2	●		21.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS25	TKY08F
E08R-SCLPL2.5	●		2.51.5○	.500	8.00	.602	.313	.485	6°	.188	.71	TS3D	TKY10F
E08R-SCLPR2.5	●		2.51.5○	.500	8.00	.602	.313	.485	6°	.188	.71	TS3D	TKY10F
E08R-SCLPL3	●		32.5○	.500	8.00	.602	.313	.485	8°	.188	.71	TS4S	TKY15F
E08R-SCLPR3	●		32.5○	.500	8.00	.602	.313	.485	8°	.188	.71	TS4S	TKY15F
E10S-SCLPL3	●		32.5○	.625	10.00	.797	.406	.600	10°	.219	1.3	TS4	TKY15F
E10S-SCLPR3	●		32.5○	.625	10.00	.797	.406	.600	10°	.219	1.3	TS4	TKY15F
E12S-SCLPL3	●		32.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS4	TKY15F
E12S-SCLPR3	●		32.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS4	TKY15F
E16T-SCLPL3	●		32.5○	1.000	12.00	1.219	.641	.975	7°	.313	5	TS4	TKY15F
E16T-SCLPR3	●		32.5○	1.000	12.00	1.219	.641	.975	7°	.313	5	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25 = 8.9, TS3D = 22, TS4S = 31, TS4 = 31

CP○○ type inserts	➤ A162, A163
CBN & PCD inserts	➤ B039, B053

CUTTING CONDITIONS	➤ E048
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

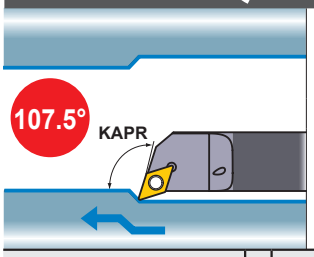
COOLANT THROUGH CARBIDE

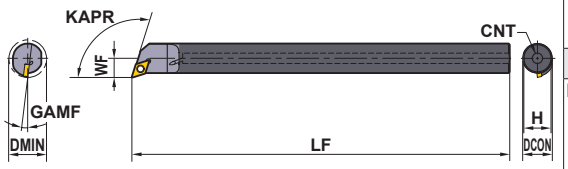
- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Carbide shanks are stocked in various diameters.

(inch)

E-SDQC

Carbide Shank Coolant Through **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L F	
(2,3)	(2,3)	(2,3)	(2,3)

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E06M-SDQCL2	●	DCET DCGT DCGW DCMT DCMW	21.5○	.375	6.00	.488	.290	.360	8°	.109	.31	TS25	TKY08F
E06M-SDQCR2	●		21.5○	.375	6.00	.488	.290	.360	8°	.109	.31	TS25	TKY08F
E08M-SDQCL2	●		21.5○	.500	6.00	.665	.375	.485	10°	.188	.51	TS25	TKY08F
E08M-SDQCR2	●		21.5○	.500	6.00	.665	.375	.485	10°	.188	.51	TS25	TKY08F
E10R-SDQCL2	●		21.5○	.625	8.00	.797	.406	.600	7°	.219	1.2	TS25	TKY08F
E10R-SDQCR2	●		21.5○	.625	8.00	.797	.406	.600	7°	.219	1.2	TS25	TKY08F
E12S-SDQCL3	●		32.5○	.750	10.00	.954	.500	.725	7°	.281	2.2	TS4	TKY15F
E12S-SDQCR3	●		32.5○	.750	10.00	.954	.500	.725	7°	.281	2.2	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25 = 8.9, TS4 = 31

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

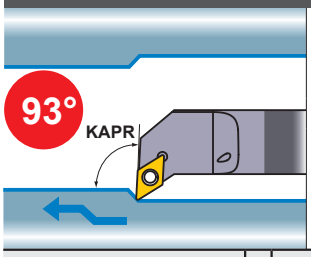
● : USA Stock

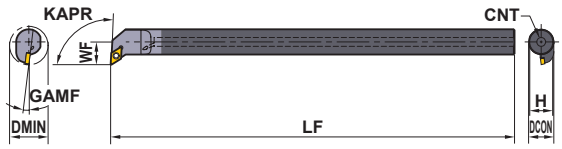
DC○○ type inserts ➤ A164–A171
CBN & PCD inserts ➤ B040, B041, B054

(inch)

E-SDUC

Carbide Shank Coolant Through **DC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**PCD**	**CBN**
MP	MM	R/L F	
(2,3,4)	(2,3,4)	(2,3)	(2,3)

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E06M-SDUCL2	●	DCET DCGT DCGW DCMT DCMW	21.5○	.375	6.00	.664	.437	.360	7°	.109	.31	TS25	TKY08F
E06M-SDUCR2	●		21.5○	.375	6.00	.664	.437	.360	7°	.109	.31	TS25	TKY08F
E08R-SDUCL2	●		21.5○	.500	8.00	.789	.500	.485	7°	.188	.71	TS25	TKY08F
E08R-SDUCR2	●		21.5○	.500	8.00	.789	.500	.485	7°	.188	.71	TS25	TKY08F
E10S-SDUCL2	●		21.5○	.625	10.00	.954	.563	.600	7°	.219	1.6	TS25	TKY08F
E10S-SDUCR2	●		21.5○	.625	10.00	.954	.563	.600	7°	.219	1.6	TS25	TKY08F
E12S-SDUCL3	●		32.5○	.750	10.00	1.079	.625	.725	7°	.281	2.2	TS4	TKY15F
E12S-SDUCR3	●		32.5○	.750	10.00	1.079	.625	.725	7°	.281	2.2	TS4	TKY15F
E16T-SDUCL4	●		43○	1.000	12.00	1.329	.750	.975	5°	.313	5.0	TS5	TKY15F
E16T-SDUCR4	●		43○	1.000	12.00	1.329	.750	.975	5°	.313	5.0	TS5	TKY15F

* Clamp Torque (lbf-in) : TS25 = 8.9, TS4 = 31, TS5 = 66

DC○○ type inserts	➢ A164–A171
CBN & PCD inserts	➢ B040, B041, B054

CUTTING CONDITIONS	➢ E048
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

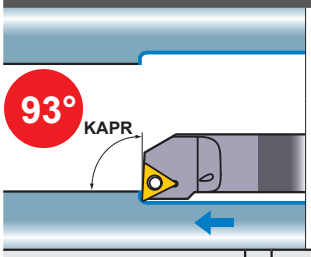
COOLANT THROUGH CARBIDE

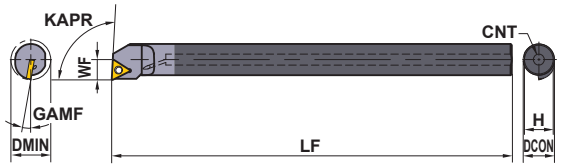
- Two wall pocket.
- 7° and 11° positive insert, low cutting force.
- Screw-on type.
- Carbide shanks are stocked in various diameters.

(inch)

E-STUC

Carbide Shank Coolant Through — **TC○○ inserts**





Right hand tool holder shown.

Finish	Finish
FP	FJ-P
(2,3)	(2,3)
Light	**Medium**
LP	MP
(2,3)	(2,3)

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E06M-STUCL2	●	TCGT TCGW TCMT TCMW	21.5○	.375	6.00	.477	.250	.360	15°	.109	.31	TS25	TKY08F
E06M-STUCR2	●		21.5○	.375	6.00	.477	.250	.360	15°	.109	.31	TS25	TKY08F
E08M-STUCL2	●		21.5○	.500	6.00	.602	.313	.485	13°	.188	.51	TS25	TKY08F
E08M-STUCR2	●		21.5○	.500	6.00	.602	.313	.485	13°	.188	.51	TS25	TKY08F
E10R-STUCL2	●		21.5○	.625	8.00	.797	.406	.600	10°	.219	1.2	TS25	TKY08F
E10R-STUCR2	●		21.5○	.625	8.00	.797	.406	.600	10°	.219	1.2	TS25	TKY08F
E12S-STUCL3	●		32.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS4	TKY15F
E12S-STUCR3	●		32.5○	.750	10.00	.954	.500	.725	8°	.281	2.2	TS4	TKY15F
E16T-STUCL3	●		32.5○	1.000	12.00	1.219	.641	.975	7°	.313	5.0	TS4	TKY15F
E16T-STUCR3	●		32.5○	1.000	12.00	1.219	.641	.975	7°	.313	5.0	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25 = 8.9, TS4 = 31

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : USA Stock

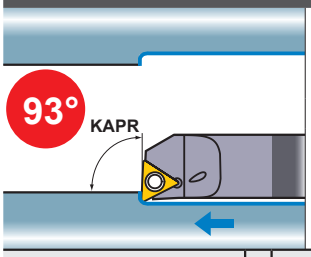
TC○○ type inserts ➤ A177–A180
CBN & PCD inserts ➤ B042, B055

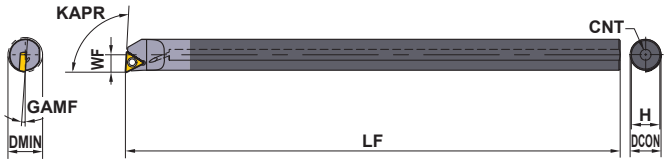
(inch)

E-STUP

Carbide Shank
Coolant Through

TP○○inserts





Right hand tool holder shown.

Finish	Light	Medium
FV	SV	MV
(1.5,1.8,2)	(1.5,1.8,2)	(1.5,1.8,2)
PCD	**CBN**	
R/L F		
(1.5,1.8,2)	(1.5,1.8,2)	

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E05K-STUPL1.5	●	TPMH TPMX TPGB TPGH TPGX	1.51.5○	.313	5.00	.402	.196	.295	10°	.094	.21	TS2D	TKY06F
E05K-STUPR1.5	●		1.51.5○	.313	5.00	.402	.196	.295	10°	.094	.21	TS2D	TKY06F
E06M-STUPL1.8	●		1.81.5○	.375	6.00	.450	.227	.360	8°	.109	.31	TS25D	TKY08F
E06M-STUPR1.8	●		1.81.5○	.375	6.00	.450	.227	.360	8°	.109	.31	TS25D	TKY08F
E08R-STUPL1.8	●		1.81.5○	.500	8.00	.580	.290	.485	7°	.188	.71	TS25D	TKY08F
E08R-STUPR1.8	●		1.81.5○	.500	8.00	.580	.290	.485	7°	.188	.71	TS25D	TKY08F
E10S-STUPL2	●		22○	.625	10.00	.700	.352	.600	4°	.219	1.6	TS31D	TKY10F
E10S-STUPR2	●		22○	.625	10.00	.700	.352	.600	4°	.219	1.6	TS31D	TKY10F
E12S-STUPL2	●		22○	.750	10.00	.825	.414	.725	0°	.281	2.2	TS31D	TKY10F
E12S-STUPR2	●		22○	.750	10.00	.825	.414	.725	0°	.281	2.2	TS31D	TKY10F
E16T-STUPL2	●		22○	1.000	12.00	1.280	.638	.975	0°	.313	5.0	TS31D	TKY10F
E16T-STUPR2	●		22○	1.000	12.00	1.280	.638	.975	0°	.313	5.0	TS31D	TKY10F

* Clamp Torque (lbf-in) : TS2D = 5.3, TS25D = 8.9, TS31D = 22

TP○○ type inserts	➤ A182–A185
CBN & PCD inserts	➤ B043, B044, B056, B057

CUTTING CONDITIONS	➤ E048
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

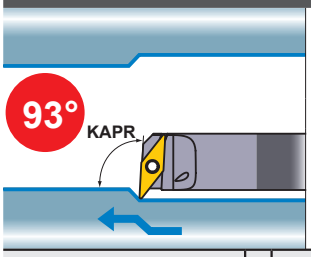
COOLANT THROUGH CARBIDE

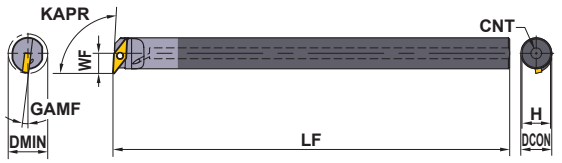
- Two wall pocket.
- 7° positive insert, low cutting force.
- Screw-on type.
- Carbide shanks are stocked in various diameters.

(inch)

E-SVUC

Carbide Shank Coolant Through **VC○○inserts**





Right hand tool holder shown.

Finish	Finish	Light	Light
FP	FM	LP	LM
(2,3)	(2,3)	(2,3)	(2,3)
Medium	**Medium**	**Medium**	**CBN**
MP	MM	Standard	
(3)	(3)	(3)	(2,3)

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E10R-SVUCL2	●	VCMT VCGT VCGW VCMW	22○	.625	8.00	.831	.508	.600	7°	.219	1.2	TS25	TKY08F
E10R-SVUCR2	●		22○	.625	8.00	.831	.508	.600	7°	.219	1.2	TS25	TKY08F
E12S-SVUCL2	●		22○	.750	10.00	.985	.600	.725	7°	.281	2.2	TS25	TKY08F
E12S-SVUCR2	●		22○	.750	10.00	.985	.600	.725	7°	.281	2.2	TS25	TKY08F
E16T-SVUCL3	●		33○	1.000	12.00	1.340	.830	.975	6°	.312	5.0	TS4	TKY15F
E16T-SVUCR3	●		33○	1.000	12.00	1.340	.830	.975	6°	.312	5.0	TS4	TKY15F

* Clamp Torque (lbf-in) : TS25 = 8.9, TS4 = 31

Note 1) The insert photos are only examples. The letters refer to the chip breaker and the dimension refers to the inscribed circle.
Note 2) When using insert with right and left hand chip breaker, please use left hand insert for right hand holder and right hand insert for left hand holder.

● : USA Stock

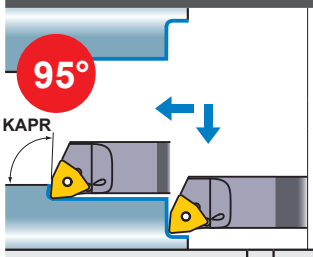
VC○○ type inserts ➤ A190–A192
CBN & PCD inserts ➤ B046, B058

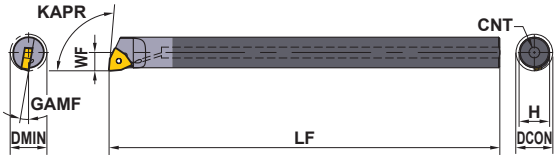
(inch)

E-SWLO

Carbide Shank
Coolant Through

WC○○inserts





Right hand tool holder shown.

Finish	Finish	Medium
FJ-P	R/L	Standard
(2,3)	(1.2,1.5)	(1.2,1.5,2,3)
Light	**PCD**	
MJ		
(2,3)	(1.5,2,3)	

Order Number	Stock	Insert Number		DCON	LF	DMIN	WF	H	GAMF	CNT	WT (lbs)	* Clamp Screw	Wrench
E04H-SWLOL1.2	●	WCMT WCMW WCGT WCGW	1.21○	.250	4.00	.313	.156	.235	17°	.078	.11	TS2	TKY06F
E04H-SWLOR1.2	●		1.21○	.250	4.00	.313	.156	.235	17°	.078	.11	TS2	TKY06F
E05M-SWLOL1.2	●		1.21○	.313	6.00	.375	.188	.295	15°	.094	.26	TS21	TKY06F
E05M-SWLOR1.2	●		1.21○	.313	6.00	.375	.188	.295	15°	.094	.26	TS21	TKY06F
E05M-SWLOL1.5	●		1.51.5○	.313	6.00	.375	.188	.295	15°	.094	.26	TS2	TKY06F
E05M-SWLOR1.5	●		1.51.5○	.313	6.00	.375	.188	.295	15°	.094	.26	TS2	TKY06F
E05K-SWLOL2	●		21.5○	.313	5.00	.406	.203	.295	15°	.094	.21	TS25	TKT08F
E05K-SWLOR2	●		21.5○	.313	5.00	.406	.203	.295	15°	.094	.21	TS25	TKT08F
E06M-SWLOL2	●		21.5○	.375	6.00	.438	.218	.358	15°	.109	.31	TS25	TKT08F
E06M-SWLOR2	●		21.5○	.375	6.00	.438	.218	.358	15°	.109	.31	TS25	TKT08F
E08M-SWLOL2	●		21.5○	.500	6.00	.625	.312	.480	13°	.188	.51	TS25	TKT08F
E08M-SWLOR2	●		21.5○	.500	6.00	.625	.312	.480	13°	.188	.51	TS25	TKT08F
E10R-SWLOL3	●		32.5○	.625	8.00	.750	.375	.600	10°	.219	1.0	TS4	TKY15F
E10R-SWLOR3	●		32.5○	.625	8.00	.750	.375	.600	10°	.219	1.0	TS4	TKY15F
E12S-SWLOL3	●		32.5○	.750	10.00	1.000	.500	.725	8°	.281	1.7	TS4	TKY15F
E12S-SWLOR3	●		32.5○	.750	10.00	1.000	.500	.725	8°	.281	1.7	TS4	TKY15F
E16T-SWLOL3	●		32.5○	1.000	12.00	1.250	.640	.975	7°	.313	4.1	TS4	TKY15F
E16T-SWLOR3	●		32.5○	1.000	12.00	1.250	.640	.975	7°	.313	4.1	TS4	TKY15F

* Clamp Torque (lbf-in) : TS2 = 5.3, TS21 = 5.3, TS25 = 8.9, TS4 = 31

WC○○ type inserts	➤ A196, A197
CBN & PCD inserts	➤ B059

CUTTING CONDITIONS	➤ E048
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

RECOMMENDED CUTTING CONDITIONS

(inch)

				Case 1			Case 2		
Heavy Metal Shank				L/D ≤ 3			3 < L/D ≤ 4		
Steel Shank				L/D ≤ 3			3 < L/D ≤ 4		
Carbide Shank				L/D ≤ 5			5 < L/D ≤ 8		
	Work Material	Hardness	Cutting Mode	**vc** (SFM)	**f** (IPR)	**ap**	**vc** (SFM)	**f** (IPR)	**ap**
P	Carbon Steel Alloy Steel	180 — 280 HB	Light Cutting	295 — 525	.002 — .006	.008	260 — 490	.002 — .006	.008
			Medium Cutting	195 — 395	.006 — .014	.118	165 — 360	.004 — .008	.059
M	Stainless Steel	≤ 200 HB	Light Cutting	330 — 590	.002 — .006	.008	330 — 590	.002 — .006	.008
			Medium Cutting	165 — 295	.006 — .010	.079	130 — 260	.004 — .008	.039
K	Cast Iron	Tensile Strength ≤ 350 MPa	Light Cutting	295 — 525	.002 — .006	.020	330 — 590	.004 — .006	.020
			Medium Cutting	195 — 390	.006 — .010	.079	130 — 260	.006 — .010	.060
N	Aluminum Alloy	—	Light Cutting	655 — 1310	.002 — .006	.008	665 — 1310	.002 — .006	.008
			Medium Cutting	490 — 820	.002 — .006	.079	490 — 820	.002 — .006	.059

Memo

HOW TO READ THE STANDARD OF GROOVING AND CUTTING OFF

●How this section page is organized

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

[For External Grooving / Cutting Off] [For Internal Grooving]

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications such as cutting off, grooving, and copying.

INDICATION OF HOLDER TYPE ACCORDING TO APPLICATION
indicates the holder types, such as the standard type or the L type, according to machining application.

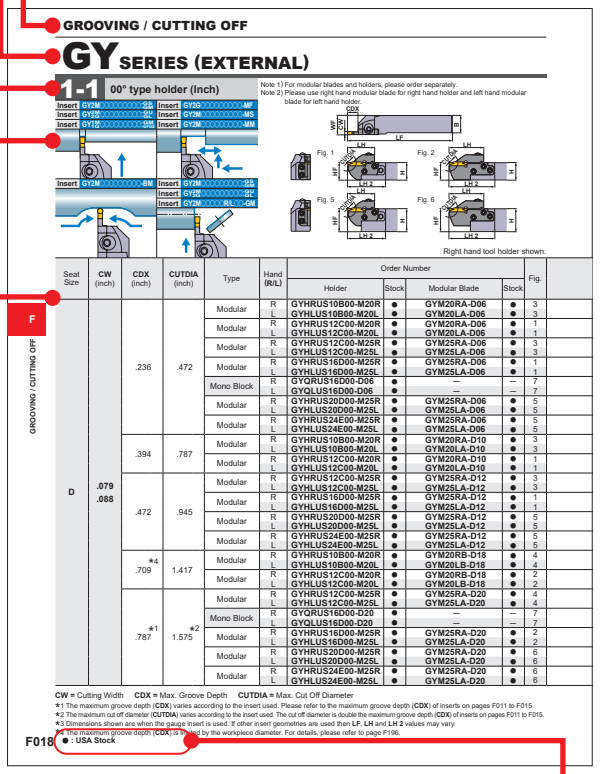
TITLE OF PRODUCT

PRODUCT SECTION

PRODUCT FEATURES

MIN. CUTTING DIAMETER
is color-coded to let you find, at a glance, the minimum cutting diameters for internal machining.

GEOMETRY


GROOVING / CUTTING OFF

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)

Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

Right hand tool holder shown.

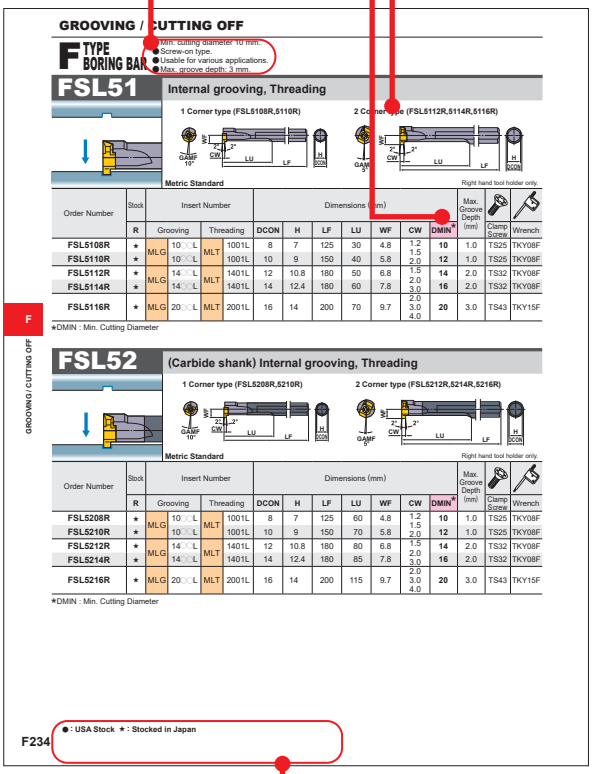
Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
D	.079 .088	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D06	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-D06	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-D06	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-D06	●	1
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D06	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-D06	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D06	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-D06	●	1
				Mono Block	R	GYQRUS16D00-D06	●	—	—	7
					L	GYQLUS16D00-D06	●	—	—	7
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D06	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-D06	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D06	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-D06	●	5
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D10	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-D10	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-D10	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-D10	●	1
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D12	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-D12	●	3
		.472	.945	Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D12	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-D12	●	1
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D12	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-D12	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D12	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-D12	●	5
		*4 .709	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-D18	●	4
					L	GYHLUS10B00-M20L	●	GYM20LB-D18	●	4
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-D18	●	2
					L	GYHLUS12C00-M20L	●	GYM20LB-D18	●	2
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D20	●	4
					L	GYHLUS12C00-M25L	●	GYM25LA-D20	●	4
		*1 .787	*2 1.575	Mono Block	R	GYQRUS16D00-D20	●	—	—	7
					L	GYQLUS16D00-D20	●	—	—	7
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D20	●	2
					L	GYHLUS16D00-M25L	●	GYM25LA-D20	●	2
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D20	●	6
					L	GYHLUS20D00-M25L	●	GYM25LA-D20	●	6
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D20	●	6
					L	GYHLUS24E00-M25L	●	GYM25LA-D20	●	6

CW = Cutting Width CDX = Max. Groove Depth CUTDIA = Max. Cut Off Diameter

*1 The maximum groove depth (CDX) varies according to the insert used. Please refer to the maximum groove depth (CDX) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (CUTDIA) varies according to the insert used. The cut off diameter is double the maximum groove depth (CDX) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then LF, LH and LH 2 values may vary.
*4 The maximum groove depth (CDX) is limited by the workpiece diameter. For details, please refer to page F196.

● : USA Stock

F018


GROOVING / CUTTING OFF

F TYPE BORING BAR

FSL51 Internal grooving, Threading

1 Corner type (FSL5108R,5110R) 2 Corner type (FSL5112R,5114R,5116R)

Metric Standard

Order Number	Stock R	Insert Number: Grooving	Insert Number: Threading	Dimensions (mm): DCON	H	LF	LU	WF	CW	DMIN*	Max. Groove Depth (mm)	Clamp Screw	Wrench
FSL5108R	★	MLG 10□L	MLT 1001L	8	7	125	30	4.8	1.2 1.5 2.0	10	1.0	TS25	TKY08F
FSL5110R	★	MLG 10□L	MLT 1001L	10	9	150	40	5.8	1.2 1.5 2.0	12	1.0	TS25	TKY08F
FSL5112R	★	MLG 14□L	MLT 1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	14	2.0	TS32	TKY08F
FSL5114R	★	MLG 14□L	MLT 1401L	14	12.4	180	60	7.8	1.5 2.0 3.0	16	2.0	TS32	TKY08F
FSL5116R	★	MLG 20□L	MLT 2001L	16	14	200	70	9.7	2.0 3.0 4.0	20	3.0	TS43	TKY15F

*DMIN : Min. Cutting Diameter

FSL52 (Carbide shank) Internal grooving, Threading

1 Corner type (FSL5208R,5210R) 2 Corner type (FSL5212R,5214R,5216R)

Metric Standard

Order Number	Stock R	Insert Number: Grooving	Insert Number: Threading	Dimensions (mm): DCON	H	LF	LU	WF	CW	DMIN*	Max. Groove Depth (mm)	Clamp Screw	Wrench
FSL5208R	★	MLG 10□L	MLT 1001L	8	7	125	60	4.8	1.2 1.5 2.0	10	1.0	TS25	TKY08F
FSL5210R	★	MLG 10□L	MLT 1001L	10	9	150	70	5.8	1.2 1.5 2.0	12	1.0	TS25	TKY08F
FSL5212R	★	MLG 14□L	MLT 1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	14	2.0	TS32	TKY08F
FSL5214R	★	MLG 14□L	MLT 1401L	14	12.4	180	85	7.8	1.5 2.0 3.0	16	2.0	TS32	TKY08F
FSL5216R	★	MLG 20□L	MLT 2001L	16	14	200	115	9.7	2.0 3.0 4.0	20	3.0	TS43	TKY15F

*DMIN : Min. Cutting Diameter

● : USA Stock ★ : Stocked in Japan

F234

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), holders, Modular Blade, cutting widths, maximum groove depths, maximum cut-off diameters, dimensions, applicable inserts, and cutting edge shapes.

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

●To Order : For holder, please specify order number and hand of tool (right/left).
For insert, please specify insert number and grade.

TURNING TOOLS

GROOVING AND CUTTING OFF

CLASSIFICATION (EXTERNAL) ····· F002
CLASSIFICATION (INTERNAL) ····· F003

STANDARD OF GROOVING AND CUTTING OFF TOOLS

EXTERNAL

FEATURES OF THE GY SERIES ····· F004
IDENTIFICATION OF GY SERIES ····· F008
GY SERIES INSERTS ····· F011
GY SERIES REFERENCE DATA ····· F015
GY SERIES ····· F016, F168
GW SERIES ····· F218

INTERNAL

GY SERIES ····· F152
FSL51/52 TYPE ····· F234
S-SL5N TYPE ····· F235
MICRO-MINI TWIN BORING BARS ····· F237

*Arranged by Alphabetical order.

F237 **CG**
F234 **FSL5**
F016 **GY (Holders)**
F011 **GY (Inserts)**
F226 **GW (Blades)**
F224 **GW (Holder)**
F229 **GW (Inserts)**
F236 **MLG (Inserts)**
F236 **MLT (Inserts)**
F235 **S-SL5N**

CLASSIFICATION

EXTERNAL

Name of Tool Holder	Insert Shape	Features	Cutting Width According to Cutting Mode (inch)					
			Shallow Grooving / Deep Grooving / Cutting Off	Copying	Recessing	Face Grooving
GY Series F016 F168		**Modular type** ● Clamp-on type. ● High accuracy and rigidity due to the modular blade. (Tri-lock system) ● Various insert types. **Mono block type** ● Spring clamp type.	.047" .059" .079" (2.0 mm) .088" .094" .098" (2.5 mm) .108" .118" (3.0 mm) .125" .128" .157" (4.0 mm) .167" .187" .197" (5.0 mm) .206" .236" (6.0 mm) .248" .250" .315" (8.0 mm)	.079" (2.0 mm) .098" (2.5 mm) .118" (3.0 mm) .125" .157" (4.0 mm) .187" .197" (5.0 mm) .236" (6.0 mm) .250" .315" (8.0 mm)	.079" (2.0 mm) .098" (2.5 mm) .118" (3.0 mm) .125" .157" (4.0 mm) .187" .197" (5.0 mm) .236" (6.0 mm) .250"	.079" (2.0 mm) .088" .094" .098" (2.5 mm) .108" .118" (3.0 mm) .125" .128" .157" (4.0 mm) .167" .187" .197" (5.0 mm) .206" .236" (6.0 mm) .248" .250"
GW Series F218		● Spring clamp type. ● Simple insert clamping method. ● The blade is possible to use with both external or through coolant. ● Breaker system offering excellent chip disposal properties. ● Maximum cut off diameter : 4.724" (120 mm).	.079" (2.0 mm) .094" .118" (3.0 mm) .157" (4.0 mm) .197" (5.0 mm)			

INTERNAL

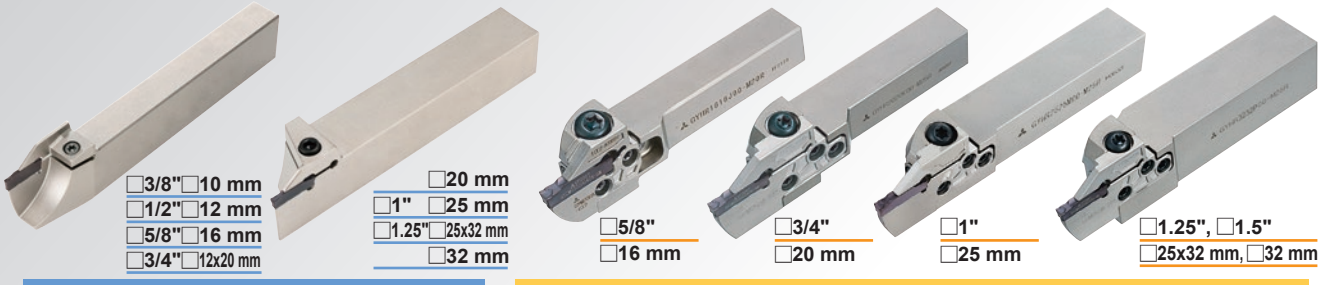
Name of Tool Holder	Insert Shape	Features	Min. Cutting Diameter (inch)	Cutting Width (inch)	Max. Groove Depth (inch)
GY Series ➲ F152		**Modular type** ● Clamp-on type. ● High accuracy and rigidity due to the modular blade. (Tri-lock system) ● Various insert types. **Mono block type** ● Spring clamp type.	.984" (25 mm)	.079" (2.0 mm) .088" .094" .098" (2.5 mm) .108" .118" (3.0 mm) .125" .128" .157" (4.0 mm) .167" .187" .197" (5.0 mm) .206" .236" (6.0 mm) .248" .250"	.157" I .512"
FSL5/S-SL5 **Boring Bars** ➲ F234		● Screw-on type. ● Precision class insert. ● Holder is capable of performing both grooving and threading. ● Maximum groove depth .118 inch.	.394"	.047" (1.2 mm) .059" (1.5 mm) .062" .079" (2.0 mm) .094" .118" (3.0 mm) .125" .156" .157" (4.0 mm)	.039" I .118"
MICRO-MINI TWIN **Boring Bars** ➲ F237	–	● Solid carbide type. ● Economical due to single holder with two cutting edges.	.118"	.04" I .08"	.04" I .08"
MICRO-MINI **Boring Bars** ➲ E031	–	● Solid carbide type. ● Insert can be ground to suit the application.	.126"	.08" I .12"	.04" I .08"

GY SERIES

A wide selection of holders and inserts available for diverse grooving and cutting off applications

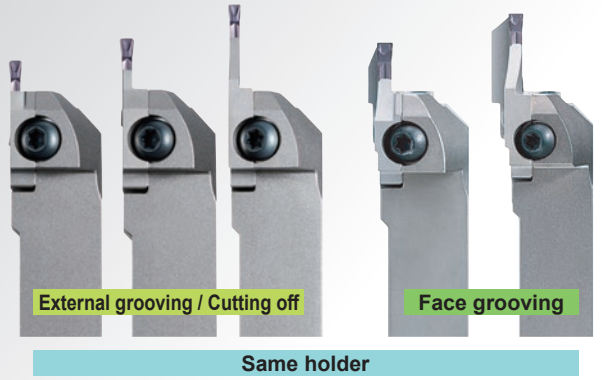
External • Face holders

Corresponding blades to a variety of modular holders with different shank sizes

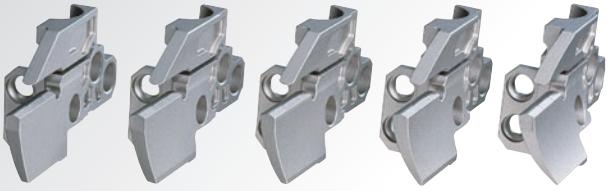


Mono block type | **Modular type**

A wide selection of holders and inserts available for diverse grooving and cutting off applications



Applicable for various diameters of face grooves by the wide array of modular blades with different grooving diameters



Internal holders

A wide range of holders available from minimum diameter of ø25 mm

Mono block type

Min.cutting diameter
(Inch)
ø1.000"
ø1.250"

(Metric)
ø25 mm
ø32 mm

Modular type

Min.cutting diameter
(Inch)
ø1.625"
ø2.000"
ø2.500"
ø2.750"

(Metric)
ø40 mm
ø50 mm
ø60 mm
ø70 mm

Short shank types are standard stocked

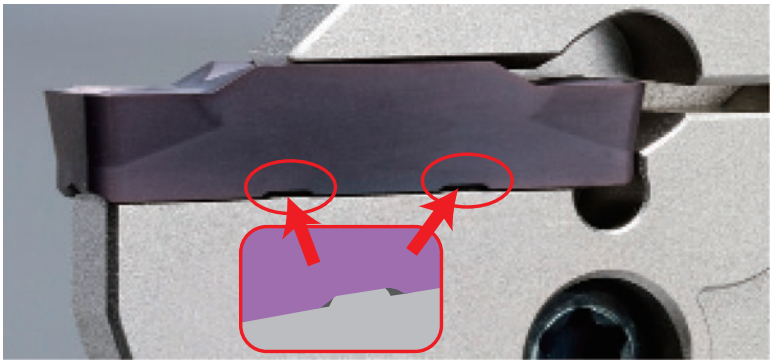
Mono block type | **Modular type**

Short | Standard | Short | Standard

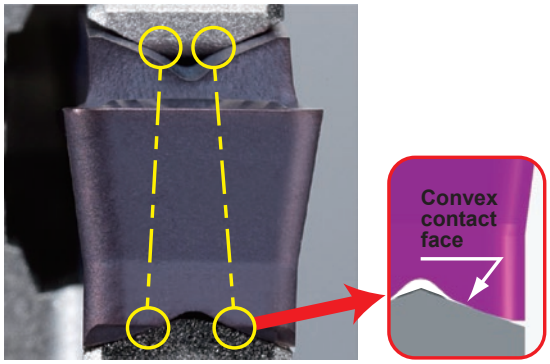
Original insert design leading the way to new grooving and cutting off applications

Highly reliable insert clamping

Safety keys prevent insert movement.



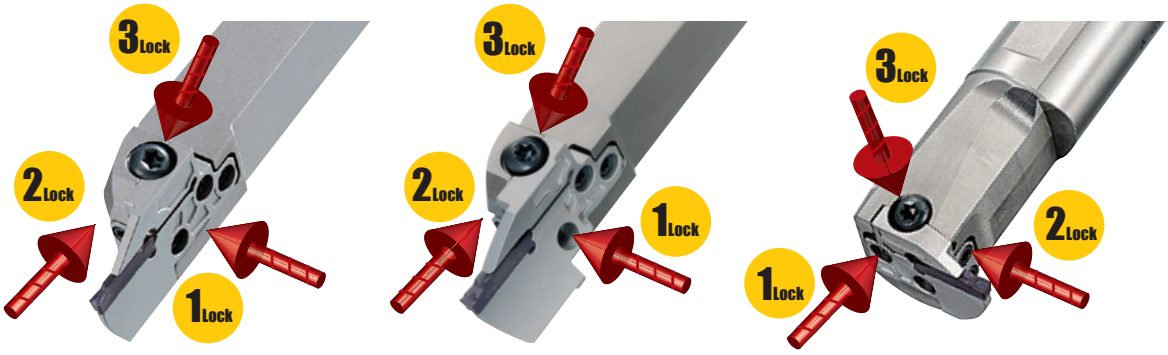
The convex geometry ensures high precision clamping.



New TRI-LOCK System for increased stability and performance!

TRI-LOCK System

The TRI-LOCK system ensures the blade is securely fixed in 3 directions (side, front and top), giving high rigidity for stable grooving and cutting off performance.



A WIDE SELECTION OF INSERTS

BREAKER SYSTEM

Grooving / Cutting Off

GUBreaker
(For Gummy Steel)

GSBreaker
(Low feeds)

GMBreaker
(Medium feeds)

GLBreaker
(For Aluminum Alloy)

Grooving

GFGS
(CBN)

Cutting Off

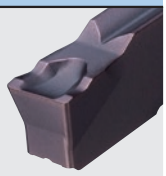
NEW

R08-GS Breaker
(Low feeds)

NEW

R15-GS Breaker
(Low feeds)

GMBreaker
(Medium feeds)



R/L05-GM Breaker
(Medium feeds)

For Multifunctional Grooving

MFBreaker
(G class)

MSBreaker
(Low feeds)

MMBreaker
(Medium feeds)

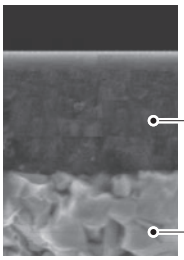
Copying/Recessing

BMBreaker

INSERT GRADE

Work Material / Machining Condition	P Steel	M Stainless Steel	K Cast Iron	N Aluminum Alloy	S Heat resistant Alloy / Titanium Alloy	H Hardened Steel
Stable ↑ Machining Condition ↓ Unstable	NX2525 MY5015 VP10RT VP20RT	VP10RT VP20RT	MY5015 VP10RT VP20RT	RT9010	NEW MP9015 / RT9010 NEW MP9025	BC8110

MP9000 Series

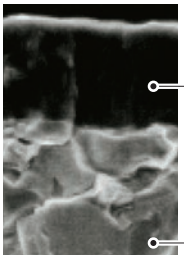


- The high Al-rich (Al, Ti)N single layer coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

High Al-rich (Al, Ti)N Single Layer Coating

Special Cemented Carbide Substrate

VP20RT (1st Recommendation)

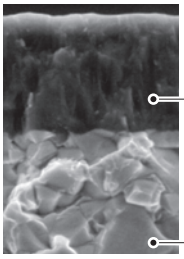


- PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

MIRACLE Coating

Carbide substrate (90.5HRA)

VP10RT



- PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult to cut materials and for extending tool life.

MIRACLE Coating

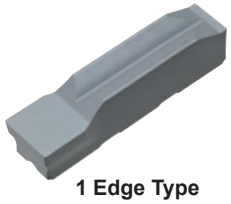
Carbide substrate (92.0HRA)

BLANK INSERTS

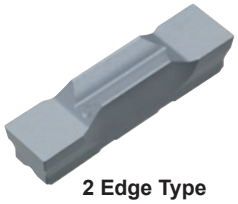
- Blank inserts for custom grinding

RT9010/RT9020 for blank insert

- First recommendation for blank inserts is RT9020 due to the tougher carbide substrate that is suitable for a wider range of applications.
  RT9010 has a harder substrate than RT9020 and is ideal for longer tool life on stable cutting applications.
  Both grades are recommended to have a coating applied that is suitable for the required application.



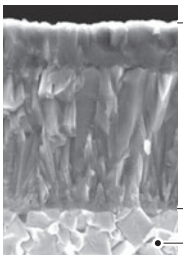
1 Edge Type



2 Edge Type

* Insert blank is not suitable for machining without grinding.

MY5015



- MY5015 is a CVD coated grade with excellent wear resistance even at high temperatures. It provides longer tool life when machining cast and ductile cast iron. Also suitable for high speed continuous cutting of steels.

CVD Coated Carbide

Carbide substrate

RT9010

- RT9010 is an uncoated cemented carbide grade. Suitable for processing non-ferrous metals.

NX2525

- NX2525, a cermet grade for finish machining of steels and for good surface finishes at lower cutting speeds.

BC8110

- A CBN coated grade for continuous cutting, which provides longer life when machining hardened steel.

GL Breaker for Aluminum Alloys

G Class Breaker

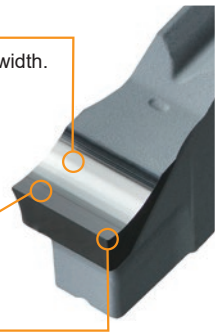
Improved chip control by narrowing the breaker width.

High Rake Angle

Achieves low cutting resistance.

Sharp Edge

Improved welding resistance for aluminium alloys.



MF Breaker (Finishing)

Efficient chip breaking when cross-feed machining.

Chips are controlled when finish machining.

IDENTIFICATION OF GY SERIES

INSERT

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
GY	2	M	0300	F	030	N	05	– M	F

①Series Description

②Number of Teeth

1	1 Edge Type
2	2 Edge Type

③Peripheral

G	Ground
M	Sintered
B	Blank

④Cutting Width

	Inch	Metric
0150	.059"	1.50 mm
0200	.079"	2.00 mm
⋮	⋮	⋮
0800	.315"	8.00 mm

⑤Seat Size *1

	Inch	Metric
B	.047"	1.20 mm
C	.059"	1.50 mm
D	.079" .088"	2.00 mm 2.24 mm
E	.094" .098" .108"	2.39 mm 2.50 mm 2.74 mm
F	.118" .125" .128"	3.00 mm 3.18 mm 3.24 mm
G	.157" .167"	4.00 mm 4.24 mm
H	.187" .197" .206"	4.75 mm 5.00 mm 5.24 mm
J	.236" .248" .250"	6.00 mm 6.31 mm 6.35 mm
K	.315"	8.00 mm

⑥Corner Radius

	Inch	Metric
010	.004"	0.10 mm
015	.006"	0.15 mm
⋮	⋮	⋮
400	.157"	4.00 mm

⑦Hand

N	Neutral
R	Right
L	Left

⑧Lead angle (R/L type insert)

05	5°
08	8°
15	15°

⑨Application 1

G	Grooving/Cutting off
M	Multifunctional
B	Copying (Ball nose)

⑩Application 2

U	For Gummy Steel
F	Finishing
S	Low feeds
M	Medium feeds
L	For Aluminum Alloys

CBN INSERT

①	②	③	④	⑤	⑥	⑦	⑨	⑪	⑫
GY	1	G	0300	F	020	N	– G	F	GS

⑪Application 3

F	Flat Top

⑫Honing Type

GS	General Purpose

*1 Select a seat size with the same symbol as that of the modular blade and mono block holder.

MODULAR BLADE

EXTERNAL/INTERNAL/RECESSING

①	②	③	④	⑤	⑥
GY	M25	R	A	– F	12 *3

①Series Description

②Modular Blade Size

M20
M25

③Hand

R	Right
L	Left

④Modular Blade Type

A	Standard Type
B	Reinforced Type
C	External Recessing
D	Face Grooving

⑤Seat Size *1

	Inch	Metric
D	.079" .088"	2.00 mm 2.24 mm
E	.094" .098" .108"	2.39 mm 2.50 mm 2.74 mm
F	.118" .125" .128"	3.00 mm 3.18 mm 3.24 mm
G	.157" .167"	4.00 mm 4.24 mm
H	.187" .197" .206"	4.75 mm 5.00 mm 5.24 mm
J	.236" .248" .250"	6.00 mm 6.31 mm 6.35 mm

⑥Max. Groove Depth *2

	Inch	Metric
005	.197"	0.5 mm
06	.236"	6 mm
⋮	⋮	⋮
25	.984"	25.0 mm

FACE GROOVING

①	②	③	④	⑤	⑥	⑦
GY	M25	R	D	– F	12	– 050

⑦Min. Groove Diameter

	Inch	Metric
035	1.378"	35 mm
040	1.575"	40 mm
⋮	⋮	⋮
250	9.843"	250 mm

*1 Select a seat size with the same symbol as that of the insert.
*2 The maximum groove depth is a value when used for external grooving and changes according to the insert used. For internal grooving, refer to the maximum groove depth on pages F152 ─ F167.
*3 GYM20R/LA-○10, GYM20R/LA-○12, GYM25R/LA-○12 and GYM25R/LA-○14 can be used for both external and internal grooving.

■ EXTERNAL/FACE GROOVING/RECESSING

● MONO BLOCK HOLDER

	①	②	③	④	⑤	⑥		⑦	⑧
(Inch)	GY	P	R	US16	D	00	–	K	25
(Metric)				2525	M				

①Series Description

②Holder Type

S	Mono Block Holder for Swiss-type Lathe
P	Offset Mono Block Holder
Q	Zero Offset Mono Block Holder
H	Modular Type Holder

③Hand of Holder

R	Right
L	Left

④Holder Size

Inch		Metric	
US06	.375"x.375"	1010	10 mmx10 mm
US08	.500"x.500"	1212	12 mmx12 mm
US10	.625"x.625"	1616	16 mmx16 mm
US12	.750"x.750"	2012	20 mmx12 mm
US16	1.000"x1.000"	2020	20 mmx20 mm
US20	1.250"x1.250"	2525	25 mmx25 mm
US24	1.500"x1.500"	3225	32 mmx25 mm
		3232	32 mmx32 mm

⑤Holder Length

Inch		Metric	
B	4.5"	J	110 mm
C	5.0"	JX	120 mm
D	6.0"	K	125 mm
E	7.0"	M	150 mm
		P	170 mm

⑥Angle (degree)

00	0°
50	50°
90	90°

⑦Seat Size *1

	Inch	Metric
B	.047"	1.20 mm
C	.059"	1.50 mm
D	.079" .088"	2.00 mm 2.24 mm
E	.094" .098" .108"	2.39 mm 2.50 mm 2.74 mm
F	.118" .125" .128"	3.00 mm 3.18 mm 3.24 mm
G	.157" .167"	4.00 mm 4.24 mm
H	.187" .197" .206"	4.75 mm 5.00 mm 5.24 mm
J	.236" .248" .250"	6.00 mm 6.31 mm 6.35 mm
K	.315"	8.00 mm

⑧Max. Grooving Depth

	Inch	Metric
06	.236"	6 mm
08	.315"	8 mm
⋮	⋮	⋮
25	.984"	25 mm

● MODULAR TYPE HOLDER

	①	②	③	④	⑤	⑥		⑨	⑩
(Inch)	GY	H	R	US16	M	00	–	M25	R
(Metric)				2525					

⑨Modular Blade Size

M20
M25

⑩Hand of Modular Blade

R	Right
L	Left

*1 Select a seat size with the same symbol as that of the insert.

■ INTERNAL

● MONO BLOCK HOLDER

	①	②	③	④	⑤	⑥	⑦		⑧	⑨
(Inch)	GY	A	R	US16	K	90	A	–	F	06
(Metric)				20						

①Series Description

②Holder Type

A	Mono Block
D	Modular Type Holder

③Hand of Holder

R	Right
L	Left

④Shank Size

Inch		Metric	
US12	.750"	20	20 mm
US16	1.000"	25	25 mm
US20	1.250"	32	32 mm
US24	1.500"	40	40 mm
US32	2.000"	50	50 mm

⑤Holder Length

	Inch	Metric
K	5.0"	125 mm
L	5.5"	140 mm
M	6.0"	150 mm
P	6.75"	170 mm
Q	7.0"	180 mm
R	8.0"	200 mm
S	10.0"	250 mm
T	12.0"	300 mm

⑥Angle (degree)

90	90°

⑦Neck Length

	Inch	Metric
A	1.250"	30 mm
B	1.500"	40 mm
C	2.000"	50 mm
D	2.500"	60 mm
F	3.250"	80 mm

⑧Seat Size *1

	Inch	Metric
D	.079" .088"	2.00 mm 2.24 mm
E	.094" .098" .108"	2.39 mm 2.50 mm 2.74 mm
F	.118" .125" .128"	3.00 mm 3.18 mm 3.24 mm
G	.157" .167"	4.00 mm 4.24 mm
H	.187" .197" .206"	4.75 mm 5.00 mm 5.24 mm
J	.236" .248" .250"	6.00 mm 6.31 mm 6.35 mm

⑨Max. Grooving Depth

	Inch	Metric
06	.236"	6 mm
07	.276"	7 mm

● MODULAR TYPE HOLDER

	①	②	③	④	⑤	⑥	⑦		⑩	⑪
(Inch)	GY	D	R	US20	M	90	D	–	M25	L
(Metric)				40						

⑩Modular Blade Size

M20
M25

⑪Hand of Modular Blade

R	Right
L	Left

*1 Select a seat size with the same symbol as that of the insert.

IDENTIFICATION OF GY-PSC Holder

■EXTERNAL

(Inch)

①	②	③	④	⑤	⑥		⑦	⑧
C4	– GY	H	R	EX	00	–	M25	R

①Coupling Size

C3
C4
C5
C6

②Series Description

③Holder Type

H	Modular blade type

④Hand of Holder

R	Right
L	Left

⑤Functional Length

CX	2.165"
D	2.362"
DX	2.559"
E	2.756"
EX	2.953"
F	3.150"

⑥Angle (degree)

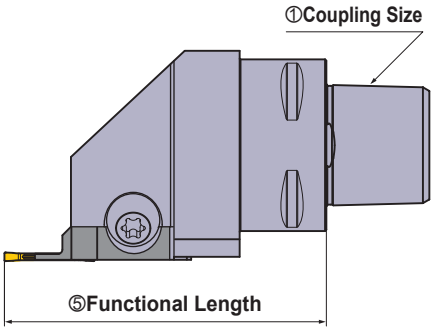
00	0°
90	90°

⑦Modular Blade Size

M20
M25

⑧Hand of Modular Blade

R	Right
L	Left



■EXTERNAL/FACE GROOVING/RECESSING

①Mounting Size

C4	PSC40
C5	PSC50
C6	PSC63

③Holder Type

H	Modular Type Holder

⑤Hand

R	Right
L	Left

⑦Angle(degree)

00	0°
50	50°
90	90°

⑨Hand of Modular Blade

R	Right
L	Left

(Metric)

①	②	③	④	⑤	⑥	⑦	⑧	⑨
C4	– GY	H	E	R	M	00	– M25	R

②Series Description

④Coolant

E	External

⑥Overall Length

M	Medium

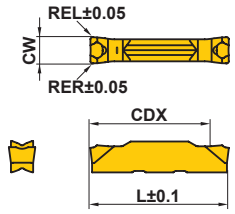
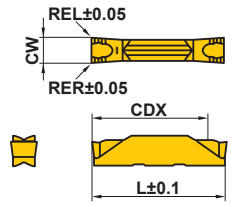
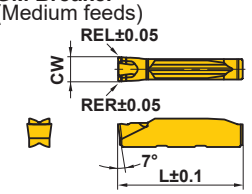
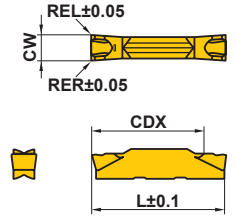
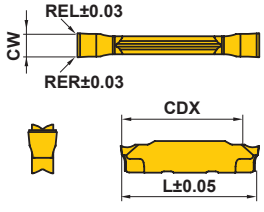
⑧Modular Blade Size

M25

GY SERIES INSERTS

INSERTS

(inch)

Applications	Geometry	Order Number	Stock: Coated NEW MP9015	Coated NEW MP9025	Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	Carbide RT9010	Carbide RT9020	Seat Size	CW: Cutting Width inch	CW: Cutting Width (mm)	CW: Tolerance	RER/L	CDX	*2 L
For Grooving / Cutting Off	**GU Breaker** (For gummy steel) 	GY2M0200D020N-GU			●	●		●			D	.079	(2.00)	±.0012	.008	.776	.815
		GY2M0239E020N-GU			●	●		●			E	.094	(2.39)	±.0012	.008	.780	.815
		GY2M0250E020N-GU			●	●		●			E	.098	(2.50)	±.0012	.008	.768	.815
		GY2M0300F030N-GU			●	●		●			F	.118	(3.00)	±.0012	.012	.760	.815
		GY2M0318F030N-GU			●	●		●			F	.125	(3.18)	±.0012	.012	.760	.815
		GY2M0400G030N-GU			●	●		●			G	.157	(4.00)	±.0016	.012	.953	1.010
		GY2M0475H040N-GU			●	●		●			H	.187	(4.75)	±.0016	.016	.953	1.010
		GY2M0500H040N-GU			●	●		●			H	.197	(5.00)	±.0016	.016	.953	1.010
		GY2M0600J040N-GU			●	●		●			J	.236	(6.00)	±.0016	.016	.953	1.010
		GY2M0635J040N-GU			●	●		●			J	.250	(6.35)	±.0016	.016	.953	1.010
	GS Breaker (Low feeds) 	NEW GY2M0120B010N-GS			●	●					B	.047	(1.20)	±.0012	.004	.480	.579
		GY2M0150C010N-GS			●	●		●			C	.059	(1.50)	±.0012	.004	.528	.579
		GY2M0200D020N-GS			●	●		●			D	.079	(2.00)	±.0012	.008	.736	.815
		GY2M0239E020N-GS			●	●		●			E	.094	(2.39)	±.0012	.008	.728	.815
		GY2M0250E020N-GS			●	●		●			E	.098	(2.50)	±.0012	.008	.728	.815
		GY2M0300F020N-GS			●	●		●			F	.118	(3.00)	±.0012	.008	.728	.815
		GY2M0318F020N-GS			●	●		●			F	.125	(3.18)	±.0012	.008	.728	.815
		GY2M0400G020N-GS			●	●		●			G	.157	(4.00)	±.0016	.008	.941	1.010
		GY2M0475H030N-GS			●	●		●			H	.187	(4.75)	±.0016	.012	.941	1.010
		GY2M0500H030N-GS			●	●		●			H	.197	(5.00)	±.0016	.012	.945	1.010
		GY2M0600J030N-GS			●	●		●			J	.236	(6.00)	±.0016	.012	.949	1.010
		GY2M0635J030N-GS			●	●		●			J	.250	(6.35)	±.0016	.012	.949	1.010
		GY2M0800K030N-GS			●	●					K	.315	(8.00)	±.0016	.012	1.146	1.201
	GM Breaker (Medium feeds) 	GY1M0200D020N-GM	●	●	●	●	●				D	.079	(2.00)	±.0012	.008	—	.815
		GY1M0250E020N-GM	●	●	●	●	●				E	.098	(2.50)	±.0012	.008	—	.815
		GY1M0300F030N-GM	●	●	●	●	●				F	.118	(3.00)	±.0012	.012	—	.815
		GY1M0400G030N-GM	●	●	●	●	●				G	.157	(4.00)	±.0016	.012	—	1.010
		GY1M0500H040N-GM	●	●	●	●	●				H	.197	(5.00)	±.0016	.016	—	1.010
	GM Breaker (Medium feeds) 	GY2M0150C020N-GM	●	●	●	●		●			C	.059	(1.50)	±.0012	.008	.547	.579
		GY2M0200D020N-GM	●	●	●	●	●	●			D	.079	(2.00)	±.0012	.008	.764	.815
		GY2M0239E020N-GM	●	●	●	●	●	●			E	.094	(2.39)	±.0012	.008	.764	.815
		GY2M0250E020N-GM	●	●	●	●	●	●			E	.098	(2.50)	±.0012	.008	.764	.815
		GY2M0300F030N-GM	●	●	●	●	●	●			F	.118	(3.00)	±.0012	.012	.764	.815
		GY2M0318F030N-GM	●	●	●	●	●	●			F	.125	(3.18)	±.0012	.012	.764	.815
		GY2M0400G030N-GM	●	●	●	●	●	●			G	.157	(4.00)	±.0016	.012	.961	1.010
		GY2M0475H040N-GM	●	●	●	●	●	●			H	.187	(4.75)	±.0016	.016	.957	1.010
		GY2M0500H040N-GM	●	●	●	●	●	●			H	.197	(5.00)	±.0016	.016	.957	1.010
		GY2M0600J040N-GM	●	●	●	●	●	●			J	.236	(6.00)	±.0016	.016	.957	1.010
		GY2M0635J040N-GM	●	●	●	●	●	●			J	.250	(6.35)	±.0016	.016	.957	1.010
		GY2M0800K050N-GM	●	●	●	●	●				K	.315	(8.00)	±.0016	.020	1.154	1.201
	GL Breaker (For Aluminum Alloys) 	GY2G0200D005N-GL							●		D	.079	(2.00)	±.0008	.002	.768	.829
		GY2G0250E005N-GL							●		E	.098	(2.50)	±.0008	.002	.752	.829
		GY2G0300F005N-GL							●		F	.118	(3.00)	±.0008	.002	.744	.829

*2 The dimension depends on the breaker. Refer to the F015 “L dimension tolerance conversion table”.

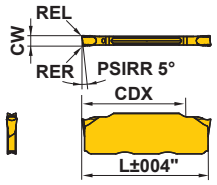
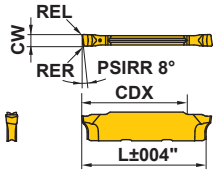
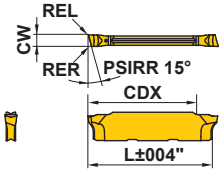
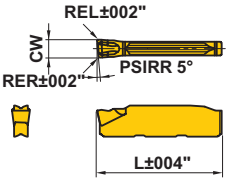
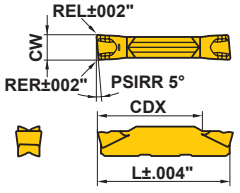
● = NEW

● : USA Stock
<10 inserts in one case>

GY SERIES INSERTS

INSERTS

(inch)

Applications	Geometry	Order Number	Stock Coated NEW MP9015	Stock Coated NEW MP9025	Stock Coated VP10RT	Stock Coated VP20RT	Stock Coated MY5015	Seat Size	CW Cutting Width inch	CW Cutting Width (mm)	CW Tolerance	Corner R REL	Corner R Tolerance	Corner R RER	Corner R Tolerance	CDX	✱2 L
For Cutting off	**R05-GS Breaker** NEW (Low feeds) 	GY2M0120B010R05-GS			●	●		B	.047	(1.20)	±.0012	.004	±.0020	.004	±.002	.481	.579
	R08-GS Breaker NEW (Low feeds) 	GY2G0150C010R08-GS			●	●		C	.059	(1.50)	±.0008	.004	±.0012	.004	—	.519	.600
		GY2G0200D020R08-GS			●	●		D	.079	(2.00)	±.0012	.008	±.0020	.008	—	.742	.840
		GY2G0250E020R08-GS			●	●		E	.098	(2.50)	±.0012	.008	±.0020	.008	—	.750	.845
		GY2G0300F020R08-GS			●	●		F	.118	(3.00)	±.0012	.008	±.0020	.008	—	.733	.848
	R15-GS Breaker NEW (Low feeds) 	GY2G0150C003R15-GS			●	●		C	.059	(1.50)	±.0008	.0012	+.0012, -.0008	.004	—	.519	.600
		GY2G0150C010R15-GS			●	●		C	.059	(1.50)	±.0008	.004	±.0012	.004	—	.519	.600
		GY2G0200D003R15-GS			●	●		D	.079	(2.00)	±.0012	.0012	+.0012, -.0008	.004	—	.742	.839
		GY2G0200D010R15-GS			●	●		D	.079	(2.00)	±.0012	.004	±.0012	.004	—	.742	.839
		GY2G0250E003R15-GS			●	●		E	.098	(2.50)	±.0012	.0012	+.0012, -.0008	.004	—	.750	.845
		GY2G0250E020R15-GS			●	●		E	.098	(2.50)	±.0012	.008	±.0020	.004	—	.750	.845
		GY2G0300F003R15-GS			●	●		F	.118	(3.00)	±.0012	.0012	+.0012, -.0008	.004	—	.733	.850
		GY2G0300F020R15-GS			●	●		F	.118	(3.00)	±.0012	.008	±.0020	.004	—	.733	.848
	R/L05-GM Breaker  Right hand insert shown.	GY1M0200D020R05-GM			●	●		D	.079	(2.00)	±.0012	.008	±.0020	.008	±.002	—	.819
		GY1M0200D020L05-GM			●	●		D	.079	(2.00)	±.0012	.008	±.0020	.008	±.002	—	.819
		GY1M0300F030R05-GM			●	●		F	.118	(3.00)	±.0012	.012	±.0020	.012	±.002	—	.821
		GY1M0300F030L05-GM			●	●		F	.118	(3.00)	±.0012	.012	±.0020	.012	±.002	—	.821
	R/L05-GM Breaker  Right hand insert shown.	GY2M0200D020R05-GM			●	●		D	.079	(2.00)	±.0012	.008	±.0020	.008	±.002	.768	.819
		GY2M0200D020L05-GM			●	●		D	.079	(2.00)	±.0012	.008	±.0020	.008	±.002	.768	.819
		GY2M0250E020R05-GM			●	●		E	.098	(2.50)	±.0012	.008	±.0020	.008	±.002	.768	.820
		GY2M0250E020L05-GM			●	●		E	.098	(2.50)	±.0012	.008	±.0020	.008	±.002	.768	.820
		GY2M0300F030R05-GM			●	●		F	.118	(3.00)	±.0012	.012	±.0020	.012	±.002	.768	.821
		GY2M0300F030L05-GM			●	●		F	.118	(3.00)	±.0012	.012	±.0020	.012	±.002	.768	.821
		GY2M0400G030R05-GM			●	●		G	.157	(4.00)	±.0016	.012	±.0020	.012	±.002	.965	1.018
		GY2M0400G030L05-GM			●	●		G	.157	(4.00)	±.0016	.012	±.0020	.012	±.002	.965	1.018
		GY2M0500H040R05-GM			●	●		H	.197	(5.00)	±.0016	.016	±.0020	.016	±.002	.965	1.022
		GY2M0500H040L05-GM			●	●		H	.197	(5.00)	±.0016	.016	±.0020	.016	±.002	.965	1.022

✱2 The dimension depends on the breaker. Refer to the F015 “L dimension tolerance conversion table”.

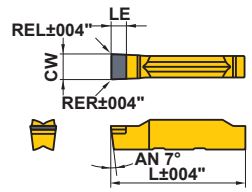
● = NEW

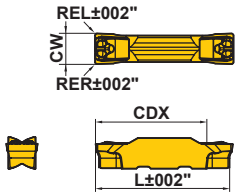
● : USA Stock

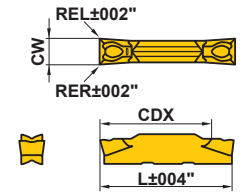
<10 inserts in one case> <CBN inserts are available in 1 piece in one case.>

(inch)

Applications	Geometry	Order Number	Stock: Coated NEW MP9015	Coated NEW MP9025	Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525	Carbide RT9010	Carbide RT9020	CBN BC8110	Seat Size	CW: Cutting Width inch	CW: Cutting Width (mm)	CW: Tolerance	RER/L	CDX	∗2 L	LE
For Grooving	**Flat Top** (For Hardened Steel)	GY1G0200D020N-GFGS									●	D	.079	(2.00)	±.0012	.008	—	.815	.106
		GY1G0239E020N-GFGS									●	E	.094	(2.39)	±.0012	.008	—	.815	.106
		GY1G0250E020N-GFGS									●	E	.098	(2.50)	±.0012	.008	—	.815	.106
		GY1G0300F020N-GFGS									●	F	.118	(3.00)	±.0012	.008	—	.815	.106
		GY1G0318F020N-GFGS									●	F	.125	(3.18)	±.0012	.008	—	.815	.106
		GY1G0400G020N-GFGS									●	G	.157	(4.00)	±.0012	.008	—	1.010	.106
		GY1G0475H020N-GFGS									●	H	.187	(4.75)	±.0012	.008	—	1.010	.106
		GY1G0500H020N-GFGS									●	H	.197	(5.00)	±.0012	.008	—	1.010	.106
		GY1G0600J020N-GFGS									●	J	.236	(6.00)	±.0012	.008	—	1.010	.106
For Multifunctional Grooving	**MF Breaker** (Finishing)	GY2G0200D020N-MF			●	●		●	●			D	.079	(2.00)	±.0008	.008	.768	.829	—
		∗1 GY2G0224D015N-MF			●	●		●	●			D	.088	(2.24)	±.0008	.006	.780	.829	—
		GY2G0239E020N-MF			●	●		●	●			E	.094	(2.39)	±.0008	.008	.756	.829	—
		GY2G0250E020N-MF			●	●		●	●			E	.098	(2.50)	±.0008	.008	.764	.829	—
		∗1 GY2G0274E020N-MF			●	●		●	●			E	.108	(2.74)	±.0008	.008	.776	.829	—
		GY2G0300F020N-MF			●	●		●	●			F	.118	(3.00)	±.0008	.008	.768	.829	—
		GY2G0300F040N-MF			●	●		●	●			F	.118	(3.00)	±.0008	.016	.760	.829	—
		GY2G0318F020N-MF			●	●		●	●			F	.125	(3.18)	±.0008	.008	.768	.829	—
		GY2G0318F040N-MF			●	●		●	●			F	.125	(3.18)	±.0008	.016	.760	.829	—
		∗1 GY2G0324F020N-MF			●	●		●	●			F	.128	(3.24)	±.0008	.008	.768	.829	—
		GY2G0400G020N-MF			●	●		●	●			G	.157	(4.00)	±.0008	.008	.980	1.022	—
		GY2G0400G040N-MF			●	●		●	●			G	.157	(4.00)	±.0008	.016	.972	1.022	—
		GY2G0400G080N-MF			●	●		●	●			G	.157	(4.00)	±.0008	.031	.957	1.022	—
		∗1 GY2G0424G020N-MF			●	●		●	●			G	.167	(4.24)	±.0008	.008	.980	1.022	—
		GY2G0475H020N-MF			●	●		●	●			H	.187	(4.75)	±.0008	.008	.961	1.022	—
		GY2G0475H040N-MF			●	●		●	●			H	.187	(4.75)	±.0008	.016	.953	1.022	—
		GY2G0475H080N-MF			●	●		●	●			H	.187	(4.75)	±.0008	.031	.937	1.022	—
		GY2G0500H020N-MF			●	●		●	●			H	.197	(5.00)	±.0008	.008	.961	1.022	—
		GY2G0500H040N-MF			●	●		●	●			H	.197	(5.00)	±.0008	.016	.953	1.022	—
		GY2G0500H080N-MF			●	●		●	●			H	.197	(5.00)	±.0008	.031	.937	1.022	—
		∗1 GY2G0524H020N-MF			●	●		●	●			H	.206	(5.24)	±.0008	.008	.961	1.022	—
		GY2G0600J020N-MF			●	●		●	●			J	.236	(6.00)	±.0008	.008	.961	1.022	—
		GY2G0600J040N-MF			●	●		●	●			J	.236	(6.00)	±.0008	.016	.953	1.022	—
		GY2G0600J080N-MF			●	●		●	●			J	.236	(6.00)	±.0008	.031	.937	1.022	—
		∗1 GY2G0631J020N-MF			●	●		●	●			J	.248	(6.31)	±.0008	.008	.961	1.022	—
		GY2G0635J020N-MF			●	●		●	●			J	.250	(6.35)	±.0008	.008	.961	1.022	—
		GY2G0635J040N-MF			●	●		●	●			J	.250	(6.35)	±.0008	.016	.953	1.022	—
		GY2G0635J080N-MF			●	●		●	●			J	.250	(6.35)	±.0008	.031	.937	1.022	—
	MS Breaker (Low feeds)	GY2M0200D020N-MS			●	●	●	●				D	.079	(2.00)	±.0012	.008	.752	.815	—
		GY2M0250E020N-MS			●	●	●	●				E	.098	(2.50)	±.0012	.008	.752	.815	—
		GY2M0300F020N-MS			●	●	●	●				F	.118	(3.00)	±.0012	.008	.756	.815	—
		GY2M0300F040N-MS			●	●	●	●				F	.118	(3.00)	±.0012	.016	.744	.815	—
		GY2M0400G020N-MS			●	●	●	●				G	.157	(4.00)	±.0016	.008	.953	1.010	—
		GY2M0400G040N-MS			●	●	●	●				G	.157	(4.00)	±.0016	.016	.941	1.010	—
		GY2M0500H040N-MS			●	●	●	●				H	.197	(5.00)	±.0016	.016	.941	1.010	—
		GY2M0500H080N-MS			●	●	●	●				H	.197	(5.00)	±.0016	.031	.925	1.010	—
		GY2M0600J040N-MS			●	●	●	●				J	.236	(6.00)	±.0016	.016	.941	1.010	—
		GY2M0600J080N-MS			●	●	●	●				J	.236	(6.00)	±.0016	.031	.925	1.010	—
		GY2M0800K080N-MS			●	●	●					K	.315	(8.00)	±.0016	.031	1.122	1.201	—







∗1 Groove width corresponding to the circlip.

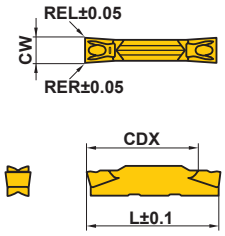
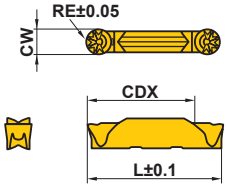
∗2 The dimension depends on the breaker. Refer to the F015 “L dimension tolerance conversion table”.

● = NEW

GY SERIES INSERTS

INSERTS

(inch)

Applications	Geometry	Order Number	Stock: Coated NEW MP9015	Coated NEW MP9025	Coated VP10RT	Coated VP20RT	Coated MY5015	Cermet NX2525		Carbide RT9010	Carbide RT9020	Seat Size	CW: Cutting Width inch	CW: Cutting Width (mm)	CW: Tolerance	RE RER/L	CDX	✶2 L
For Multifunctional Grooving	**MM Breaker** (Medium feeds) 	**GY2M0200D020N-MM**	●	●	●	●	●	●				**D**	.079	(2.00)	±.0012	.008	.752	.815
		GY2M0250E020N-MM	●	●	●	●	●	●				**E**	.098	(2.50)	±.0012	.008	.752	.815
		GY2M0300F020N-MM	●	●	●	●	●	●				**F**	.118	(3.00)	±.0012	.008	.752	.815
		GY2M0300F040N-MM	●	●	●	●	●	●				**F**	.118	(3.00)	±.0012	.016	.744	.815
		GY2M0300F080N-MM	●	●	●	●	●	●				**F**	.118	(3.00)	±.0012	.031	.728	.815
		GY2M0400G020N-MM	●	●	●	●	●	●				**G**	.157	(4.00)	±.0016	.008	.949	1.010
		GY2M0400G040N-MM	●	●	●	●	●	●				**G**	.157	(4.00)	±.0016	.016	.941	1.010
		GY2M0400G080N-MM	●	●	●	●	●	●				**G**	.157	(4.00)	±.0016	.031	.925	1.010
		GY2M0500H040N-MM	●	●	●	●	●	●				**H**	.197	(5.00)	±.0016	.016	.941	1.010
		GY2M0500H080N-MM	●	●	●	●	●	●				**H**	.197	(5.00)	±.0016	.031	.925	1.010
		GY2M0600J040N-MM	●	●	●	●	●	●				**J**	.236	(6.00)	±.0016	.016	.941	1.010
		GY2M0600J080N-MM	●	●	●	●	●	●				**J**	.236	(6.00)	±.0016	.031	.925	1.010
		GY2M0800K080N-MM	●	●	●	●	●					**K**	.315	(8.00)	±.0016	.031	1.122	1.201
		GY2M0800K120N-MM	●	●	●	●	●					**K**	.315	(8.00)	±.0016	.047	1.106	1.201
For Copying / For Recessing	**BM Breaker** 	**GY2M0200D100N-BM**	●	●	●	●	●	●				**D**	.079	(2.00)	±.0012	.039	.768	.815
		GY2M0250E125N-BM	●	●	●	●	●	●				**E**	.098	(2.50)	±.0012	.049	.760	.815
		GY2M0300F150N-BM	●	●	●	●	●	●				**F**	.118	(3.00)	±.0012	.059	.748	.823
		GY2M0318F159N-BM	●	●	●	●	●	●				**F**	.125	(3.18)	±.0012	.063	.744	.823
		GY2M0400G200N-BM	●	●	●	●	●	●				**G**	.157	(4.00)	±.0016	.079	.921	1.016
		GY2M0475H238N-BM	●	●	●	●	●	●				**H**	.187	(4.75)	±.0016	.094	.902	1.016
		GY2M0500H250N-BM	●	●	●	●	●	●				**H**	.197	(5.00)	±.0016	.098	.898	1.016
		GY2M0600J300N-BM	●	●	●	●	●	●				**J**	.236	(6.00)	±.0016	.118	.886	1.020
		GY2M0635J318N-BM	●	●	●	●	●	●				**J**	.250	(6.35)	±.0016	.125	.878	1.020
		GY2M0800K400N-BM	●	●	●	●	●					**K**	.315	(8.00)	±.0016	.157	1.043	1.213

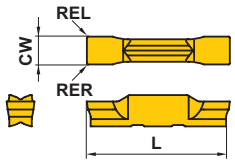
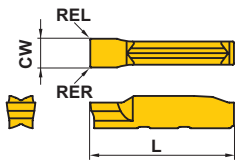
✶2 The dimension depends on the breaker. Refer to the F015 “L dimension tolerance conversion table”.

● = NEW

● : USA Stock ★ : Stocked in Japan

<10 inserts in one case>

(inch)

Applications	Geometry	Order Number	Stock				Seat Size	CW			RER/L	L
			Cermet		Carbide			Grooving Width		Tolerance		
			NX2525		RT9010	RT9020		inch	(mm)			
*1 Blank	**2 Edge Type** 	**GY2B0220D020N**	★		★	★	D	.087	(2.20)	± .0039	.008	.829
		GY2B0250D020N	★		★	★	D	.100	(2.55)	± .0039	.008	.838
		GY2B0270E020N	★		★	★	E	.106	(2.70)	± .0039	.008	.829
		GY2B0300E020N	★		★	★	E	.120	(3.05)	± .0039	.008	.838
		GY2B0340F020N	★		★	★	F	.134	(3.40)	± .0039	.008	.829
		GY2B0360F020N	★		★	★	F	.144	(3.65)	± .0039	.008	.838
		GY2B0420G020N	★		★	★	G	.165	(4.20)	± .0039	.008	1.024
		GY2B0460G020N	★		★	★	G	.183	(4.65)	± .0039	.008	1.031
		GY2B0520H020N	★		★	★	H	.205	(5.20)	± .0039	.008	1.024
		GY2B0560H020N	★		★	★	H	.222	(5.65)	± .0039	.008	1.031
		GY2B0655J020N	★		★	★	J	.258	(6.55)	± .0039	.008	1.025
		GY2B0680J020N	★		★	★	J	.270	(6.85)	± .0039	.008	1.031
		GY2B0880K020N			★	★	K	.348	(8.85)	± .0039	.008	1.216
	1 Edge Type 	**GY1B0220D020N**	★		★	★	D	.087	(2.20)	± .0039	.008	.830
		GY1B0270E020N	★		★	★	E	.106	(2.70)	± .0039	.008	.831
		GY1B0340F020N	★		★	★	F	.134	(3.40)	± .0039	.008	.827
		GY1B0420G020N	★		★	★	G	.165	(4.20)	± .0039	.008	1.018
		GY1B0520H020N	★		★	★	H	.205	(5.20)	± .0039	.008	1.020
		GY1B0655J020N	★		★	★	J	.258	(6.55)	± .0039	.008	1.020

∗1 Insert blank is not suitable for machining without grinding.

REFERENCE DATA

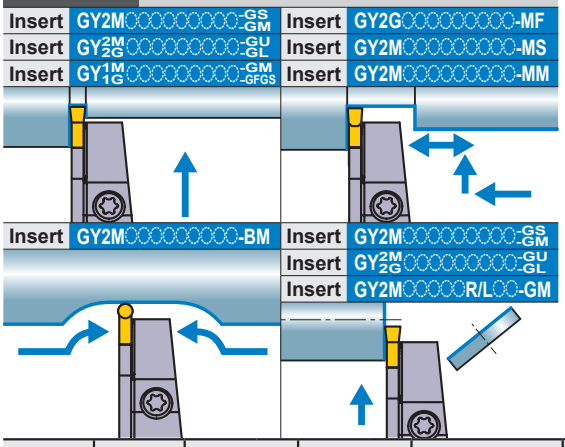
L dimension tolerance conversion table

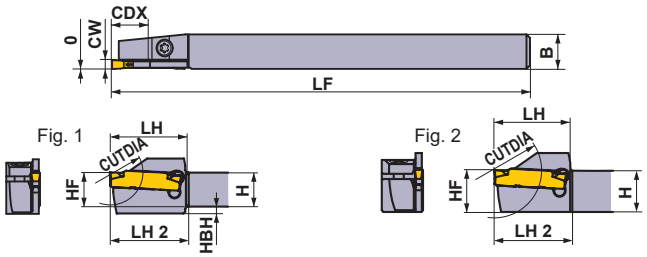
Cutting Width ∗1 CW	Dimensions L	∗2 Dimensional tolerance versus standard dimension (L) of each breaker									
		GU	GS/GM	MS/MM	R05-GS	R08/15-GS	R/L-GM	Flat Top	MF	BM	GL
.047", 1.20 mm	.579		0		0						
.059", 1.50 mm	.579		0			.020					
.079", 2.00 mm	.815	0	0	0		.024	.004	0	.014	.008	.014
.088", 2.24 mm	∗3 (.815)								.014		
.094", 2.39 mm	.815	0	0					0	.014		
.098", 2.50 mm	.815	0	0	0		.031	.005	0	.014	.008	.014
.108", 2.74 mm	∗3 (.815)								.014		
.118", 3.00 mm	.815	0	0	0		.031	.006	0	.014	.008	.014
.125", 3.18 mm	.815	0	0					0	.014	.008	
.128", 3.24 mm	∗3 (.815)								.014		
.157", 4.00 mm	1.010	0	0	0			.008	0	.012	.006	
.167", 4.24 mm	∗3 (1.010)								.012		
.187", 4.75 mm	1.010	0	0					0	.012	.006	
.197", 5.00 mm	1.010	0	0	0			.012	0	.012	.006	
.206", 5.24 mm	∗3 (1.010)								.012		
.236", 6.00 mm	1.010	0	0	0				0	.012	.010	
.248", 6.31 mm	∗3 (1.010)								.012		
.250", 6.35 mm	1.010	0	0						.012	.010	
.315", 8.00 mm	1.201		0	0						.012	

∗1 This value is used at the described holder dimension.
∗2 ▢ when there is no applicable breaker.
∗3 The dimension is the value for approximate cutting width.

GY SERIES (External for Swiss-type lathes)

1-1 00° type holder (Inch)





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) *4	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
C	.059	.433	.866	Mono Block	R	GYSRUS06B00-C11	●	1
					L	GYSLUS06B00-C11	●	1
		.512	1.024	Mono Block	R	GYSRUS08B00-C13	●	2
					L	GYSLUS08B00-C13	●	2
		.669 *1	1.338 *2	Mono Block	R	GYSRUS10B00-C17	●	2
					L	GYSLUS10B00-C17	●	2
				Mono Block	R	GYSRUS12B00-C17	●	2
					L	GYSLUS12B00-C17	●	2
D	.079 .088	.433	.866	Mono Block	R	GYSRUS06B00-D11	●	1
					L	GYSLUS06B00-D11	●	1
		.512	1.024	Mono Block	R	GYSRUS08B00-D13	●	2
					L	GYSLUS08B00-D13	●	2
		.669 *1	1.338 *2	Mono Block	R	GYSRUS10B00-D17	●	2
					L	GYSLUS10B00-D17	●	2
				Mono Block	R	GYSRUS12B00-D17	●	2
					L	GYSLUS12B00-D17	●	2
E	.094 .098 .108	.433	.866	Mono Block	R	GYSRUS06B00-E11	●	1
					L	GYSLUS06B00-E11	●	1
		.512	1.024	Mono Block	R	GYSRUS08B00-E13	●	2
					L	GYSLUS08B00-E13	●	2
		.669 *1	1.338 *2	Mono Block	R	GYSRUS10B00-E17	●	2
					L	GYSLUS10B00-E17	●	2
				Mono Block	R	GYSRUS12B00-E17	●	2
					L	GYSLUS12B00-E17	●	2
		.787 *1	1.574 *2	Mono Block	R	GYSRUS10B00-E20	●	2
					L	GYSLUS10B00-E20	●	2
				Mono Block	R	GYSRUS12B00-E20	●	2
					L	GYSLUS12B00-E20	●	2
F	.118 .125 .128	.512	1.024	Mono Block	R	GYSRUS08B00-F13	●	2
					L	GYSLUS08B00-F13	●	2
		.669 *1	1.338 *2	Mono Block	R	GYSRUS10B00-F17	●	2
					L	GYSLUS10B00-F17	●	2
				Mono Block	R	GYSRUS12B00-F17	●	2
					L	GYSLUS12B00-F17	●	2
		.787 *1	1.574 *2	Mono Block	R	GYSRUS10B00-F20	●	2
					L	GYSLUS10B00-F20	●	2
				Mono Block	R	GYSRUS12B00-F20	●	2
					L	GYSLUS12B00-F20	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F199.

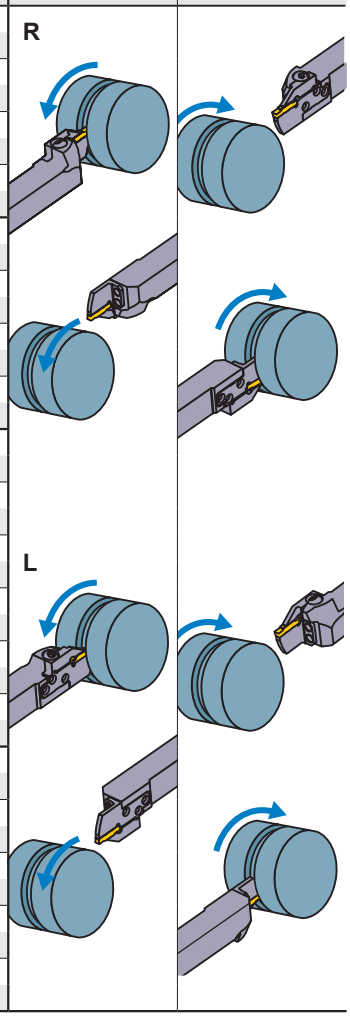
● : **USA Stock**

SPARE PARTS

Holder Number	Clamp Screw	Wrench
GYSR/LUS06B00-○11	CS350990T (Clamp Torque : 22 lbf-in)	TKY10R
GYSR/LUS08B00-○13		
GYSR/LUS10B00-○18	TS4SBL (Clamp Torque : 31 lbf-in)	TKY15R
GYSR/LUS12B00-○17		

Dimensions (inch) ✶3						
H	B	LF	LH	LH 2	HF	HBH
.375	.375	4.500	.866	.620	.375	.125
.375	.375	4.500	.866	.620	.375	.125
.500	.500	4.500	.866	.620	.500	—
.500	.500	4.500	.866	.620	.500	—
.625	.625	4.500	1.063	.638	.625	—
.625	.625	4.500	1.063	.638	.625	—
.750	.750	4.500	1.102	.638	.750	—
.750	.750	4.500	1.102	.638	.750	—
.375	.375	4.500	.866	.899	.375	.125
.375	.375	4.500	.866	.899	.375	.125
.500	.500	4.500	.866	.899	.500	—
.500	.500	4.500	.866	.899	.500	—
.625	.625	4.500	1.063	.918	.625	—
.625	.625	4.500	1.063	.918	.625	—
.750	.750	4.500	1.102	.878	.750	—
.750	.750	4.500	1.102	.878	.750	—
.375	.375	4.500	.866	.901	.375	.125
.375	.375	4.500	.866	.901	.375	.125
.500	.500	4.500	.866	.901	.500	—
.500	.500	4.500	.866	.901	.500	—
.625	.625	4.500	1.063	.920	.625	—
.625	.625	4.500	1.063	.920	.625	—
.750	.750	4.500	1.102	.880	.750	—
.750	.750	4.500	1.102	.880	.750	—
.625	.625	4.500	1.220	.920	.625	—
.625	.625	4.500	1.220	.920	.625	—
.750	.750	4.500	1.220	.880	.750	—
.750	.750	4.500	1.220	.880	.750	—
.500	.500	4.500	.866	.903	.500	—
.500	.500	4.500	.866	.903	.500	—
.625	.625	4.500	1.063	.925	.625	—
.625	.625	4.500	1.063	.925	.625	—
.750	.750	4.500	1.102	.885	.750	—
.750	.750	4.500	1.102	.885	.750	—
.625	.625	4.500	1.220	.925	.625	—
.625	.625	4.500	1.220	.925	.625	—
.750	.750	4.500	1.220	.885	.750	—
.750	.750	4.500	1.220	.885	.750	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
C	**GY○○0150C○○○○−Breaker**
D	**GY○○0200/0224D○○○○−Breaker**
E	**GY○○0239/0250/0274E○○○○−Breaker**
F	**GY○○0300/0318/0324F○○○○−Breaker**

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
C	.059", 1.50 mm		●	●		
D	.079", 2.00 mm	●	●	●	●	●
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	CW \ Breaker	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
C	.059", 1.50 mm		●	●	
D	.079", 2.00 mm		●	●	●
E	.098", 2.50 mm		●	●	●
F	.118", 3.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

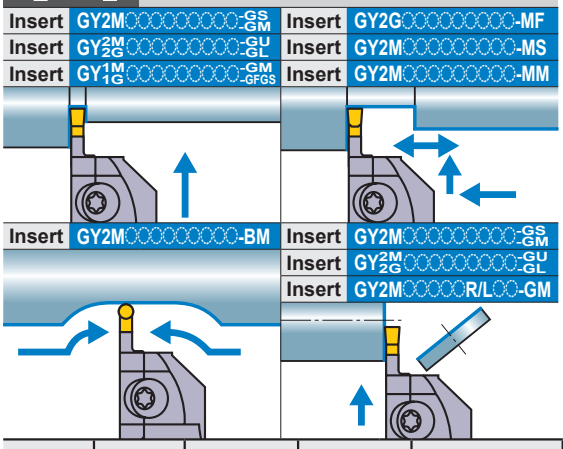
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

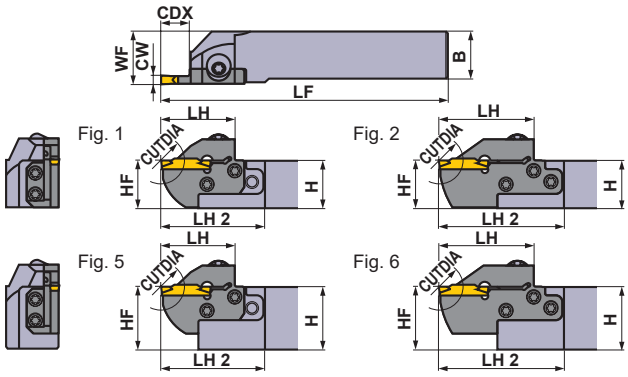
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



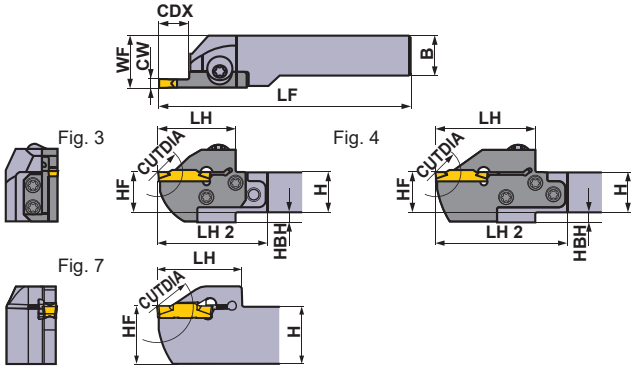
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
D	.079 .088	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D06	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-D06	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-D06	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-D06	●	1
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D06	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-D06	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D06	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-D06	●	1
				Mono Block	R	GYQRUS16D00-D06	●	—	—	7
					L	GYQLUS16D00-D06	●	—	—	7
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D06	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-D06	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D06	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-D06	●	5
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-D10	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-D10	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-D10	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-D10	●	1
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D12	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-D12	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D12	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-D12	●	1
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D12	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-D12	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D12	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-D12	●	5
		*4 .709	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-D18	●	4
					L	GYHLUS10B00-M20L	●	GYM20LB-D18	●	4
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-D18	●	2
					L	GYHLUS12C00-M20L	●	GYM20LB-D18	●	2
		*1 .787	*2 1.575	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-D20	●	4
					L	GYHLUS12C00-M25L	●	GYM25LA-D20	●	4
				Mono Block	R	GYQRUS16D00-D20	●	—	—	7
					L	GYQLUS16D00-D20	●	—	—	7
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-D20	●	2
					L	GYHLUS16D00-M25L	●	GYM25LA-D20	●	2
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-D20	●	6
					L	GYHLUS20D00-M25L	●	GYM25LA-D20	●	6
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-D20	●	6
					L	GYHLUS24E00-M25L	●	GYM25LA-D20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

● : USA Stock



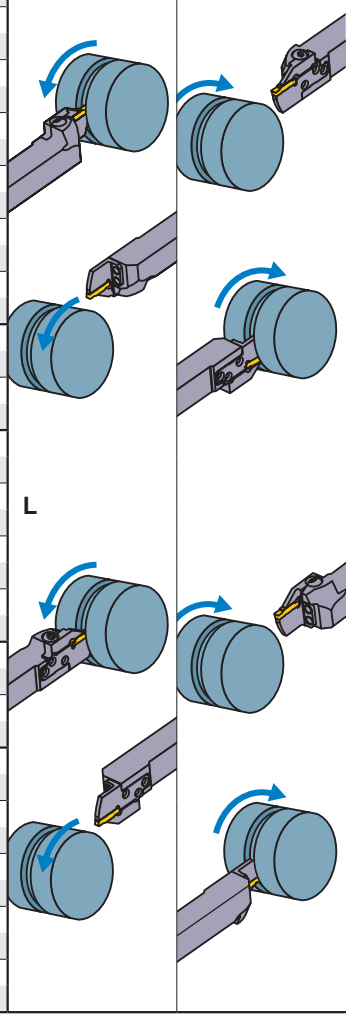
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (inch) ∗3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	.625	.625	4.264	1.102	1.761	.625	.812	.125	R	
	.625	.625	4.264	1.102	1.761	.625	.812	.125		
	.750	.750	4.764	1.102	1.698	.750	.875	—		
	.750	.750	4.764	1.102	1.698	.750	.875	—		
	.750	.750	4.685	1.220	2.060	.750	1.000	.250		
	.750	.750	4.685	1.220	2.060	.750	1.000	.250		
	1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
	1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
	1.000	1.000	6.000	1.417	—	1.000	1.006	—		
	1.000	1.000	6.000	1.417	—	1.000	1.006	—		
	1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
	1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
	1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
	1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—	L	
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	.625	.625	4.736	1.575	2.233	.625	.812	.125		
	.625	.625	4.736	1.575	2.233	.625	.812	.125		
	.750	.750	5.236	1.575	2.170	.750	.875	—		
	.750	.750	5.236	1.575	2.170	.750	.875	—		
	.750	.750	5.236	1.772	2.611	.750	1.000	.250		
	.750	.750	5.236	1.772	2.611	.750	1.000	.250		
	1.000	1.000	6.000	1.614	—	1.000	1.004	—		
	1.000	1.000	6.000	1.614	—	1.000	1.004	—		
	1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
	1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
	1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
	1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
	1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		
	1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○-Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
D	.079", 2.00 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
D	.079", 2.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

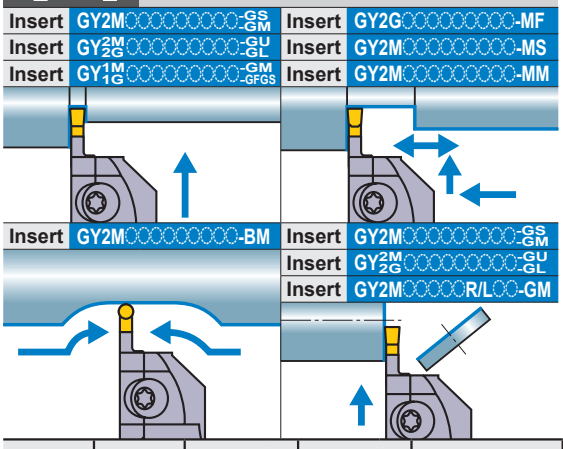
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

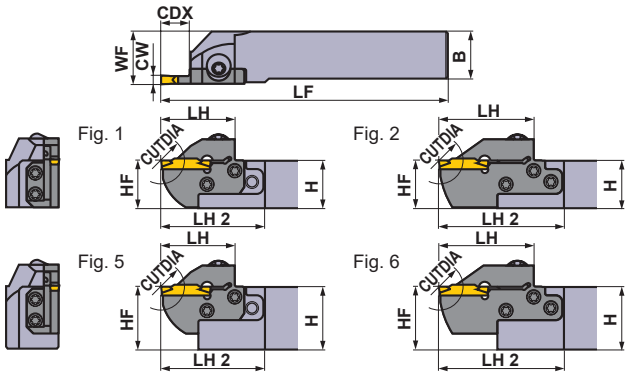
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



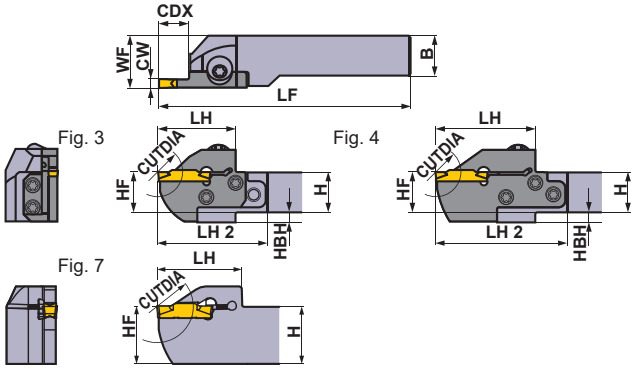
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
E	.094 .098 .108	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-E06	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-E06	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-E06	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-E06	●	1
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-E06	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-E06	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-E06	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-E06	●	1
				Mono Block	R	GYQRUS16D00-E06	●	—	—	7
					L	GYQLUS16D00-E06	●	—	—	7
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-E06	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-E06	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-E06	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-E06	●	5
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-E10	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-E10	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-E10	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-E10	●	1
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-E12	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-E12	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-E12	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-E12	●	1
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-E12	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-E12	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-E12	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-E12	●	5
		*4 .709	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-E18	●	4
					L	GYHLUS10B00-M20L	●	GYM20LB-E18	●	4
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-E18	●	2
					L	GYHLUS12C00-M20L	●	GYM20LB-E18	●	2
		*1 .787	*2 1.575	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-E20	●	4
					L	GYHLUS12C00-M25L	●	GYM25LA-E20	●	4
				Mono Block	R	GYQRUS16D00-E20	●	—	—	7
					L	GYQLUS16D00-E20	●	—	—	7
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-E20	●	2
					L	GYHLUS16D00-M25L	●	GYM25LA-E20	●	2
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-E20	●	6
					L	GYHLUS20D00-M25L	●	GYM25LA-E20	●	6
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-E20	●	6
					L	GYHLUS24E00-M25L	●	GYM25LA-E20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

● : USA Stock



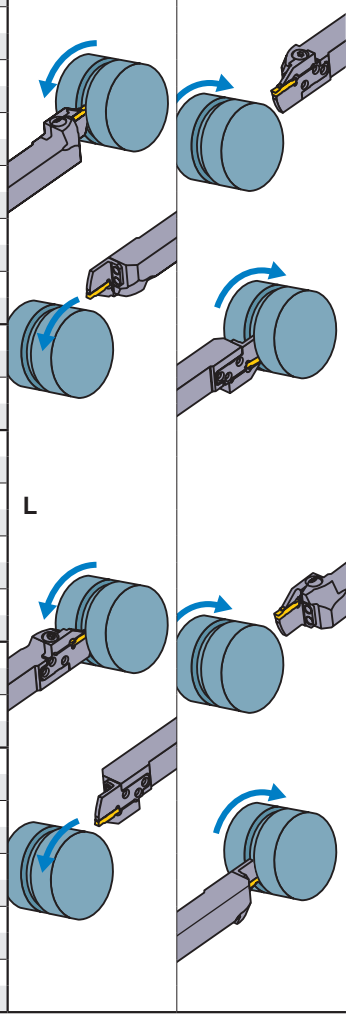
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (inch) ∗3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	.625	.625	4.264	1.102	1.761	.625	.812	.125	R	
	.625	.625	4.264	1.102	1.761	.625	.812	.125		
	.750	.750	4.764	1.102	1.698	.750	.875	—		
	.750	.750	4.764	1.102	1.698	.750	.875	—		
	.750	.750	4.685	1.220	2.060	.750	1.000	.250		
	.750	.750	4.685	1.220	2.060	.750	1.000	.250		
	1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
	1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
	1.000	1.000	6.000	1.417	—	1.000	1.008	—		
	1.000	1.000	6.000	1.417	—	1.000	1.008	—		
	1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
	1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
	1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
	1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—	L	
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	.625	.625	4.736	1.575	2.233	.625	.812	.125		
	.625	.625	4.736	1.575	2.233	.625	.812	.125		
	.750	.750	5.236	1.575	2.170	.750	.875	—		
	.750	.750	5.236	1.575	2.170	.750	.875	—		
	.750	.750	5.236	1.772	2.611	.750	1.000	.250		
	.750	.750	5.236	1.772	2.611	.750	1.000	.250		
	1.000	1.000	6.000	1.614	—	1.000	1.004	—		
	1.000	1.000	6.000	1.614	—	1.000	1.004	—		
	1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
	1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
	1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
	1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
	1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		
	1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
E	.098", 2.50 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

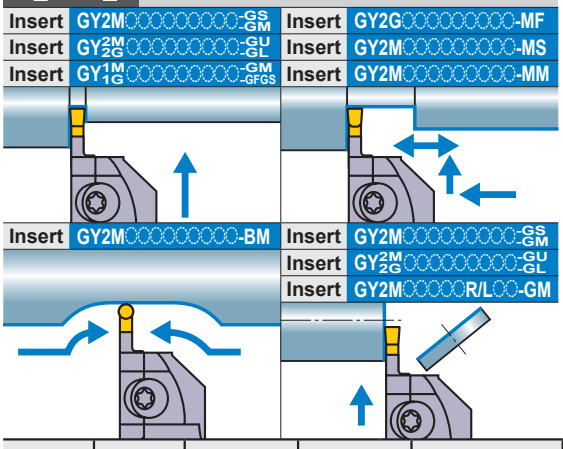
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

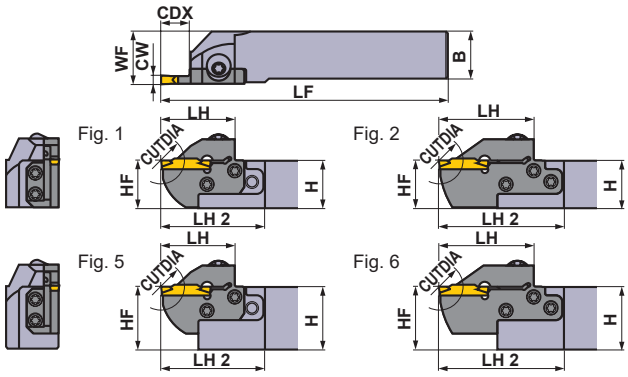
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



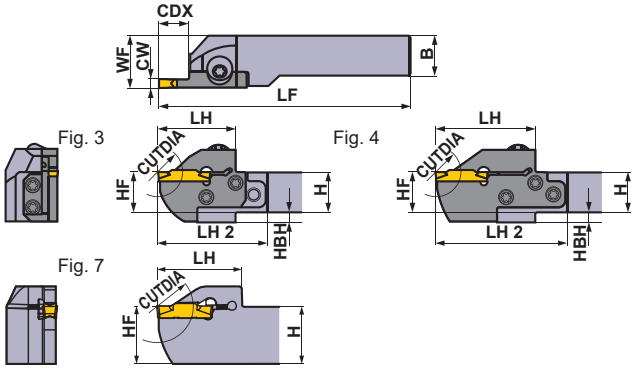
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
F	.118 .125 .128	.236	.472	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-F06	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-F06	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-F06	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-F06	●	1
				Modular	R	GYHRUS12C00-M25R	●	GYM25RA-F06	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-F06	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-F06	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-F06	●	1
				Mono Block	R	GYQRUS16D00-F06	●	—	—	7
					L	GYQLUS16D00-F06	●	—	—	7
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-F06	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-F06	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-F06	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-F06	●	5
		.394	.787	Modular	R	GYHRUS10B00-M20R	●	GYM20RA-F10	●	3
					L	GYHLUS10B00-M20L	●	GYM20LA-F10	●	3
				Modular	R	GYHRUS12C00-M20R	●	GYM20RA-F10	●	1
					L	GYHLUS12C00-M20L	●	GYM20LA-F10	●	1
		.472	.945	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-F12	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-F12	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-F12	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-F12	●	1
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-F12	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-F12	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-F12	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-F12	●	5
		*4 .709	1.417	Modular	R	GYHRUS10B00-M20R	●	GYM20RB-F18	●	4
					L	GYHLUS10B00-M20L	●	GYM20LB-F18	●	4
				Modular	R	GYHRUS12C00-M20R	●	GYM20RB-F18	●	2
					L	GYHLUS12C00-M20L	●	GYM20LB-F18	●	2
		*1 .787	*2 1.575	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-F20	●	4
					L	GYHLUS12C00-M25L	●	GYM25LA-F20	●	4
				Mono Block	R	GYQRUS16D00-F20	●	—	—	7
					L	GYQLUS16D00-F20	●	—	—	7
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-F20	●	2
					L	GYHLUS16D00-M25L	●	GYM25LA-F20	●	2
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-F20	●	6
					L	GYHLUS20D00-M25L	●	GYM25LA-F20	●	6
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-F20	●	6
					L	GYHLUS24E00-M25L	●	GYM25LA-F20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

● : USA Stock



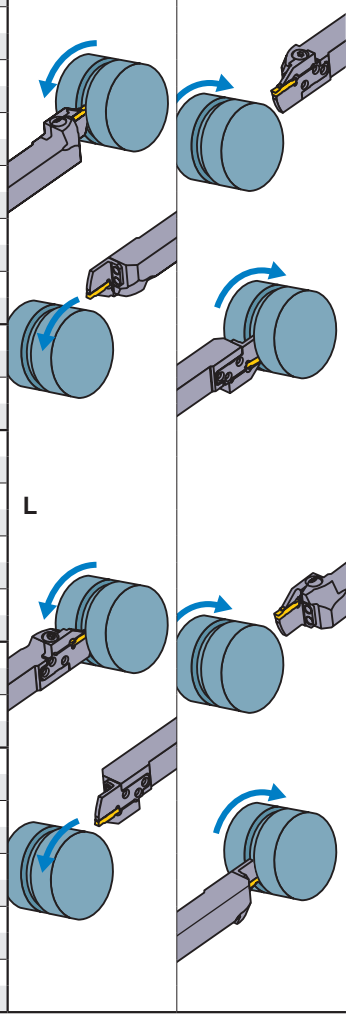
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (inch) ∗3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	.625	.625	4.264	1.102	1.761	.625	.812	.125	R	
	.625	.625	4.264	1.102	1.761	.625	.812	.125		
	.750	.750	4.764	1.102	1.698	.750	.875	—		
	.750	.750	4.764	1.102	1.698	.750	.875	—		
	.750	.750	4.685	1.220	2.060	.750	1.000	.250		
	.750	.750	4.685	1.220	2.060	.750	1.000	.250		
	1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
	1.000	1.000	5.685	1.220	1.934	1.000	1.125	—		
	1.000	1.000	6.000	1.417	—	1.000	1.012	—		
	1.000	1.000	6.000	1.417	—	1.000	1.012	—		
	1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
	1.250	1.250	5.685	1.220	1.942	1.250	1.375	—		
	1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
	1.500	1.500	6.685	1.220	1.926	1.500	1.625	—		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—	L	
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	.625	.625	4.736	1.575	2.233	.625	.812	.125		
	.625	.625	4.736	1.575	2.233	.625	.812	.125		
	.750	.750	5.236	1.575	2.170	.750	.875	—		
	.750	.750	5.236	1.575	2.170	.750	.875	—		
	.750	.750	5.236	1.772	2.611	.750	1.000	.250		
	.750	.750	5.236	1.772	2.611	.750	1.000	.250		
	1.000	1.000	6.000	1.614	—	1.000	1.010	—		
	1.000	1.000	6.000	1.614	—	1.000	1.010	—		
	1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
	1.000	1.000	6.236	1.772	2.485	1.000	1.125	—		
	1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
	1.250	1.250	6.236	1.772	2.493	1.250	1.375	—		
	1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		
	1.500	1.500	7.236	1.772	2.477	1.500	1.625	—		



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
F	.118", 3.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

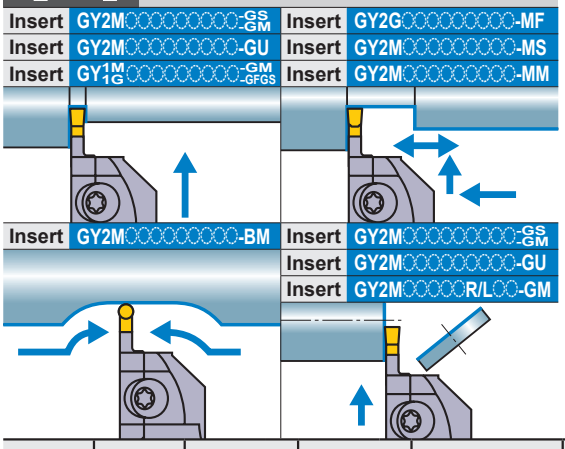
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

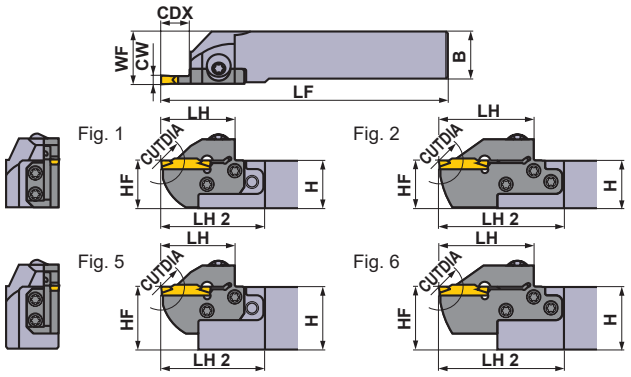
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



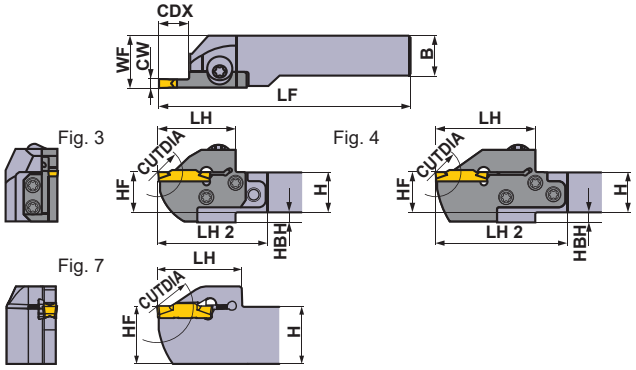
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
G	.157 .167	.315	.630	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RA-G08**	●	3
					L	**GYHLUS12C00-M25L**	●	**GYM25LA-G08**	●	3
				Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RA-G08**	●	1
					L	**GYHLUS16D00-M25L**	●	**GYM25LA-G08**	●	1
				Mono Block	R	**GYQRUS16D00-G08**	●	—	—	7
					L	**GYQLUS16D00-G08**	●	—	—	7
				Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RA-G08**	●	5
					L	**GYHLUS20D00-M25L**	●	**GYM25LA-G08**	●	5
				Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RA-G08**	●	5
					L	**GYHLUS24E00-M25L**	●	**GYM25LA-G08**	●	5
		.472	.945	Modular	R	**GYHRUS10B00-M20R**	●	**GYM20RA-G12**	●	3
					L	**GYHLUS10B00-M20L**	●	**GYM20LA-G12**	●	3
				Modular	R	**GYHRUS12C00-M20R**	●	**GYM20RA-G12**	●	1
					L	**GYHLUS12C00-M20L**	●	**GYM20LA-G12**	●	1
		.551	1.102	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RA-G14**	●	3
					L	**GYHLUS12C00-M25L**	●	**GYM25LA-G14**	●	3
				Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RA-G14**	●	1
					L	**GYHLUS16D00-M25L**	●	**GYM25LA-G14**	●	1
				Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RA-G14**	●	5
					L	**GYHLUS20D00-M25L**	●	**GYM25LA-G14**	●	5
				Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RA-G14**	●	5
					L	**GYHLUS24E00-M25L**	●	**GYM25LA-G14**	●	5
		.984 *1	1.969 *2	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RA-G25**	●	4
					L	**GYHLUS12C00-M25L**	●	**GYM25LA-G25**	●	4
				Mono Block	R	**GYQRUS16D00-G25**	●	—	—	7
					L	**GYQLUS16D00-G25**	●	—	—	7
				Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RA-G25**	●	2
					L	**GYHLUS16D00-M25L**	●	**GYM25LA-G25**	●	2
				Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RA-G25**	●	6
					L	**GYHLUS20D00-M25L**	●	**GYM25LA-G25**	●	6
				Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RA-G25**	●	6
					L	**GYHLUS24E00-M25L**	●	**GYM25LA-G25**	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (inch) ∗3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	.750	.750	4.764	1.299	2.139	.750	1.000	.250	R	
	.750	.750	4.764	1.299	2.139	.750	1.000	.250		
	1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
	1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
	1.000	1.000	6.000	1.614	—	1.000	1.014	—		
	1.000	1.000	6.000	1.614	—	1.000	1.014	—		
	1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
	1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
	1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
	1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.625	.625	4.500	1.339	1.997	.625	.812	.125		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.339	1.934	.750	.875	—		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	.750	.750	5.000	1.535	2.375	.750	1.000	.250		
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
	1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
	.750	.750	5.433	1.969	2.808	.750	1.000	.250	L	
	.750	.750	5.433	1.969	2.808	.750	1.000	.250		
	1.000	1.000	6.000	1.811	—	1.000	1.014	—		
	1.000	1.000	6.000	1.811	—	1.000	1.014	—		
	1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
	1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
	1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
	1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
	1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		
	1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○-Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
G	.157", 4.00 mm	●	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

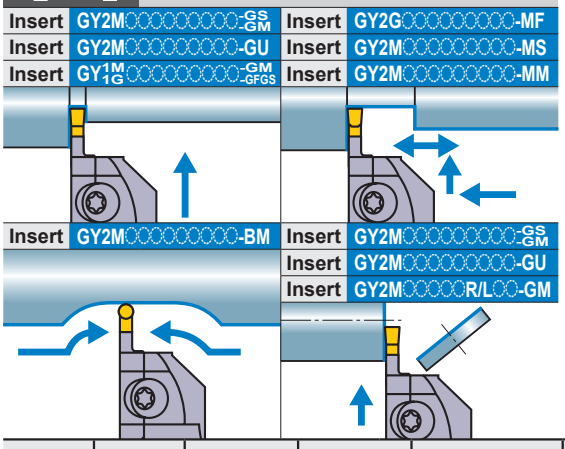
F

GROOVING / CUTTING OFF

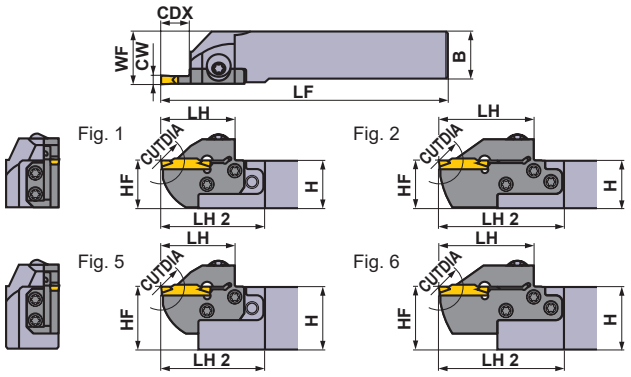
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



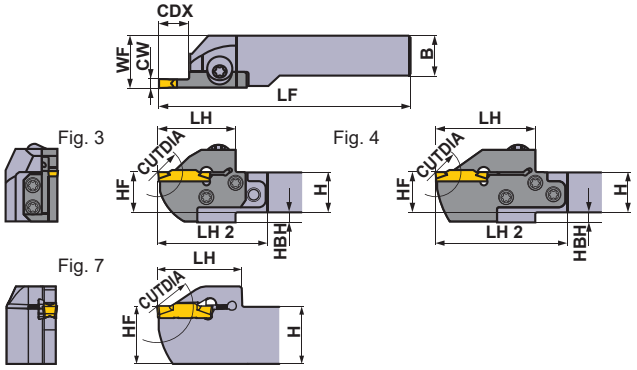
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
H	.187 .197 .206	.315	.630	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RA-H08**	●	3
					L	**GYHLUS12C00-M25L**	●	**GYM25LA-H08**	●	3
				Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RA-H08**	●	1
					L	**GYHLUS16D00-M25L**	●	**GYM25LA-H08**	●	1
				Mono Block	R	**GYQRUS16D00-H08**	●	—	—	7
					L	**GYQLUS16D00-H08**	●	—	—	7
				Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RA-H08**	●	5
					L	**GYHLUS20D00-M25L**	●	**GYM25LA-H08**	●	5
				Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RA-H08**	●	5
					L	**GYHLUS24E00-M25L**	●	**GYM25LA-H08**	●	5
		.472	.945	Modular	R	**GYHRUS10B00-M20R**	●	**GYM20RA-H12**	●	3
					L	**GYHLUS10B00-M20L**	●	**GYM20LA-H12**	●	3
				Modular	R	**GYHRUS12C00-M20R**	●	**GYM20RA-H12**	●	1
					L	**GYHLUS12C00-M20L**	●	**GYM20LA-H12**	●	1
		.551	1.102	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RA-H14**	●	3
					L	**GYHLUS12C00-M25L**	●	**GYM25LA-H14**	●	3
				Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RA-H14**	●	1
					L	**GYHLUS16D00-M25L**	●	**GYM25LA-H14**	●	1
				Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RA-H14**	●	5
					L	**GYHLUS20D00-M25L**	●	**GYM25LA-H14**	●	5
				Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RA-H14**	●	5
					L	**GYHLUS24E00-M25L**	●	**GYM25LA-H14**	●	5
		*1 .984	*2 1.969	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RA-H25**	●	4
					L	**GYHLUS12C00-M25L**	●	**GYM25LA-H25**	●	4
				Mono Block	R	**GYQRUS16D00-H25**	●	—	—	7
					L	**GYQLUS16D00-H25**	●	—	—	7
				Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RA-H25**	●	2
					L	**GYHLUS16D00-M25L**	●	**GYM25LA-H25**	●	2
				Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RA-H25**	●	6
					L	**GYHLUS20D00-M25L**	●	**GYM25LA-H25**	●	6
				Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RA-H25**	●	6
					L	**GYHLUS24E00-M25L**	●	**GYM25LA-H25**	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock



Right hand tool holder shown.

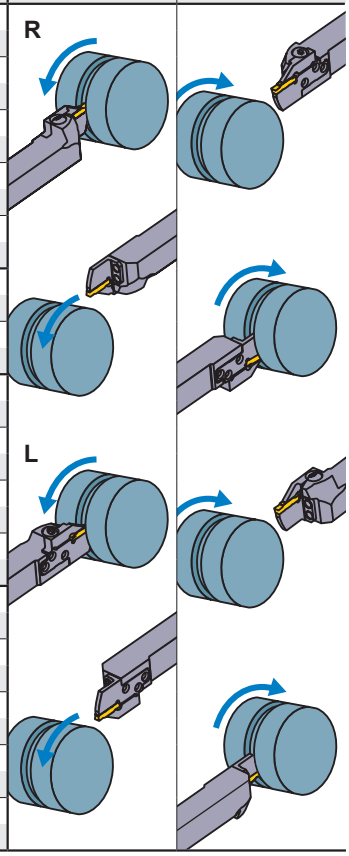
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/LUS○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗3							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	4.764	1.299	2.139	.750	1.000	.250
.750	.750	4.764	1.299	2.139	.750	1.000	.250
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—
1.000	1.000	6.000	1.614	—	1.000	1.014	—
1.000	1.000	6.000	1.614	—	1.000	1.014	—
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—
.625	.625	4.500	1.339	1.997	.625	.812	.125
.625	.625	4.500	1.339	1.997	.625	.812	.125
.750	.750	5.000	1.339	1.934	.750	.875	—
.750	.750	5.000	1.339	1.934	.750	.875	—
.750	.750	5.000	1.535	2.375	.750	1.000	.250
.750	.750	5.000	1.535	2.375	.750	1.000	.250
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	2.808	.750	1.000	.250
.750	.750	5.433	1.969	2.808	.750	1.000	.250
1.000	1.000	6.000	1.811	—	1.000	1.014	—
1.000	1.000	6.000	1.811	—	1.000	1.014	—
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
H	.187", 4.75 mm	●	●	●	●	
	.197", 5.00 mm	●	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

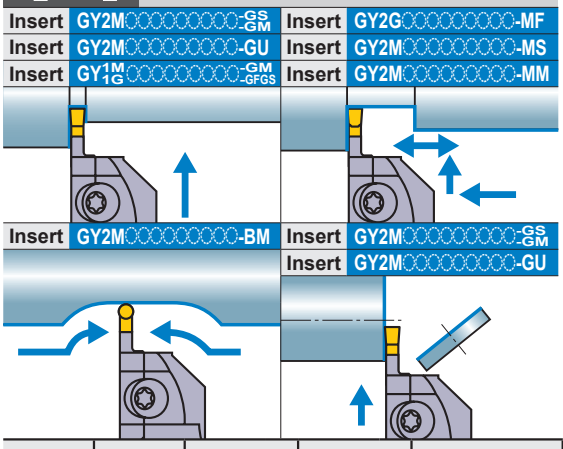
F

GROOVING / CUTTING OFF

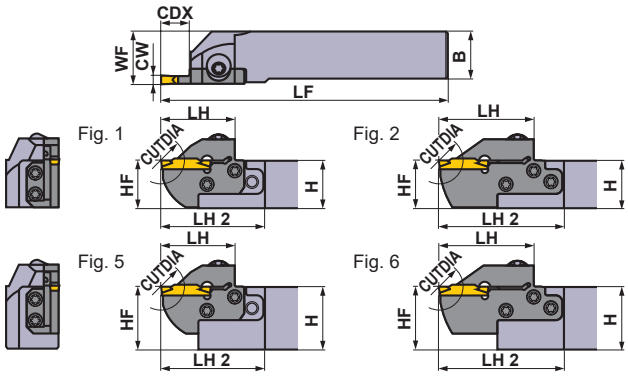
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



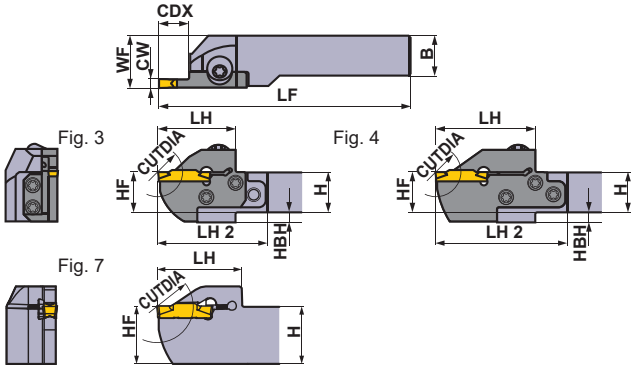
Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
J	.236 .248 .250	.315	.630	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-J08	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-J08	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-J08	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-J08	●	1
				Mono Block	R	GYQRUS16D00-J08	●	—	—	7
					L	GYQLUS16D00-J08	●	—	—	7
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-J08	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-J08	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-J08	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-J08	●	5
		.551	1.102	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-J14	●	3
					L	GYHLUS12C00-M25L	●	GYM25LA-J14	●	3
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-J14	●	1
					L	GYHLUS16D00-M25L	●	GYM25LA-J14	●	1
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-J14	●	5
					L	GYHLUS20D00-M25L	●	GYM25LA-J14	●	5
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-J14	●	5
					L	GYHLUS24E00-M25L	●	GYM25LA-J14	●	5
		*1 .984	*2 1.969	Modular	R	GYHRUS12C00-M25R	●	GYM25RA-J25	●	4
					L	GYHLUS12C00-M25L	●	GYM25LA-J25	●	4
				Mono Block	R	GYQRUS16D00-J25	●	—	—	7
					L	GYQLUS16D00-J25	●	—	—	7
				Modular	R	GYHRUS16D00-M25R	●	GYM25RA-J25	●	2
					L	GYHLUS16D00-M25L	●	GYM25LA-J25	●	2
				Modular	R	GYHRUS20D00-M25R	●	GYM25RA-J25	●	6
					L	GYHLUS20D00-M25L	●	GYM25LA-J25	●	6
				Modular	R	GYHRUS24E00-M25R	●	GYM25RA-J25	●	6
					L	GYHLUS24E00-M25L	●	GYM25LA-J25	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/LUS○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/LUS○○○○○-M25R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
.750	.750	4.764	1.299	2.139	.750	1.000	.250	R	
.750	.750	4.764	1.299	2.139	.750	1.000	.250		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	5.764	1.299	2.013	1.000	1.125	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.000	1.000	6.000	1.614	—	1.000	1.014	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.250	1.250	5.764	1.299	2.021	1.250	1.375	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
1.500	1.500	6.764	1.299	2.005	1.500	1.625	—		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
.750	.750	5.000	1.535	2.375	.750	1.000	.250		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.000	1.000	6.000	1.535	2.249	1.000	1.125	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.250	1.250	6.000	1.535	2.257	1.250	1.375	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—		
.750	.750	5.433	1.969	2.808	.750	1.000	.250	L	
.750	.750	5.433	1.969	2.808	.750	1.000	.250		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.000	1.811	—	1.000	1.014	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.000	1.000	6.433	1.969	2.682	1.000	1.125	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.250	1.250	6.433	1.969	2.690	1.250	1.375	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—		

Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
J	.236", 6.00 mm	●	●	●	●	
	.250", 6.35 mm	●	●	●		

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

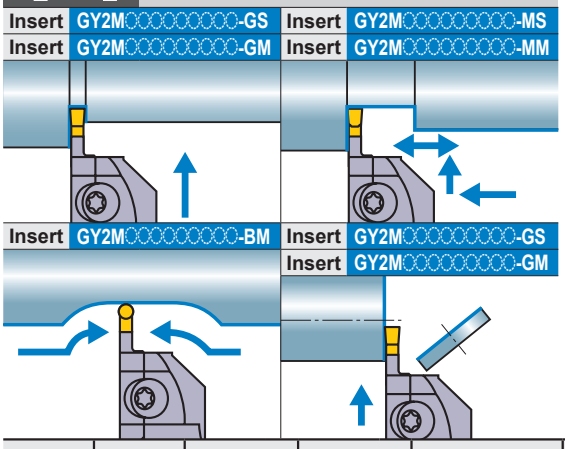
F

GROOVING / CUTTING OFF

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-1 00° type holder (Inch)



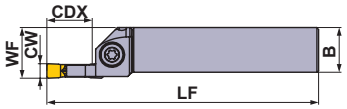
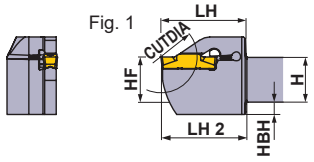


Fig. 1



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
K	.315	*1 .984	*2 1.968	Mono Block	R	**GYPRUS16D00-K25**	●	—	—	1
					L	**GYPLUS16D00-K25**	●	—	—	1
				Mono Block	R	**GYPRUS20D00-K25**	●	—	—	2
					L	**GYPLUS20D00-K25**	●	—	—	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock

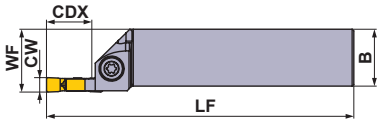
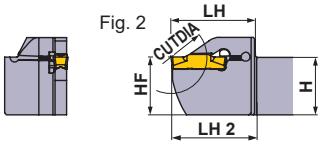


Fig. 2



Right hand tool holder shown.

SPARE PARTS

Holder Number	Clamp Screw	Wrench
GYPR/LUS○○○00-K25	GY06013M (Clamp Torque : 53 lbf-in)	TKY30R

	Dimensions (inch) *3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	1.000	1.000	6.000	1.850	1.875	1.000	1.161	.260	R	
	1.000	1.000	6.000	1.850	1.875	1.000	1.161	.260		
	1.250	1.250	7.000	1.850	2.875	1.250	1.377	—		
	1.250	1.250	7.000	1.850	2.875	1.250	1.377	—		
									L	

Select an Insert

Seat Size	Insert Number
K	**GY○○0800K○○○○–Breaker**

For Grooving/Cutting off ➤ F011

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
K	.315", 8.00 mm		●	●		

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
K	.315", 8.00 mm				●
	RE .031"		●	●	
	RE .047"			●	

● : Gauge insert shown dimensions

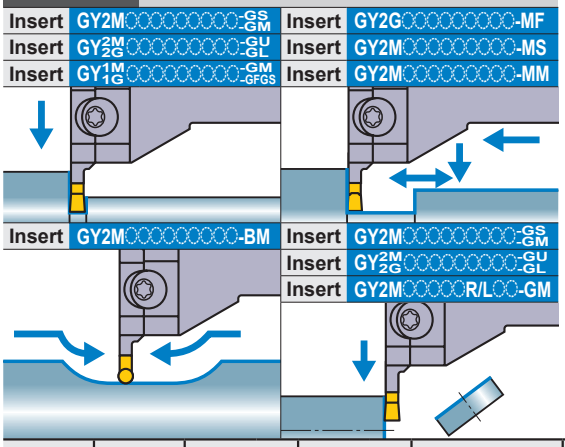
F

GROOVING / CUTTING OFF

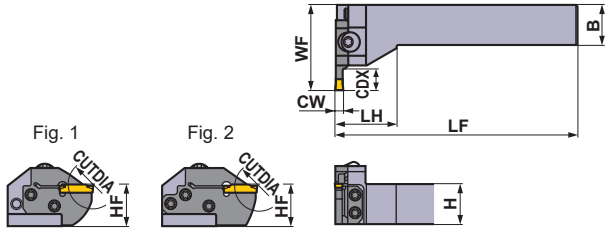
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

2-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
D	.079 .088	.236	.472	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-D06**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-D06**	●	1
				Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-D06**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-D06**	●	1
		.394	.787	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-D10**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-D10**	●	1
		.472	.945	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-D12**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-D12**	●	1
		.709 *4	1.417	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LB-D18**	●	2
					L	**GYHLUS12C90-M20R**	●	**GYM20RB-D18**	●	2
		.787 *1	1.575 *2	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-D20**	●	2
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-D20**	●	2
E	.094 .098 .108	.236	.472	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-E06**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-E06**	●	1
				Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-E06**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-E06**	●	1
		.394	.787	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-E10**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-E10**	●	1
		.472	.945	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-E12**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-E12**	●	1
		.709 *4	1.417	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LB-E18**	●	2
					L	**GYHLUS12C90-M20R**	●	**GYM20RB-E18**	●	2
		.787 *1	1.575 *2	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-E20**	●	2
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-E20**	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

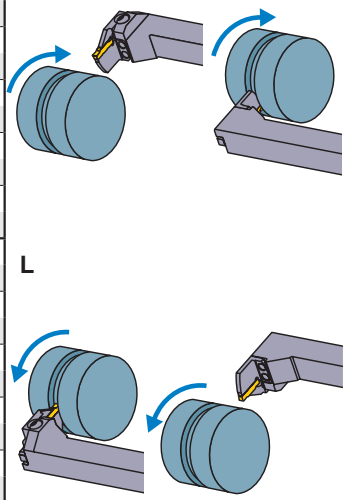
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHRUS12C90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHLUS12C90-M20R			
GYHRUS16D90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

	Dimensions (inch) ∗3						Cutting Mode
	H	**B**	**LF**	**LH**	**HF**	**WF**	
	.750	.750	5.000	1.375	.750	1.545	R
	.750	.750	5.000	1.375	.750	1.545	
	1.000	1.000	6.000	1.500	1.000	1.779	
	1.000	1.000	6.000	1.500	1.000	1.779	
	.750	.750	5.000	1.375	.750	1.781	
	.750	.750	5.000	1.375	.750	1.781	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.094	
	.750	.750	5.000	1.375	.750	2.017	
	.750	.750	5.000	1.375	.750	2.017	
	1.000	1.000	6.000	1.500	1.000	2.330	
	1.000	1.000	6.000	1.500	1.000	2.330	
	.750	.750	5.000	1.375	.750	1.545	L
	.750	.750	5.000	1.375	.750	1.545	
	1.000	1.000	6.000	1.500	1.000	1.779	
	1.000	1.000	6.000	1.500	1.000	1.779	
	.750	.750	5.000	1.375	.750	1.781	
	.750	.750	5.000	1.375	.750	1.781	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.094	
	.750	.750	5.000	1.375	.750	2.017	
	.750	.750	5.000	1.375	.750	2.017	
	1.000	1.000	6.000	1.500	1.000	2.330	
	1.000	1.000	6.000	1.500	1.000	2.330	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
D	.079", 2.00 mm	●	●	●	●	●
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
D	.079", 2.00 mm		●	●	●
E	.098", 2.50 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

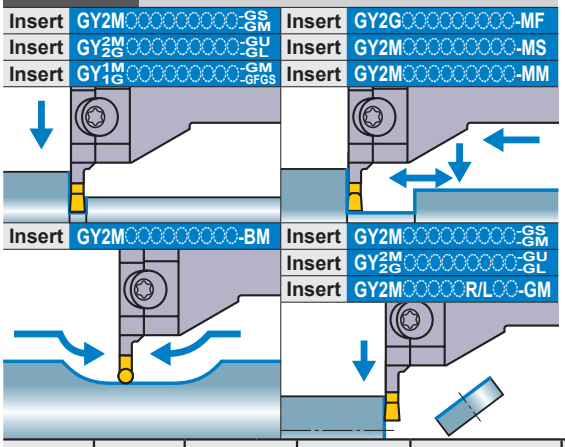
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

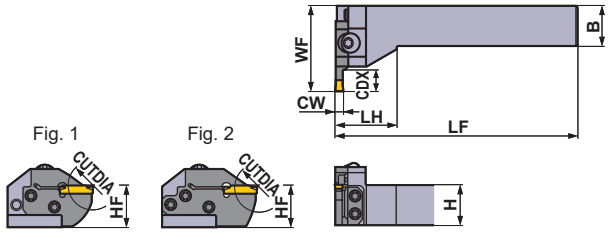
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

2-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

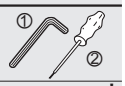
Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
F	.118 .125 .128	.236	.472	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-F06**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-F06**	●	1
				Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-F06**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-F06**	●	1
		.394	.787	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-F10**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-F10**	●	1
		.472	.945	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-F12**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-F12**	●	1
		.709 *4	1.417	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LB-F18**	●	2
					L	**GYHLUS12C90-M20R**	●	**GYM20RB-F18**	●	2
		.787 *1	1.575 *2	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-F20**	●	2
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-F20**	●	2
G	.157 .167	.315	.630	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-G08**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-G08**	●	1
		.472	.945	Modular	R	**GYHRUS12C90-M20L**	●	**GYM20LA-G12**	●	1
					L	**GYHLUS12C90-M20R**	●	**GYM20RA-G12**	●	1
		.551	1.102	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-G14**	●	1
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-G14**	●	1
		.984 *1	1.969 *2	Modular	R	**GYHRUS16D90-M25L**	●	**GYM25LA-G25**	●	2
					L	**GYHLUS16D90-M25R**	●	**GYM25RA-G25**	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

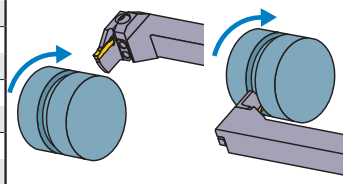
*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

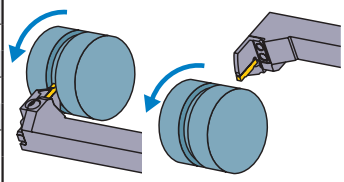
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	5 pcs. Blade Screw	 Wrench ∗
GYHRUS12C90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHLUS12C90-M20R			
GYHRUS16D90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

	Dimensions (inch) ∗3						Cutting Mode
	H	B	LF	LH	HF	WF	
	.750	.750	5.000	1.375	.750	1.545	R
	.750	.750	5.000	1.375	.750	1.545	
	1.000	1.000	6.000	1.500	1.000	1.779	
	1.000	1.000	6.000	1.500	1.000	1.779	
	.750	.750	5.000	1.375	.750	1.781	
	.750	.750	5.000	1.375	.750	1.781	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.094	
	.750	.750	5.000	1.375	.750	2.017	
	.750	.750	5.000	1.375	.750	2.017	
	1.000	1.000	6.000	1.500	1.000	2.330	
	1.000	1.000	6.000	1.500	1.000	2.330	
	1.000	1.000	6.000	1.500	1.000	1.857	L
	1.000	1.000	6.000	1.500	1.000	1.857	
	.750	.750	5.000	1.375	.750	1.781	
	.750	.750	5.000	1.375	.750	1.781	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.527	
	1.000	1.000	6.000	1.500	1.000	2.527	





Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●
G	.157", 4.00 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
F	.118", 3.00 mm		●	●	●
G	.157", 4.00 mm				●

For Multifunctional Grooving ➤ F013, F014

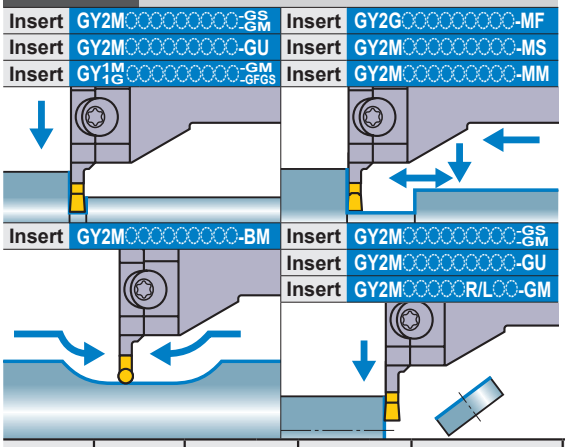
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

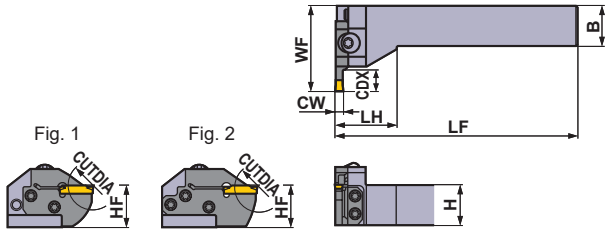
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

2-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
H	.187 .197 .206	.315	.630	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-H08	●	1
					L	GYHLUS16D90-M25R	●	GYM25RA-H08	●	1
		.472	.945	Modular	R	GYHRUS12C90-M20L	●	GYM20LA-H12	●	1
					L	GYHLUS12C90-M20R	●	GYM20RA-H12	●	1
		.551	1.102	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-H14	●	1
					L	GYHLUS16D90-M25R	●	GYM25RA-H14	●	1
		.984 *1	1.969 *2	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-H25	●	2
					L	GYHLUS16D90-M25R	●	GYM25RA-H25	●	2
J	.236 .248 .250	.315	.630	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-J08	●	1
					L	GYHLUS16D90-M25R	●	GYM25RA-J08	●	1
		.551	1.102	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-J14	●	1
					L	GYHLUS16D90-M25R	●	GYM25RA-J14	●	1
		.984 *1	1.969 *2	Modular	R	GYHRUS16D90-M25L	●	GYM25LA-J25	●	2
					L	GYHLUS16D90-M25R	●	GYM25RA-J25	●	2

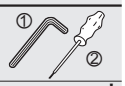
CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

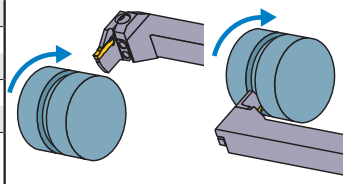
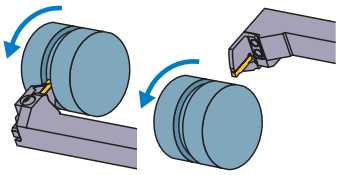
*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	5 pcs. Blade Screw	 Wrench ∗
GYHRUS12C90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHLUS12C90-M20R			
GYHRUS16D90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

	Dimensions (inch) ∗3						Cutting Mode
	H	**B**	**LF**	**LH**	**HF**	**WF**	
	1.000	1.000	6.000	1.500	1.000	1.857	**R**
	1.000	1.000	6.000	1.500	1.000	1.857	
	.750	.750	5.000	1.375	.750	1.781	
	.750	.750	5.000	1.375	.750	1.781	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.527	
	1.000	1.000	6.000	1.500	1.000	2.527	
							
	1.000	1.000	6.000	1.500	1.000	1.857	**L**
	1.000	1.000	6.000	1.500	1.000	1.857	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.094	
	1.000	1.000	6.000	1.500	1.000	2.527	
	1.000	1.000	6.000	1.500	1.000	2.527	
							

Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
H	.187", 4.75 mm	●	●	●	●	
	.197", 5.00 mm	●	●	●	●	●
J	.236", 6.00 mm	●	●	●	●	
	.250", 6.35 mm	●	●	●		

For Multifunctional Grooving ➤ F013, F014

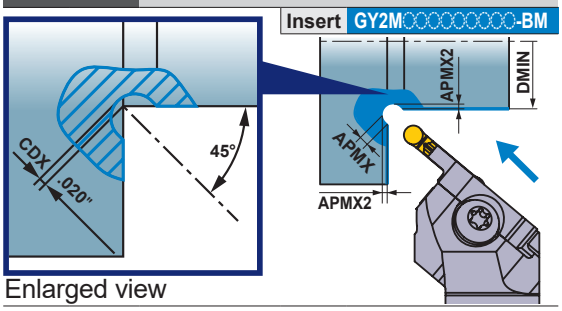
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

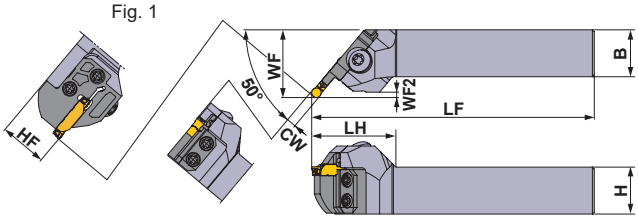
GY SERIES (EXTERNAL RECESSING)

3-1 50° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	DMIN (inch)	APMX (inch)	APMX2 (inch)	Type	Hand (R/L)	Order Number				Fig.
								Holder	Stock	Modular Blade	Stock	
D	.079	.020	1.181	.059	.025	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-D005	●	1
							L	GYHLUS12C50-M20R	●	GYM20RC-D005	●	1
	.088					Modular	R	GYHRUS16D50-M25L	●	GYM25LC-D005	●	1
							L	GYHLUS16D50-M25R	●	GYM25RC-D005	●	1
E	.094			.069	.028	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-E005	●	1
							L	GYHLUS12C50-M20R	●	GYM20RC-E005	●	1
	.098					Modular	R	GYHRUS16D50-M25L	●	GYM25LC-E005	●	1
	.108						L	GYHLUS16D50-M25R	●	GYM25RC-E005	●	1
F	.118			.082	.032	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-F005	●	1
							L	GYHLUS12C50-M20R	●	GYM20RC-F005	●	1
	.125					Modular	R	GYHRUS16D50-M25L	●	GYM25LC-F005	●	1
	.128						L	GYHLUS16D50-M25R	●	GYM25RC-F005	●	1
G	.157		.787	.098	.037	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-G005	●	1
							L	GYHLUS12C50-M20R	●	GYM20RC-G005	●	1
	.167					Modular	R	GYHRUS16D50-M25L	●	GYM25LC-G005	●	1
							L	GYHLUS16D50-M25R	●	GYM25RC-G005	●	1
H	.187			.113	.041	Modular	R	GYHRUS12C50-M20L	●	GYM20LC-H005	●	1
							L	GYHLUS12C50-M20R	●	GYM20RC-H005	●	1
	.197					Modular	R	GYHRUS16D50-M25L	●	GYM25LC-H005	●	1
	.206						L	GYHLUS16D50-M25R	●	GYM25RC-H005	●	1
J	.236			.144	.051	Modular	R	GYHRUS16D50-M25L	●	GYM25LC-J005	●	1
							L	GYHLUS16D50-M25R	●	GYM25RC-J005	●	1
	.248											
	.250											

*1 Blades for external and face grooving cannot be used since it interferes with work materials.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **WF** and **WF2** values may vary.

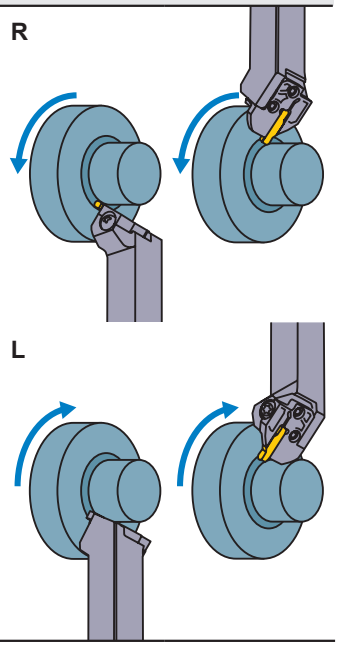
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (4 pcs.)	Wrench ∗
GYHR/LUS12C50-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D50-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (inch) ∗2							Cutting Mode
	H	B	LF	LH	HF	WF	WF2	
	.750	.750	5.007	1.632	.750	1.232	.076	R
	.750	.750	5.007	1.632	.750	1.232	.076	
	1.000	1.000	6.007	1.819	1.000	1.357	.076	
	1.000	1.000	6.007	1.819	1.000	1.357	.076	
	.750	.750	5.003	1.628	.750	1.241	.084	
	.750	.750	5.003	1.628	.750	1.241	.084	
	1.000	1.000	6.003	1.815	1.000	1.366	.084	
	1.000	1.000	6.003	1.815	1.000	1.366	.084	
	.750	.750	5.000	1.625	.750	1.250	.094	
	.750	.750	5.000	1.625	.750	1.250	.094	
	1.000	1.000	6.000	1.813	1.000	1.375	.094	
	1.000	1.000	6.000	1.813	1.000	1.375	.094	
	.750	.750	4.989	1.614	.750	1.265	.109	
	.750	.750	4.989	1.614	.750	1.265	.109	
	1.000	1.000	5.989	1.802	1.000	1.390	.109	
	1.000	1.000	5.989	1.802	1.000	1.390	.109	
	.750	.750	4.980	1.605	.750	1.281	.125	
	.750	.750	4.980	1.605	.750	1.281	.125	
	1.000	1.000	5.980	1.792	1.000	1.406	.125	
	1.000	1.000	5.980	1.792	1.000	1.406	.125	
	1.000	1.000	5.978	1.791	1.000	1.429	.148	
	1.000	1.000	5.978	1.791	1.000	1.429	.148	



Select an Insert

Insert Number
GY2M○○○○○○○○○N-BM

For Multifunctional Grooving ➤ F014

Seat Size	Breaker CW	BM (Copying, Recessing) Ball nose
D	.079", 2.00 mm	●
E	.098", 2.50 mm	●
F	.118", 3.00 mm	●
	.125", 3.18 mm	●
G	.157", 4.00 mm	●
H	.187", 4.75 mm	●
	.197", 5.00 mm	●
J	.236", 6.00 mm	●
	.250", 6.35 mm	●

● : Gauge insert shown dimensions

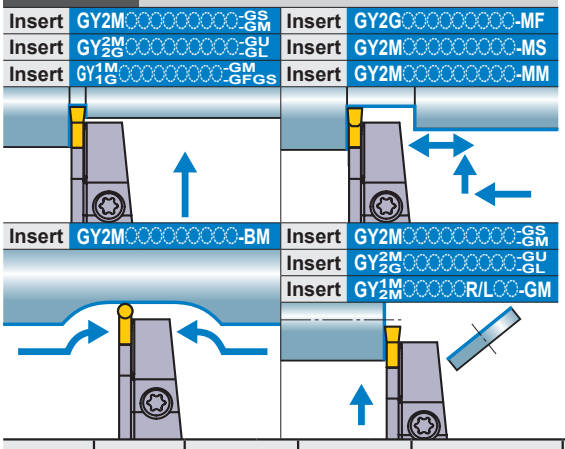
F

GROOVING / CUTTING OFF

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F200
INSTRUCTION MANUAL ➤ F200

GY SERIES (External for Swiss-type lathes)

1-2 00° type holder (Metric) NEW



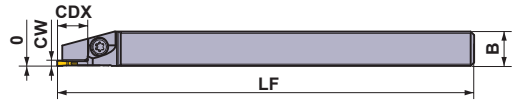


Fig. 1

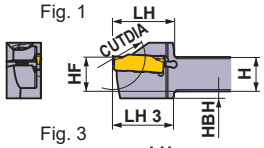


Fig. 2

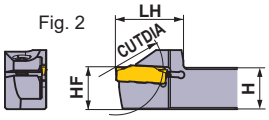
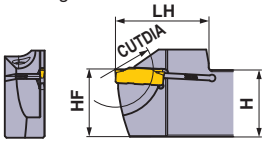


Fig. 3



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *4	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
B	1.20 .047"	8	16	Mono Block	R	GYSR1010JX00-B08	★	1
					L	GYSL1010JX00-B08	★	1
				Mono Block	R	GYSR1212JX00-B08	●	2
					L	GYSL1212JX00-B08	●	2
		12	24	Mono Block	R	GYSR1212JX00-B12	●	1
					L	GYSL1212JX00-B12	●	1
		13	16	Mono Block	R	GYSR1616JX00-B08	●	2
					L	GYSL1616JX00-B08	●	2
			26	Mono Block	R	GYSR1616JX00-B13	●	2
					L	GYSL1616JX00-B13	★	2
C	1.50	8	16	Mono Block	R	GYSR1010JX00-C08	★	1
					L	GYSL1010JX00-C08	★	1
				Mono Block	R	GYSR1212JX00-C08	★	2
					L	GYSL1212JX00-C08	★	2
		12	24	Mono Block	R	GYSR1212JX00-C12	★	1
					L	GYSL1212JX00-C12	★	1
		13	26	Mono Block	R	GYSR1616JX00-C13	★	2
					L	GYSL1616JX00-C13	★	2
				Mono Block	R	GYSR2012JX00-C13	★	3
					L	GYSL2012JX00-C13	★	3
D	2.00 2.24	10	20	Mono Block	R	GYSR1010JX00-D10	★	1
					L	GYSL1010JX00-D10	★	1
		12	24	Mono Block	R	GYSR1212JX00-D12	●	1
					L	GYSL1212JX00-D12	●	1
		13	26	Mono Block	R	GYSR1616JX00-D13	●	2
					L	GYSL1616JX00-D13	●	2
		16	32	Mono Block	R	GYSR1616JX00-D16	●	2
					L	GYSL1616JX00-D16	●	2
		17	34	Mono Block	R	GYSR1915K00-D17	★	3
					L	GYSL1915K00-D17	★	3
				Mono Block	R	GYSR2012JX00-D17	●	3
					L	GYSL2012JX00-D17	★	3
				Mono Block	R	GYSR2020K00-D17	★	2
					L	GYSL2020K00-D17	★	2
				Mono Block	R	GYSR2525M00-D17	★	2
					L	GYSL2525M00-D17	★	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.

*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.

*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 3** values may vary.

*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F197.

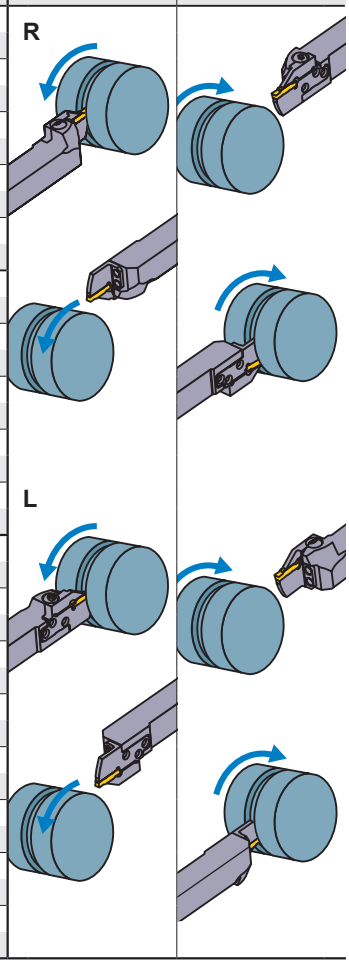
● : USA Stock ★ : Stocked in Japan

SPARE PARTS

Holder	Clamp Screw	Wrench
GYSR/L1010JX00	CS350990T	TKY10R
GYSR/L1212JX00		
GYSR/L1616JX00	TS4SBL	TKY15R
GYSR/L1915K00		
GYSR/L2012JX00	CS350990T	TKY10R
GYSR/L2020K00	HSC05018	TKY40R
GYSR/L2525K00		

Dimensions (mm) *3						
H	B	LF	LH	LH 3	HF	HBH
10	10	120	17.5	17.5	10	2
10	10	120	17.5	17.5	10	2
12	12	120	19.5	—	12	—
12	12	120	19.5	—	12	—
12	12	120	19.5	19.5	12	2
12	12	120	19.5	19.5	12	2
16	16	120	25	—	16	—
16	16	120	25	—	16	—
16	16	120	25	—	16	—
16	16	120	25	—	16	—
10	10	120	17.5	17.5	10	2
10	10	120	17.5	17.5	10	2
12	12	120	19.5	—	12	—
12	12	120	19.5	—	12	—
12	12	120	19.5	19.5	12	2
12	12	120	19.5	19.5	12	2
16	16	120	25	—	16	—
16	16	120	25	—	16	—
20	12	120	28	—	20	—
20	12	120	28	—	20	—
10	10	120	17.5	17.5	10	2
10	10	120	17.5	17.5	10	2
12	12	120	19.5	19.5	12	2
12	12	120	19.5	19.5	12	2
16	16	120	25	—	16	—
16	16	120	25	—	16	—
16	16	120	28	—	16	—
16	16	120	28	—	16	—
19.05	15.875	125	28	—	19.05	—
19.05	15.875	125	28	—	19.05	—
20	12	120	28	—	20	—
20	12	120	28	—	20	—
20	20	125	35	—	20	—
20	20	125	35	—	20	—
25	25	150	40	—	25	—
25	25	150	40	—	25	—

Cutting Mode



Clockwise | Anticlockwise

Select an Insert

Seat Size	Insert Number
B	GY○○0120B○○○○–Breaker
C	GY○○0150C○○○○–Breaker
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
B	.047", 1.20 mm		●			
C	.059", 1.50 mm		●	●		
D	.079", 2.00 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
B	.047", 1.20 mm	●			
C	.059", 1.50 mm		●	●	
D	.079", 2.00 mm		●	●	●

For multifunctional grooving ➤ F013, F014

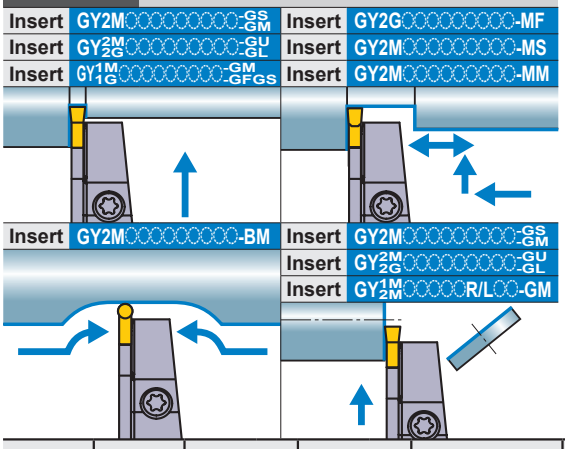
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (External for Swiss-type lathes)

1-2 00° type holder (Metric) NEW



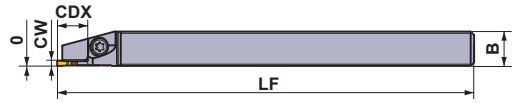


Fig. 1

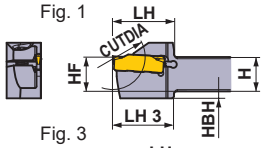


Fig. 2

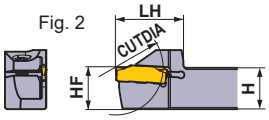
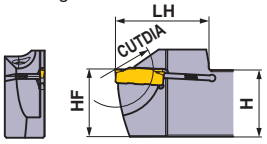


Fig. 3



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *4	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
E	2.39 2.50 2.74	10	20	Mono Block	R	GYSR1010JX00-E10	●	1
					L	GYSL1010JX00-E10	★	1
		12	24	Mono Block	R	GYSR1212JX00-E12	★	1
					L	GYSL1212JX00-E12	●	1
		13	26	Mono Block	R	GYSR1616JX00-E13	★	2
					L	GYSL1616JX00-E13	★	2
		16	32	Mono Block	R	GYSR1616JX00-E16	★	2
					L	GYSL1616JX00-E16	★	2
		17	34	Mono Block	R	GYSR1915K00-E17	★	3
					L	GYSL1915K00-E17	★	3
				Mono Block	R	GYSR2012JX00-E17	★	3
					L	GYSL2012JX00-E17	★	3
				Mono Block	R	GYSR2020K00-E17	★	2
					L	GYSL2020K00-E17	★	2
				Mono Block	R	GYSR2525M00-E17	★	2
					L	GYSL2525M00-E17	★	2
F	3.00 3.18 3.24	12	24	Mono Block	R	GYSR1212JX00-F12	●	1
					L	GYSL1212JX00-F12	★	1
		13	26	Mono Block	R	GYSR1616JX00-F13	●	2
					L	GYSL1616JX00-F13	★	2
		16	32	Mono Block	R	GYSR1616JX00-F16	●	2
					L	GYSL1616JX00-F16	●	2
		17	34	Mono Block	R	GYSR1915K00-F17	★	3
					L	GYSL1915K00-F17	★	3
				Mono Block	R	GYSR2012JX00-F17	★	3
					L	GYSL2012JX00-F17	★	3

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.

*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.

*3 Dimensions shown are when the standard insert is used. If other insert geometries are used then **LF**, **LH** and **LH 3** values may vary.

*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F197.

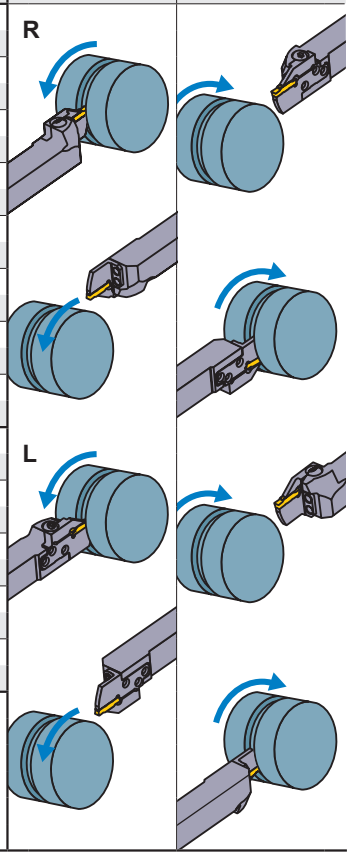
● : USA Stock ★ : Stocked in Japan

SPARE PARTS

Holder	Clamp Screw	Wrench
GYSR/L1010JX00	CS350990T	TKY10R
GYSR/L1212JX00		
GYSR/L1616JX00	TS4SBL	TKY15R
GYSR/L1915K00		
GYSR/L2012JX00	CS350990T	TKY10R
GYSR/L2020K00	HSC05018	TKY40R
GYSR/L2525K00		

Dimensions (mm) *3						
H	**B**	**LF**	**LH**	**LH 3**	**HF**	**HBH**
10	10	120	17.5	17.5	10	2
10	10	120	17.5	17.5	10	2
12	12	120	19.5	19.5	12	2
12	12	120	19.5	19.5	12	2
16	16	120	25	—	16	—
16	16	120	25	—	16	—
16	16	120	28	—	16	—
16	16	120	28	—	16	—
19.05	15.875	125	28	—	19.05	—
19.05	15.875	125	28	—	19.05	—
20	12	120	28	—	20	—
20	12	120	28	—	20	—
20	20	125	35	—	20	—
20	20	125	35	—	20	—
25	25	150	40	—	25	—
25	25	150	40	—	25	—
12	12	120	19.5	19.5	12	2
12	12	120	19.5	19.5	12	2
16	16	120	25	—	16	—
16	16	120	25	—	16	—
16	16	120	28	—	16	—
16	16	120	28	—	16	—
19.05	15.875	125	28	—	19.05	—
19.05	15.875	125	28	—	19.05	—
20	12	120	28	—	20	—
20	12	120	28	—	20	—

Cutting Mode



Clockwise | Anticlockwise

Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	CW \ Breaker	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
E	.098", 2.50 mm		●	●	●
F	.118", 3.00 mm		●	●	●

For multifunctional grooving ➤ F013, F014

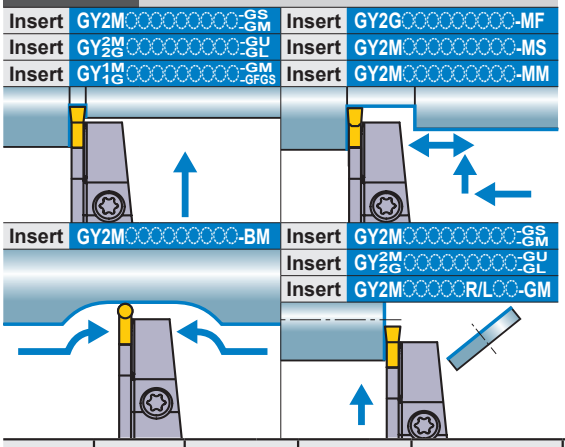
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying)
					Ball shape
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			
F	.118", 3.00 mm				●
	RE .008", 0.2 mm	●	●	●	
	RE .016", 0.4 mm	●	●	●	
	RE .031", 0.8 mm			●	
	.125", 3.18 mm				●
	RE .008", 0.2 mm	●			
	RE .016", 0.4 mm	●			
	.128", 3.24 mm	●			

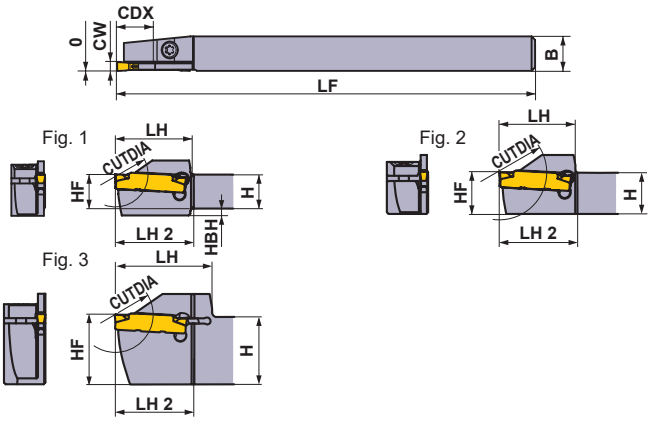
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (External for Swiss-type lathes)

1-2 00° type holder (Metric)





Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *4	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
C	1.50	11	22	Mono Block	R	GYSR1010JX00-C11	●	1
					L	GYSL1010JX00-C11	●	1
		13	26	Mono Block	R	GYSR1212JX00-C13	●	2
					L	GYSL1212JX00-C13	●	2
		17 *1	34 *2	Mono Block	R	GYSR1616JX00-C17	●	2
					L	GYSL1616JX00-C17	●	2
		18 *1	36 *2	Mono Block	R	GYSR2012JX00-C18	●	3
					L	GYSL2012JX00-C18	●	3
D	2.00 2.24	11	22	Mono Block	R	GYSR1010JX00-D11	●	1
					L	GYSL1010JX00-D11	●	1
		13	26	Mono Block	R	GYSR1212JX00-D13	●	2
					L	GYSL1212JX00-D13	●	2
		17	34	Mono Block	R	GYSR1616JX00-D17	●	2
					L	GYSL1616JX00-D17	●	2
		18	36	Mono Block	R	GYSR2012JX00-D18	●	3
					L	GYSL2012JX00-D18	●	3
E	2.39 2.50 2.74	11	22	Mono Block	R	GYSR1010JX00-E11	●	1
					L	GYSL1010JX00-E11	●	1
		13	26	Mono Block	R	GYSR1212JX00-E13	●	2
					L	GYSL1212JX00-E13	●	2
		17	34	Mono Block	R	GYSR1616JX00-E17	●	2
					L	GYSL1616JX00-E17	●	2
		18	36	Mono Block	R	GYSR2012JX00-E18	●	3
					L	GYSL2012JX00-E18	●	3
F	3.00 3.18 3.24	11	22	Mono Block	R	GYSR1010JX00-F11	●	1
					L	GYSL1010JX00-F11	●	1
		13	26	Mono Block	R	GYSR1212JX00-F13	●	2
					L	GYSL1212JX00-F13	●	2
		17	34	Mono Block	R	GYSR1616JX00-F17	●	2
					L	GYSL1616JX00-F17	●	2
		18	36	Mono Block	R	GYSR2012JX00-F18	●	3
					L	GYSL2012JX00-F18	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F199.

● : USA Stock

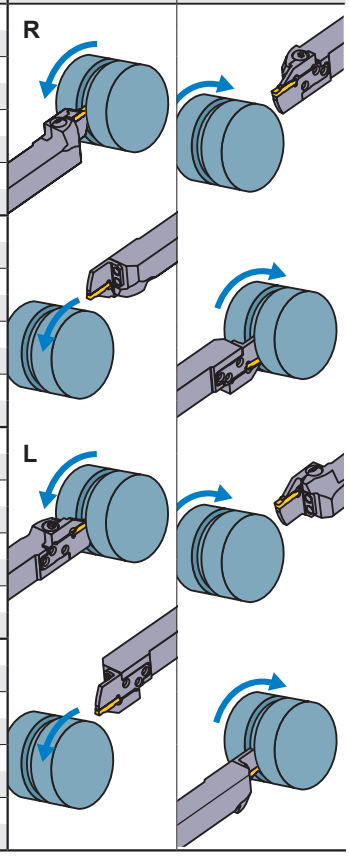
SPARE PARTS

Holder Number	Clamp Screw	Wrench
GYSR/L1010JX00-○11	CS350990T (Clamp Torque : 22 lbf-in)	TKY10R
GYSR/L1212JX00-○13		
GYSR/L2012JX00-○18		
GYSR/L1616JX00-○17	TS4SBL (Clamp Torque : 31 lbf-in)	TKY15R

Dimensions (mm) *3						
H	B	LF	LH	LH 2	HF	HBH
10	10	120	22	16	10	2
10	10	120	22	16	10	2
12	12	120	22	16	12	—
12	12	120	22	16	12	—
16	16	120	27	17	16	—
16	16	120	27	17	16	—
20	12	120	28	16	20	—
20	12	120	28	16	20	—
10	10	120	22	23	10	2
10	10	120	22	23	10	2
12	12	120	22	23	12	—
12	12	120	22	23	12	—
16	16	120	27	24	16	—
16	16	120	27	24	16	—
20	12	120	28	23	20	—
20	12	120	28	23	20	—
10	10	120	22	23	10	2
10	10	120	22	23	10	2
12	12	120	22	23	12	—
12	12	120	22	23	12	—
16	16	120	27	24	16	—
16	16	120	27	24	16	—
20	12	120	28	23	20	—
20	12	120	28	23	20	—
10	10	120	22	23	10	2
10	10	120	22	23	10	2
12	12	120	22	23	12	—
12	12	120	22	23	12	—
16	16	120	27	24	16	—
16	16	120	27	24	16	—
20	12	120	28	23	20	—
20	12	120	28	23	20	—

Cutting Mode

Clockwise	Anticlockwise



Select an Insert

Seat Size	Insert Number
C	GY○○0150C○○○○–Breaker
D	GY○○0200/0224D○○○○–Breaker
E	GY○○0239/0250/0274E○○○○–Breaker
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
C	.059", 1.50 mm		●	●		
D	.079", 2.00 mm	●	●	●	●	●
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	CW \ Breaker	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
C	.059", 1.50 mm		●	●	
D	.079", 2.00 mm		●	●	●
E	.098", 2.50 mm		●	●	●
F	.118", 3.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

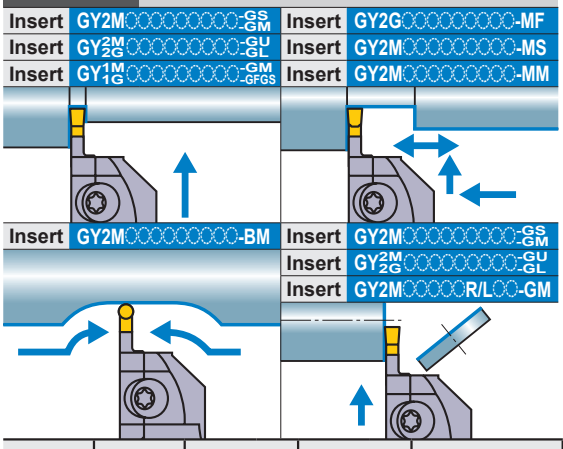
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

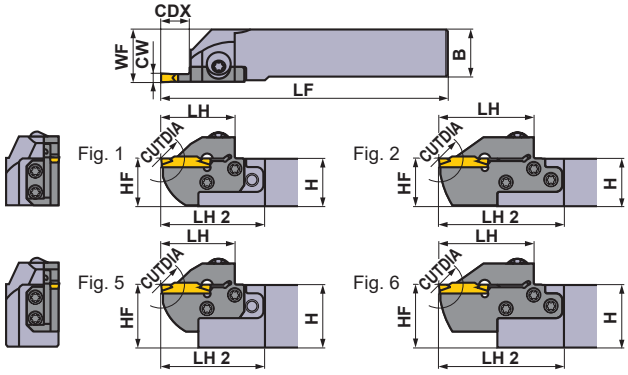
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

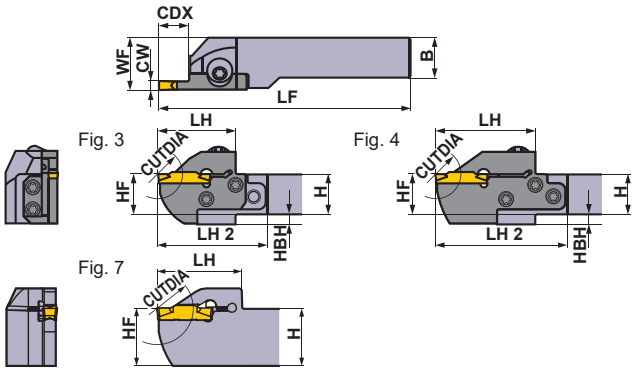


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	6	12	Modular	R	**GYHR1616J00-M20R**	●	**GYM20RA-D06**	●	3
					L	**GYHL1616J00-M20L**	●	**GYM20LA-D06**	●	3
				Mono Block	R	**GYQR2020K00-D06**	★	—	—	7
					L	**GYQL2020K00-D06**	★	—	—	7
				Modular	R	**GYHR2020K00-M20R**	●	**GYM20RA-D06**	●	1
					L	**GYHL2020K00-M20L**	●	**GYM20LA-D06**	●	1
				Modular	R	**GYHR2020K00-M25R**	●	**GYM25RA-D06**	●	3
					L	**GYHL2020K00-M25L**	●	**GYM25LA-D06**	●	3
				Mono Block	R	**GYQR2525M00-D06**	★	—	—	7
					L	**GYQL2525M00-D06**	★	—	—	7
				Modular	R	**GYHR2525M00-M25R**	●	**GYM25RA-D06**	●	1
					L	**GYHL2525M00-M25L**	●	**GYM25LA-D06**	●	1
				Modular	R	**GYHR3225P00-M25R**	★	**GYM25RA-D06**	●	5
					L	**GYHL3225P00-M25L**	★	**GYM25LA-D06**	●	5
				Modular	R	**GYHR3232P00-M25R**	★	**GYM25RA-D06**	●	5
					L	**GYHL3232P00-M25L**	★	**GYM25LA-D06**	●	5
		10	20	Modular	R	**GYHR1616J00-M20R**	●	**GYM20RA-D10**	●	3
					L	**GYHL1616J00-M20L**	●	**GYM20LA-D10**	●	3
				Modular	R	**GYHR2020K00-M20R**	●	**GYM20RA-D10**	●	1
					L	**GYHL2020K00-M20L**	●	**GYM20LA-D10**	●	1
		12	24	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RA-D12**	●	3
					L	**GYHL2020K00-M25L**	●	**GYM25LA-D12**	●	3
				Modular	R	**GYHR2525M00-M25R**	●	**GYM25RA-D12**	●	1
					L	**GYHL2525M00-M25L**	●	**GYM25LA-D12**	●	1
				Modular	R	**GYHR3225P00-M25R**	★	**GYM25RA-D12**	●	5
					L	**GYHL3225P00-M25L**	★	**GYM25LA-D12**	●	5
				Modular	R	**GYHR3232P00-M25R**	★	**GYM25RA-D12**	●	5
					L	**GYHL3232P00-M25L**	★	**GYM25LA-D12**	●	5
		18 ✶4	36	Modular	R	**GYHR1616J00-M20R**	●	**GYM20RB-D18**	●	4
					L	**GYHL1616J00-M20L**	●	**GYM20LB-D18**	●	4
				Mono Block	R	**GYQR2020K00-D18**	★	—	—	7
					L	**GYQL2020K00-D18**	★	—	—	7
				Modular	R	**GYHR2020K00-M20R**	●	**GYM20RB-D18**	●	2
					L	**GYHL2020K00-M20L**	●	**GYM20LB-D18**	●	2
		20 ✶1	40 ✶2	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RA-D20**	●	4
					L	**GYHL2020K00-M25L**	●	**GYM25LA-D20**	●	4
				Mono Block	R	**GYQR2525M00-D20**	★	—	—	7
					L	**GYQL2525M00-D20**	★	—	—	7
				Modular	R	**GYHR2525M00-M25R**	●	**GYM25RA-D20**	●	2
					L	**GYHL2525M00-M25L**	●	**GYM25LA-D20**	●	2
				Modular	R	**GYHR3225P00-M25R**	★	**GYM25RA-D20**	●	6
					L	**GYHL3225P00-M25L**	★	**GYM25LA-D20**	●	6
				Modular	R	**GYHR3232P00-M25R**	★	**GYM25RA-D20**	●	6
					L	**GYHL3232P00-M25L**	★	**GYM25LA-D20**	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter
✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
✶4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

 ● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

	Dimensions (mm) ∗3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	16	16	104	28	44	16	20	4	R	
	16	16	104	28	44	16	20	4		
	20	20	125	36	—	20	20.15	—		
	20	20	125	36	—	20	20.15	—		
	20	20	119	28	43	20	23	—		
	20	20	119	28	43	20	23	—		
	20	20	117	31	52	20	26	5		
	20	20	117	31	52	20	26	5		
	25	25	150	36	—	25	25.15	—		
	25	25	150	36	—	25	25.15	—		
	25	25	142	31	49	25	28	—		
	25	25	142	31	49	25	28	—		
	32	25	162	31	49	32	28	—		
	32	25	162	31	49	32	28	—		
	32	32	162	31	49	32	35	—		
	32	32	162	31	49	32	35	—		
	16	16	110	34	50	16	20	4		
	16	16	110	34	50	16	20	4		
	20	20	125	34	49	20	23	—		
	20	20	125	34	49	20	23	—		
	20	20	125	39	60	20	26	5		
	20	20	125	39	60	20	26	5		
	25	25	150	39	57	25	28	—		
	25	25	150	39	57	25	28	—		
	32	25	170	39	57	32	28	—		
	32	25	170	39	57	32	28	—		
	32	32	170	39	57	32	35	—		
	32	32	170	39	57	32	35	—		
	16	16	116	40	56	16	20	4	L	
	16	16	116	40	56	16	20	4		
	20	20	125	39	—	20	20.10	—		
	20	20	125	39	—	20	20.10	—		
	20	20	131	40	55	20	23	—		
	20	20	131	40	55	20	23	—		
	20	20	131	45	66	20	26	5		
	20	20	131	45	66	20	26	5		
	25	25	150	41	—	25	25.10	—		
	25	25	150	41	—	25	25.10	—		
	25	25	156	45	63	25	28	—		
	25	25	156	45	63	25	28	—		
	32	25	176	45	63	32	28	—		
	32	25	176	45	63	32	28	—		
	32	32	176	45	63	32	35	—		
	32	32	176	45	63	32	35	—		

Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○-Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
D	.079", 2.00 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
D	.079", 2.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

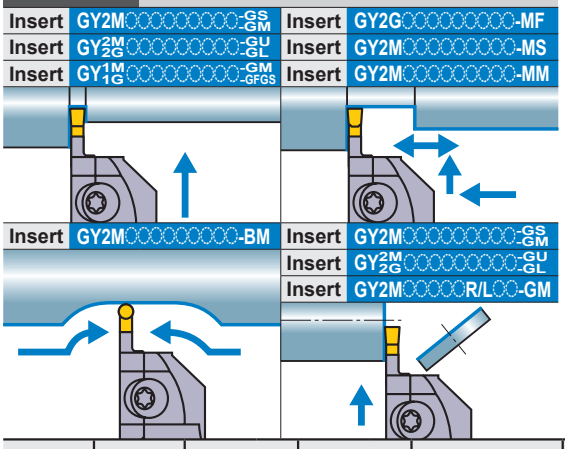
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

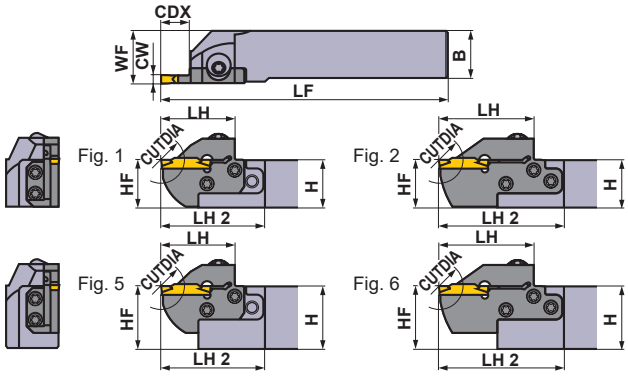
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E06	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-E06	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E06	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-E06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-E06	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-E06	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E06	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-E06	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-E06	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-E06	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-E06	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-E06	●	5
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-E10	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-E10	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-E10	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-E10	●	1
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E12	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-E12	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E12	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-E12	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-E12	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-E12	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-E12	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-E12	●	5
		18 ✶4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-E18	●	4
					L	GYHL1616J00-M20L	●	GYM20LB-E18	●	4
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-E18	●	2
					L	GYHL2020K00-M20L	●	GYM20LB-E18	●	2
		20 ✶1	40 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-E20	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-E20	●	4
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-E20	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-E20	●	2
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-E20	●	6
					L	GYHL3225P00-M25L	★	GYM25LA-E20	●	6
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-E20	●	6
					L	GYHL3232P00-M25L	★	GYM25LA-E20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
✶4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

● : USA Stock ★ : Stocked in Japan

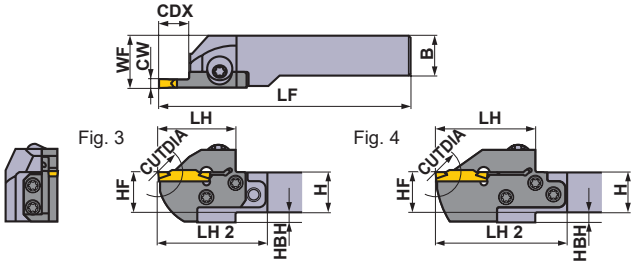


Fig. 3 Fig. 4

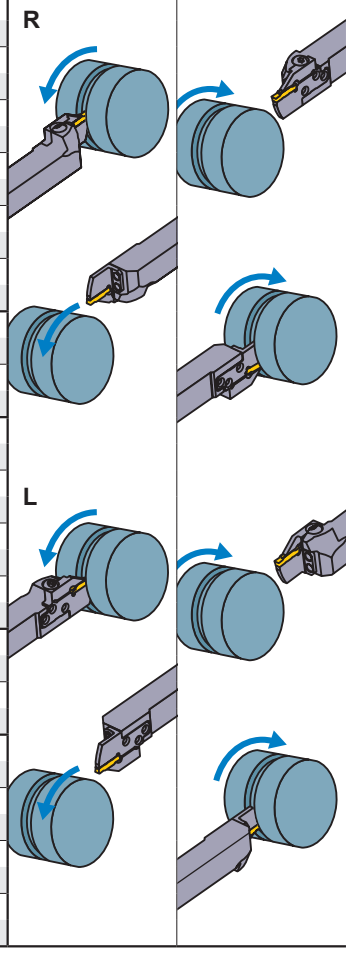
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	R	
16	16	104	28	44	16	20	4		
20	20	119	28	43	20	23	—		
20	20	119	28	43	20	23	—		
20	20	117	31	52	20	26	5		
20	20	117	31	52	20	26	5		
25	25	142	31	49	25	28	—		
25	25	142	31	49	25	28	—		
32	25	162	31	49	32	28	—		
32	25	162	31	49	32	28	—		
32	32	162	31	49	32	35	—		
32	32	162	31	49	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
16	16	116	40	56	16	20	4		
16	16	116	40	56	16	20	4		
20	20	131	40	55	20	23	—		
20	20	131	40	55	20	23	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel) Neutral	GS (Low) Neutral	GM (Medium) Neutral	GL (Aluminum Alloy) Neutral	GFGS (Hardened steel) Neutral
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low) R	08-GS (Low) R	15-GS (Low) R	05-GM (Medium) R/L
E	.098", 2.50 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing) Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

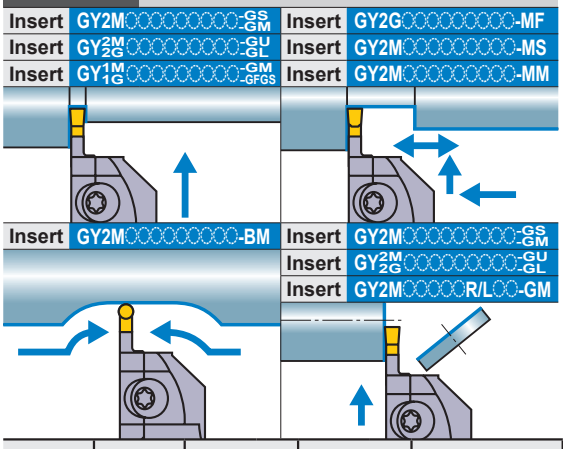
F

GROOVING / CUTTING OFF

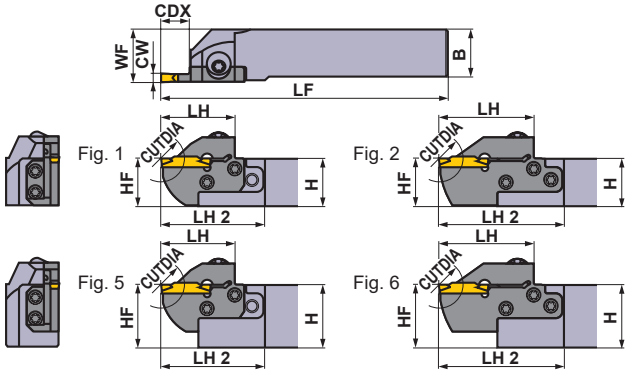
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

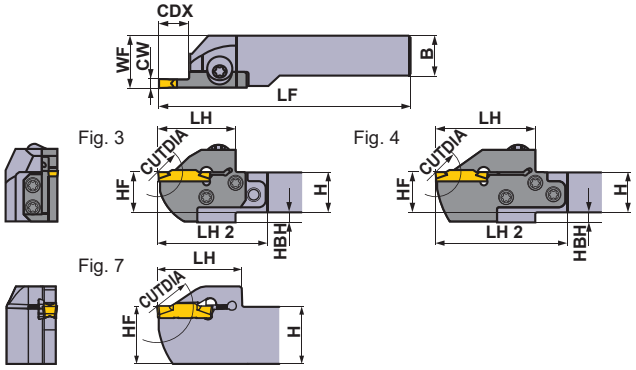


Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	6	12	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F06	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-F06	●	3
				Mono Block	R	GYQR2020K00-F06	★	—	—	7
					L	GYQL2020K00-F06	★	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F06	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-F06	●	1
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-F06	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-F06	●	3
				Mono Block	R	GYQR2525M00-F06	★	—	—	7
					L	GYQL2525M00-F06	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F06	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-F06	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-F06	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-F06	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-F06	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-F06	●	5
		10	20	Modular	R	GYHR1616J00-M20R	●	GYM20RA-F10	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-F10	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-F10	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-F10	●	1
		12	24	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F12	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-F12	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F12	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-F12	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-F12	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-F12	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-F12	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-F12	●	5
		18 ✶4	36	Modular	R	GYHR1616J00-M20R	●	GYM20RB-F18	●	4
					L	GYHL1616J00-M20L	●	GYM20LB-F18	●	4
				Mono Block	R	GYQR2020K00-F18	★	—	—	7
					L	GYQL2020K00-F18	★	—	—	7
				Modular	R	GYHR2020K00-M20R	●	GYM20RB-F18	●	2
					L	GYHL2020K00-M20L	●	GYM20LB-F18	●	2
		20 ✶1	40 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RA-F20	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-F20	●	4
				Mono Block	R	GYQR2525M00-F20	★	—	—	7
					L	GYQL2525M00-F20	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-F20	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-F20	●	2
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-F20	●	6
					L	GYHL3225P00-M25L	★	GYM25LA-F20	●	6
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-F20	●	6
					L	GYHL3232P00-M25L	★	GYM25LA-F20	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter
✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
✶4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

● : USA Stock ★ : Stocked in Japan



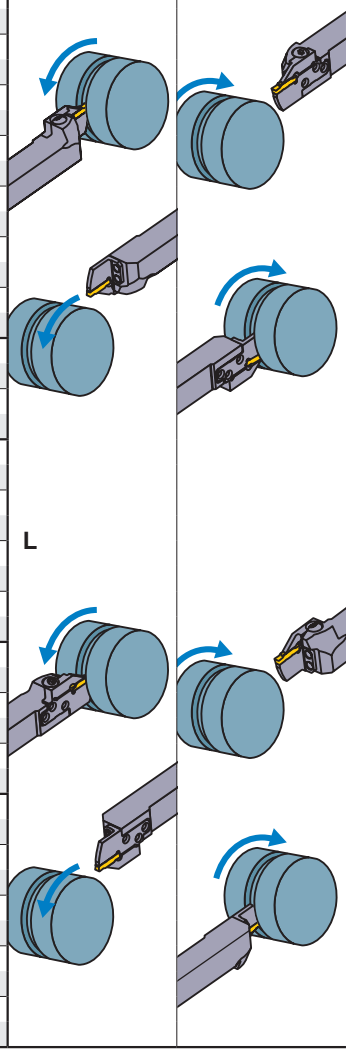
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
16	16	104	28	44	16	20	4	R	
16	16	104	28	44	16	20	4		
20	20	125	36	—	20	20.30	—		
20	20	125	36	—	20	20.30	—		
20	20	119	28	43	20	23	—		
20	20	119	28	43	20	23	—		
20	20	117	31	52	20	26	5		
20	20	117	31	52	20	26	5		
25	25	150	36	—	25	25.30	—		
25	25	150	36	—	25	25.30	—		
25	25	142	31	49	25	28	—		
25	25	142	31	49	25	28	—		
32	25	162	31	49	32	28	—		
32	25	162	31	49	32	28	—		
32	32	162	31	49	32	35	—		
32	32	162	31	49	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
16	16	116	40	56	16	20	4	L	
16	16	116	40	56	16	20	4		
20	20	125	39	—	20	20.25	—		
20	20	125	39	—	20	20.25	—		
20	20	131	40	55	20	23	—		
20	20	131	40	55	20	23	—		
20	20	131	45	66	20	26	5		
20	20	131	45	66	20	26	5		
25	25	150	41	—	25	25.25	—		
25	25	150	41	—	25	25.25	—		
25	25	156	45	63	25	28	—		
25	25	156	45	63	25	28	—		
32	25	176	45	63	32	28	—		
32	25	176	45	63	32	28	—		
32	32	176	45	63	32	35	—		
32	32	176	45	63	32	35	—		



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
F	.118", 3.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

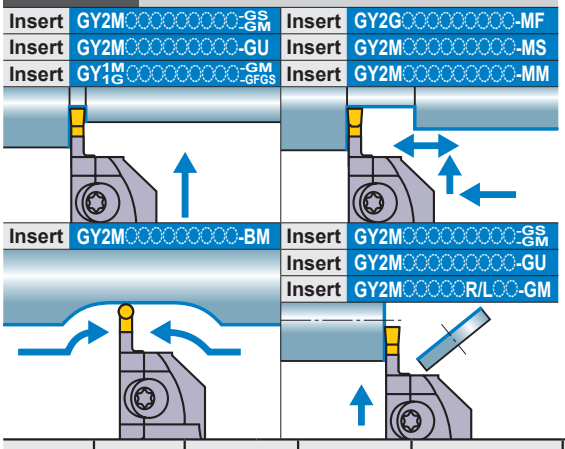
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

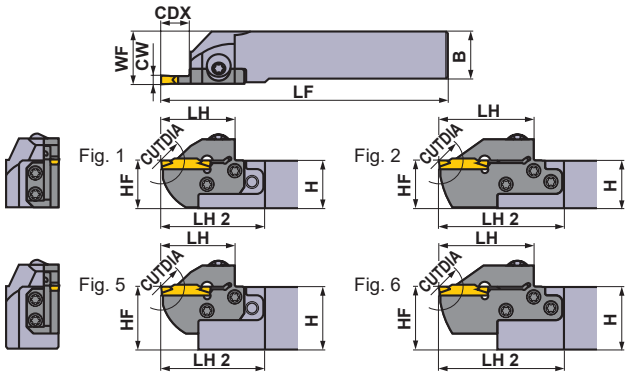
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
G	4.00 4.24	8	16	Mono Block	R	GYQR2020K00-G08	★	—	—	7
					L	GYQL2020K00-G08	★	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-G08	●	3
				Mono Block	R	GYQR2525M00-G08	★	—	—	7
					L	GYQL2525M00-G08	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-G08	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-G08	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-G08	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-G08	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-G08	●	5
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-G12	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-G12	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-G12	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-G12	●	1
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-G14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-G14	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-G14	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-G14	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-G14	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-G14	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-G14	●	5
		25 ✶1	50 ✶2	Mono Block	R	GYQR2020K00-G25	★	—	—	8
					L	GYQL2020K00-G25	★	—	—	8
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-G25	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-G25	●	4
				Mono Block	R	GYQR2525M00-G25	★	—	—	7
					L	GYQL2525M00-G25	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-G25	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-G25	●	2
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-G25	●	6
					L	GYHL3225P00-M25L	★	GYM25LA-G25	●	6
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-G25	●	6
					L	GYHL3232P00-M25L	★	GYM25LA-G25	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

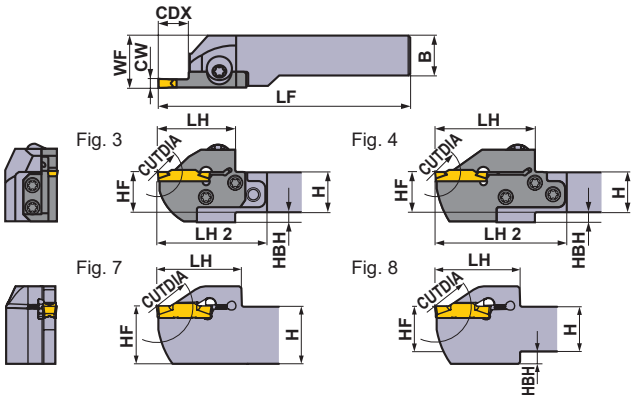
✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D



Right hand tool holder shown.

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4		
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○-Breaker

For Grooving/Cutting off ➢ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
G	.157", 4.00 mm	●	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

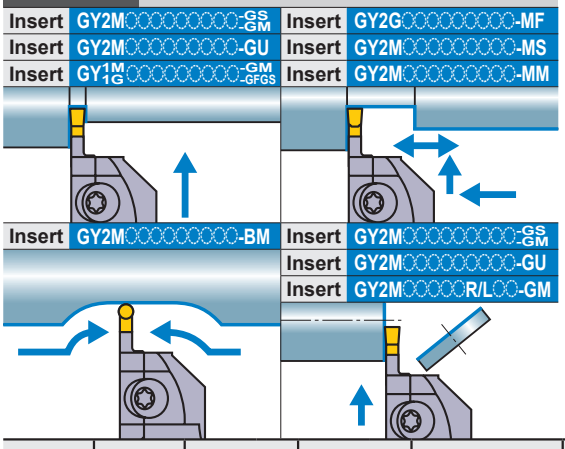
F

GROOVING / CUTTING OFF

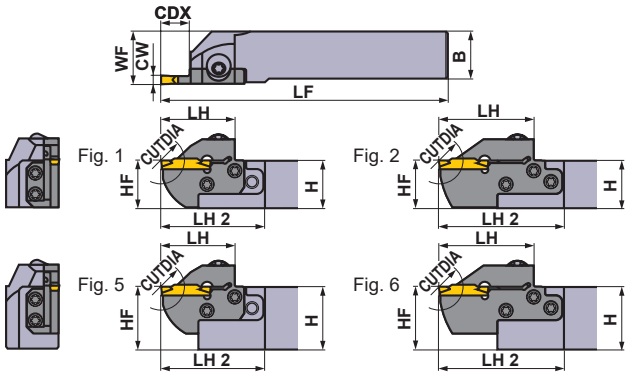
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F194
INSTRUCTION MANUAL ➢ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



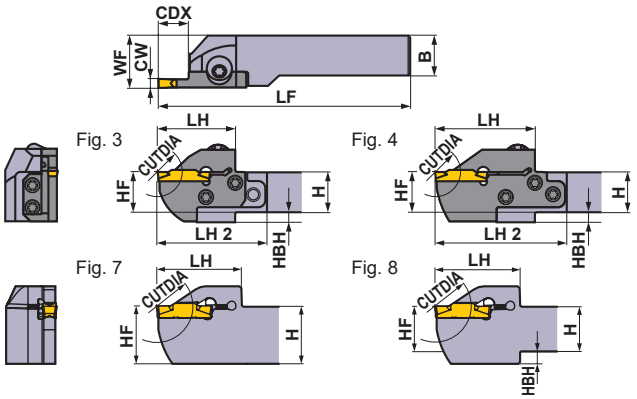
Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	8	16	Mono Block	R	GYQR2020K00-H08	★	—	—	7
					L	GYQL2020K00-H08	★	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-H08	●	3
				Mono Block	R	GYQR2525M00-H08	★	—	—	7
					L	GYQL2525M00-H08	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-H08	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-H08	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-H08	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-H08	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-H08	●	5
		12	24	Modular	R	GYHR1616J00-M20R	●	GYM20RA-H12	●	3
					L	GYHL1616J00-M20L	●	GYM20LA-H12	●	3
				Modular	R	GYHR2020K00-M20R	●	GYM20RA-H12	●	1
					L	GYHL2020K00-M20L	●	GYM20LA-H12	●	1
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-H14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-H14	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-H14	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-H14	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-H14	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-H14	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-H14	●	5
		25 ✶1	50 ✶2	Mono Block	R	GYQR2020K00-H25	★	—	—	8
					L	GYQL2020K00-H25	★	—	—	8
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-H25	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-H25	●	4
				Mono Block	R	GYQR2525M00-H25	★	—	—	7
					L	GYQL2525M00-H25	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-H25	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-H25	●	2
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-H25	●	6
					L	GYHL3225P00-M25L	★	GYM25LA-H25	●	6
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-H25	●	6
					L	GYHL3232P00-M25L	★	GYM25LA-H25	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M20R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHR/L○○○○○○○○-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
16	16	110	34	50	16	20	4		
16	16	110	34	50	16	20	4		
20	20	125	34	49	20	23	—		
20	20	125	34	49	20	23	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—	L	
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4		
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○-Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
H	.187", 4.75 mm	●	●	●	●	
	.197", 5.00 mm	●	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

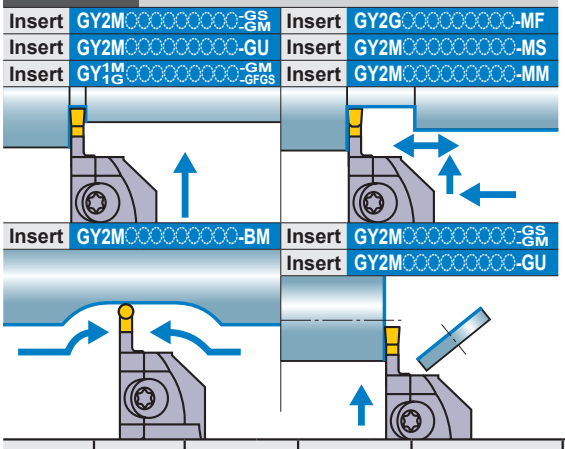
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

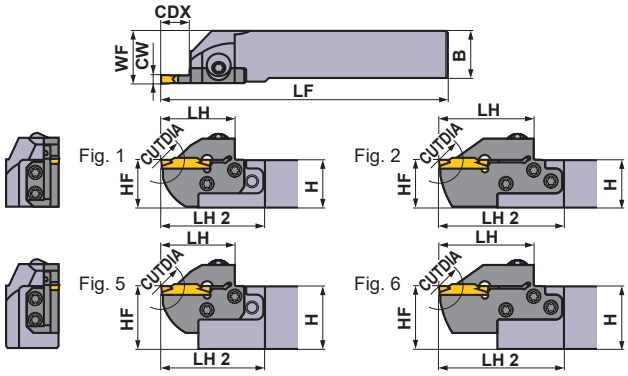
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



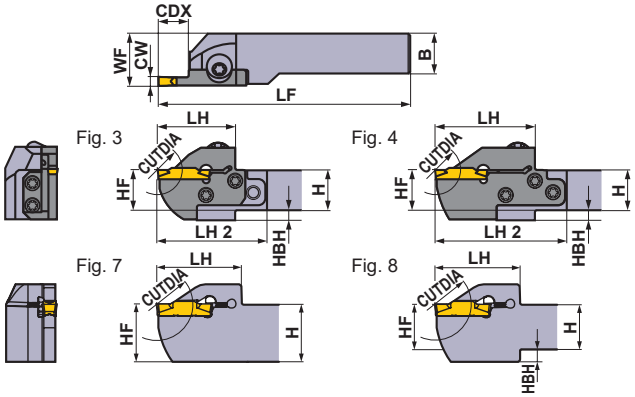
Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
J	6.00 6.31 6.35	8	16	Mono Block	R	GYQR2020K00-J08	★	—	—	7
					L	GYQL2020K00-J08	★	—	—	7
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J08	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-J08	●	3
				Mono Block	R	GYQR2525M00-J08	★	—	—	7
					L	GYQL2525M00-J08	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J08	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-J08	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-J08	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-J08	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-J08	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-J08	●	5
		14	28	Modular	R	GYHR2020K00-M25R	●	GYM25RA-J14	●	3
					L	GYHL2020K00-M25L	●	GYM25LA-J14	●	3
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J14	●	1
					L	GYHL2525M00-M25L	●	GYM25LA-J14	●	1
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-J14	●	5
					L	GYHL3225P00-M25L	★	GYM25LA-J14	●	5
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-J14	●	5
					L	GYHL3232P00-M25L	★	GYM25LA-J14	●	5
		25 ✶1	50 ✶2	Mono Block	R	GYQR2020K00-J25	★	—	—	8
					L	GYQL2020K00-J25	★	—	—	8
				Modular	R	GYHR2020K00-M25R	●	GYM25RA-J25	●	4
					L	GYHL2020K00-M25L	●	GYM25LA-J25	●	4
				Mono Block	R	GYQR2525M00-J25	★	—	—	7
					L	GYQL2525M00-J25	★	—	—	7
				Modular	R	GYHR2525M00-M25R	●	GYM25RA-J25	●	2
					L	GYHL2525M00-M25L	●	GYM25LA-J25	●	2
				Modular	R	GYHR3225P00-M25R	★	GYM25RA-J25	●	6
					L	GYHL3225P00-M25L	★	GYM25LA-J25	●	6
				Modular	R	GYHR3232P00-M25R	★	GYM25RA-J25	●	6
					L	GYHL3232P00-M25L	★	GYM25LA-J25	●	6

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

✶1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
✶3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	5 pcs. Blade Screw	① ② Wrench ∗
GYQR/L○○○○○○○○-○○○	①HSC05030 (Clamp Torque : 62 lbf-in)	—	HKY40R
GYHR/L○○○○○○○○-M25R/L	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗3								Cutting Mode	
H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
20	20	125	41	—	20	20.35	—	R	
20	20	125	41	—	20	20.35	—		
20	20	119	33	54	20	26	5		
20	20	119	33	54	20	26	5		
25	25	150	41	—	25	25.35	—		
25	25	150	41	—	25	25.35	—		
25	25	144	33	51	25	28	—		
25	25	144	33	51	25	28	—		
32	25	164	33	51	32	28	—		
32	25	164	33	51	32	28	—		
32	32	164	33	51	32	35	—		
32	32	164	33	51	32	35	—		
20	20	125	39	60	20	26	5		
20	20	125	39	60	20	26	5		
25	25	150	39	57	25	28	—		
25	25	150	39	57	25	28	—		
32	25	170	39	57	32	28	—		
32	25	170	39	57	32	28	—		
32	32	170	39	57	32	35	—		
32	32	170	39	57	32	35	—		
20	20	125	46	—	20	20.35	4	L	
20	20	125	46	—	20	20.35	4		
20	20	136	50	71	20	26	5		
20	20	136	50	71	20	26	5		
25	25	150	46	—	25	25.35	—		
25	25	150	46	—	25	25.35	—		
25	25	161	50	68	25	28	—		
25	25	161	50	68	25	28	—		
32	25	181	50	68	32	28	—		
32	25	181	50	68	32	28	—		
32	32	181	50	68	32	35	—		
32	32	181	50	68	32	35	—		

Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
J	.236", 6.00 mm	●	●	●	●	
	.250", 6.35 mm	●	●	●		

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			

● : Gauge insert shown dimensions

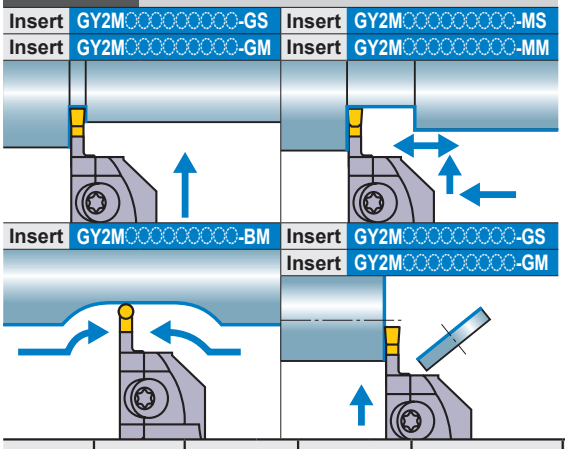
F

GROOVING / CUTTING OFF

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

1-2 00° type holder (Metric)



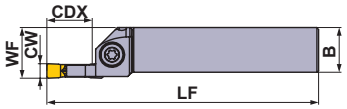


Fig. 1

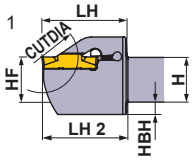
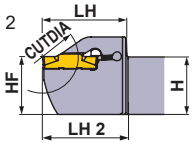


Fig. 2



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
K	8.00	25 *1	50 *2	Mono Block	R	**GYPR2525M00-K25**	●	—	—	1
					L	**GYPL2525M00-K25**	●	—	—	1
				Mono Block	R	**GYPR3225P00-K25**	●	—	—	2
					L	**GYPL3225P00-K25**	●	—	—	2
				Mono Block	R	**GYPR3232P00-K25**	●	—	—	3
					L	**GYPL3232P00-K25**	●	—	—	3

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock

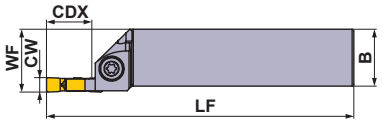
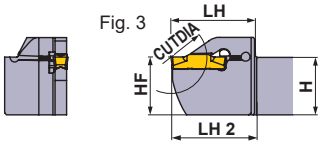


Fig. 3



Right hand tool holder shown.

SPARE PARTS

Holder Number	Clamp Screw	Wrench
GYPR/L○○○○○00-K25	GY06013M (Clamp Torque : 53 lbf-in)	TKY30R

	Dimensions (mm) ∗3								Cutting Mode	
	H	B	LF	LH	LH 2	HF	WF	HBH	Clockwise	Anticlockwise
	25	25	150	47	48	25	28	7	R	
	25	25	150	47	48	25	28	7		
	32	25	170	47	48	32	28	—		
	32	25	170	47	48	32	28	—		
	32	32	170	47	48	32	35	—		
	32	32	170	47	48	32	35	—		
									L	

Select an Insert

Seat Size	Insert Number
K	**GY○○0800K○○○○–Breaker**

For Grooving/Cutting off ➤ F011

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
K	.315", 8.00 mm		●	●		

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
K	.315", 8.00 mm				●
	RE 0.8 mm		●	●	
	RE 1.2 mm			●	

● : Gauge insert shown dimensions

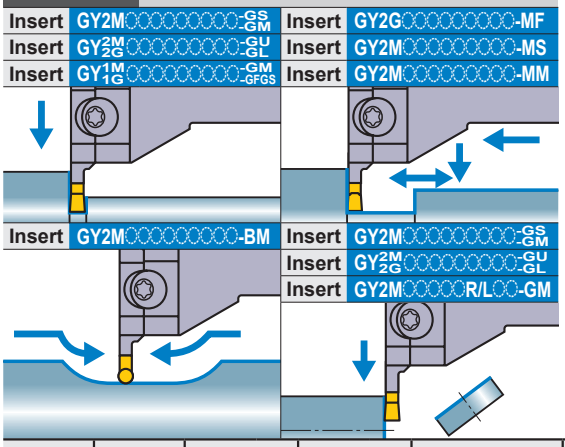
F

GROOVING / CUTTING OFF

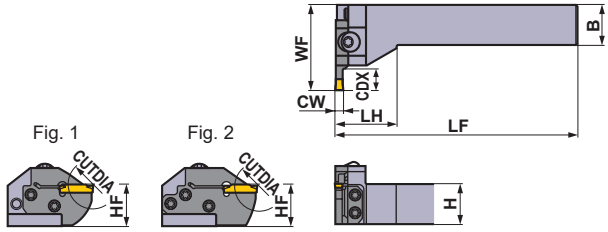
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

2-2 90° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D06	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-D06	●	1
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-D06	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-D06	●	1
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-D10	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-D10	●	1
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D12	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-D12	●	1
		18 *4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-D18	●	2
					L	GYHL2020K90-M20R	●	GYM20RB-D18	●	2
		20 *1	40 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-D20	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-D20	●	2
E	2.39 2.50 2.74	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E06	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-E06	●	1
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-E06	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-E06	●	1
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-E10	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-E10	●	1
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E12	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-E12	●	1
		18 *4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-E18	●	2
					L	GYHL2020K90-M20R	●	GYM20RB-E18	●	2
		20 *1	40 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-E20	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-E20	●	2

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

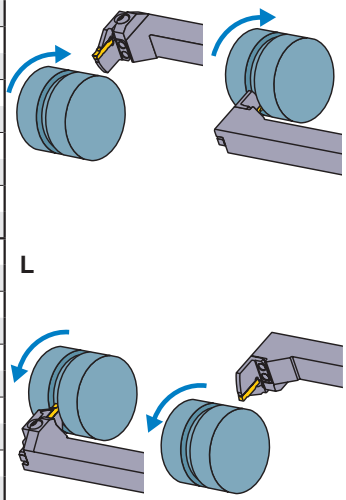
*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2020K90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗3						Cutting Mode
H	**B**	**LF**	**LH**	**HF**	**WF**	
20	20	125	35	20	39	R
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	
20	20	125	35	20	39	L
20	20	125	35	20	39	
25	25	150	38	25	45	
25	25	150	38	25	45	
20	20	125	35	20	45	
20	20	125	35	20	45	
25	25	150	38	25	53	
25	25	150	38	25	53	
20	20	125	35	20	51	
20	20	125	35	20	51	
25	25	150	38	25	59	
25	25	150	38	25	59	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
D	.079", 2.00 mm	●	●	●	●	●
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
D	.079", 2.00 mm		●	●	●
E	.098", 2.50 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

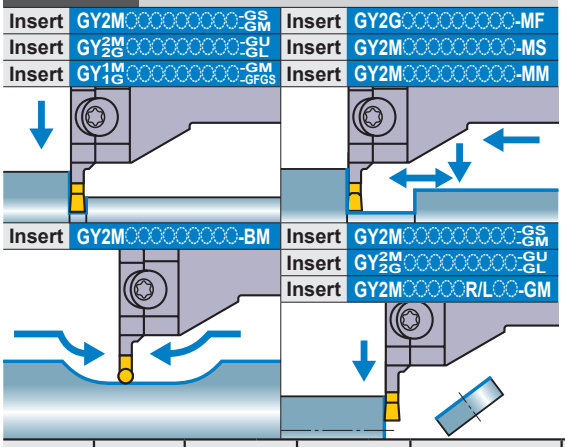
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

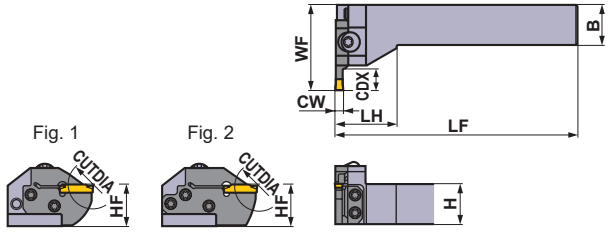
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

2-2 90° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	6	12	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F06	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-F06	●	1
				Modular	R	GYHR2525M90-M25L	●	GYM25LA-F06	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-F06	●	1
		10	20	Modular	R	GYHR2020K90-M20L	●	GYM20LA-F10	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-F10	●	1
		12	24	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F12	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-F12	●	1
		18 *4	36	Modular	R	GYHR2020K90-M20L	●	GYM20LB-F18	●	2
					L	GYHL2020K90-M20R	●	GYM20RB-F18	●	2
		20 *1	40 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-F20	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-F20	●	2
G	4.00 4.24	8	16	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G08	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-G08	●	1
		12	24	Modular	R	GYHR2020K90-M20L	●	GYM20LA-G12	●	1
					L	GYHL2020K90-M20R	●	GYM20RA-G12	●	1
		14	28	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G14	●	1
					L	GYHL2525M90-M25R	●	GYM25RA-G14	●	1
		25 *1	50 *2	Modular	R	GYHR2525M90-M25L	●	GYM25LA-G25	●	2
					L	GYHL2525M90-M25R	●	GYM25RA-G25	●	2

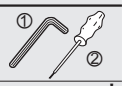
CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

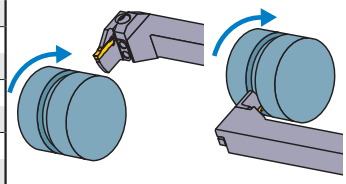
● : USA Stock

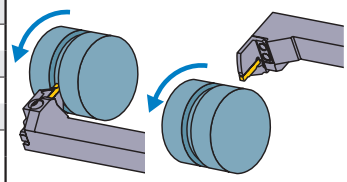
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	5 pcs. Blade Screw	 Wrench ∗
GYHR2020K90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

	Dimensions (mm) ∗3						Cutting Mode
	H	**B**	**LF**	**LH**	**HF**	**WF**	
	20	20	125	35	20	39	**R**
	20	20	125	35	20	39	
	25	25	150	38	25	45	
	25	25	150	38	25	45	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	20	20	125	35	20	51	
	20	20	125	35	20	51	
	25	25	150	38	25	59	
	25	25	150	38	25	59	
	25	25	150	38	25	47	**L**
	25	25	150	38	25	47	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	





Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
F	.118", 3.00 mm	●	●	●	●	●
F	.125", 3.18 mm	●	●	●		●
G	.157", 4.00 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
F	.118", 3.00 mm		●	●	●
G	.157", 4.00 mm				●

For Multifunctional Grooving ➤ F013, F014

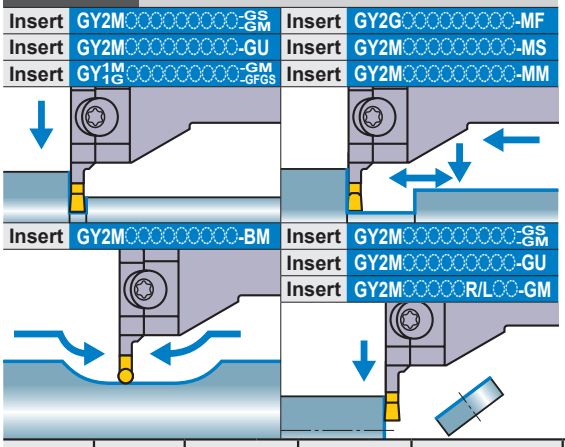
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
F	RE 0.2 mm	●	●	●	
F	RE 0.4 mm	●	●	●	
F	RE 0.8 mm			●	
F	.125", 3.18 mm				●
F	RE 0.2 mm	●			
F	RE 0.4 mm	●			
F	.128", 3.24 mm	●			
G	.157", 4.00 mm				●
G	RE 0.2 mm	●	●	●	
G	RE 0.4 mm	●	●	●	
G	RE 0.8 mm	●		●	
G	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

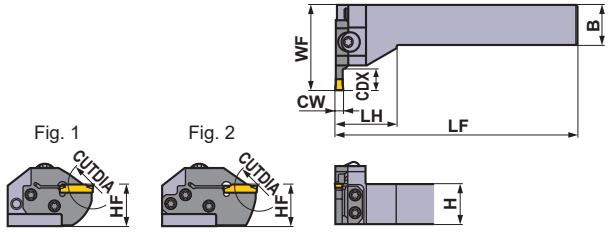
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL)

2-2 90° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number				Fig.
						Holder	Stock	Modular Blade	Stock	
H	4.75 5.00 5.24	8	16	Modular	R	**GYHR2525M90-M25L**	●	**GYM25LA-H08**	●	1
					L	**GYHL2525M90-M25R**	●	**GYM25RA-H08**	●	1
		12	24	Modular	R	**GYHR2020K90-M20L**	●	**GYM20LA-H12**	●	1
					L	**GYHL2020K90-M20R**	●	**GYM20RA-H12**	●	1
		14	28	Modular	R	**GYHR2525M90-M25L**	●	**GYM25LA-H14**	●	1
					L	**GYHL2525M90-M25R**	●	**GYM25RA-H14**	●	1
		25 *1	50 *2	Modular	R	**GYHR2525M90-M25L**	●	**GYM25LA-H25**	●	2
					L	**GYHL2525M90-M25R**	●	**GYM25RA-H25**	●	2
J	6.00 6.31 6.35	8	16	Modular	R	**GYHR2525M90-M25L**	●	**GYM25LA-J08**	●	1
					L	**GYHL2525M90-M25R**	●	**GYM25RA-J08**	●	1
		14	28	Modular	R	**GYHR2525M90-M25L**	●	**GYM25LA-J14**	●	1
					L	**GYHL2525M90-M25R**	●	**GYM25RA-J14**	●	1
		25 *1	50 *2	Modular	R	**GYHR2525M90-M25L**	●	**GYM25LA-J25**	●	2
					L	**GYHL2525M90-M25R**	●	**GYM25RA-J25**	●	2

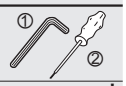
CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

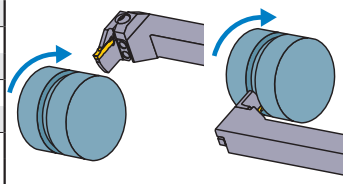
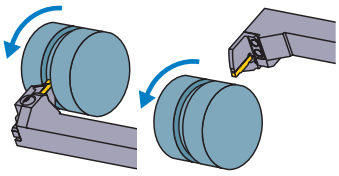
*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2** and **WF** values may vary.

● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	5 pcs. Blade Screw	 Wrench ∗
GYHR2020K90-M20L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYHL2020K90-M20R			
GYHR2525M90-M25L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

	Dimensions (mm) ∗3						Cutting Mode
	H	**B**	**LF**	**LH**	**HF**	**WF**	
	25	25	150	38	25	47	**R**
	25	25	150	38	25	47	
	20	20	125	35	20	45	
	20	20	125	35	20	45	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
							
	25	25	150	38	25	47	**L**
	25	25	150	38	25	47	
	25	25	150	38	25	53	
	25	25	150	38	25	53	
	25	25	150	38	25	64	
	25	25	150	38	25	64	
							

Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➢ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
H	.187", 4.75 mm	●	●	●		●
	.197", 5.00 mm	●	●	●	●	●
J	.236", 6.00 mm	●	●	●		●
	.250", 6.35 mm	●	●	●		

For Multifunctional Grooving ➢ F013, F014

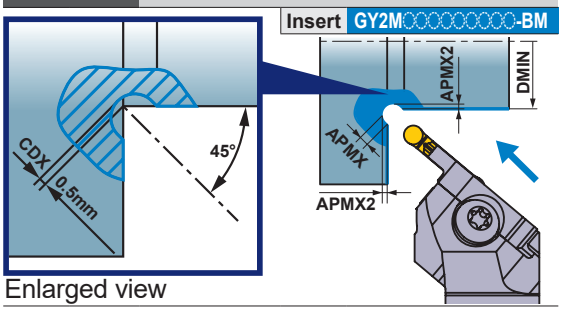
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			
J	.236", 6.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F194
INSTRUCTION MANUAL ➢ F201

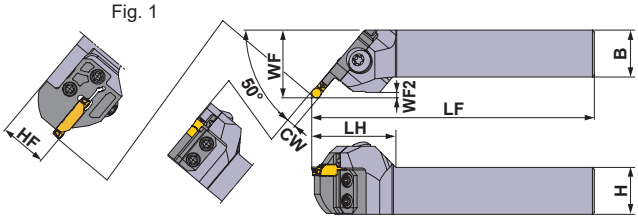
GY SERIES (EXTERNAL RECESSING)

3-2 50° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1



Right hand tool holder shown.

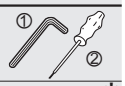
Seat Size	CW (mm)	CDX (mm)	DMIN (mm)	APMX (mm)	APMX2 (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	2.00	0.5	30	1.5	0.646	Modular	R	GYHR2020K50-M20L	●	GYM20LC-D005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-D005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-D005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-D005	●	1
E	2.50			1.75	0.72	Modular	R	GYHR2020K50-M20L	●	GYM20LC-E005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-E005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-E005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-E005	●	1
F	3.00 3.18			2	0.793	Modular	R	GYHR2020K50-M20L	●	GYM20LC-F005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-F005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-F005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-F005	●	1
G	4.00		20	2.5	0.939	Modular	R	GYHR2020K50-M20L	●	GYM20LC-G005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-G005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-G005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-G005	●	1
H	4.75 5.00			2.88	1.049	Modular	R	GYHR2020K50-M20L	●	GYM20LC-H005	●	1
							L	GYHL2020K50-M20R	●	GYM20RC-H005	●	1
						Modular	R	GYHR2525M50-M25L	●	GYM25LC-H005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-H005	●	1
J	6.00 6.35			3.5	1.232	Modular	R	GYHR2525M50-M25L	●	GYM25LC-J005	●	1
							L	GYHL2525M50-M25R	●	GYM25RC-J005	●	1

*1 Blades for external and face grooving cannot be used since it interferes with work materials.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH**, **WF** and **WF2** values may vary.

● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

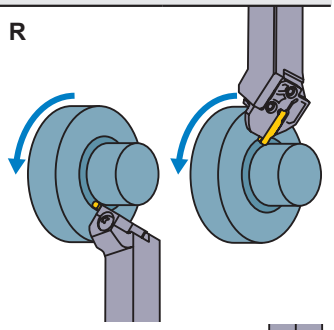
SPARE PARTS

Holder Number	Clamp Screw	4 pcs. Blade Screw	 Wrench ∗
GYHR/L2020K50-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M50-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

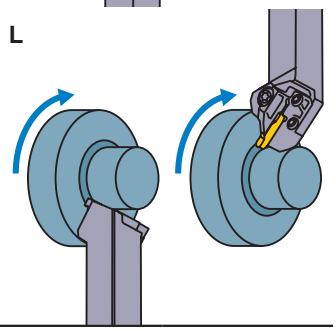
	Dimensions (mm) ∗2						
	H	B	LF	LH	HF	WF	WF2
	20	20	125	40	20	32	1.6
	20	20	125	40	20	32	1.6
	25	25	150	45	25	35	1.6
	25	25	150	45	25	35	1.6
	20	20	125	40	20	32	1.8
	20	20	125	40	20	32	1.8
	25	25	150	45	25	35	1.8
	25	25	150	45	25	35	1.8
	20	20	125	40	20	32	2.0
	20	20	125	40	20	32	2.0
	25	25	150	45	25	35	2.0
	25	25	150	45	25	35	2.0
	20	20	125	40	20	32	2.4
	20	20	125	40	20	32	2.4
	25	25	150	45	25	35	2.4
	25	25	150	45	25	35	2.4
	20	20	125	40	20	33	2.8
	20	20	125	40	20	33	2.8
	25	25	150	45	25	36	2.8
	25	25	150	45	25	36	2.8
	25	25	150	44	25	36	3.4
	25	25	150	44	25	36	3.4

Cutting Mode

R



L



Select an Insert

Insert Number
GY2M○○○○○○○○○N-BM

For Multifunctional Grooving ➢ F014

Seat Size	Breaker CW	BM (Copying, Recessing) Ball nose
D	.079", 2.00 mm	●
E	.098", 2.50 mm	●
F	.118", 3.00 mm	●
	.125", 3.18 mm	●
G	.157", 4.00 mm	●
H	.187", 4.75 mm	●
	.197", 5.00 mm	●
J	.236", 6.00 mm	●
	.250", 6.35 mm	●

● : Gauge insert shown dimensions

F

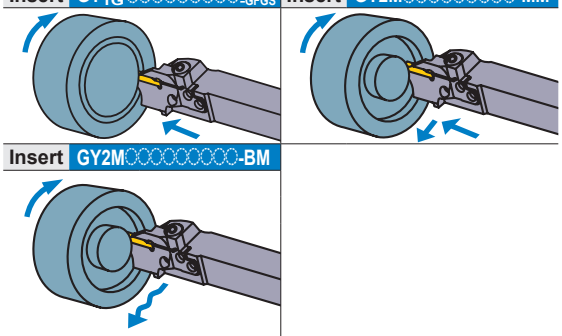
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F200
INSTRUCTION MANUAL ➢ F200

GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

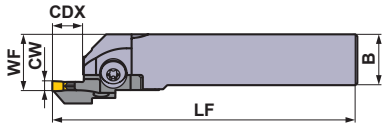


Fig. 1

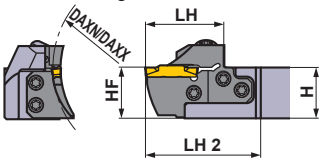
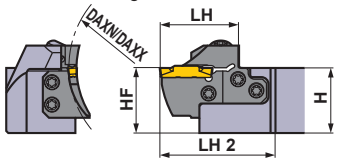


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
D	.079 .088	1.575	1.969	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-040	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-040	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-040	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-040	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-040	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-040	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-040	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-040	●	2
		1.969	2.362	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-050	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-050	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-050	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-050	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-050	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-050	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-050	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-050	●	2
		2.362	2.953	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-060	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-060	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-060	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-060	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-060	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-060	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-060	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-060	●	2
		2.953	3.937	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-075	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-075	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-075	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-075	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-075	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-075	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-075	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-075	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock

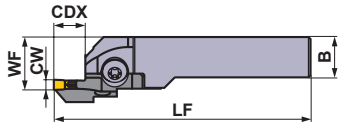
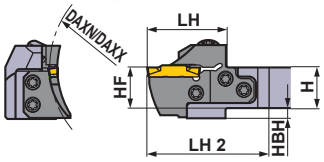


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

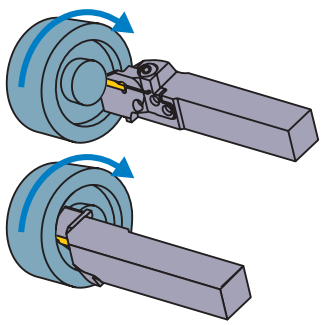
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

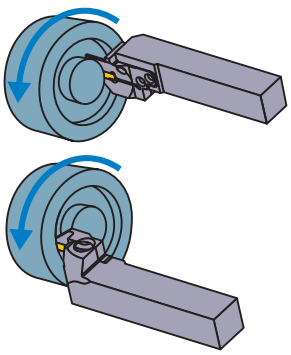
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

F

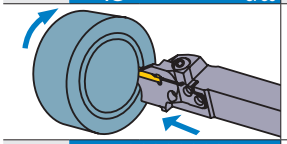
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM



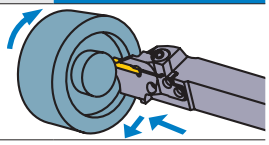
Insert GY2G○○○○○○○○○-MF

Insert GY2M○○○○○○○○○-GU

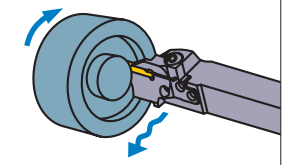
Insert GY2M○○○○○○○○○-MS

Insert GY1M/1G○○○○○○○○○-GM/-GFGS

Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

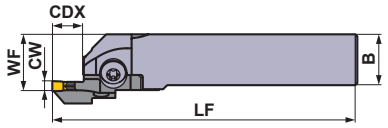


Fig. 1

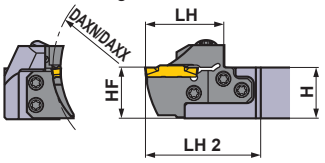
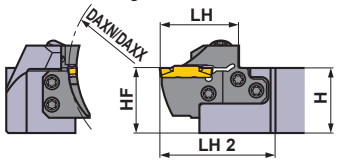


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
D	.079 .088	3.937	5.906	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-100	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-100	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-100	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-100	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-100	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-100	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-100	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-100	●	2
		5.315	7.874	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-135	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-135	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-135	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-135	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-135	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-135	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-135	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-135	●	2
		7.087	9.843	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-D12-180	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-D12-180	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-D12-180	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-D12-180	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-D12-180	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-D12-180	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-D12-180	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-D12-180	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock

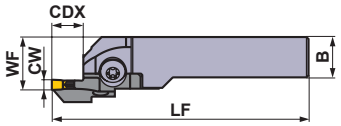
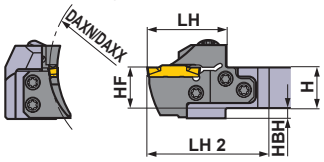


Fig. 3



Right hand tool holder shown.

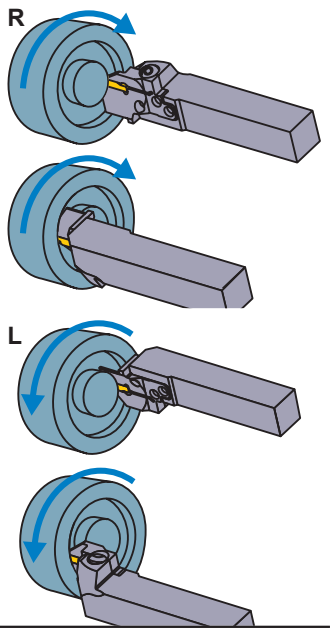
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

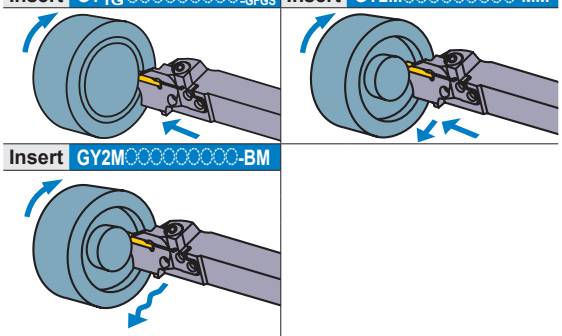
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

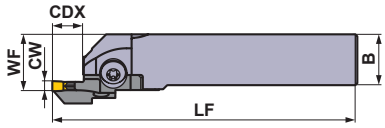


Fig. 1

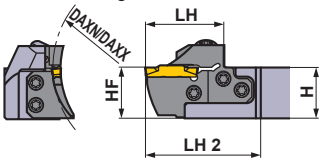
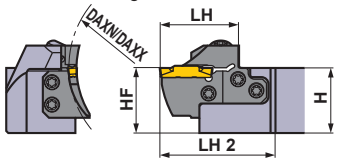


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
E	.094 .098 .108	1.575	1.969	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-040	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-040	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-040	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-040	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-040	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-040	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-040	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-040	●	2
		1.969	2.362	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-050	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-050	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-050	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-050	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-050	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-050	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-050	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-050	●	2
		2.362	2.953	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-060	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-060	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-060	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-060	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-060	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-060	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-060	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-060	●	2
		2.953	3.937	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-075	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-075	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-075	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-075	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-075	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-075	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-075	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-075	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock

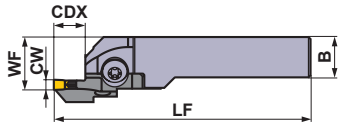
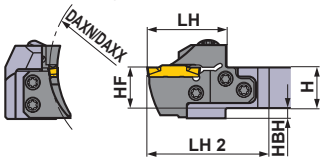


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

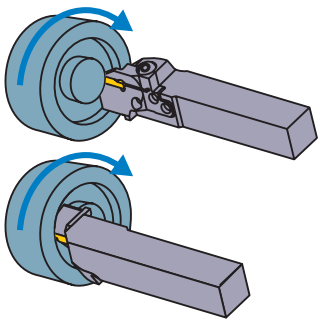
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

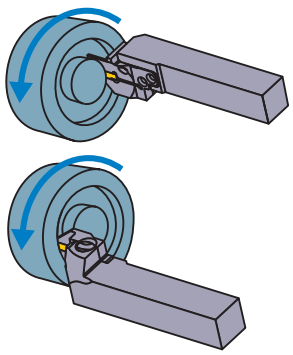
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
E	.094", 2.39 mm	●	●	●	●
	.098", 2.50 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

F

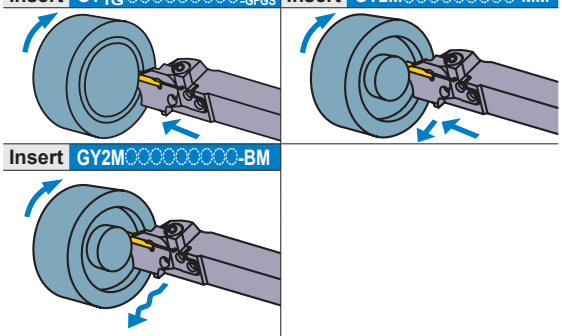
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

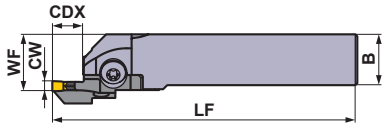


Fig. 1

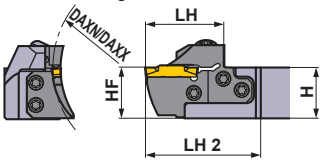
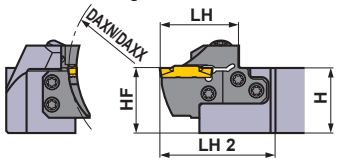


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Modular Blade	Stock	Fig.
E	.094 .098 .108	3.937	5.906	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-100	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-100	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-100	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-100	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-100	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-100	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-100	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-100	●	2
		5.315	7.874	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-135	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-135	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-135	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-135	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-135	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-135	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-135	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-135	●	2
		7.087	9.843	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-E12-180	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-E12-180	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-E12-180	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-E12-180	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-E12-180	●	2
						L	GYHLUS20D00-M25L	●	GYM25LD-E12-180	●	2
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-E12-180	●	2
						L	GYHLUS24E00-M25L	●	GYM25LD-E12-180	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock

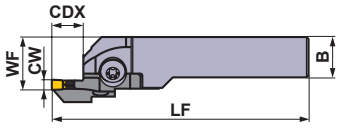
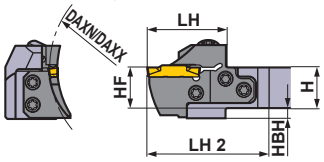


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

	Dimensions (inch) ∗1								Cutting Mode
	H	B	LF	LH	LH 2	HF	WF	HBH	
	.750	.750	5.000	1.535	.241	.750	1.000	.250	R
	.750	.750	5.000	1.535	.241	.750	1.000	.250	
	1.000	1.000	6.000	1.535	1.241	1.000	1.125	—	
	1.000	1.000	6.000	1.535	1.241	1.000	1.125	—	
	1.250	1.250	6.000	1.535	1.241	1.250	1.375	—	
	1.250	1.250	6.000	1.535	1.241	1.250	1.375	—	
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—	
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—	
	.750	.750	5.000	1.535	.241	.750	1.000	.250	
	.750	.750	5.000	1.535	.241	.750	1.000	.250	
	1.000	1.000	6.000	1.535	1.241	1.000	1.125	—	
	1.000	1.000	6.000	1.535	1.241	1.000	1.125	—	
	1.250	1.250	6.000	1.535	1.241	1.250	1.375	—	
	1.250	1.250	6.000	1.535	1.241	1.250	1.375	—	
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—	
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—	
	.750	.750	5.000	1.535	.241	.750	1.000	.250	L
	.750	.750	5.000	1.535	.241	.750	1.000	.250	
	1.000	1.000	6.000	1.535	1.241	1.000	1.125	—	
	1.000	1.000	6.000	1.535	1.241	1.000	1.125	—	
	1.250	1.250	6.000	1.535	1.241	1.250	1.375	—	
	1.250	1.250	6.000	1.535	1.241	1.250	1.375	—	
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—	
	1.500	1.500	7.000	1.535	2.241	1.500	1.625	—	

Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
E	.094", 2.39 mm	●	●	●	●
	.098", 2.50 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

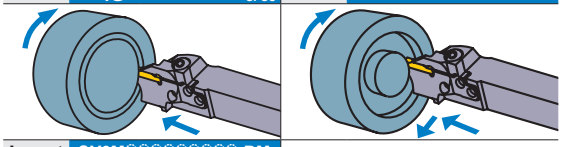
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

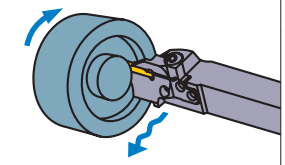
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

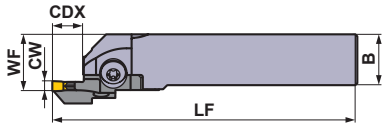


Fig. 1

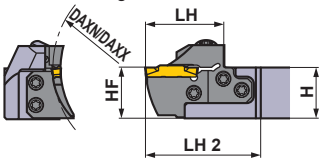
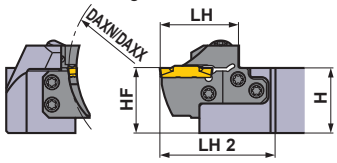


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
F	.118 .125 .128	1.378	1.575	.472	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-F12-035**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-F12-035**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-F12-035**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-F12-035**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-F12-035**	●	2
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-F12-035**	●	2
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-F12-035**	●	2
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-F12-035**	●	2
		1.575	1.969	.472	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-F12-040**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-F12-040**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-F12-040**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-F12-040**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-F12-040**	●	2
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-F12-040**	●	2
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-F12-040**	●	2
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-F12-040**	●	2
		1.969	2.362	.472	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-F12-050**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-F12-050**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-F12-050**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-F12-050**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-F12-050**	●	2
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-F12-050**	●	2
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-F12-050**	●	2
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-F12-050**	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock

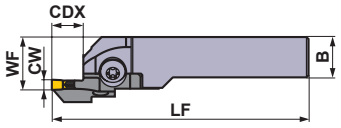
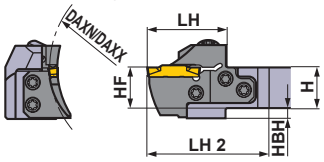


Fig. 3



Right hand tool holder shown.

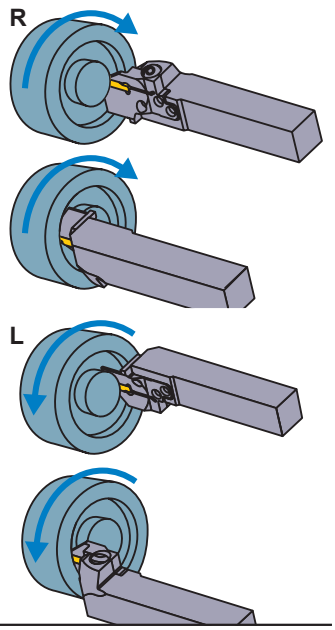
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

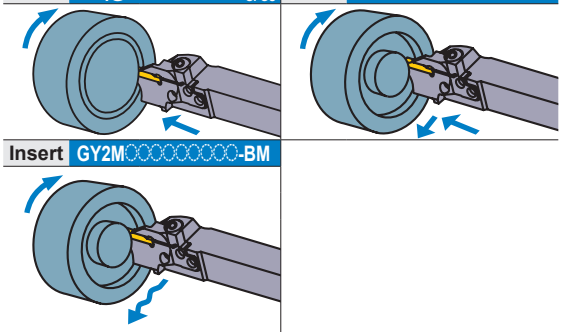
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

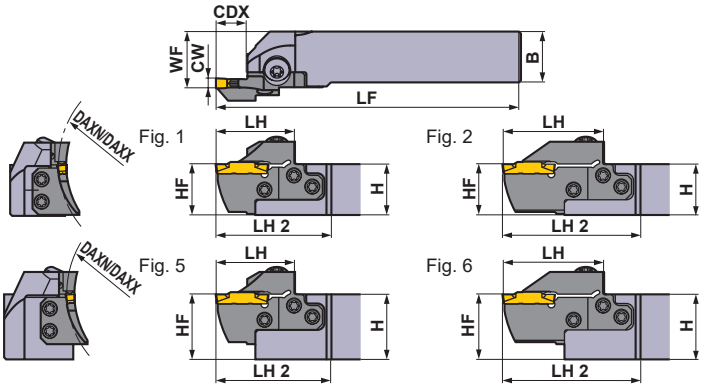
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



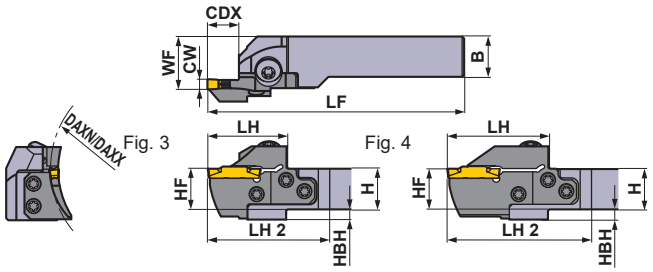
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	.118 .125 .128	2.362	2.953	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-060	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-060	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-060	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-060	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-060	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-060	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-060	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-060	●	5
				.787✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-060	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-060	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-060	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-060	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-060	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-060	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-060	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-060	●	6
		2.953	3.937	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-075	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-075	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-075	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-075	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-075	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-075	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-075	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-075	●	5
				.787✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-075	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-075	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-075	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-075	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-075	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-075	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-075	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-075	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

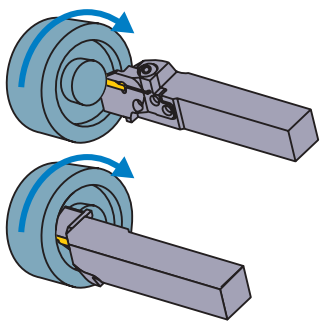
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

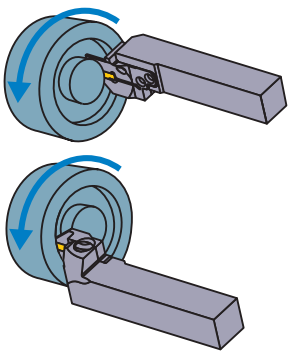
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

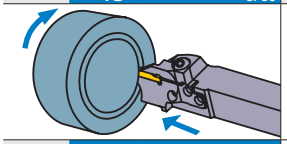
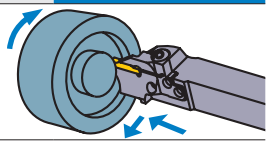
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

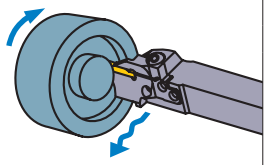
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

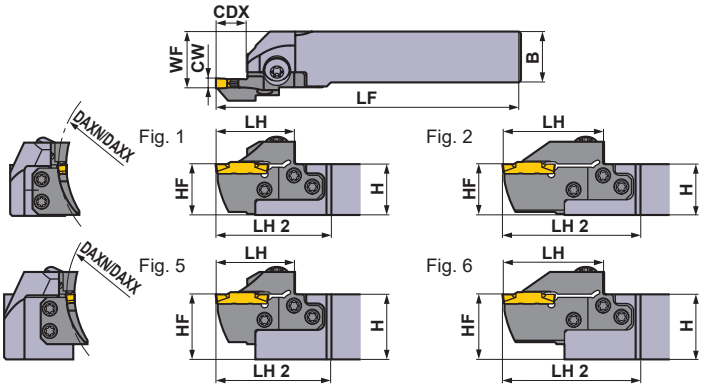
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



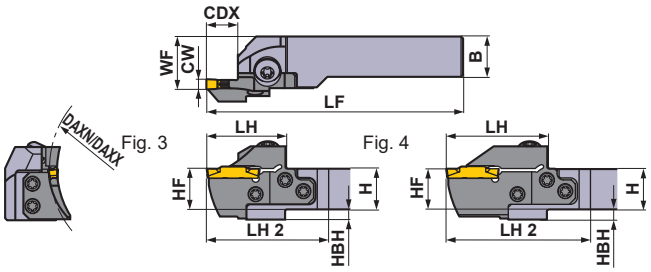
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	.118 .125 .128	3.937	5.906	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-100	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-100	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-100	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-100	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-100	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-100	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-100	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-100	●	5
				.787*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-100	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-100	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-100	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-100	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-100	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-100	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-100	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-100	●	6
		5.315	7.874	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-135	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-135	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-135	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-135	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-135	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-135	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-135	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-135	●	5
				.787*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-135	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-135	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-135	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-135	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-135	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-135	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-135	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-135	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

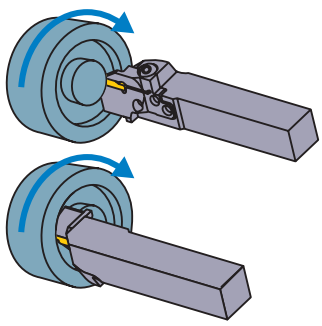
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

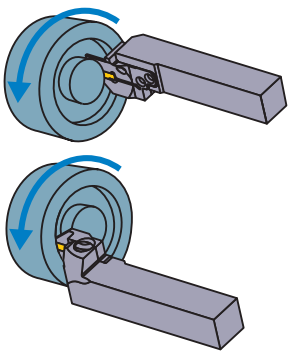
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

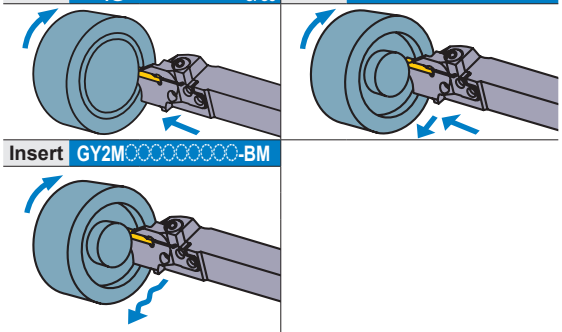
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

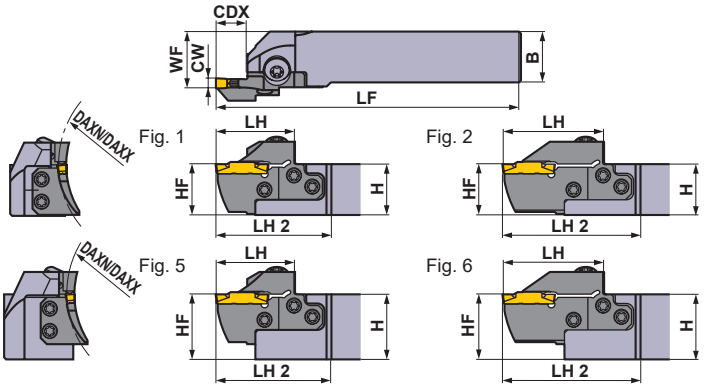
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



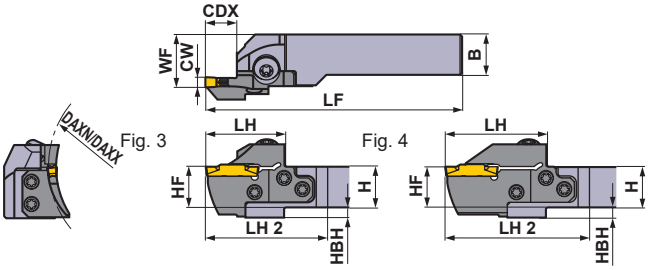
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
F	.118 .125 .128	7.087	9.843	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-180	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-180	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-180	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-180	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-180	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-180	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-180	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-180	●	5
				.787*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-180	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-180	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-180	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-180	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-180	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-180	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-180	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-180	●	6
		8.858	39.331	.472	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F12-225	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-F12-225	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F12-225	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-F12-225	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F12-225	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-F12-225	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F12-225	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-F12-225	●	5
				.787*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-F20-225	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-F20-225	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-F20-225	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-F20-225	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-F20-225	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-F20-225	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-F20-225	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-F20-225	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

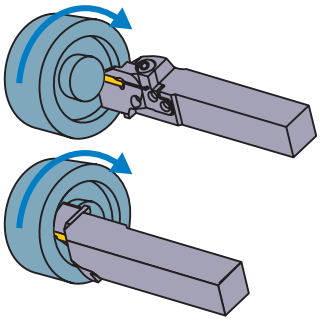
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

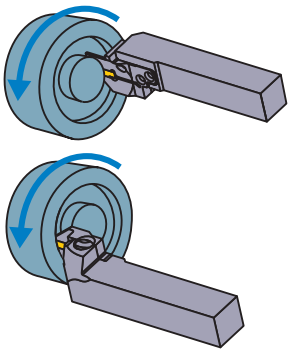
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.236	1.772	.477	.750	1.000	.250
.750	.750	5.236	1.772	.477	.750	1.000	.250
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.000	1.000	6.236	1.772	1.477	1.000	1.125	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.250	1.250	6.236	1.772	1.477	1.250	1.375	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—
1.500	1.500	7.236	1.772	2.477	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

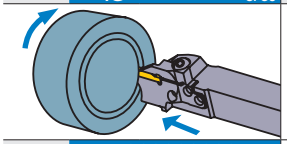
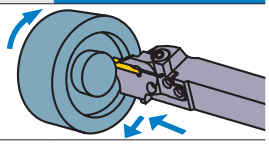
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

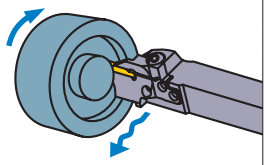
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

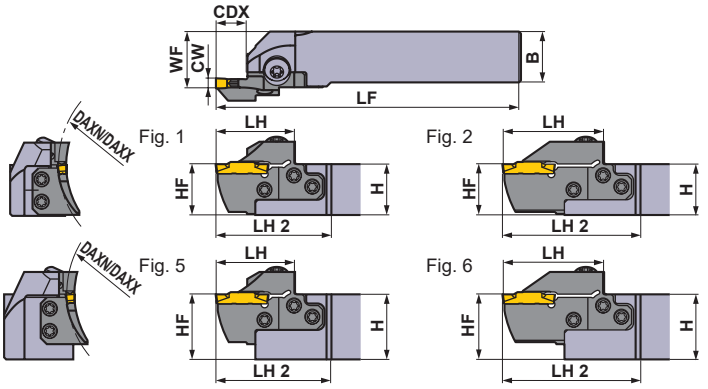
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

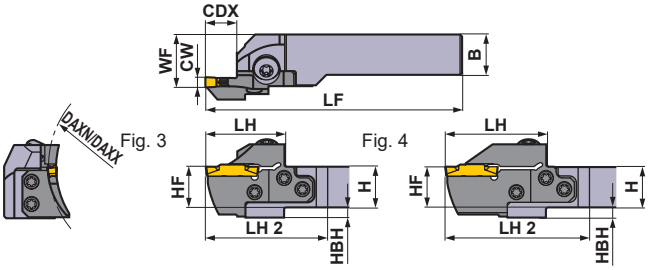


Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	.157 .167	1.575	1.969	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-040	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-040	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-040	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-040	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-040	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-040	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-040	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-040	●	5
		1.969	2.362	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-050	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-050	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-050	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-050	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-050	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-050	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-050	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-050	●	5
		2.362	3.346	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-060	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-060	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-060	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-060	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-060	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-060	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-060	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-060	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-060	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-060	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-060	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-060	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-060	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-060	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-060	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-060	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

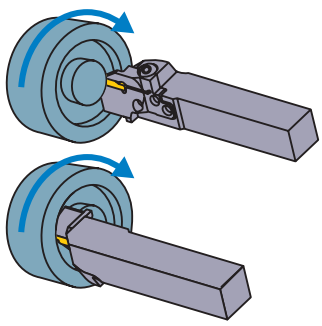
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



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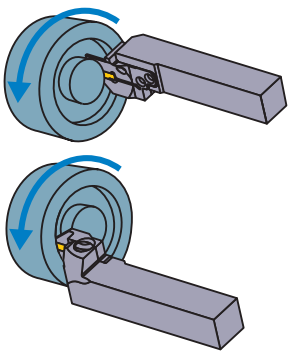


Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

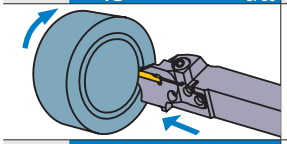
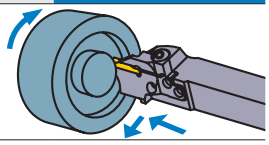
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

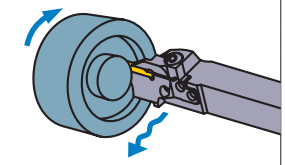
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

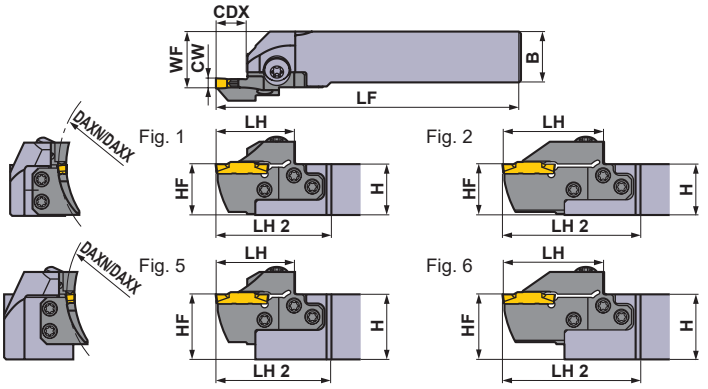
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G ○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



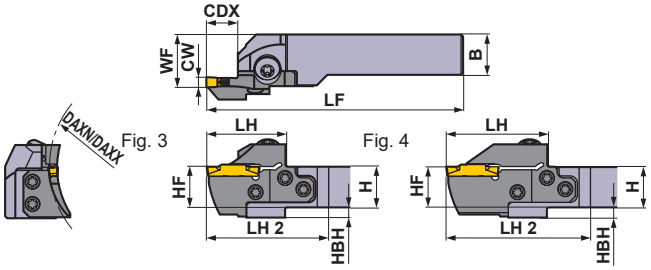
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	.157 .167	3.346	4.921	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-085	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-085	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-085	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-085	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-085	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-085	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-085	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-085	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-085	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-085	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-085	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-085	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-085	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-085	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-085	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-085	●	6
		4.921	7.874	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-125	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-125	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-125	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-125	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-125	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-125	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-125	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-125	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-125	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-125	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-125	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-125	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-125	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-125	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-125	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-125	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

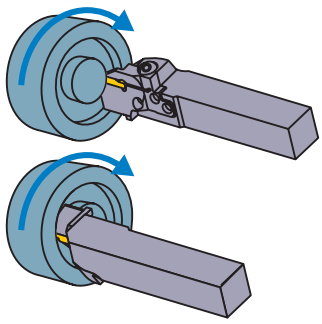
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

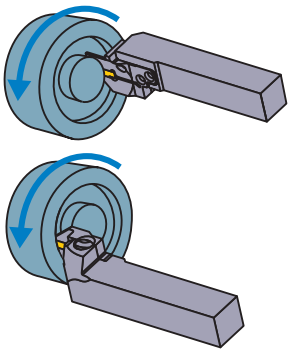
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

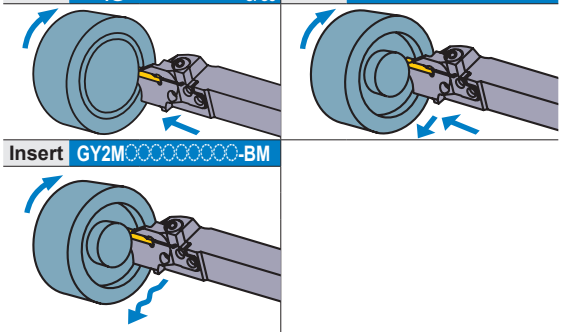
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

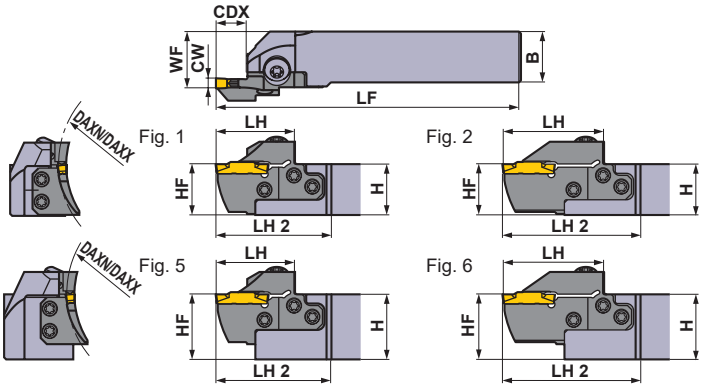
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



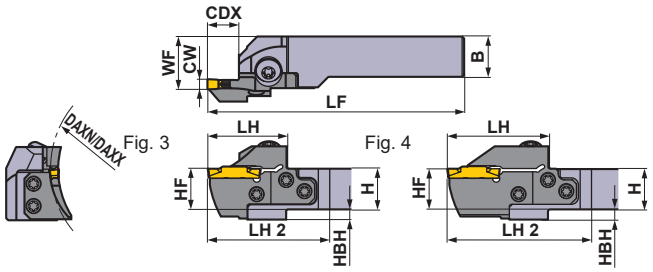
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
G	.157 .167	7.087	11.024	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-180	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-180	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-180	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-180	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-180	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-180	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-180	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-180	●	5
				.984*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-180	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-180	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-180	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-180	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-180	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-180	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-180	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-180	●	6
		9.843	39.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G14-250	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-G14-250	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G14-250	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-G14-250	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G14-250	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-G14-250	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G14-250	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-G14-250	●	5
				.984*2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-G25-250	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-G25-250	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-G25-250	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-G25-250	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-G25-250	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-G25-250	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-G25-250	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-G25-250	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

*1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
*2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

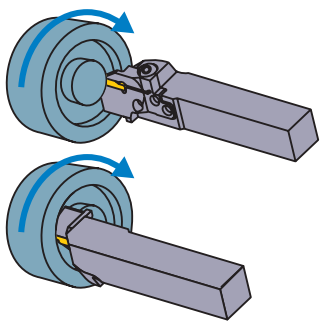
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

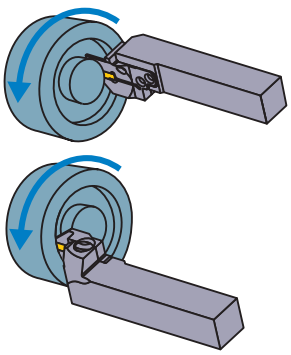
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

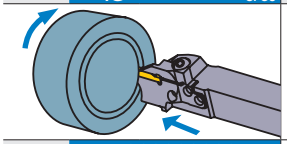
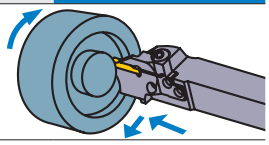
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

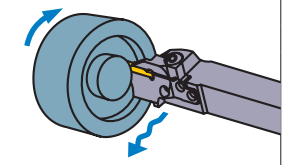
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

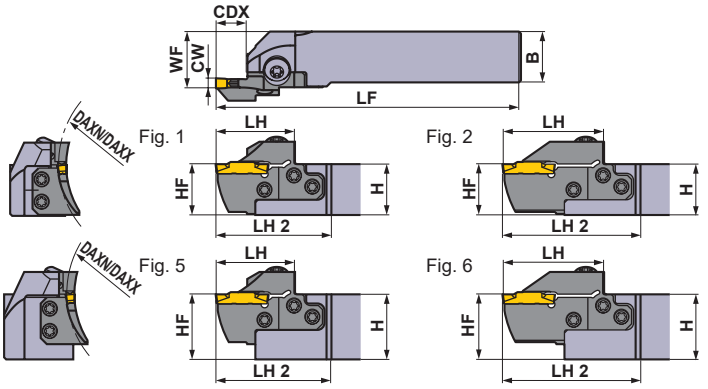
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



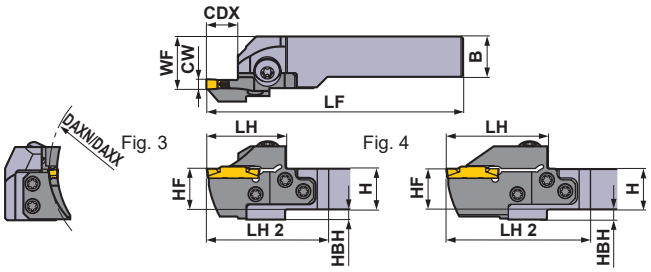
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
H	.187 .197 .206	1.969	2.362	.551	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-H14-050**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-H14-050**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-H14-050**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-H14-050**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-H14-050**	●	5
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-H14-050**	●	5
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-H14-050**	●	5
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-H14-050**	●	5
		2.362	3.346	.551	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-H14-060**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-H14-060**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-H14-060**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-H14-060**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-H14-060**	●	5
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-H14-060**	●	5
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-H14-060**	●	5
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-H14-060**	●	5
				.984∗2	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-H25-060**	●	4
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-H25-060**	●	4
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-H25-060**	●	2
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-H25-060**	●	2
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-H25-060**	●	6
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-H25-060**	●	6
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-H25-060**	●	6
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-H25-060**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
∗2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

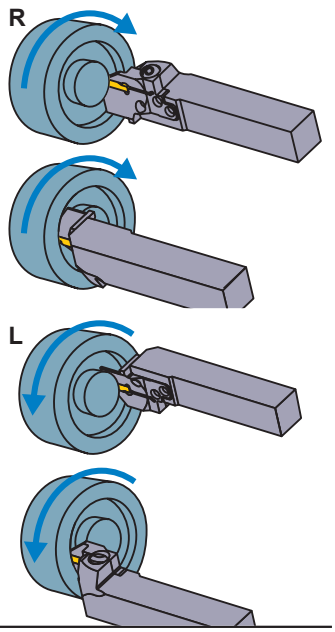
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

F

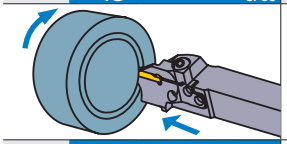
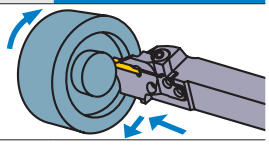
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

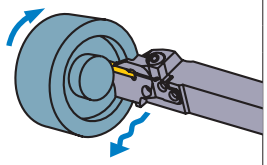
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

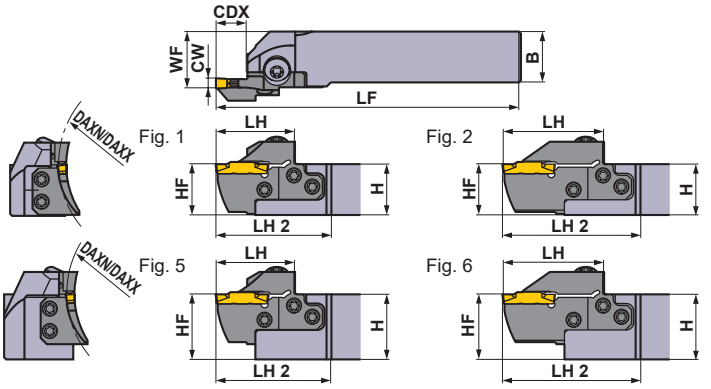
Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



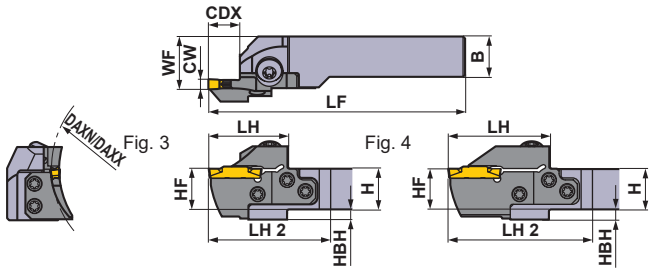
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
H	.187 .197 .206	3.346	4.921	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-085	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-085	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-085	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-085	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-085	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-085	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-085	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-085	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-085	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-085	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-085	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-085	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-085	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-085	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-085	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-085	●	6
		4.921	7.874	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-125	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-125	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-125	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-125	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-125	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-125	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-125	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-125	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-125	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-125	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-125	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-125	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-125	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-125	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-125	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-125	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

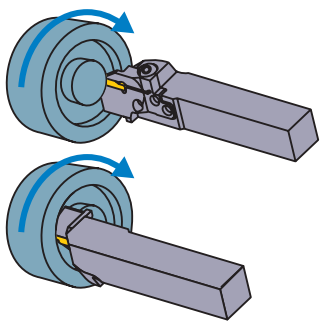
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

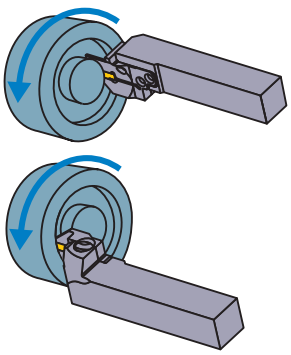
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

F

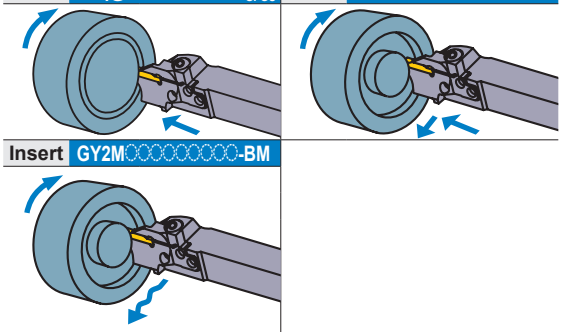
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

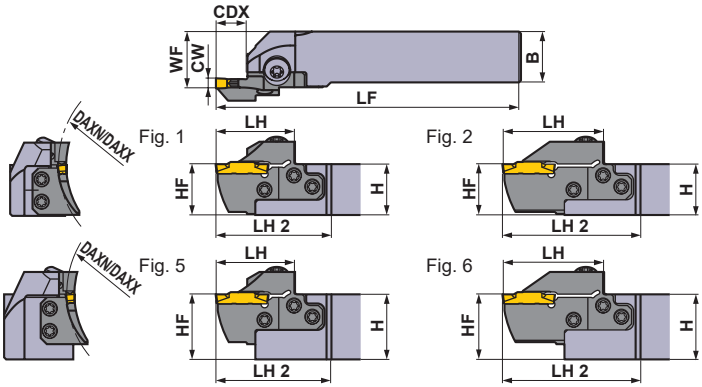
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



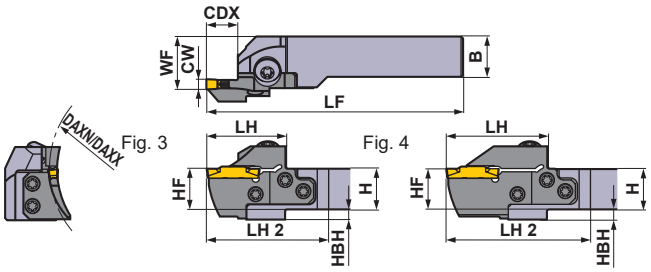
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
H	.187 .197 .206	7.087	11.024	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-180	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-180	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-180	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-180	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-180	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-180	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-180	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-180	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-180	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-180	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-180	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-180	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-180	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-180	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-180	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-180	●	6
		9.843	39.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H14-250	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-H14-250	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H14-250	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-H14-250	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H14-250	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-H14-250	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H14-250	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-H14-250	●	5
				.984✶2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-H25-250	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-H25-250	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-H25-250	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-H25-250	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-H25-250	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-H25-250	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-H25-250	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-H25-250	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

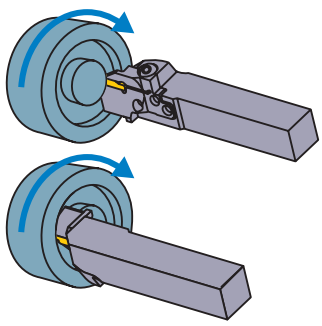
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



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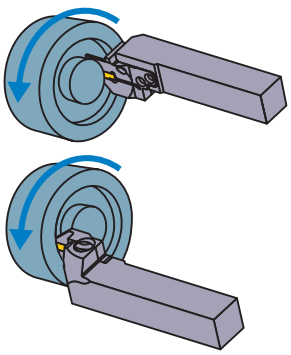


Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

F

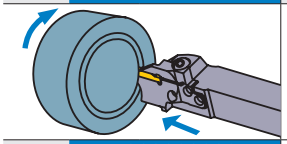
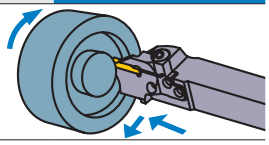
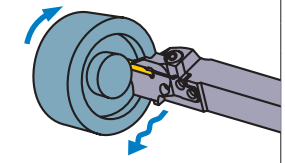
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

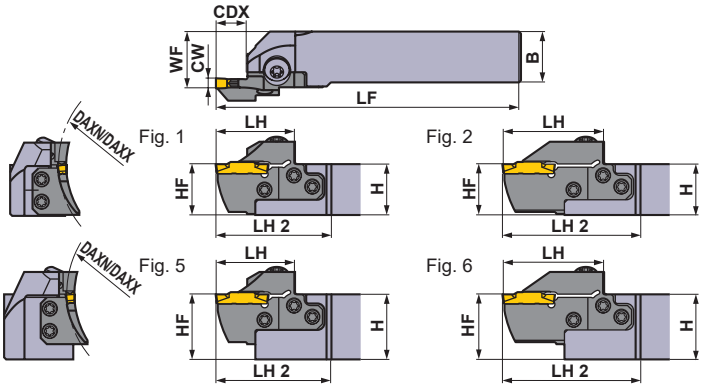
4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM

Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



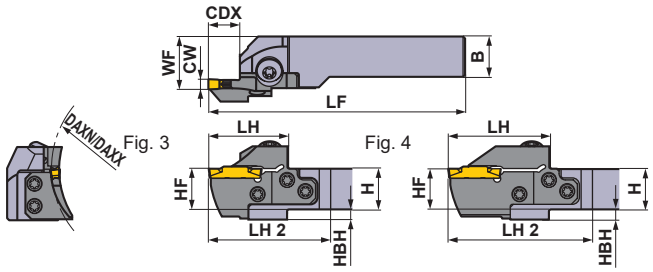
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
J	.236 .248 .250	1.969	2.756	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-050	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-050	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-050	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-050	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-050	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-050	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-050	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-050	●	5
		2.756	4.331	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-070	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-070	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-070	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-070	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-070	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-070	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-070	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-070	●	5
				.984∗2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J25-070	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-J25-070	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J25-070	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-J25-070	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J25-070	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-J25-070	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J25-070	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-J25-070	●	6
		4.331	7.874	.551	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J14-110	●	3
						L	GYHLUS12C00-M25L	●	GYM25LD-J14-110	●	3
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J14-110	●	1
						L	GYHLUS16D00-M25L	●	GYM25LD-J14-110	●	1
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J14-110	●	5
						L	GYHLUS20D00-M25L	●	GYM25LD-J14-110	●	5
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J14-110	●	5
						L	GYHLUS24E00-M25L	●	GYM25LD-J14-110	●	5
				.984∗2	Modular	R	GYHRUS12C00-M25R	●	GYM25RD-J25-110	●	4
						L	GYHLUS12C00-M25L	●	GYM25LD-J25-110	●	4
					Modular	R	GYHRUS16D00-M25R	●	GYM25RD-J25-110	●	2
						L	GYHLUS16D00-M25L	●	GYM25LD-J25-110	●	2
					Modular	R	GYHRUS20D00-M25R	●	GYM25RD-J25-110	●	6
						L	GYHLUS20D00-M25L	●	GYM25LD-J25-110	●	6
					Modular	R	GYHRUS24E00-M25R	●	GYM25RD-J25-110	●	6
						L	GYHLUS24E00-M25L	●	GYM25LD-J25-110	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
∗2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

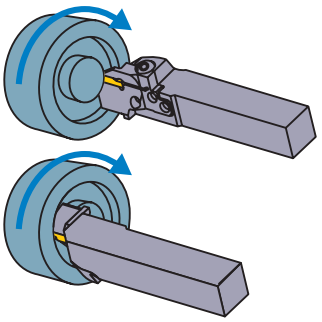
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

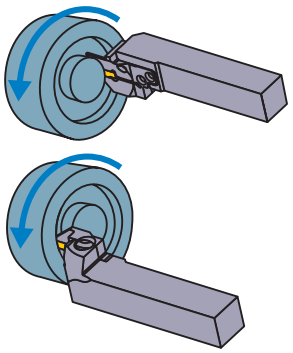
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

F

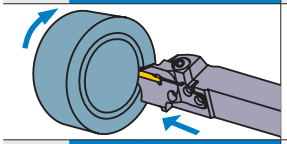
GROOVING / CUTTING OFF

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

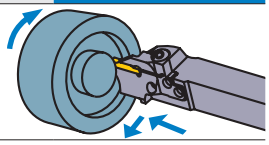
GY SERIES (FACE GROOVING)

4-1 00° type holder (Inch)

Insert GY2M○○○○○○○○○-GS -GM



Insert GY2G○○○○○○○○○-MF



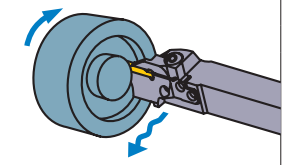
Insert GY2M○○○○○○○○○-GU

Insert GY2M○○○○○○○○○-MS

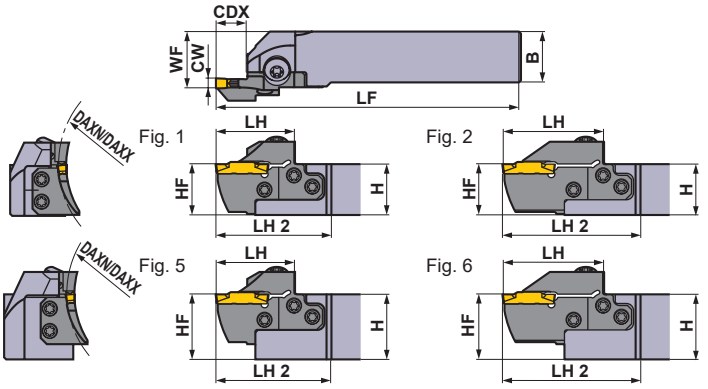
Insert GY1G○○○○○○○○○-GFGS

Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



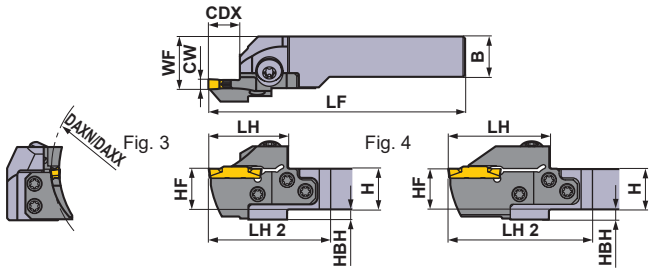
Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
J	.236 .248 .250	6.693	11.024	.551	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-J14-170**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-J14-170**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-J14-170**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-J14-170**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-J14-170**	●	5
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-J14-170**	●	5
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-J14-170**	●	5
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-J14-170**	●	5
				.984✶2	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-J25-170**	●	4
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-J25-170**	●	4
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-J25-170**	●	2
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-J25-170**	●	2
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-J25-170**	●	6
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-J25-170**	●	6
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-J25-170**	●	6
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-J25-170**	●	6
		9.843	39.331	.551	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-J14-250**	●	3
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-J14-250**	●	3
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-J14-250**	●	1
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-J14-250**	●	1
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-J14-250**	●	5
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-J14-250**	●	5
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-J14-250**	●	5
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-J14-250**	●	5
				.984✶2	Modular	R	**GYHRUS12C00-M25R**	●	**GYM25RD-J25-250**	●	4
						L	**GYHLUS12C00-M25L**	●	**GYM25LD-J25-250**	●	4
					Modular	R	**GYHRUS16D00-M25R**	●	**GYM25RD-J25-250**	●	2
						L	**GYHLUS16D00-M25L**	●	**GYM25LD-J25-250**	●	2
					Modular	R	**GYHRUS20D00-M25R**	●	**GYM25RD-J25-250**	●	6
						L	**GYHLUS20D00-M25L**	●	**GYM25LD-J25-250**	●	6
					Modular	R	**GYHRUS24E00-M25R**	●	**GYM25RD-J25-250**	●	6
						L	**GYHLUS24E00-M25L**	●	**GYM25LD-J25-250**	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

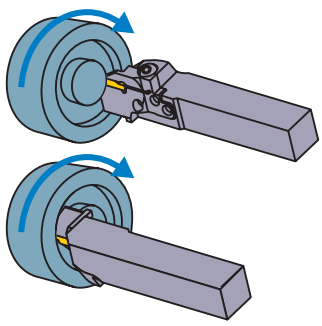
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/LUS12C00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/LUS16D00-M25R/L			
GYHR/LUS20D00-M25R/L			
GYHR/LUS24E00-M25R/L			

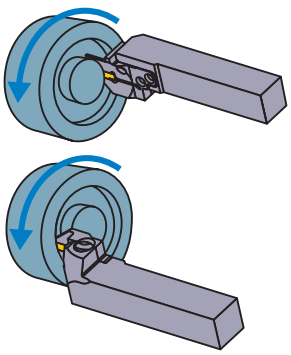
Dimensions (inch) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
.750	.750	5.000	1.535	.241	.750	1.000	.250
.750	.750	5.000	1.535	.241	.750	1.000	.250
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.000	1.000	6.000	1.535	1.241	1.000	1.125	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.250	1.250	6.000	1.535	1.241	1.250	1.375	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
1.500	1.500	7.000	1.535	2.241	1.500	1.625	—
.750	.750	5.433	1.969	.674	.750	1.000	.250
.750	.750	5.433	1.969	.674	.750	1.000	.250
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.000	1.000	6.433	1.969	1.674	1.000	1.125	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.250	1.250	6.433	1.969	1.674	1.250	1.375	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—
1.500	1.500	7.433	1.969	2.674	1.500	1.625	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

F

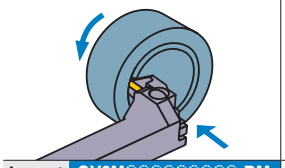
GROOVING / CUTTING OFF

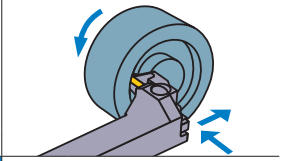
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

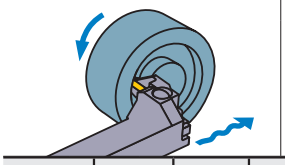
5-1 90° type holder (inch)

Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G ○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM



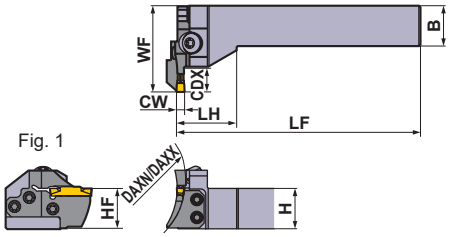


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
D	.079 .088	1.575	1.969	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-040	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-040	●	1
		1.969	2.362	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-050	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-050	●	1
		2.362	2.953	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-060	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-060	●	1
		2.953	3.937	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-075	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-075	●	1
		3.937	5.906	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-100	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-100	●	1
		5.315	7.874	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-135	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-135	●	1
		7.087	9.843	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-D12-180	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-D12-180	●	1
E	.094 .098 .108	1.575	1.969	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-040	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-040	●	1
		1.969	2.362	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-050	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-050	●	1
		2.362	2.953	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-060	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-060	●	1
		2.953	3.937	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-075	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-075	●	1
		3.937	5.906	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-100	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-100	●	1
		5.315	7.874	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-135	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-135	●	1
		7.087	9.843	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-E12-180	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-E12-180	●	1

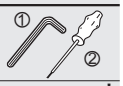
CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.

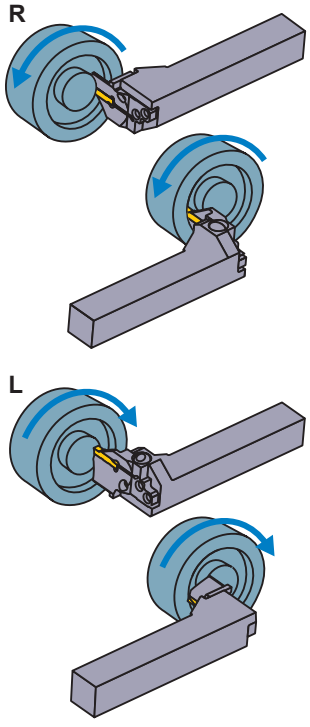
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	5 pcs. Blade Screw	 Wrench ∗
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	L
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●
E	.094", 2.39 mm	●	●	●	●
	.098", 2.50 mm	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

F

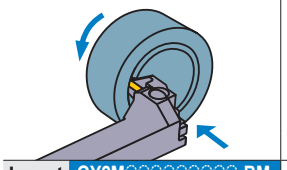
GROOVING / CUTTING OFF

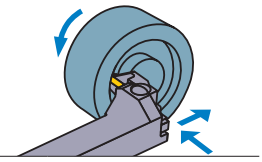
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

GY SERIES (FACE GROOVING)

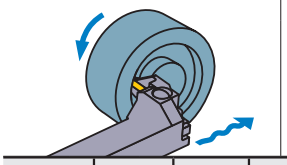
5-1 90° type holder (inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

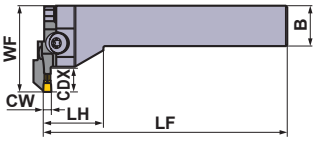


Fig. 1

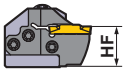


Fig. 2

Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
F	.118 .125 .128	1.378	1.575	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-035	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-035	●	1
		1.575	1.969	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-040	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-040	●	1
		1.969	2.362	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-050	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-050	●	1
		2.362	2.953	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-060	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-060	●	1
				.787✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-060	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-060	●	2
		2.953	3.937	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-075	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-075	●	1
				.787✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-075	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-075	●	2
		3.937	5.906	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-100	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-100	●	1
				.787✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-100	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-100	●	2
		5.315	7.874	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-135	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-135	●	1
				.787✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-135	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-135	●	2
		7.087	9.843	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-180	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-180	●	1
				.787✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-180	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-180	●	2
		8.858	39.331	.472	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F12-225	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-F12-225	●	1
				.787✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-F20-225	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-F20-225	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

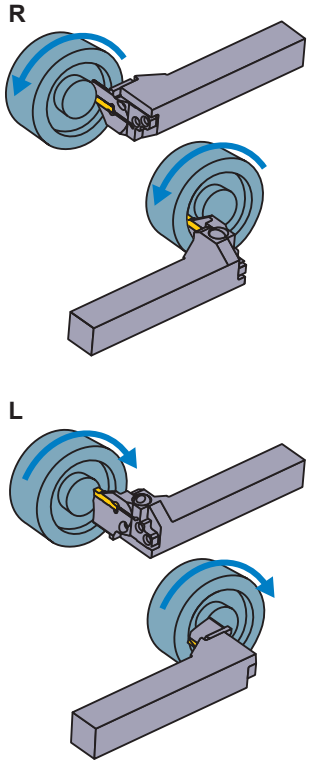
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	L
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.330	
1.000	1.000	6.000	1.500	1.000	2.330	



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

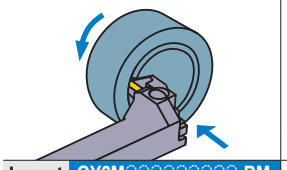
● : Gauge insert shown dimensions

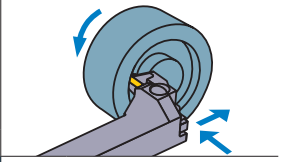
IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

GY SERIES (FACE GROOVING)

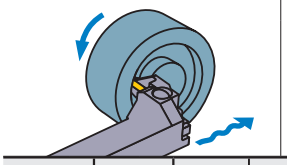
5-1 90° type holder (inch)

Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G ○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

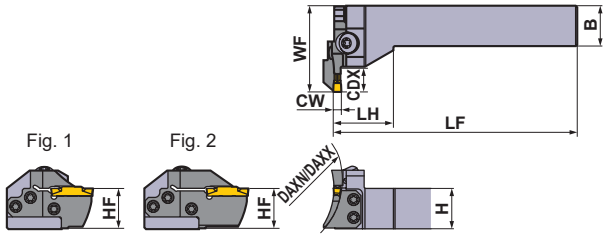




Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	.157 .167	1.575	1.969	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-040	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-040	●	1
		1.969	2.362	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-050	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-050	●	1
		2.362	3.346	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-060	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-060	●	1
				.984∗2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-060	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-060	●	2
		3.346	4.921	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-085	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-085	●	1
				.984∗2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-085	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-085	●	2
		4.921	7.874	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-125	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-125	●	1
				.984∗2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-125	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-125	●	2
		7.087	11.024	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-180	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-180	●	1
				.984∗2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-180	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-180	●	2
		9.843	39.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G14-250	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-G14-250	●	1
				.984∗2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-G25-250	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-G25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
∗2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock

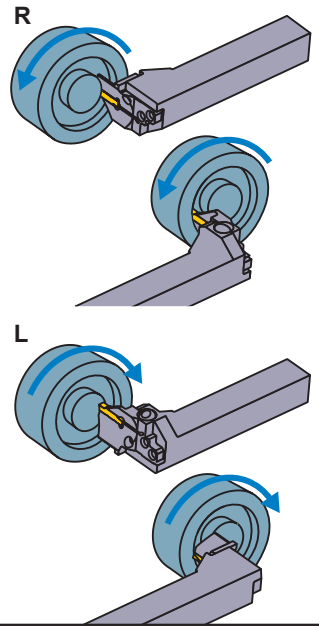
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) ∗1					
H	**B**	**LF**	**LH**	**HF**	**WF**
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527

Cutting Mode



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

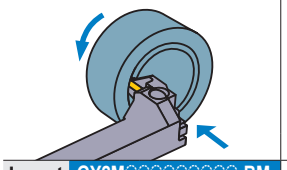
GROOVING / CUTTING OFF

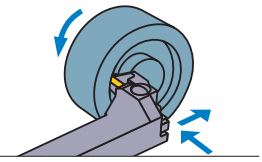
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

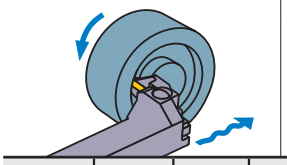
5-1 90° type holder (inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

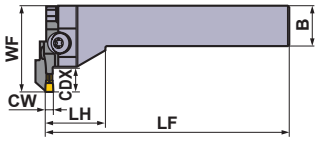


Fig. 1

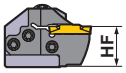


Fig. 2

Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
H	.187 .197 .206	1.969	2.362	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-050	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-050	●	1
		2.362	3.346	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-060	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-060	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-060	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-060	●	2
		3.346	4.921	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-085	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-085	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-085	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-085	●	2
		4.921	7.874	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-125	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-125	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-125	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-125	●	2
		7.087	11.024	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-180	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-180	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-180	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-180	●	2
		9.843	39.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H14-250	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-H14-250	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-H25-250	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-H25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

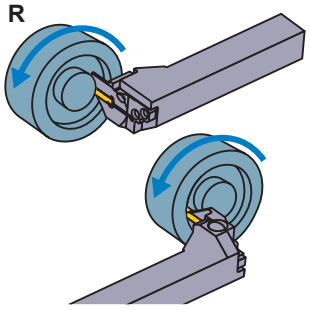
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

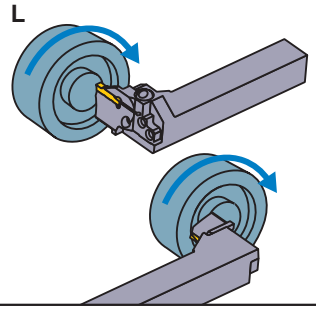
Dimensions (inch) ∗1					
H	**B**	**LF**	**LH**	**HF**	**WF**
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.094
1.000	1.000	6.000	1.500	1.000	2.527
1.000	1.000	6.000	1.500	1.000	2.527

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			

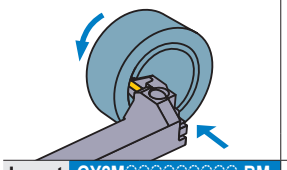
● : Gauge insert shown dimensions

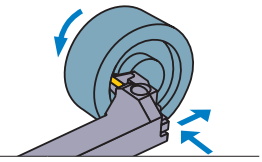
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

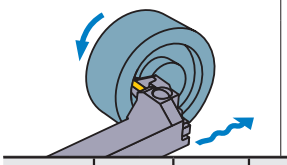
5-1 90° type holder (inch)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GFGS
Insert GY2M○○○○○○○○○-MM

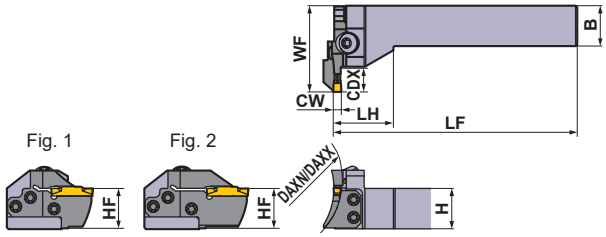




Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (inch)	DAXN (inch)	DAXX (inch)	CDX (inch)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
J	.236 .248 .250	1.969	2.756	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-050	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-050	●	1
		2.756	4.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-070	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-070	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-070	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-070	●	2
		4.331	7.874	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-110	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-110	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-110	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-110	●	2
		6.693	11.024	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-170	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-170	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-170	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-170	●	2
		9.843	39.331	.551	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J14-250	●	1
						L	GYHLUS16D90-M25R	●	GYM25RD-J14-250	●	1
				.984✶2	Modular	R	GYHRUS16D90-M25L	●	GYM25LD-J25-250	●	2
						L	GYHLUS16D90-M25R	●	GYM25RD-J25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
GYHRUS16D90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHLUS16D90-M25R			

Dimensions (inch) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
1.000	1.000	6.000	1.500	1.000	2.094	R
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.527	
1.000	1.000	6.000	1.500	1.000	2.094	
1.000	1.000	6.000	1.500	1.000	2.094	
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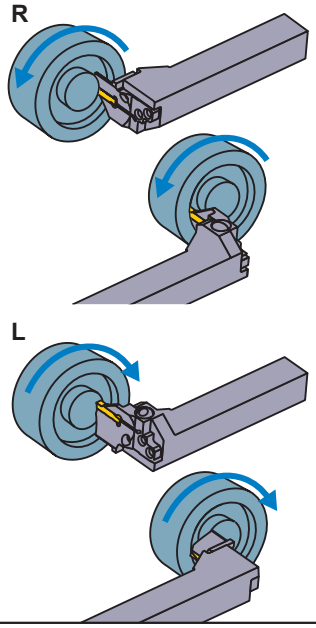
1.000	1.000	6.000	1.500	1.000	2.527	



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

F

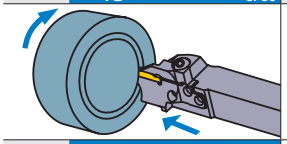
GROOVING / CUTTING OFF

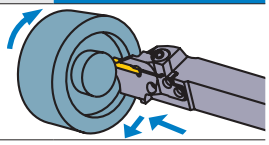
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

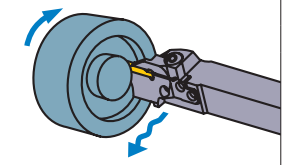
4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

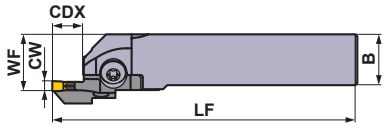


Fig. 1

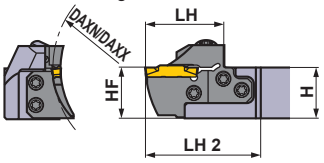
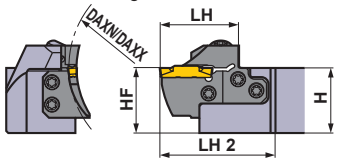


Fig. 2



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
D	2.00 2.24	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-040	●	1
					Modular	R	GYHR3225P00-M25R	●	GYM25RD-D12-040	●	2
						L	GYHL3225P00-M25L	●	GYM25LD-D12-040	●	2
					Modular	R	GYHR3232P00-M25R	●	GYM25RD-D12-040	●	2
						L	GYHL3232P00-M25L	●	GYM25LD-D12-040	●	2
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-050	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-050	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-D12-050	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-050	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-D12-050	●	2
		60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-060	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-060	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-D12-060	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-060	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-D12-060	●	2
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-075	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-075	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-075	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-075	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-075	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-D12-075	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-075	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-D12-075	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan

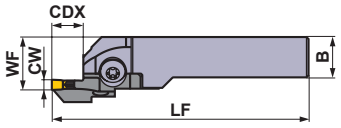
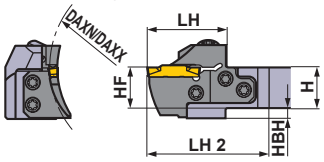


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

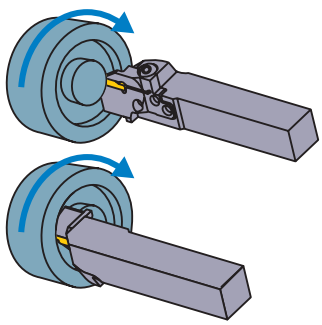
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

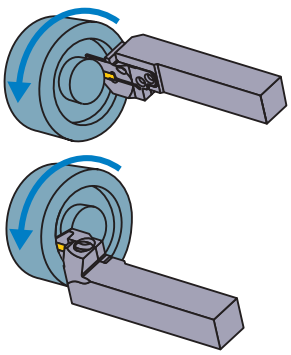
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

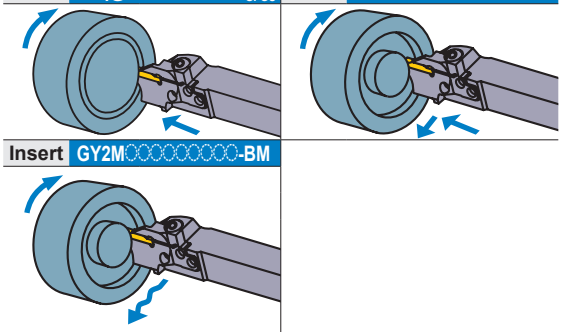
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-BM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

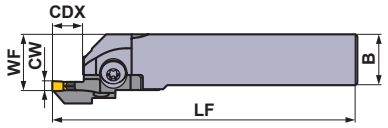


Fig. 1

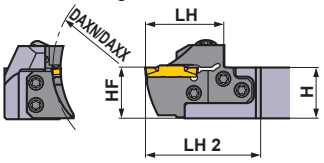
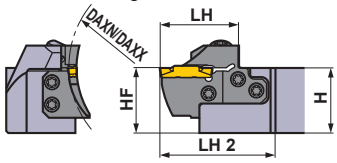


Fig. 2



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-100	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-100	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-100	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-100	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-D12-100	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-100	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-D12-100	●	2
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-135	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-135	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-135	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-135	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-135	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-D12-135	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-135	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-D12-135	●	2
		180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-D12-180	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-D12-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-D12-180	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-D12-180	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-D12-180	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-D12-180	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-D12-180	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-D12-180	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan

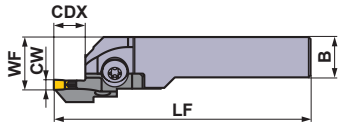
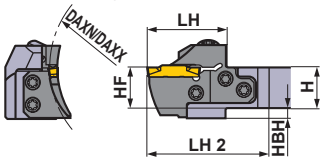


Fig. 3



Right hand tool holder shown.

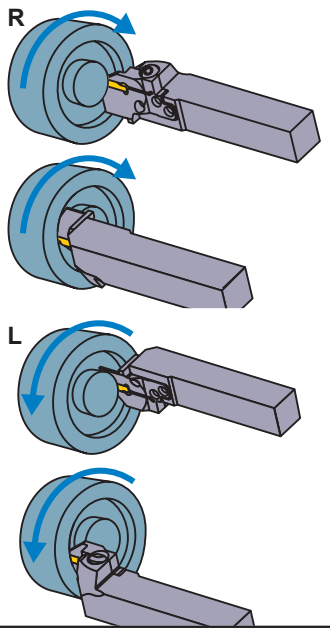
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

F

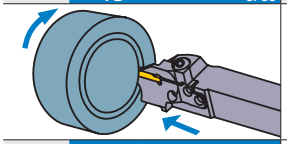
GROOVING / CUTTING OFF

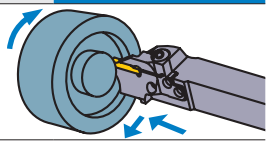
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

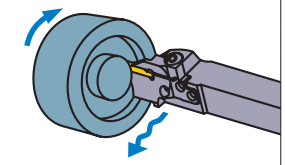
4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

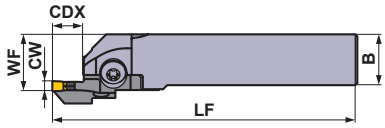


Fig. 1

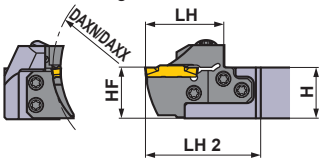
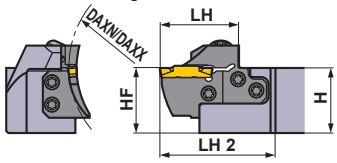


Fig. 2



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-040	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-040	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-E12-040	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-040	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-E12-040	●	2
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-050	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-050	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-E12-050	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-050	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-E12-050	●	2
		60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-060	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-060	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-E12-060	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-060	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-E12-060	●	2
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-E12-075	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-E12-075	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-E12-075	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-E12-075	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-E12-075	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-E12-075	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-E12-075	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-E12-075	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan

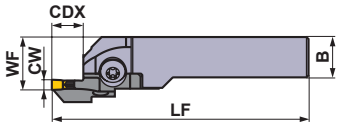
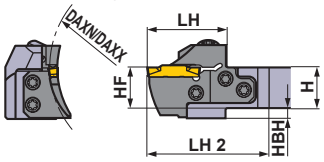


Fig. 3



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

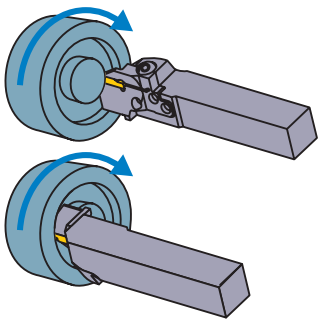
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

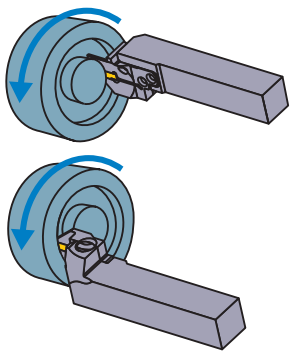
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
E	.094", 2.39 mm	●	●	●	●
	.098", 2.50 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

F

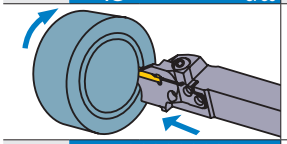
GROOVING / CUTTING OFF

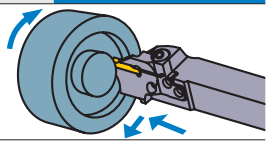
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

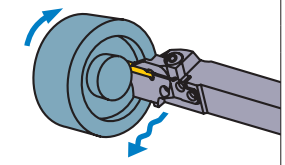
4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

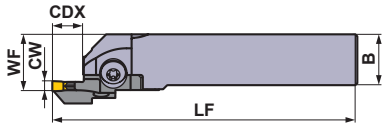


Fig. 1

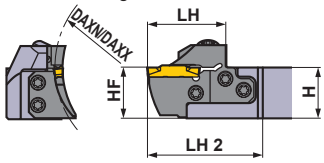
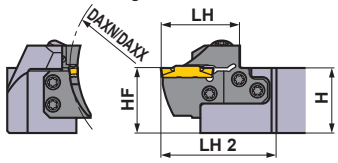


Fig. 2



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
E	2.39 2.50 2.74	100	150	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-E12-100**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-E12-100**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-E12-100**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-E12-100**	●	1
					Modular	R	**GYHR3225P00-M25R**	★	**GYM25RD-E12-100**	●	2
						L	**GYHL3225P00-M25L**	★	**GYM25LD-E12-100**	●	2
					Modular	R	**GYHR3232P00-M25R**	★	**GYM25RD-E12-100**	●	2
						L	**GYHL3232P00-M25L**	★	**GYM25LD-E12-100**	●	2
		135	200	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-E12-135**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-E12-135**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-E12-135**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-E12-135**	●	1
					Modular	R	**GYHR3225P00-M25R**	★	**GYM25RD-E12-135**	●	2
						L	**GYHL3225P00-M25L**	★	**GYM25LD-E12-135**	●	2
					Modular	R	**GYHR3232P00-M25R**	★	**GYM25RD-E12-135**	●	2
						L	**GYHL3232P00-M25L**	★	**GYM25LD-E12-135**	●	2
		180	250	12	Modular	R	**GYHR2020K00-M25R**	●	**GYM25RD-E12-180**	●	3
						L	**GYHL2020K00-M25L**	●	**GYM25LD-E12-180**	●	3
					Modular	R	**GYHR2525M00-M25R**	●	**GYM25RD-E12-180**	●	1
						L	**GYHL2525M00-M25L**	●	**GYM25LD-E12-180**	●	1
					Modular	R	**GYHR3225P00-M25R**	★	**GYM25RD-E12-180**	●	2
						L	**GYHL3225P00-M25L**	★	**GYM25LD-E12-180**	●	2
					Modular	R	**GYHR3232P00-M25R**	★	**GYM25RD-E12-180**	●	2
						L	**GYHL3232P00-M25L**	★	**GYM25LD-E12-180**	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

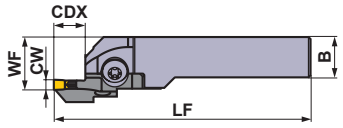
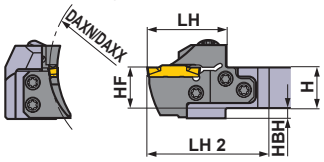


Fig. 3



Right hand tool holder shown.

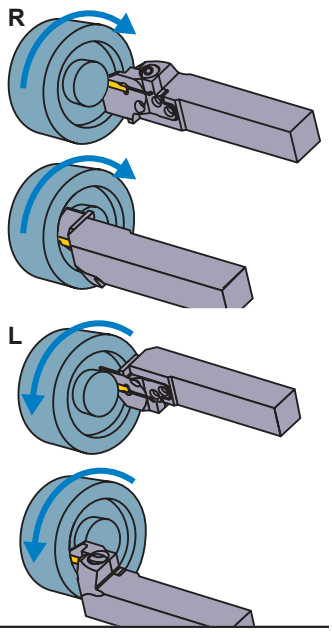
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
E	.094", 2.39 mm	●	●	●	●
	.098", 2.50 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

F

GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

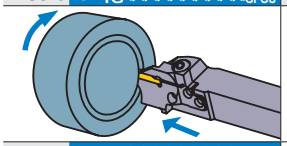
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM

Insert GY2M○○○○○○○○○-GU

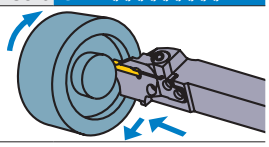
Insert GY1M/1G○○○○○○○○○-GM/-GFGS



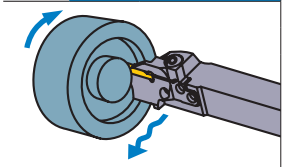
Insert GY2G○○○○○○○○○-MF

Insert GY2M○○○○○○○○○-MS

Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

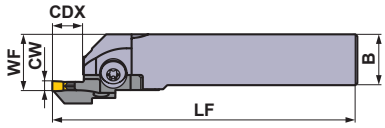


Fig. 1

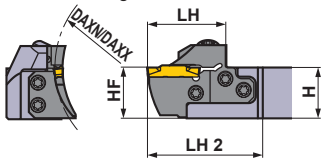
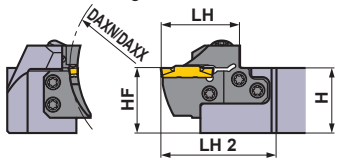


Fig. 2



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-035	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-035	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-035	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-035	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-035	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-F12-035	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-035	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-F12-035	●	2
		40	50	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-040	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-040	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-F12-040	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-040	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-F12-040	●	2
		50	60	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-050	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-050	●	2
						L	GYHL3225P00-M25L	★	GYM25LD-F12-050	●	2
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-050	●	2
						L	GYHL3232P00-M25L	★	GYM25LD-F12-050	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.

● : USA Stock ★ : Stocked in Japan

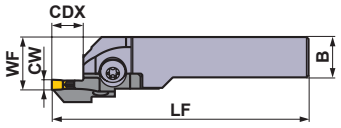
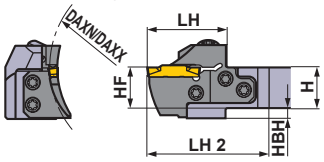


Fig. 3



Right hand tool holder shown.

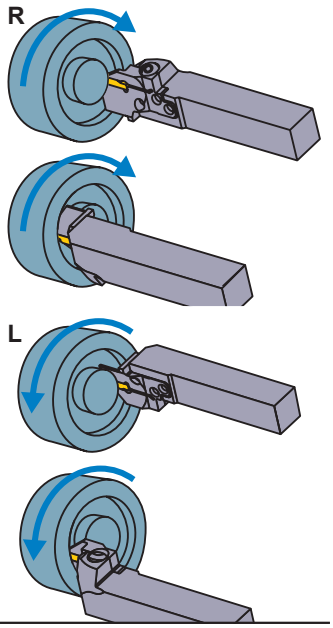
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

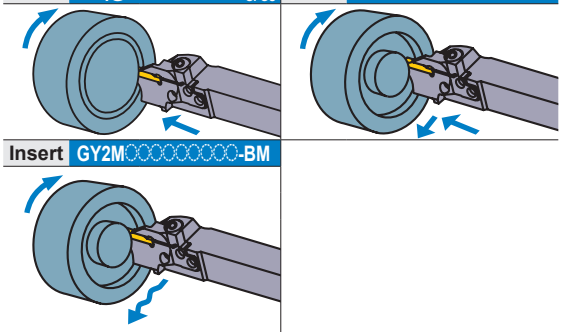
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

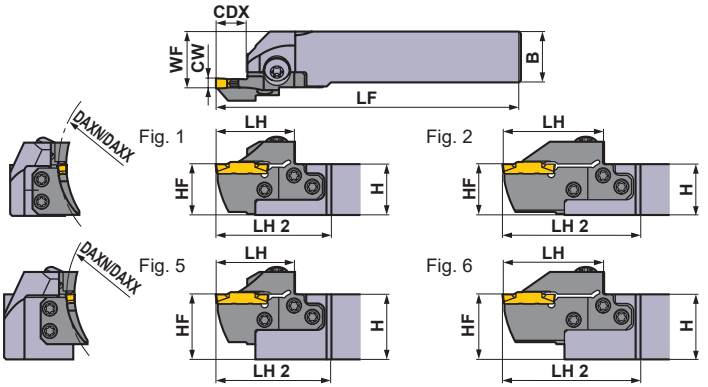
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



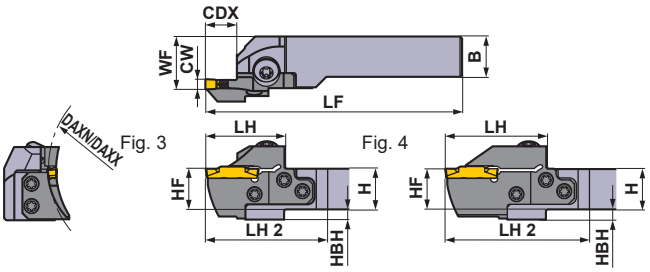
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	60	75	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-060	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-060	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-F12-060	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-060	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-F12-060	●	5
				20 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-060	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-F20-060	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-060	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-F20-060	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-060	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-F20-060	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-060	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-F20-060	●	6
		75	100	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-075	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-075	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-075	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-075	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-075	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-F12-075	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-075	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-F12-075	●	5
				20 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-075	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-F20-075	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-075	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-F20-075	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-075	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-F20-075	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-075	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-F20-075	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

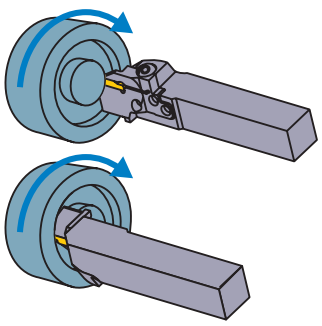
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

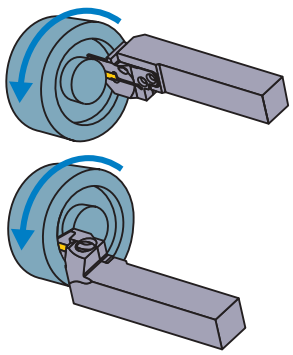
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

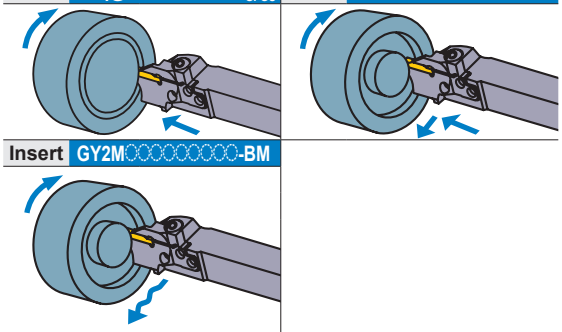
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

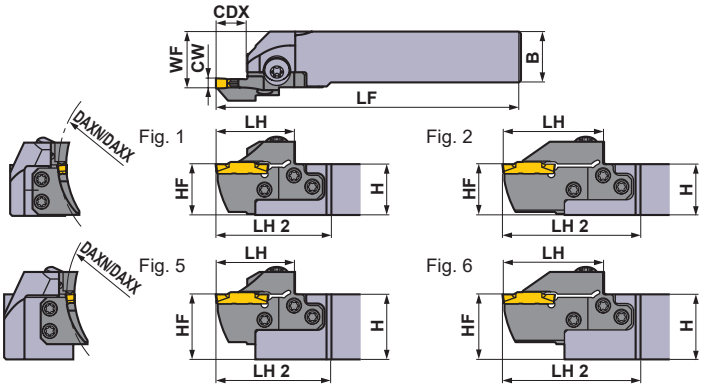
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



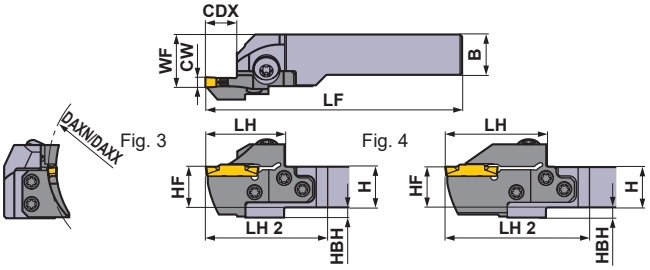
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	100	150	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-100	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-100	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-100	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-100	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-100	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-F12-100	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-100	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-F12-100	●	5
				20 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-100	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-F20-100	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-100	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-F20-100	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-100	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-F20-100	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-100	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-F20-100	●	6
		135	200	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-135	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-135	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-135	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-135	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-135	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-F12-135	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-135	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-F12-135	●	5
				20 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-135	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-F20-135	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-135	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-F20-135	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-135	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-F20-135	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-135	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-F20-135	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

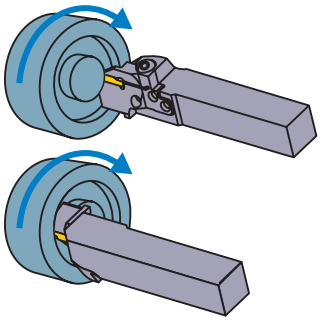
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

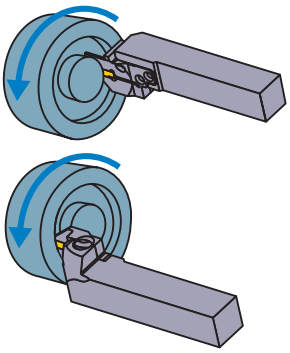
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

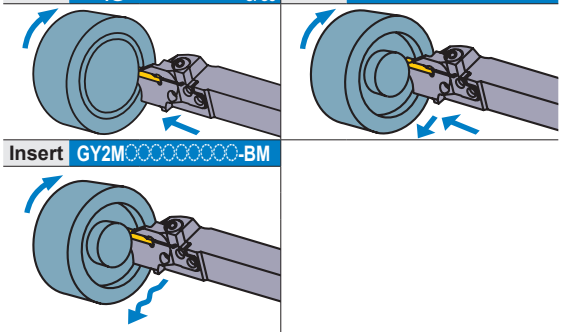
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

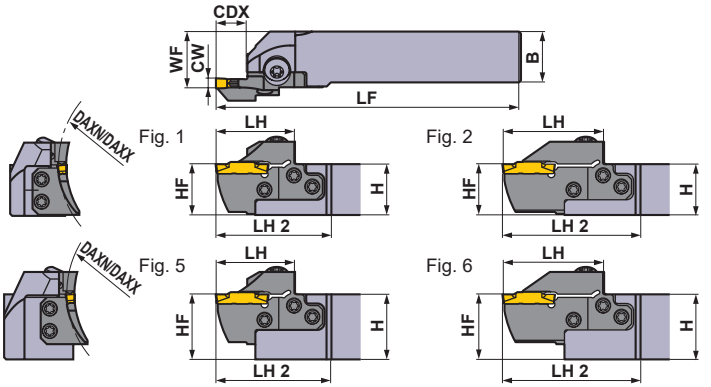
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



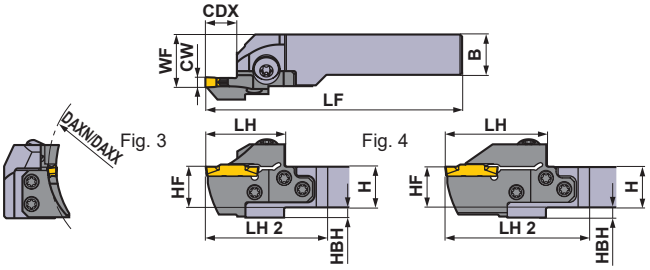
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	180	250	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-180	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-180	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-180	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-180	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-F12-180	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-180	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-F12-180	●	5
				20 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-180	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-F20-180	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-180	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-F20-180	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-180	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-F20-180	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-180	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-F20-180	●	6
		225	999	12	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F12-225	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-F12-225	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F12-225	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-F12-225	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F12-225	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-F12-225	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F12-225	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-F12-225	●	5
				20 ✶2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-F20-225	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-F20-225	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-F20-225	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-F20-225	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-F20-225	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-F20-225	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-F20-225	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-F20-225	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

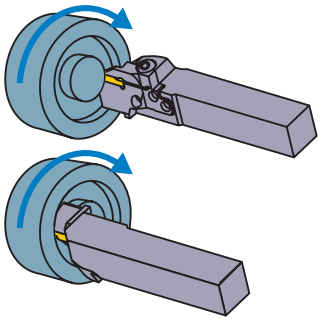
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

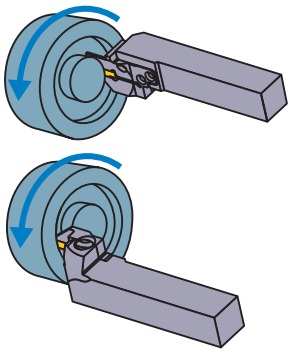
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	131	45	66	20	26	5
20	20	131	45	66	20	26	5
25	25	156	45	63	25	28	—
25	25	156	45	63	25	28	—
32	25	176	45	63	32	28	—
32	25	176	45	63	32	28	—
32	32	176	45	63	32	35	—
32	32	176	45	63	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

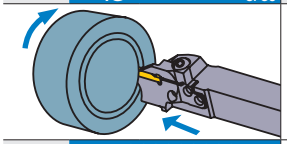
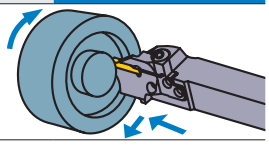
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

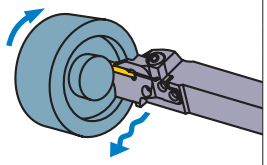
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

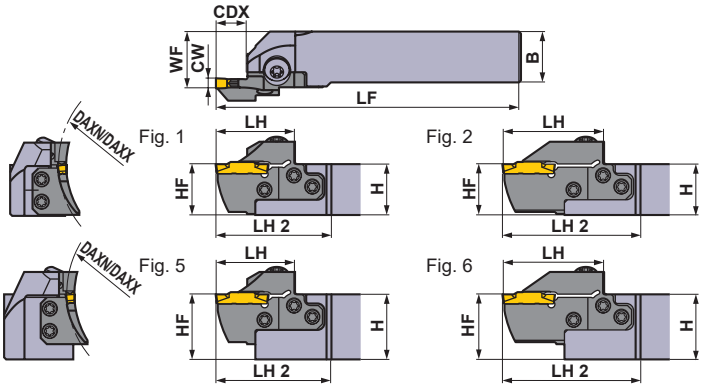
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



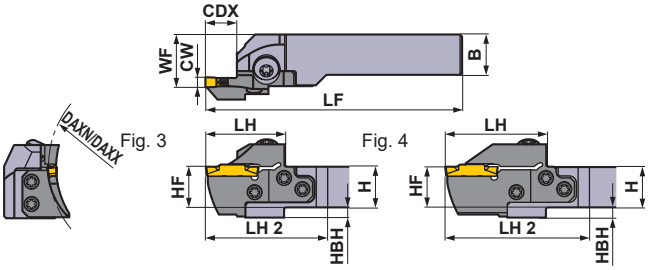
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
G	4.00 4.24	40	50	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-040	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-040	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-040	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-040	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-040	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-040	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-040	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-040	●	5
		50	60	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-050	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-050	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-050	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-050	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-050	●	5
		60	85	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-060	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-060	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-060	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-060	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-060	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-060	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-060	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-060	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-060	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-060	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-G25-060	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-060	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-G25-060	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

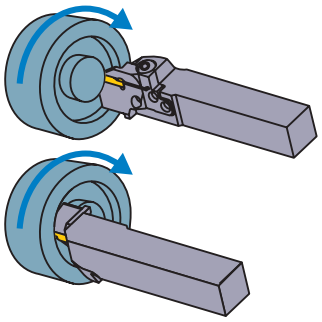
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

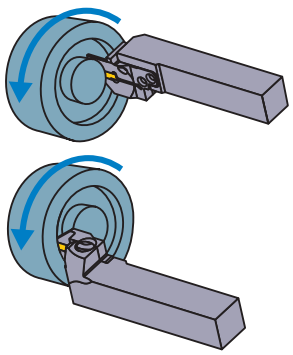
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

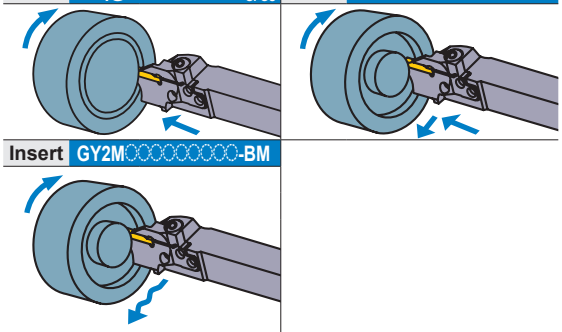
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

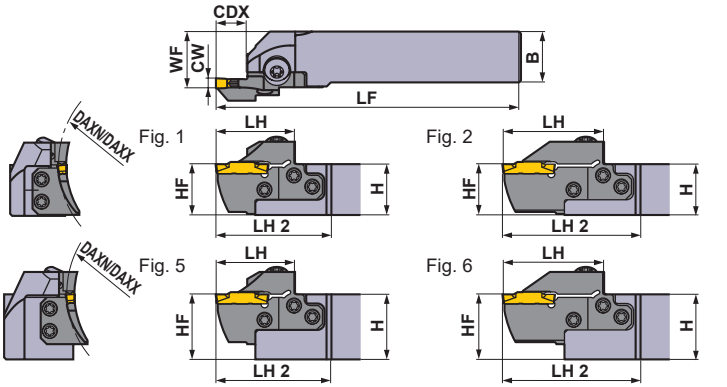
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



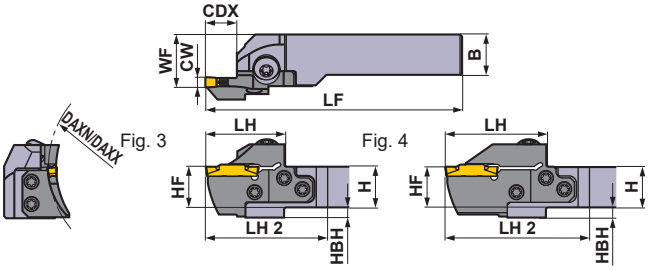
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
G	4.00 4.24	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-085	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-085	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-085	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-085	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-085	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-085	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-085	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-085	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-085	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-085	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-085	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-085	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-085	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-G25-085	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-085	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-G25-085	●	6
		125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-125	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-125	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-125	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-125	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-125	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-125	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-125	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-125	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-125	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-125	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-125	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-125	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-125	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-G25-125	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-125	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-G25-125	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

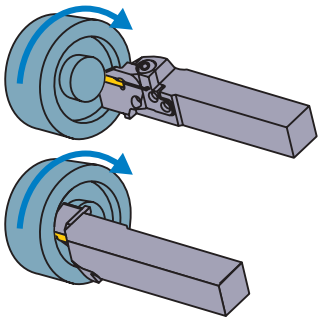
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

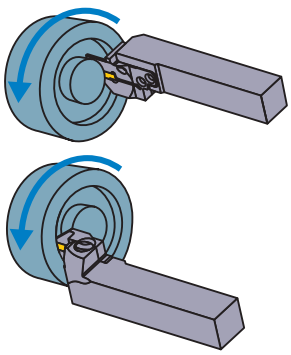
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

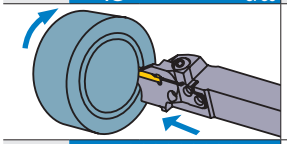
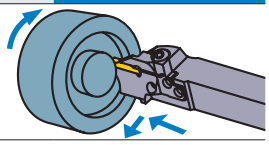
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

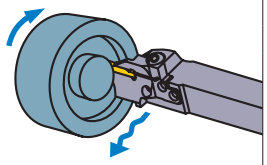
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

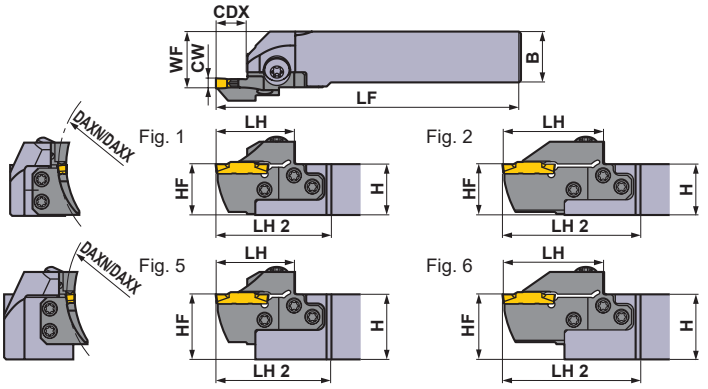
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



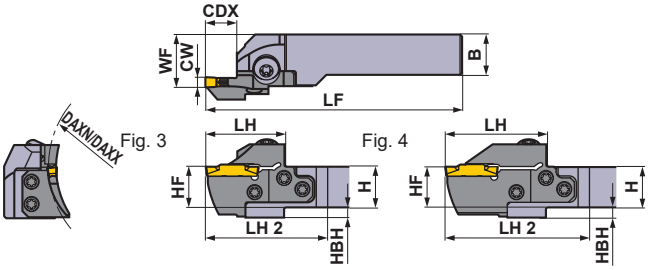
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
G	4.00 4.24	180	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-180	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-180	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-180	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-180	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-180	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-180	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-180	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-180	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-180	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-180	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-180	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-180	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-G25-180	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-180	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-G25-180	●	6
		250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G14-250	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-G14-250	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G14-250	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-G14-250	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G14-250	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-G14-250	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G14-250	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-G14-250	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-G25-250	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-G25-250	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-G25-250	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-G25-250	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-G25-250	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-G25-250	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-G25-250	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-G25-250	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

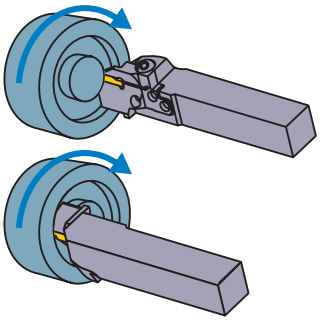
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

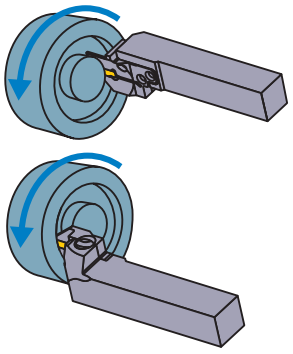
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

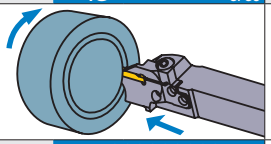
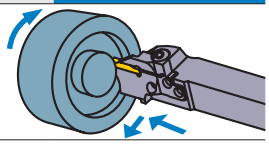
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

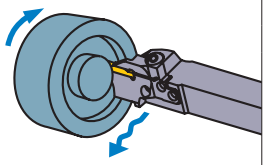
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

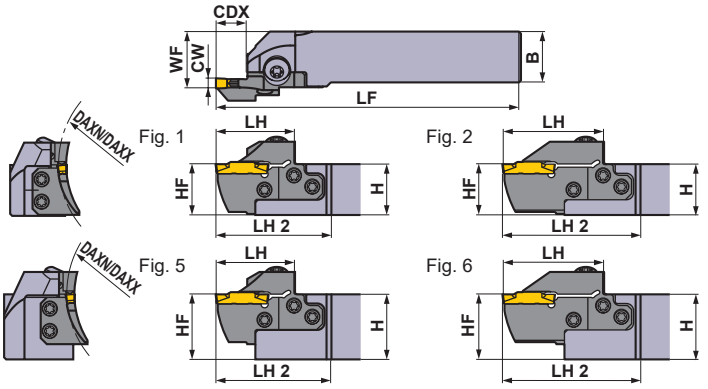
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



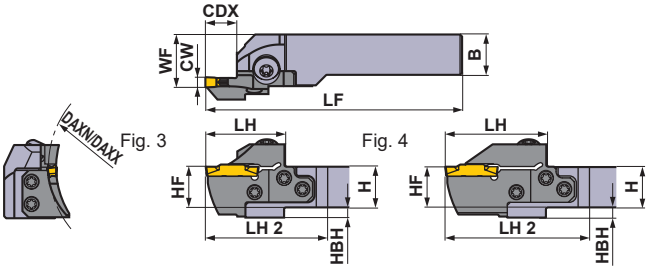
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-H14-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-H14-050	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-050	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-H14-050	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-050	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-H14-050	●	5
		60	85	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-060	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-H14-060	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-060	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-H14-060	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-060	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-H14-060	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-060	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-H14-060	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-060	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-H25-060	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-060	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-H25-060	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-060	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-H25-060	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-060	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-H25-060	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

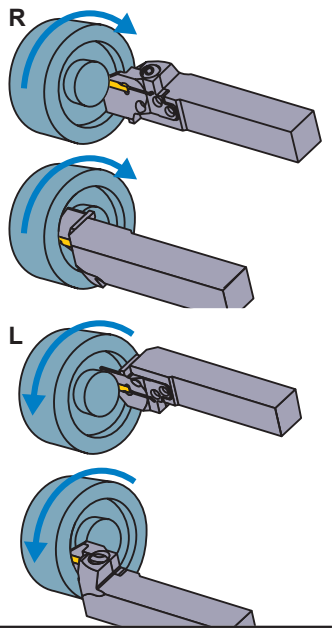
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

F

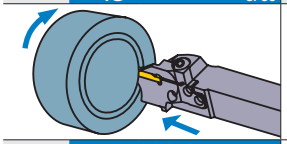
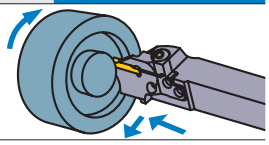
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

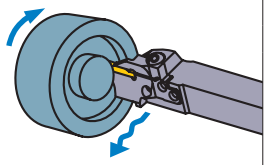
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

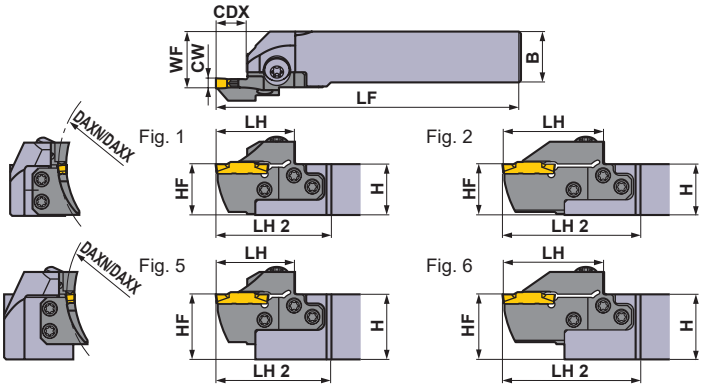
Insert GY2M○○○○○○○○○-GS -GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



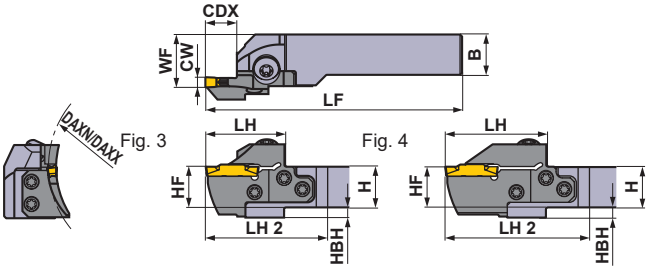
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	85	125	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-085	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-H14-085	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-085	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-H14-085	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-085	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-H14-085	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-085	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-H14-085	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-085	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-H25-085	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-085	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-H25-085	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-085	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-H25-085	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-085	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-H25-085	●	6
		125	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-125	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-H14-125	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-125	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-H14-125	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-125	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-H14-125	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-125	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-H14-125	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-125	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-H25-125	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-125	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-H25-125	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-125	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-H25-125	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-125	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-H25-125	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

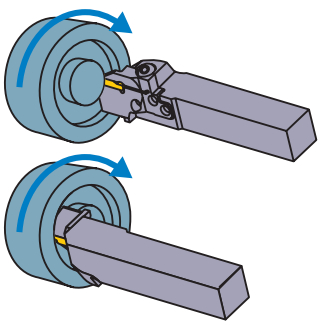
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

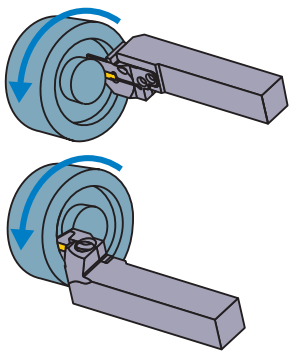
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			

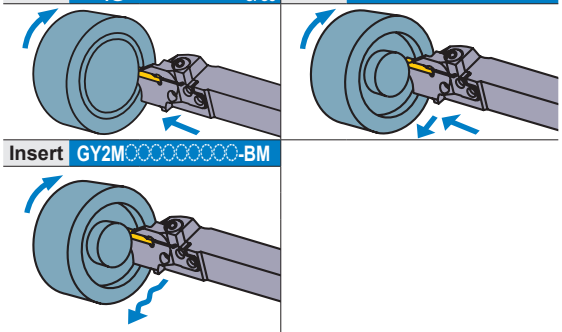
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

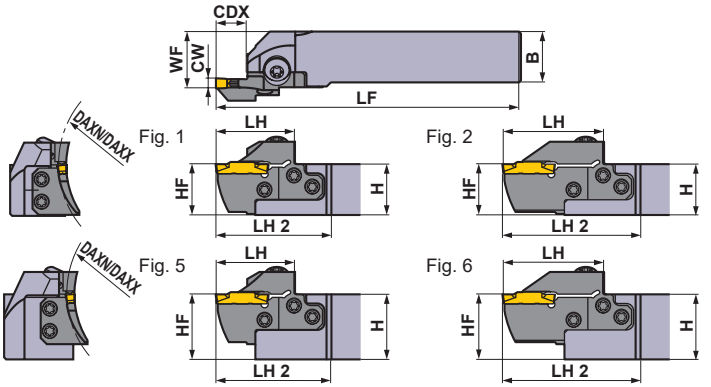
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS -GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M 1G○○○○○○○○○-GM -GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



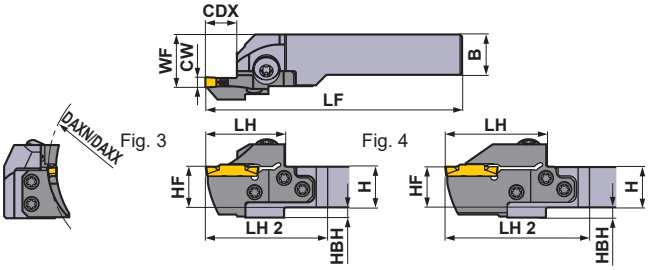
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	180	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-180	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-H14-180	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-180	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-H14-180	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-180	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-H14-180	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-180	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-H14-180	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-180	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-H25-180	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-180	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-H25-180	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-180	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-H25-180	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-180	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-H25-180	●	6
		250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H14-250	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-H14-250	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H14-250	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-H14-250	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H14-250	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-H14-250	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H14-250	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-H14-250	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-H25-250	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-H25-250	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-H25-250	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-H25-250	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-H25-250	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-H25-250	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-H25-250	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-H25-250	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

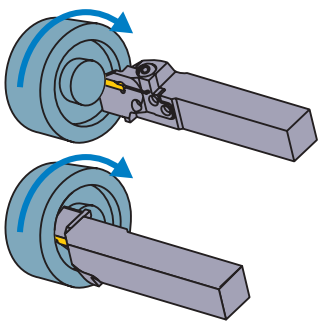
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

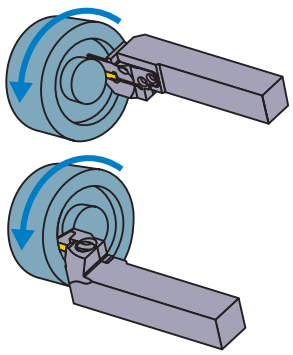
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			

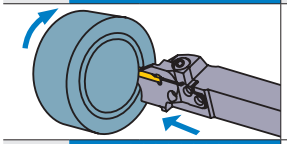
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

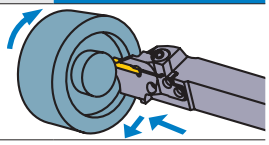
GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS -GM



Insert GY2G○○○○○○○○○-MF



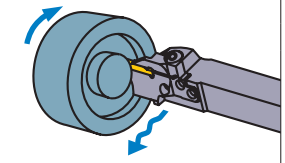
Insert GY2M○○○○○○○○○-GU

Insert GY2M○○○○○○○○○-MS

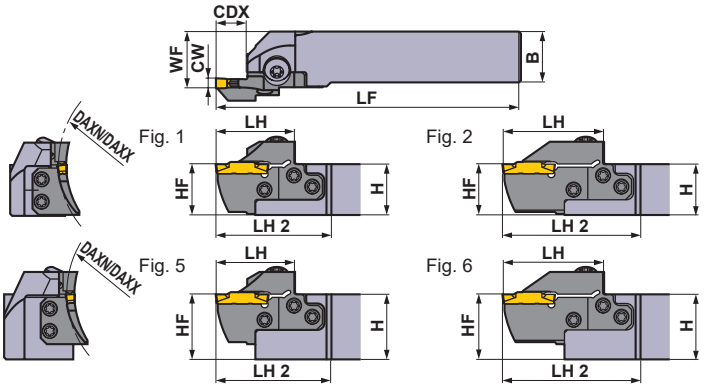
Insert GY1G○○○○○○○○○-GFGS

Insert GY2M○○○○○○○○○-MM

Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



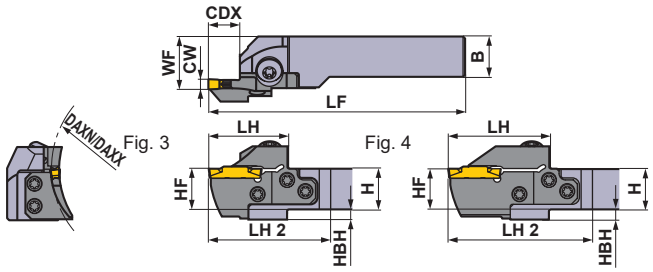
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-050	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-050	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-050	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-050	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-050	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-J14-050	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-050	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-J14-050	●	5
		70	110	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-070	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-070	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-070	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-070	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-070	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-J14-070	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-070	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-J14-070	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-070	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-J25-070	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-070	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-J25-070	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-070	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-J25-070	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-070	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-J25-070	●	6
		110	200	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-110	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-110	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-110	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-110	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-110	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-J14-110	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-110	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-J14-110	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-110	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-J25-110	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-110	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-J25-110	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-110	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-J25-110	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-110	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-J25-110	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

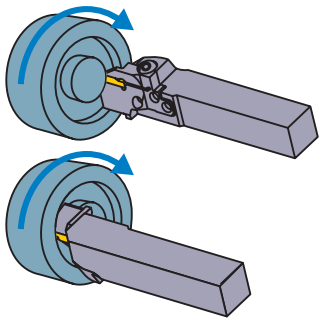
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

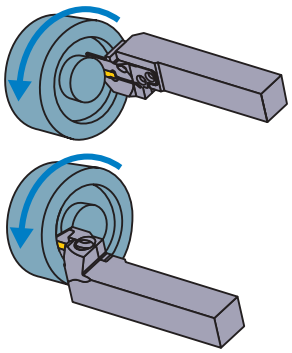
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			

● : Gauge insert shown dimensions

F

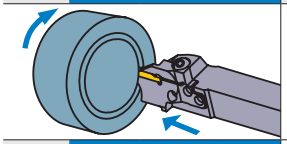
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

4-2 00° type holder (Metric)

Insert GY2M○○○○○○○○○-GS -GM



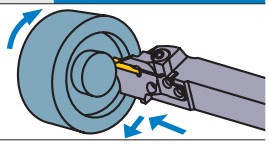
Insert GY2G○○○○○○○○○-MF

Insert GY2M○○○○○○○○○-GU

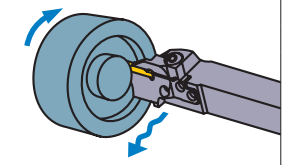
Insert GY2M○○○○○○○○○-MS

Insert GY1G○○○○○○○○○-GFGS

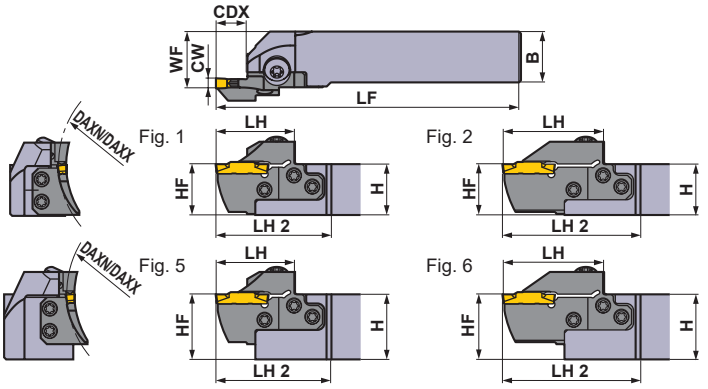
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



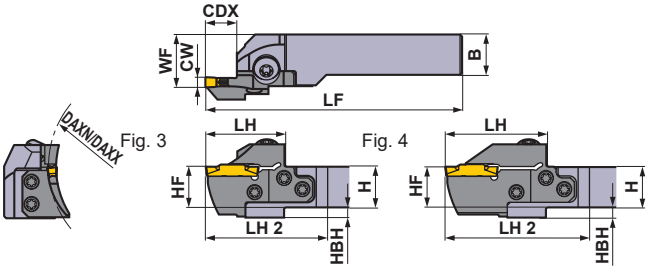
Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	170	280	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-170	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-170	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-170	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-170	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-170	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-J14-170	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-170	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-J14-170	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-170	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-J25-170	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-170	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-J25-170	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-170	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-J25-170	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-170	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-J25-170	●	6
		250	999	14	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J14-250	●	3
						L	GYHL2020K00-M25L	●	GYM25LD-J14-250	●	3
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J14-250	●	1
						L	GYHL2525M00-M25L	●	GYM25LD-J14-250	●	1
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J14-250	●	5
						L	GYHL3225P00-M25L	★	GYM25LD-J14-250	●	5
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J14-250	●	5
						L	GYHL3232P00-M25L	★	GYM25LD-J14-250	●	5
				25 ★2	Modular	R	GYHR2020K00-M25R	●	GYM25RD-J25-250	●	4
						L	GYHL2020K00-M25L	●	GYM25LD-J25-250	●	4
					Modular	R	GYHR2525M00-M25R	●	GYM25RD-J25-250	●	2
						L	GYHL2525M00-M25L	●	GYM25LD-J25-250	●	2
					Modular	R	GYHR3225P00-M25R	★	GYM25RD-J25-250	●	6
						L	GYHL3225P00-M25L	★	GYM25LD-J25-250	●	6
					Modular	R	GYHR3232P00-M25R	★	GYM25RD-J25-250	●	6
						L	GYHL3232P00-M25L	★	GYM25LD-J25-250	●	6

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

★1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, **LH 2**, and **WF** values may vary.
★2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock ★ : Stocked in Japan



Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

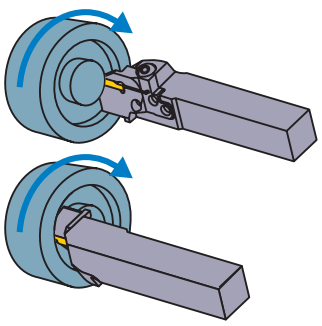
SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR/L2020K00-M25R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHR/L2525M00-M25R/L			
GYHR/L3225P00-M25R/L			
GYHR/L3232P00-M25R/L			

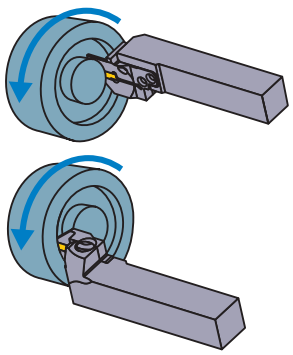
Dimensions (mm) ∗1							
H	B	LF	LH	LH 2	HF	WF	HBH
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—
20	20	125	39	60	20	26	5
20	20	125	39	60	20	26	5
25	25	150	39	57	25	28	—
25	25	150	39	57	25	28	—
32	25	170	39	57	32	28	—
32	25	170	39	57	32	28	—
32	32	170	39	57	32	35	—
32	32	170	39	57	32	35	—
20	20	136	50	71	20	26	5
20	20	136	50	71	20	26	5
25	25	161	50	68	25	28	—
25	25	161	50	68	25	28	—
32	25	181	50	68	32	28	—
32	25	181	50	68	32	28	—
32	32	181	50	68	32	35	—
32	32	181	50	68	32	35	—

Cutting Mode

R



L



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			

● : Gauge insert shown dimensions

F

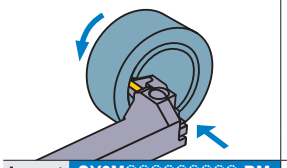
GROOVING / CUTTING OFF

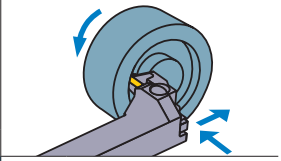
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

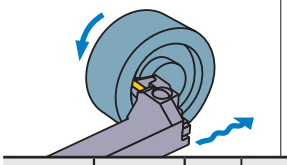
5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



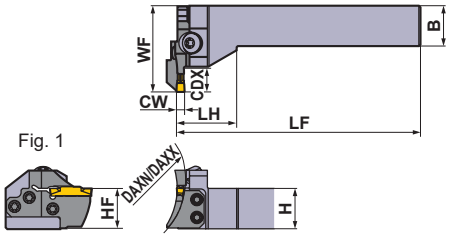


Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number				Fig.
							Holder	Stock	Modular Blade	Stock	
D	2.00 2.24	40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-040	●	1
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-050	●	1
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-060	●	1
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-075	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-075	●	1
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-100	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-100	●	1
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-135	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-135	●	1
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-D12-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-D12-180	●	1
E	2.39 2.50 2.74	40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-040	●	1
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-050	●	1
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-060	●	1
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-075	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-075	●	1
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-100	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-100	●	1
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-135	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-135	●	1
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-E12-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-E12-180	●	1

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.

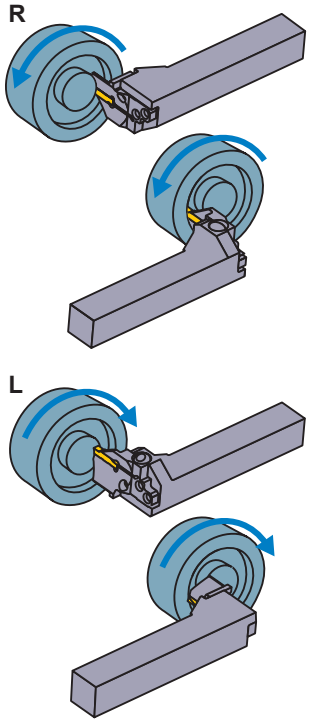
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	L
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●
E	.094", 2.39 mm	●	●	●	●
	.098", 2.50 mm	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

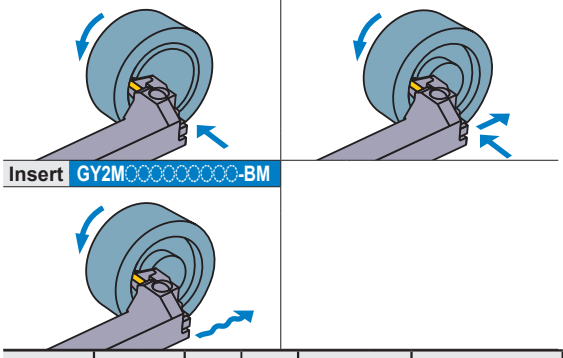
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F206
INSTRUCTION MANUAL ➤ F208

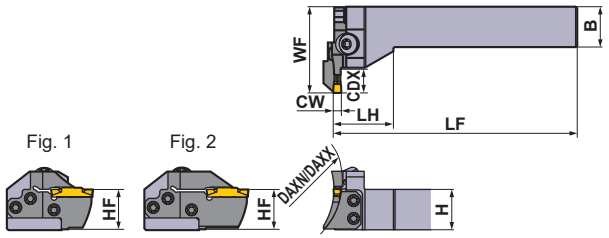
GY SERIES (FACE GROOVING)

5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	35	40	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-035	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-035	●	1
		40	50	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-040	●	1
		50	60	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-050	●	1
		60	75	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-060	●	1
				20 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-060	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-060	●	2
		75	100	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-075	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-075	●	1
				20 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-075	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-075	●	2
		100	150	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-100	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-100	●	1
				20 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-100	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-100	●	2
		135	200	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-135	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-135	●	1
				20 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-135	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-135	●	2
		180	250	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-180	●	1
				20 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-180	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-180	●	2
		225	999	12	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F12-225	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-F12-225	●	1
				20 ✶2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-F20-225	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-F20-225	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

✶1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
✶2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

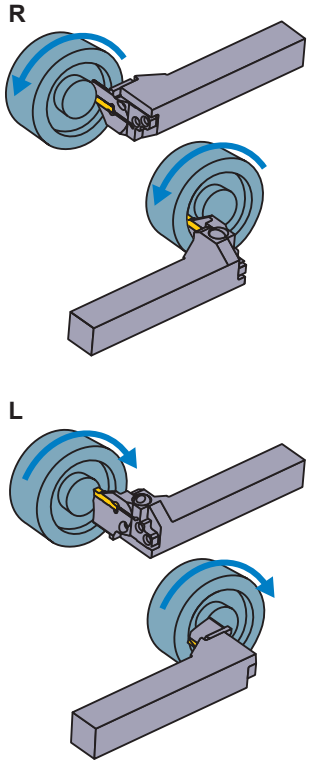
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	L
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	59	
25	25	150	38	25	59	



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●
	.125", 3.18 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

F

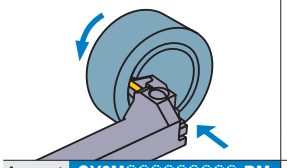
GROOVING / CUTTING OFF

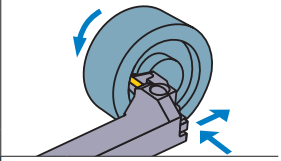
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

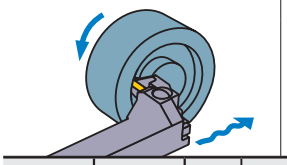
5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

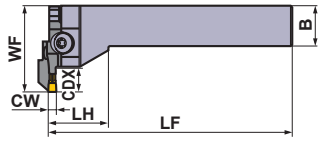


Fig. 1

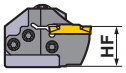


Fig. 2

Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
G	4.00 4.24	40	50	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-040	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-040	●	1
		50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-050	●	1
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-060	●	1
				25 ∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-060	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-060	●	2
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-085	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-085	●	1
				25 ∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-085	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-085	●	2
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-125	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-125	●	1
				25 ∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-125	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-125	●	2
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-180	●	1
				25 ∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-180	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-180	●	2
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G14-250	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-G14-250	●	1
				25 ∗2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-G25-250	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-G25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

∗1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
∗2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	L
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	

Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
G	.157", 4.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

F

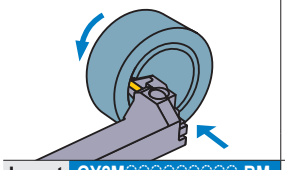
GROOVING / CUTTING OFF

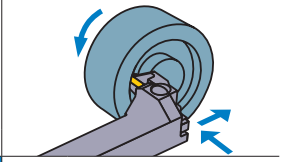
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

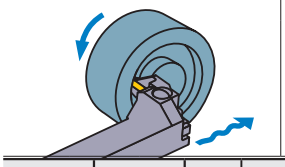
5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM





Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

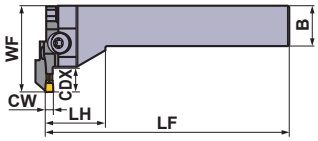


Fig. 1

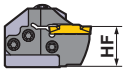


Fig. 2

Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	50	60	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-050	●	1
		60	85	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-060	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-060	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-060	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-060	●	2
		85	125	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-085	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-085	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-085	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-085	●	2
		125	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-125	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-125	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-125	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-125	●	2
		180	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-180	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-180	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-180	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-180	●	2
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H14-250	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-H14-250	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-H25-250	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-H25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

● : USA Stock

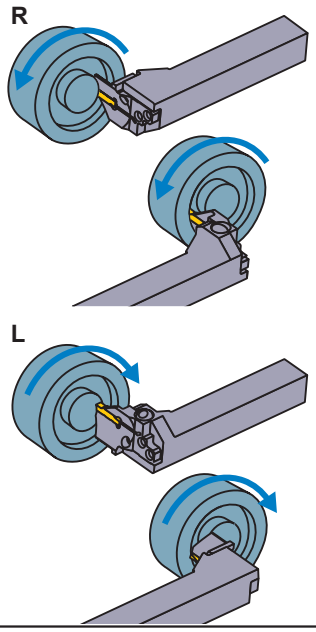
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗1					
H	**B**	**LF**	**LH**	**HF**	**WF**
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	64
25	25	150	38	25	64
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	64
25	25	150	38	25	64
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	64
25	25	150	38	25	64
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	64
25	25	150	38	25	64
25	25	150	38	25	53
25	25	150	38	25	53
25	25	150	38	25	64
25	25	150	38	25	64

Cutting Mode



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○−Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			

● : Gauge insert shown dimensions

F

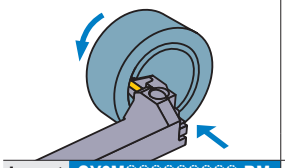
GROOVING / CUTTING OFF

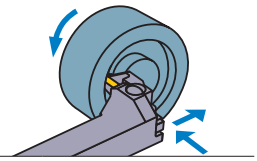
IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

GY SERIES (FACE GROOVING)

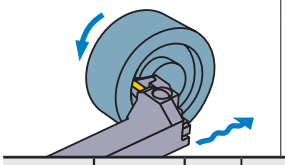
5-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-GU
Insert GY2M○○○○○○○○○-MS
Insert GY1G○○○○○○○○○-GFGS
Insert GY2M○○○○○○○○○-MM

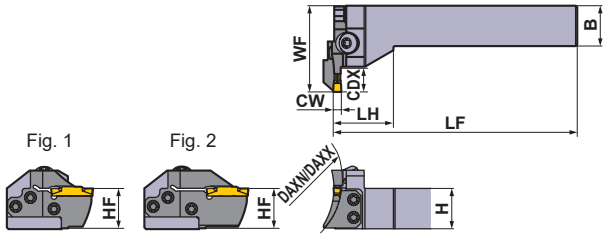




Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Right hand tool holder shown.

Seat Size	CW (mm)	DAXN (mm)	DAXX (mm)	CDX (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
J	6.00 6.31 6.35	50	70	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-050	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-050	●	1
		70	110	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-070	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-070	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-070	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-070	●	2
		110	200	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-110	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-110	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-110	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-110	●	2
		170	280	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-170	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-170	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-170	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-170	●	2
		250	999	14	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J14-250	●	1
						L	GYHL2525M90-M25R	●	GYM25RD-J14-250	●	1
				25 ⁎2	Modular	R	GYHR2525M90-M25L	●	GYM25LD-J25-250	●	2
						L	GYHL2525M90-M25R	●	GYM25RD-J25-250	●	2

CW = Cutting Width **DAXN =** Axial groove outside diameter minimum **DAXX =** Axial groove outside diameter maximum **CDX =** Max. Groove Depth

⁎1 Dimensions shown are when gauge insert is used. If other insert geometries are used then **LF**, **LH**, and **WF** values may vary.
⁎2 The maximum groove depth varies according to the insert used. Please refer to the maximum groove depth of inserts on pages F011 to F015.

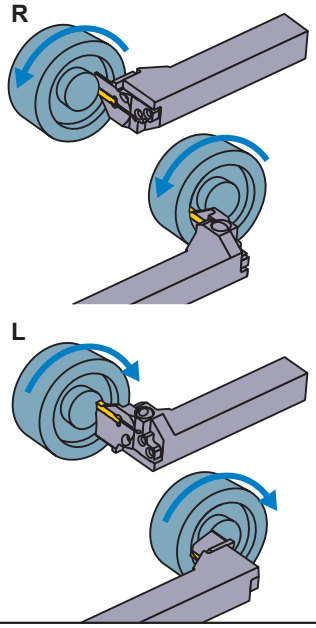
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
GYHR2525M90-M25L	GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYHL2525M90-M25R			

Dimensions (mm) ∗1						Cutting Mode
H	B	LF	LH	HF	WF	
25	25	150	38	25	53	R
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	
25	25	150	38	25	64	
25	25	150	38	25	53	
25	25	150	38	25	53	
25	25	150	38	25	64	L
25	25	150	38	25	64	



Select an Insert

Seat Size	Insert Number
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➢ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
J	.236", 6.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			

● : Gauge insert shown dimensions

F

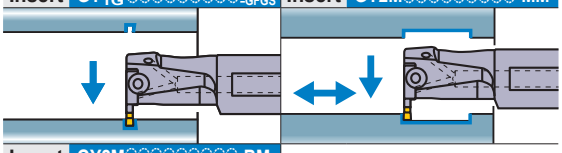
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F206
INSTRUCTION MANUAL ➢ F208

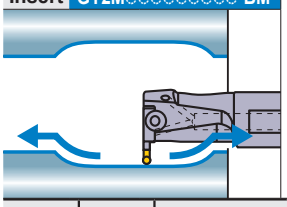
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

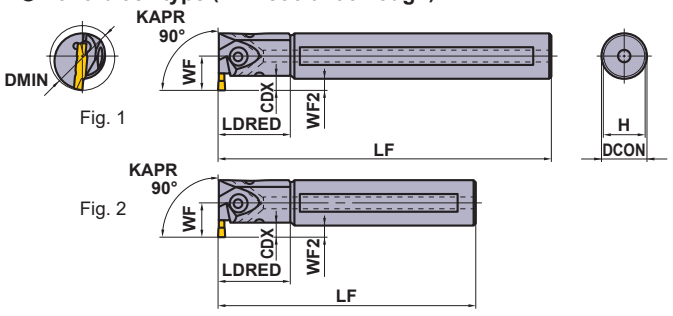


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) *3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
D	.079 .088	.236	1.000	Mono Block	R	GYARUS12K90A-D06	●	—	—	2
					L	GYALUS12K90A-D06	●	—	—	2
				Mono Block	R	GYARUS12Q90A-D06	●	—	—	1
					L	GYALUS12Q90A-D06	●	—	—	1
			1.250	Mono Block	R	GYARUS16K90B-D06	●	—	—	2
					L	GYALUS16K90B-D06	●	—	—	2
				Mono Block	R	GYARUS16R90B-D06	●	—	—	1
					L	GYALUS16R90B-D06	●	—	—	1
		.157—.374 *1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-D10	●	4
					L	GYDLUS20L90C-M20R	●	GYM20RA-D10	●	4
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-D10	●	3
					L	GYDLUS20S90C-M20R	●	GYM20RA-D10	●	3
		.217—.374 *1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-D10	●	4
					L	GYDLUS24M90D-M20R	●	GYM20RA-D10	●	4
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-D10	●	3
					L	GYDLUS24T90D-M20R	●	GYM20RA-D10	●	3
		.276—.453 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-D12	●	4
					L	GYDLUS24M90D-M25R	●	GYM25RA-D12	●	4
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-D12	●	3
					L	GYDLUS24T90D-M25R	●	GYM25RA-D12	●	3
			2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-D12	●	4
					L	GYDLUS32P90F-M25R	●	GYM25RA-D12	●	4
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-D12	●	3
					L	GYDLUS32T90F-M25R	●	GYM25RA-D12	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : USA Stock

●Modular blade type (Air / coolant through)

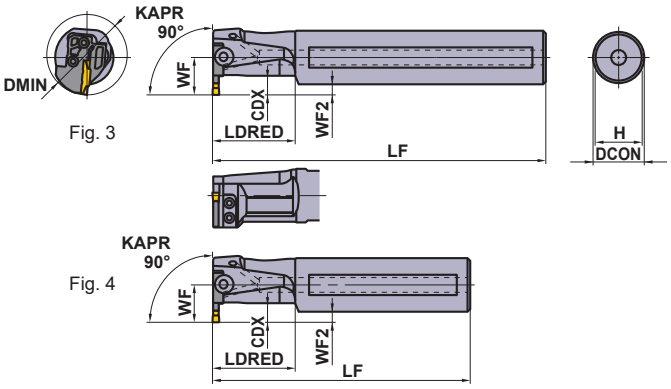


Fig. 3

Fig. 4

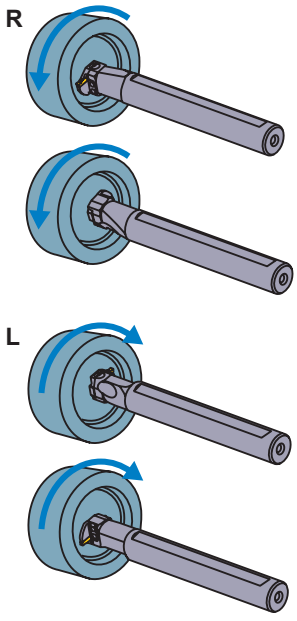
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS12○90A-○06 GYAR/LUS16○90B-○06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/LUS20○90C-M20L/R GYDR/LUS24○90D-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M25L/R GYDR/LUS32○90F-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
.750	5.000	1.250	.605	.230	.671	R
.750	5.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
1.000	5.000	1.500	.730	.230	.921	
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

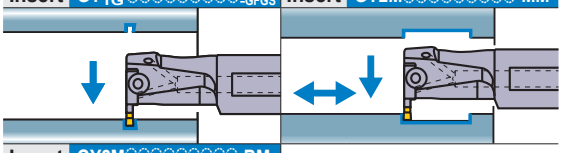
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F213
INSTRUCTION MANUAL ➢ F215

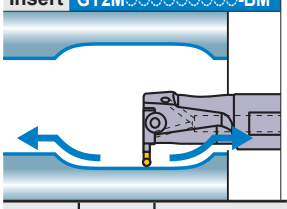
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

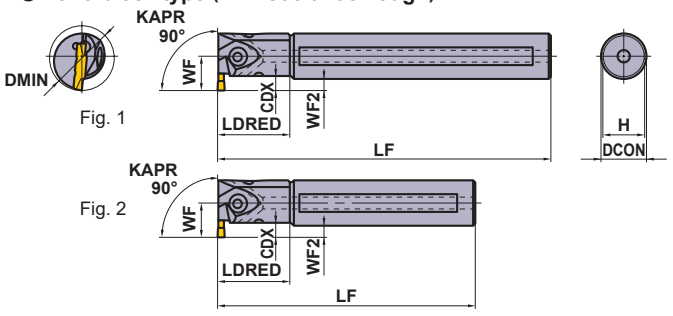


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) *3	DMIN (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
E	.094 .098 .108	.236	1.000	Mono Block	R	GYARUS12K90A-E06	●	—	—	2
					L	GYALUS12K90A-E06	●	—	—	2
				Mono Block	R	GYARUS12Q90A-E06	●	—	—	1
					L	GYALUS12Q90A-E06	●	—	—	1
			1.250	Mono Block	R	GYARUS16K90B-E06	●	—	—	2
					L	GYALUS16K90B-E06	●	—	—	2
				Mono Block	R	GYARUS16R90B-E06	●	—	—	1
					L	GYALUS16R90B-E06	●	—	—	1
		.157—.374 *1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-E10	●	4
					L	GYDLUS20L90C-M20R	●	GYM20RA-E10	●	4
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-E10	●	3
					L	GYDLUS20S90C-M20R	●	GYM20RA-E10	●	3
		.217—.374 *1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-E10	●	4
					L	GYDLUS24M90D-M20R	●	GYM20RA-E10	●	4
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-E10	●	3
					L	GYDLUS24T90D-M20R	●	GYM20RA-E10	●	3
		.276—.453 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-E12	●	4
					L	GYDLUS24M90D-M25R	●	GYM25RA-E12	●	4
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-E12	●	3
					L	GYDLUS24T90D-M25R	●	GYM25RA-E12	●	3
			2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-E12	●	4
					L	GYDLUS32P90F-M25R	●	GYM25RA-E12	●	4
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-E12	●	3
					L	GYDLUS32T90F-M25R	●	GYM25RA-E12	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : USA Stock

●Modular blade type (Air / coolant through)

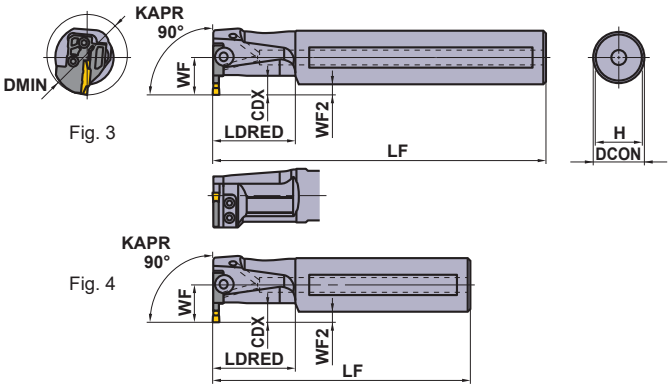


Fig. 3

Fig. 4

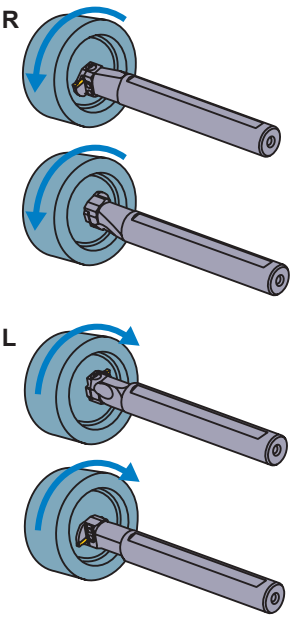
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS12○90A-○06 GYAR/LUS16○90B-○06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/LUS20○90C-M20L/R GYDR/LUS24○90D-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M25L/R GYDR/LUS32○90F-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
.750	5.000	1.250	.605	.230	.671	R
.750	5.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
1.000	5.000	1.500	.730	.230	.921	
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	L
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

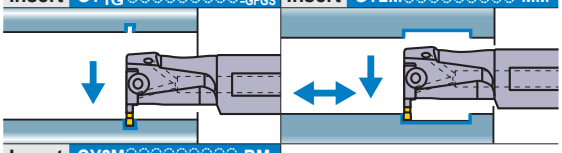
● : Gauge insert shown dimensions

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F213
INSTRUCTION MANUAL ➢ F215

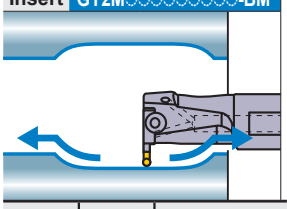
GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

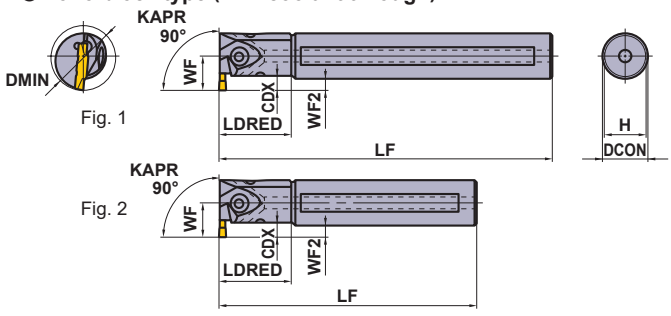


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) *3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	.118 .125 .128	.236	1.000	Mono Block	R	GYARUS12K90A-F06	●	—	—	2
					L	GYALUS12K90A-F06	●	—	—	2
				Mono Block	R	GYARUS12Q90A-F06	●	—	—	1
					L	GYALUS12Q90A-F06	●	—	—	1
			1.250	Mono Block	R	GYARUS16K90B-F06	●	—	—	2
					L	GYALUS16K90B-F06	●	—	—	2
				Mono Block	R	GYARUS16R90B-F06	●	—	—	1
					L	GYALUS16R90B-F06	●	—	—	1
		.157—.374 *1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-F10	●	4
					L	GYDLUS20L90C-M20R	●	GYM20RA-F10	●	4
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-F10	●	3
					L	GYDLUS20S90C-M20R	●	GYM20RA-F10	●	3
		.217—.374 *1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-F10	●	4
					L	GYDLUS24M90D-M20R	●	GYM20RA-F10	●	4
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-F10	●	3
					L	GYDLUS24T90D-M20R	●	GYM20RA-F10	●	3
		.276—.453 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-F12	●	4
					L	GYDLUS24M90D-M25R	●	GYM25RA-F12	●	4
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-F12	●	3
					L	GYDLUS24T90D-M25R	●	GYM25RA-F12	●	3
			2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-F12	●	4
					L	GYDLUS32P90F-M25R	●	GYM25RA-F12	●	4
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-F12	●	3
					L	GYDLUS32T90F-M25R	●	GYM25RA-F12	●	3
G	.157 .167	.276	1.250	Mono Block	R	GYARUS16K90B-G07	●	—	—	2
					L	GYALUS16K90B-G07	●	—	—	2
				Mono Block	R	GYARUS16R90B-G07	●	—	—	1
					L	GYALUS16R90B-G07	●	—	—	1
		.197 - .453 *1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-G12	●	4
					L	GYDLUS20L90C-M20R	●	GYM20RA-G12	●	4
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-G12	●	3
					L	GYDLUS20S90C-M20R	●	GYM20RA-G12	●	3
		.236 - .453 *1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-G12	●	4
					L	GYDLUS24M90D-M20R	●	GYM20RA-G12	●	4
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-G12	●	3
					L	GYDLUS24T90D-M20R	●	GYM20RA-G12	●	3
		.295 - .512 *1	2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-G14	●	4
					L	GYDLUS32P90F-M25R	●	GYM25RA-G14	●	4
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-G14	●	3
					L	GYDLUS32T90F-M25R	●	GYM25RA-G14	●	3
		.315 - .512 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-G14	●	4
					L	GYDLUS24M90D-M25R	●	GYM25RA-G14	●	4
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-G14	●	3
					L	GYDLUS24T90D-M25R	●	GYM25RA-G14	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : USA Stock

●Modular blade type (Air / coolant through)

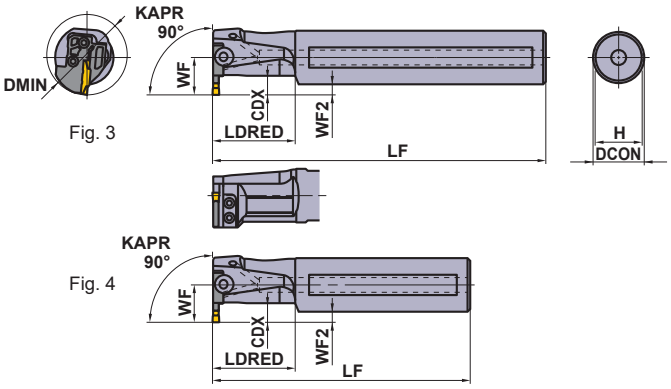


Fig. 3

Fig. 4

Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS12○90A-F06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYAR/LUS16○90B-○○○			
GYDR/LUS20○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M20L/R			
GYDR/LUS24○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32○90F-M25L/R			

Dimensions (inch) ∗2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
.750	5.000	1.250	.605	.230	.671	R
.750	5.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
.750	7.000	1.250	.605	.230	.671	
1.000	5.000	1.500	.730	.230	.921	
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
1.000	5.000	1.500	.730	.230	.921	L
1.000	5.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.000	8.000	1.500	.730	.230	.921	
1.250	5.500	2.000	.875	.250	1.171	
1.250	5.500	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.250	10.000	2.000	.875	.250	1.171	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
1.500	12.000	2.500	1.125	.375	1.382	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	6.750	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
2.000	12.000	3.250	1.250	.250	1.882	
1.500	6.000	2.500	1.125	.375	1.382	
1.500	6.000	2.500	1.125	.375	1.382	
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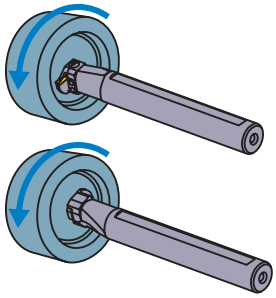
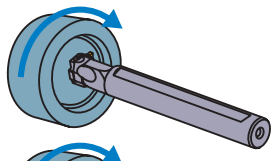
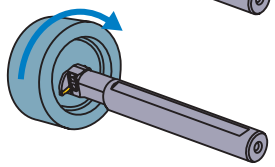






Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●
G	.157", 4.00 mm	●	●	●		●

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

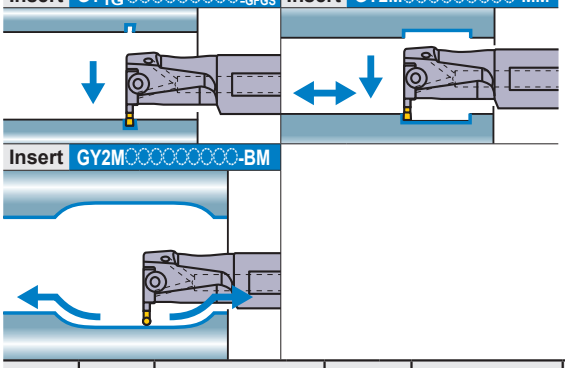
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F213
INSTRUCTION MANUAL ➤ F215

GY SERIES (INTERNAL GROOVING)

6-1 90° type holder (Inch)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

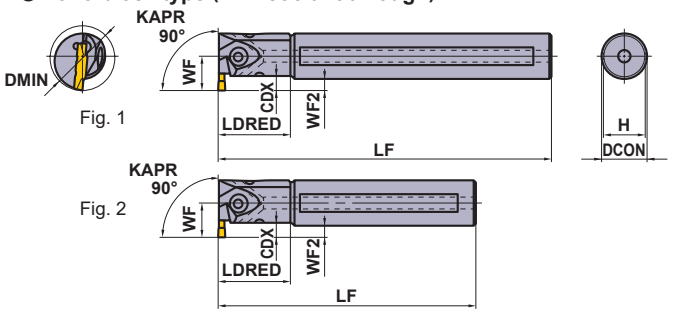


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch) *3	DMIN (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Order Number Modular Blade	Stock	Fig.
H	.187 .197 .206	.276	1.250	Mono Block	R	GYARUS16K90B-H07	●	—	—	2
					L	GYALUS16K90B-H07	●	—	—	2
				Mono Block	R	GYARUS16R90B-H07	●	—	—	1
					L	GYALUS16R90B-H07	●	—	—	1
		.197 - .453 *1	1.625	Modular	R	GYDRUS20L90C-M20L	●	GYM20LA-H12	●	4
					L	GYDLUS20L90C-M20R	●	GYM20RA-H12	●	4
				Modular	R	GYDRUS20S90C-M20L	●	GYM20LA-H12	●	3
					L	GYDLUS20S90C-M20R	●	GYM20RA-H12	●	3
		.236 - .453 *1	2.000	Modular	R	GYDRUS24M90D-M20L	●	GYM20LA-H12	●	4
					L	GYDLUS24M90D-M20R	●	GYM20RA-H12	●	4
				Modular	R	GYDRUS24T90D-M20L	●	GYM20LA-H12	●	3
					L	GYDLUS24T90D-M20R	●	GYM20RA-H12	●	3
		.295 - .512 *1	2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-H14	●	4
					L	GYDLUS32P90F-M25R	●	GYM25RA-H14	●	4
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-H14	●	3
					L	GYDLUS32T90F-M25R	●	GYM25RA-H14	●	3
		.315 - .512 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-H14	●	4
					L	GYDLUS24M90D-M25R	●	GYM25RA-H14	●	4
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-H14	●	3
					L	GYDLUS24T90D-M25R	●	GYM25RA-H14	●	3
J	.236 .248 .250	.295 - .512 *1	2.750	Modular	R	GYDRUS32P90F-M25L	●	GYM25LA-J14	●	4
					L	GYDLUS32P90F-M25R	●	GYM25RA-J14	●	4
				Modular	R	GYDRUS32T90F-M25L	●	GYM25LA-J14	●	3
					L	GYDLUS32T90F-M25R	●	GYM25RA-J14	●	3
		.315 - .512 *1	2.500	Modular	R	GYDRUS24M90D-M25L	●	GYM25LA-J14	●	4
					L	GYDLUS24M90D-M25R	●	GYM25RA-J14	●	4
				Modular	R	GYDRUS24T90D-M25L	●	GYM25LA-J14	●	3
					L	GYDLUS24T90D-M25R	●	GYM25RA-J14	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

●Modular blade type (Air / coolant through)

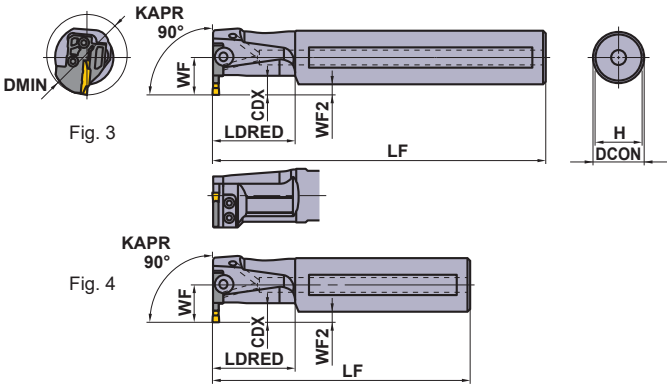


Fig. 3

Fig. 4

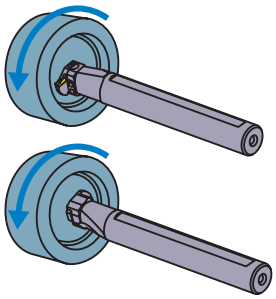
Right hand tool holder shown.

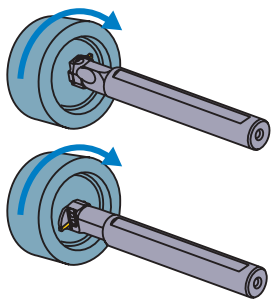
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/LUS16○90B-○07	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/LUS20○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/LUS24○90D-M20L/R			
GYDR/LUS32○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/LUS32○90F-M25L/R			

	Dimensions (inch) ∗2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	1.000	5.000	1.500	.730	.230	.921	R
	1.000	5.000	1.500	.730	.230	.921	
	1.000	8.000	1.500	.730	.230	.921	
	1.000	8.000	1.500	.730	.230	.921	
	1.250	5.500	2.000	.875	.250	1.171	
	1.250	5.500	2.000	.875	.250	1.171	
	1.250	10.000	2.000	.875	.250	1.171	
	1.250	10.000	2.000	.875	.250	1.171	
	1.500	6.000	2.500	1.125	.375	1.382	
	1.500	6.000	2.500	1.125	.375	1.382	
	1.500	12.000	2.500	1.125	.375	1.382	
	1.500	12.000	2.500	1.125	.375	1.382	
	2.000	6.750	3.250	1.250	.250	1.882	
	2.000	6.750	3.250	1.250	.250	1.882	
	2.000	12.000	3.250	1.250	.250	1.882	
	2.000	12.000	3.250	1.250	.250	1.882	
	1.500	6.000	2.500	1.125	.375	1.382	
	1.500	6.000	2.500	1.125	.375	1.382	
	1.500	12.000	2.500	1.125	.375	1.382	
	1.500	12.000	2.500	1.125	.375	1.382	
	2.000	6.750	3.250	1.250	.250	1.882	L
	2.000	6.750	3.250	1.250	.250	1.882	
	2.000	12.000	3.250	1.250	.250	1.882	
	2.000	12.000	3.250	1.250	.250	1.882	
	1.500	6.000	2.500	1.125	.375	1.382	
	1.500	6.000	2.500	1.125	.375	1.382	
	1.500	12.000	2.500	1.125	.375	1.382	
	1.500	12.000	2.500	1.125	.375	1.382	





Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●
J	.236", 6.00 mm	●	●	●	●
	.250", 6.35 mm	●	●	●	

For Multifunctional Grooving ➤ F013, F014

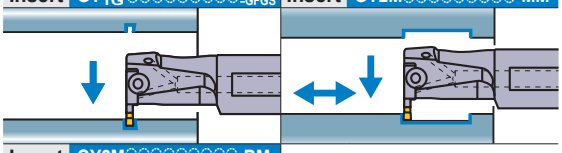
Seat Size	Breaker CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

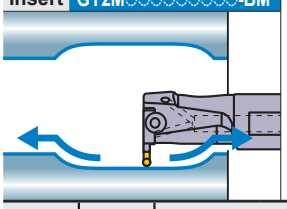
GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

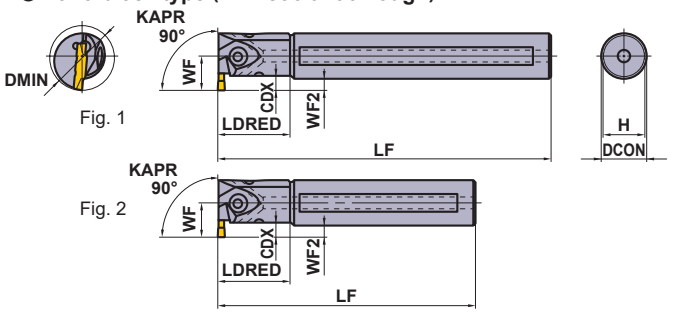


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
D	2.00 2.24	6	25	Mono Block	R	GYAR20K90A-D06	●	—	—	2
					L	GYAL20K90A-D06	●	—	—	2
				Mono Block	R	GYAR20Q90A-D06	●	—	—	1
					L	GYAL20Q90A-D06	●	—	—	1
			32	Mono Block	R	GYAR25K90B-D06	●	—	—	2
					L	GYAL25K90B-D06	●	—	—	2
				Mono Block	R	GYAR25R90B-D06	●	—	—	1
					L	GYAL25R90B-D06	●	—	—	1
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-D10	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-D10	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-D10	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-D10	●	3
		5.5—9.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-D10	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-D10	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-D10	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-D10	●	3
		7—11.5 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-D12	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-D12	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-D12	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-D12	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-D12	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-D12	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-D12	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-D12	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : USA Stock

●Modular blade type (Air / coolant through)

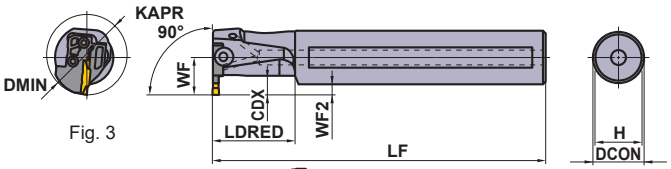


Fig. 3

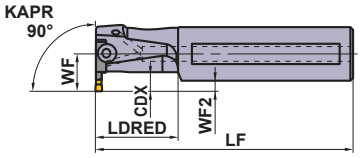


Fig. 4

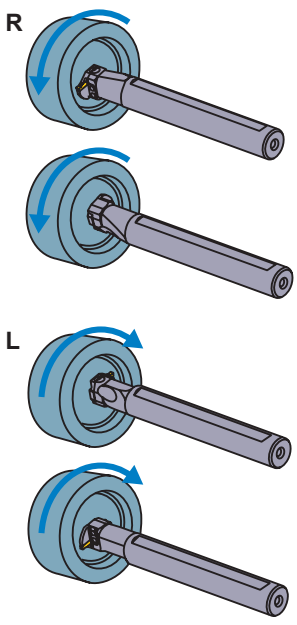
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/L20○90A-○06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYAR/L25○90B-○06			
GYDR/L32○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

	Dimensions (mm) ∗2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	20	125	30	14.5	4.5	18	R
	20	125	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	25	125	40	19.0	6.5	23	
	25	125	40	19.0	6.5	23	
	25	200	40	19.0	6.5	23	
	25	200	40	19.0	6.5	23	
	32	140	50	22.0	6.0	30	
	32	140	50	22.0	6.0	30	
	32	250	50	22.0	6.0	30	
	32	250	50	22.0	6.0	30	
	40	150	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	50	170	80	34.0	9.0	47	
	50	170	80	34.0	9.0	47	
	50	300	80	34.0	9.0	47	
	50	300	80	34.0	9.0	47	



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
D	.079", 2.00 mm	●	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

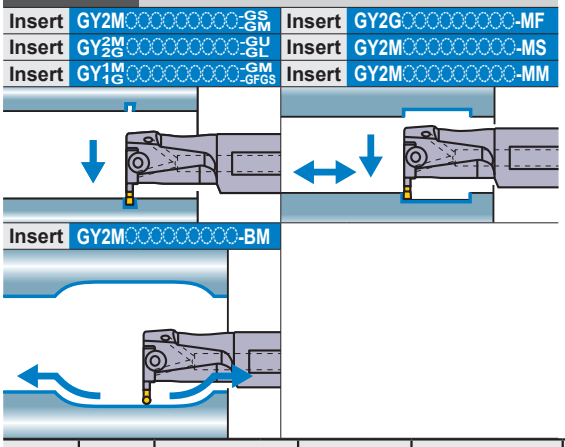
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F213
INSTRUCTION MANUAL ➤ F215

GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

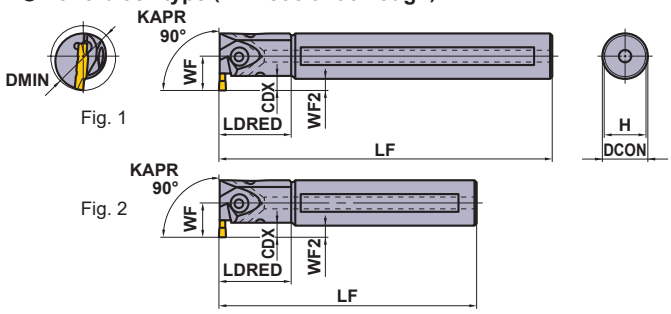


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
E	2.39 2.50 2.74	6	25	Mono Block	R	GYAR20K90A-E06	●	—	—	2
					L	GYAL20K90A-E06	●	—	—	2
				Mono Block	R	GYAR20Q90A-E06	●	—	—	1
					L	GYAL20Q90A-E06	●	—	—	1
			32	Mono Block	R	GYAR25K90B-E06	●	—	—	2
					L	GYAL25K90B-E06	●	—	—	2
				Mono Block	R	GYAR25R90B-E06	●	—	—	1
					L	GYAL25R90B-E06	●	—	—	1
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-E10	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-E10	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-E10	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-E10	●	3
		5.5—9.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-E10	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-E10	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-E10	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-E10	●	3
		7—11.5 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-E12	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-E12	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-E12	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-E12	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-E12	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-E12	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-E12	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-E12	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : USA Stock

●Modular blade type (Air / coolant through)

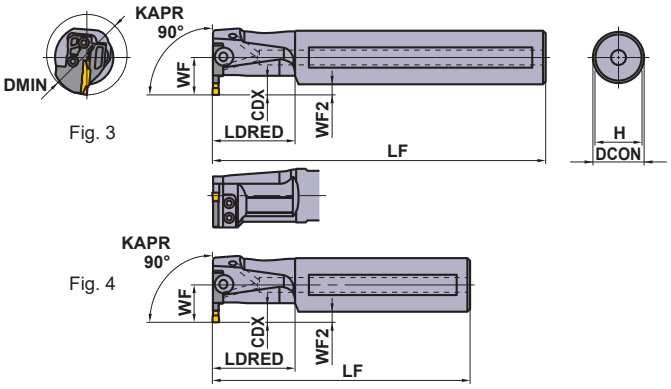


Fig. 3

Fig. 4

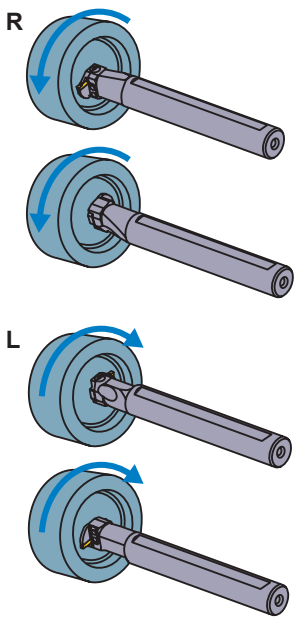
Right hand tool holder shown.

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/L20○90A-○06	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYAR/L25○90B-○06			
GYDR/L32○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

	Dimensions (mm) ∗2						Cutting Mode
	DCON	LF	LDRED	WF	WF2	H	
	20	125	30	14.5	4.5	18	R
	20	125	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	20	180	30	14.5	4.5	18	
	25	125	40	19.0	6.5	23	
	25	125	40	19.0	6.5	23	
	25	200	40	19.0	6.5	23	
	25	200	40	19.0	6.5	23	
	32	140	50	22.0	6.0	30	
	32	140	50	22.0	6.0	30	
	32	250	50	22.0	6.0	30	
	32	250	50	22.0	6.0	30	
	40	150	60	28.0	8.0	37	L
	40	150	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	150	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	40	300	60	28.0	8.0	37	
	50	170	80	34.0	9.0	47	
	50	170	80	34.0	9.0	47	
	50	300	80	34.0	9.0	47	
	50	300	80	34.0	9.0	47	



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➢ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

F

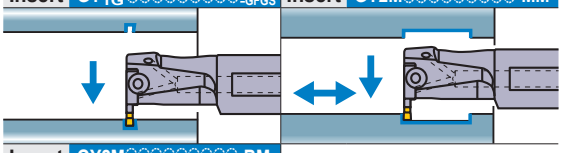
GROOVING / CUTTING OFF

IDENTIFICATION ➢ F008, F009
CUTTING CONDITIONS ➢ F213
INSTRUCTION MANUAL ➢ F215

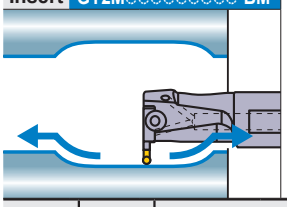
GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2G○○○○○○○○○-MF
Insert GY2M/2G○○○○○○○○○-GU/-GL
Insert GY2M○○○○○○○○○-MS
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2M○○○○○○○○○-MM



Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

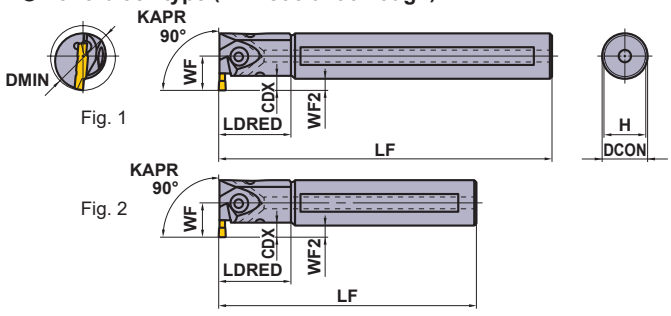


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *3	DMIN (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.
F	3.00 3.18 3.24	6	25	Mono Block	R	GYAR20K90A-F06	●	—	—	2
					L	GYAL20K90A-F06	●	—	—	2
				Mono Block	R	GYAR20Q90A-F06	●	—	—	1
					L	GYAL20Q90A-F06	●	—	—	1
			32	Mono Block	R	GYAR25K90B-F06	●	—	—	2
					L	GYAL25K90B-F06	●	—	—	2
				Mono Block	R	GYAR25R90B-F06	●	—	—	1
					L	GYAL25R90B-F06	●	—	—	1
		4—9.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-F10	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-F10	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-F10	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-F10	●	3
		5.5—9.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-F10	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-F10	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-F10	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-F10	●	3
		7—11.5 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-F12	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-F12	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-F12	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-F12	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-F12	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-F12	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-F12	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-F12	●	3
G	4.00 4.24	7	32	Mono Block	R	GYAR25K90B-G07	●	—	—	2
					L	GYAL25K90B-G07	●	—	—	2
				Mono Block	R	GYAR25R90B-G07	●	—	—	1
					L	GYAL25R90B-G07	●	—	—	1
		4.5—11.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-G12	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-G12	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-G12	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-G12	●	3
		6—11.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-G12	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-G12	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-G12	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-G12	●	3
		7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-G14	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-G14	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-G14	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-G14	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-G14	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-G14	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-G14	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-G14	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

● : USA Stock

●Modular blade type (Air / coolant through)

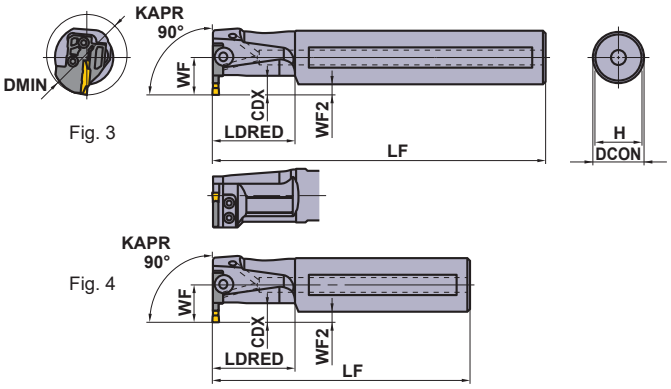


Fig. 3

Fig. 4

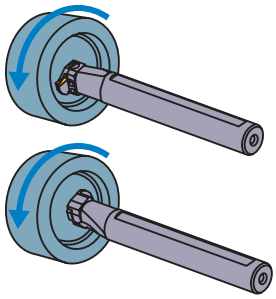
Right hand tool holder shown.

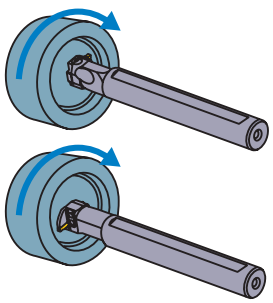
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/L20○90A-F06 GYAR/L25○90B-○○○	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/L32○90C-M20L/R GYDR/L40○90D-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M25L/R GYDR/L50○90F-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D

Dimensions (mm) ∗2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
20	125	30	14.5	4.5	18	R
20	125	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
20	180	30	14.5	4.5	18	
25	125	40	19.0	6.5	23	
25	125	40	19.0	6.5	23	
25	200	40	19.0	6.5	23	
25	200	40	19.0	6.5	23	
32	140	50	22.0	6.0	30	
32	140	50	22.0	6.0	30	
32	250	50	22.0	6.0	30	
32	250	50	22.0	6.0	30	
40	150	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
50	170	80	34.0	9.0	47	
50	170	80	34.0	9.0	47	
50	300	80	34.0	9.0	47	
50	300	80	34.0	9.0	47	
25	125	40	19.0	6.5	23	L
25	125	40	19.0	6.5	23	
25	200	40	19.0	6.5	23	
25	200	40	19.0	6.5	23	
32	140	50	22.0	6.0	30	
32	140	50	22.0	6.0	30	
32	250	50	22.0	6.0	30	
32	250	50	22.0	6.0	30	
40	150	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	150	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
40	300	60	28.0	8.0	37	
50	170	80	34.0	9.0	47	
50	170	80	34.0	9.0	47	
50	300	80	34.0	9.0	47	
50	300	80	34.0	9.0	47	





Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○–Breaker
G	GY○○0400/0424G○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●
G	.157", 4.00 mm	●	●	●		●

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE 0.2 mm	●	●	●	
	RE 0.4 mm	●	●	●	
	RE 0.8 mm			●	
	.125", 3.18 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	.128", 3.24 mm	●			
G	.157", 4.00 mm				●
	RE 0.2mm	●	●	●	
	RE 0.4mm	●	●	●	
	RE 0.8mm	●		●	
	.167", 4.24 mm	●			

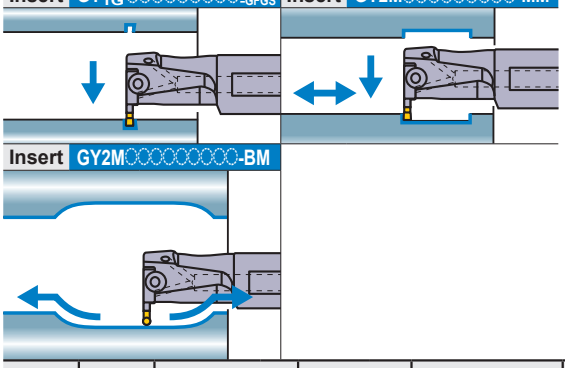
● : Gauge insert shown dimensions

IDENTIFICATION ➤ F008, F009
CUTTING CONDITIONS ➤ F213
INSTRUCTION MANUAL ➤ F215

GY SERIES (INTERNAL GROOVING)

6-2 90° type holder (Metric)

Insert GY2M○○○○○○○○○-GS/-GM
Insert GY2M○○○○○○○○○-GU
Insert GY1M/1G○○○○○○○○○-GM/-GFGS
Insert GY2G○○○○○○○○○-MF
Insert GY2M○○○○○○○○○-MS
Insert GY2M○○○○○○○○○-MM
Insert GY2M○○○○○○○○○-BM



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

●Mono block type (Air / coolant through)

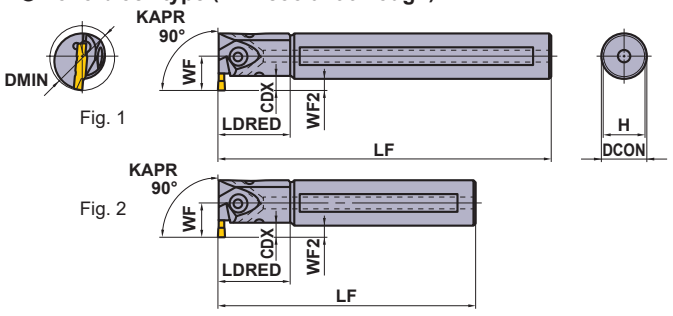


Fig. 1

Fig. 2

Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm) *3	DMIN (mm)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.
H	4.75 5.00 5.24	7	32	Mono Block	R	GYAR25K90B-H07	●	—	—	2
					L	GYAL25K90B-H07	●	—	—	2
				Mono Block	R	GYAR25R90B-H07	●	—	—	1
					L	GYAL25R90B-H07	●	—	—	1
		4.5—11.5 *1	40	Modular	R	GYDR32L90C-M20L	●	GYM20LA-H12	●	4
					L	GYDL32L90C-M20R	●	GYM20RA-H12	●	4
				Modular	R	GYDR32S90C-M20L	●	GYM20LA-H12	●	3
					L	GYDL32S90C-M20R	●	GYM20RA-H12	●	3
		6—11.5 *1	50	Modular	R	GYDR40M90D-M20L	●	GYM20LA-H12	●	4
					L	GYDL40M90D-M20R	●	GYM20RA-H12	●	4
				Modular	R	GYDR40T90D-M20L	●	GYM20LA-H12	●	3
					L	GYDL40T90D-M20R	●	GYM20RA-H12	●	3
		7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-H14	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-H14	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-H14	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-H14	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-H14	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-H14	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-H14	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-H14	●	3
J	6.00 6.31 6.35	7.5—13 *1	60	Modular	R	GYDR40M90D-M25L	●	GYM25LA-J14	●	4
					L	GYDL40M90D-M25R	●	GYM25RA-J14	●	4
				Modular	R	GYDR40T90D-M25L	●	GYM25LA-J14	●	3
					L	GYDL40T90D-M25R	●	GYM25RA-J14	●	3
			70	Modular	R	GYDR50P90F-M25L	●	GYM25LA-J14	●	4
					L	GYDL50P90F-M25R	●	GYM25RA-J14	●	4
				Modular	R	GYDR50T90F-M25L	●	GYM25LA-J14	●	3
					L	GYDL50T90F-M25R	●	GYM25RA-J14	●	3

CW = Cutting Width **CDX =** Max. Groove Depth **DMIN =** Minimum cutting diameter

*1 The maximum groove depth (**CDX**) varies according to the cutting diameter (**DMIN**). For details, please refer to page F212.
*2 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF, LDRED, WF** and **WF2** values may vary.
*3 The maximum groove depth (**CDX**) is a value within the dimension (**LDRED**).

●Modular blade type (Air / coolant through)

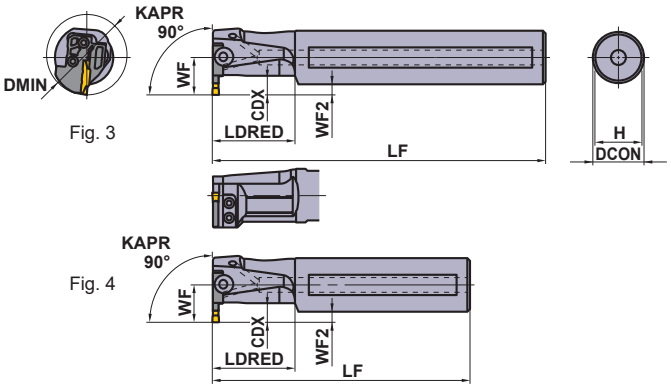


Fig. 3

Fig. 4

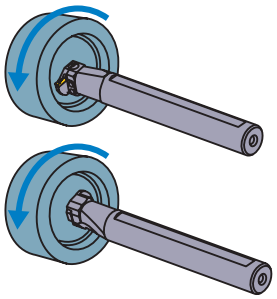
Right hand tool holder shown.

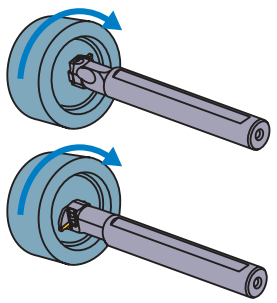
∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	① ② Clamp Screw	4 pcs. Blade Screw	① ② Wrench ∗
GYAR/L25○90B-○07	①GY05016S (Clamp Torque : 44 lbf-in)	–	①TKY20R
GYDR/L32○90C-M20L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
GYDR/L40○90D-M20L/R			
GYDR/L40○90D-M25L/R	②GY06013M (Clamp Torque : 53 lbf-in)	TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
GYDR/L50○90F-M25L/R			

Dimensions (mm) ∗2						Cutting Mode
DCON	LF	LDRED	WF	WF2	H	
25	125	40	19	6.5	23	R
25	125	40	19	6.5	23	
25	200	40	19	6.5	23	
25	200	40	19	6.5	23	
32	140	50	22	6.0	30	
32	140	50	22	6.0	30	
32	250	50	22	6.0	30	
32	250	50	22	6.0	30	
40	150	60	28	8.0	37	
40	150	60	28	8.0	37	
40	300	60	28	8.0	37	
40	300	60	28	8.0	37	
40	150	60	28	8.0	37	
40	150	60	28	8.0	37	
40	300	60	28	8.0	37	
40	300	60	28	8.0	37	
50	170	80	34	9.0	47	
50	170	80	34	9.0	47	
50	300	80	34	9.0	47	
50	300	80	34	9.0	47	
40	150	60	28	8.0	37	L
40	150	60	28	8.0	37	
40	300	60	28	8.0	37	
40	300	60	28	8.0	37	
50	170	80	34	9.0	47	
50	170	80	34	9.0	47	
50	300	80	34	9.0	47	
50	300	80	34	9.0	47	





Select an Insert

Seat Size	Insert Number
H	**GY○○0475/0500/0524H○○○○−Breaker**
J	**GY○○0600/0631/0635J○○○○−Breaker**

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)
H	.187", 4.75 mm	●	●	●	●
	.197", 5.00 mm	●	●	●	●
J	.236", 6.00 mm	●	●	●	
	.250", 6.35 mm	●	●	●	

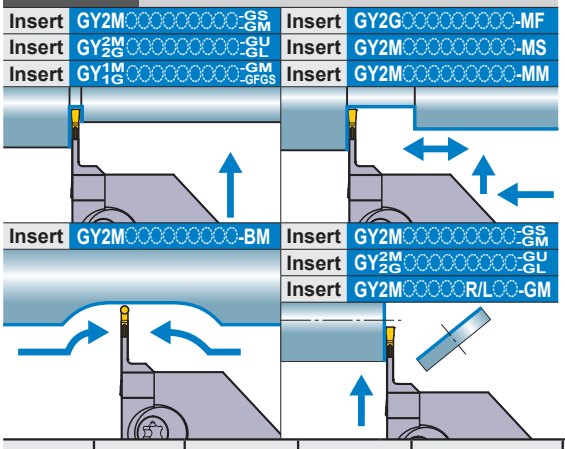
For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			
	.197", 5.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.206", 5.24 mm	●			
J	.236", 6.00 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●	●	●	
	RE 0.8 mm	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE 0.2 mm	●			
	RE 0.4 mm	●			
	RE 0.8 mm	●			

● : Gauge insert shown dimensions

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

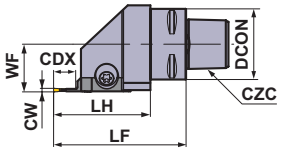


Fig. 1

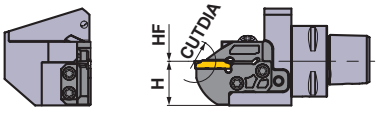
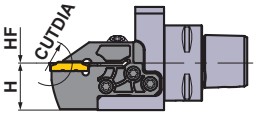


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.	CZC
						Holder	Stock	Modular Blade	Stock		
D	.079 .088	.236	.472	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-D06	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-D06	●	1	
				Modular	R	C4-GYHREX00-M25R	●	GYM25RA-D06	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-D06	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-D06	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-D06	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-D06	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-D06	●	1	
		.394	.787	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-D10	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-D10	●	1	
		.472	.945	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-D12	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-D12	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-D12	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-D12	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-D12	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-D12	●	1	
		.709*4	1.417	Modular	R	C3-GYHRDX00-M20R	●	GYM20RB-D18	●	2	C3
					L	C3-GYHLDX00-M20L	●	GYM20LB-D18	●	2	
		.787*1	1.575*2	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-D20	●	2	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-D20	●	2	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-D20	●	2	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-D20	●	2	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-D20	●	2	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-D20	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

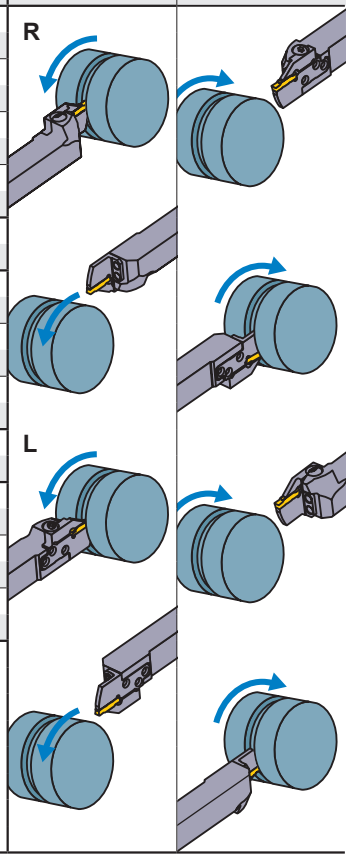
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

	Dimensions (inch) ∗3						Cutting Mode	
	DCON	LF	LH	WF	HF	H	Clockwise	Anticlockwise
	1.260	2.323	1.724	.866	0	.787	R	
	1.260	2.323	1.724	.866	0	.787		
	1.575	2.638	1.843	1.063	0	.984		
	1.575	2.638	1.843	1.063	0	.984		
	1.969	2.638	1.843	1.378	0	1.063		
	1.969	2.638	1.843	1.378	0	1.063		
	2.480	2.835	1.961	1.772	0	1.378		
	2.480	2.835	1.961	1.772	0	1.378		
	1.260	2.559	1.961	.866	0	.787		
	1.260	2.559	1.961	.866	0	.787		
	1.575	2.953	2.157	1.063	0	.984		
	1.575	2.953	2.157	1.063	0	.984		
	1.969	2.953	2.157	1.378	0	1.063		
	1.969	2.953	2.157	1.378	0	1.063		
	2.480	3.150	2.276	1.772	0	1.378		
	2.480	3.150	2.276	1.772	0	1.378		
	1.260	2.795	2.197	.866	0	.787	L	
	1.260	2.795	2.197	.866	0	.787		
	1.575	3.189	2.394	1.063	0	.984		
	1.575	3.189	2.394	1.063	0	.984		
	1.969	3.189	2.394	1.378	0	1.063		
	1.969	3.189	2.394	1.378	0	1.063		
	2.480	3.386	2.512	1.772	0	1.378		
	2.480	3.386	2.512	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
D	.079", 2.00 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
D	.079", 2.00 mm		●	●	●

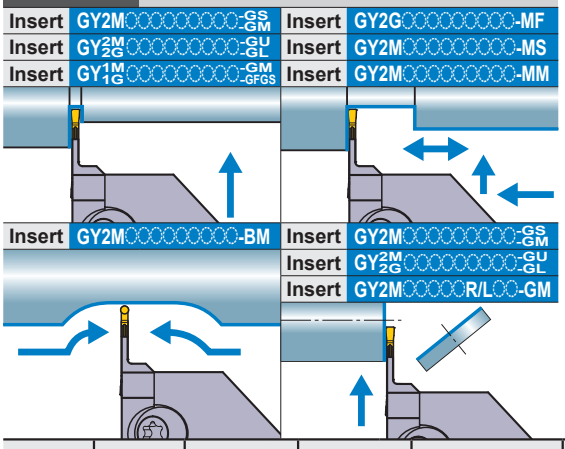
For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

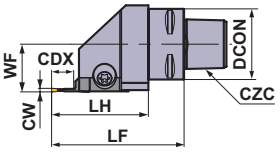


Fig. 1

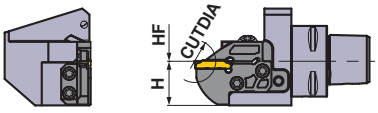
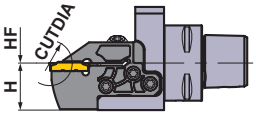


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.	CZC
E	.094 .098 .108	.236	.472	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-E06	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-E06	●	1	
				Modular	R	C4-GYHREX00-M25R	●	GYM25RA-E06	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-E06	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-E06	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-E06	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-E06	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-E06	●	1	
		.394	.787	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-E10	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-E10	●	1	
		.472	.945	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-E12	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-E12	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-E12	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-E12	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-E12	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-E12	●	1	
		.709*4	1.417	Modular	R	C3-GYHRDX00-M20R	●	GYM20RB-E18	●	2	C3
					L	C3-GYHLDX00-M20L	●	GYM20LB-E18	●	2	
		.787*1	1.575*2	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-E20	●	2	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-E20	●	2	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-E20	●	2	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-E20	●	2	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-E20	●	2	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-E20	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

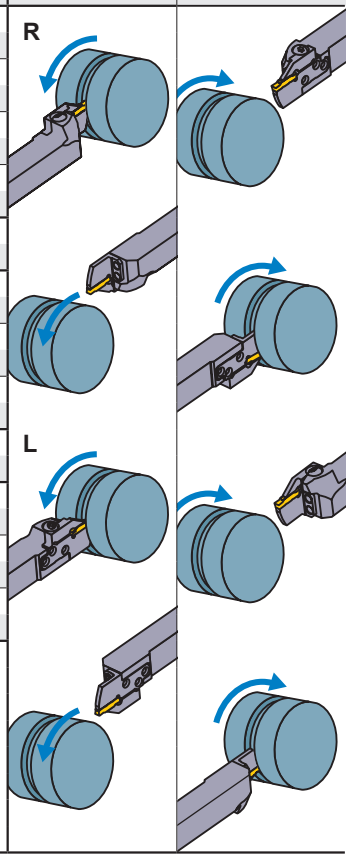
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

	Dimensions (inch) ∗3						Cutting Mode	
	DCON	LF	LH	WF	HF	H	Clockwise	Anticlockwise
	1.260	2.323	1.724	.866	0	.787	R	
	1.260	2.323	1.724	.866	0	.787		
	1.575	2.638	1.843	1.063	0	.984		
	1.575	2.638	1.843	1.063	0	.984		
	1.969	2.638	1.843	1.378	0	1.063		
	1.969	2.638	1.843	1.378	0	1.063		
	2.480	2.835	1.961	1.772	0	1.378		
	2.480	2.835	1.961	1.772	0	1.378		
	1.260	2.559	1.961	.866	0	.787		
	1.260	2.559	1.961	.866	0	.787		
	1.575	2.953	2.157	1.063	0	.984		
	1.575	2.953	2.157	1.063	0	.984		
	1.969	2.953	2.157	1.378	0	1.063		
	1.969	2.953	2.157	1.378	0	1.063		
	2.480	3.150	2.276	1.772	0	1.378		
	2.480	3.150	2.276	1.772	0	1.378		
	1.260	2.795	2.197	.866	0	.787	L	
	1.260	2.795	2.197	.866	0	.787		
	1.575	3.189	2.394	1.063	0	.984		
	1.575	3.189	2.394	1.063	0	.984		
	1.969	3.189	2.394	1.378	0	1.063		
	1.969	3.189	2.394	1.378	0	1.063		
	2.480	3.386	2.512	1.772	0	1.378		
	2.480	3.386	2.512	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○–Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
E	.098", 2.50 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

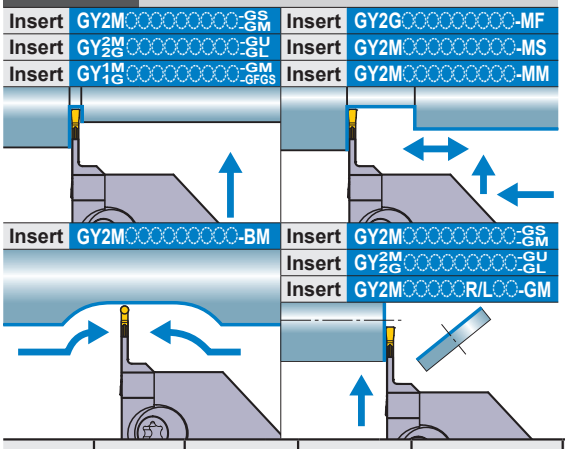
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

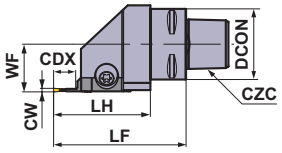


Fig. 1

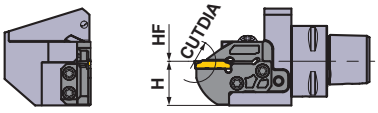
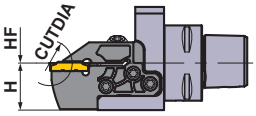


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.	CZC
F	.118 .125 .128	.236	.472	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-F06	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-F06	●	1	
				Modular	R	C4-GYHREX00-M25R	●	GYM25RA-F06	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-F06	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-F06	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-F06	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-F06	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-F06	●	1	
		.394	.787	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-F10	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-F10	●	1	
		.472	.945	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-F12	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-F12	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-F12	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-F12	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-F12	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-F12	●	1	
		.709*4	1.417	Modular	R	C3-GYHRDX00-M20R	●	GYM20RB-F18	●	2	C3
					L	C3-GYHLDX00-M20L	●	GYM20LB-F18	●	2	
		.787*1	1.575*2	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-F20	●	2	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-F20	●	2	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-F20	●	2	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-F20	●	2	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-F20	●	2	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-F20	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

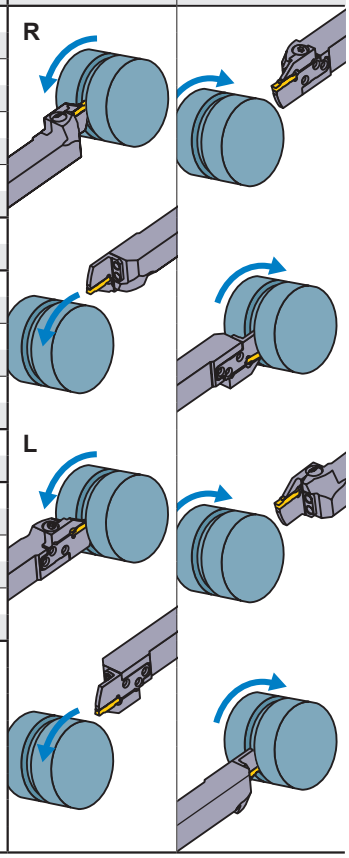
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

Dimensions (inch) ∗3						Cutting Mode	
DCON	LF	LH	WF	HF	H	Clockwise	Anticlockwise
1.260	2.323	1.724	.866	0	.787	R	
1.260	2.323	1.724	.866	0	.787		
1.575	2.638	1.843	1.063	0	.984		
1.575	2.638	1.843	1.063	0	.984		
1.969	2.638	1.843	1.378	0	1.063		
1.969	2.638	1.843	1.378	0	1.063		
2.480	2.835	1.961	1.772	0	1.378		
2.480	2.835	1.961	1.772	0	1.378		
1.260	2.559	1.961	.866	0	.787		
1.260	2.559	1.961	.866	0	.787		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.260	2.795	2.197	.866	0	.787	L	
1.260	2.795	2.197	.866	0	.787		
1.575	3.189	2.394	1.063	0	.984		
1.575	3.189	2.394	1.063	0	.984		
1.969	3.189	2.394	1.378	0	1.063		
1.969	3.189	2.394	1.378	0	1.063		
2.480	3.386	2.512	1.772	0	1.378		
2.480	3.386	2.512	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
F	.118", 3.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

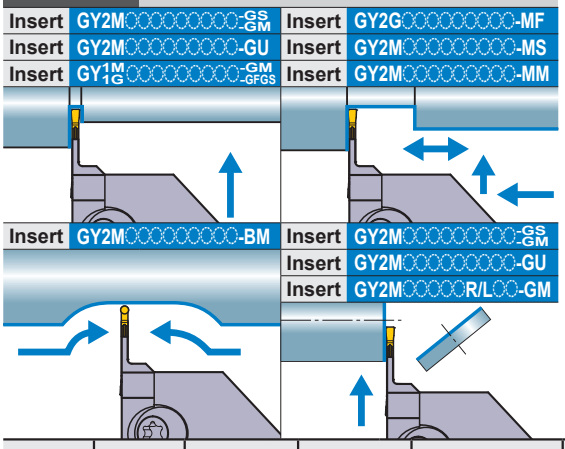
F

GROOVING / CUTTING OFF

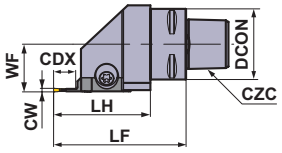
IDENTIFICATION ➤ F010
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



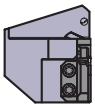


Fig. 1

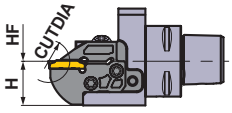
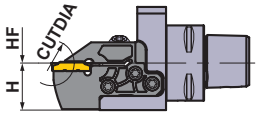


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.	CZC
						Holder	Stock	Modular Blade	Stock		
G	.157 .167	.315	.630	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-G08	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-G08	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-G08	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-G08	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-G08	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-G08	●	1	
		.472	.945	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-G12	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-G12	●	1	
		.551	1.102	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-G14	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-G14	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-G14	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-G14	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-G14	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-G14	●	1	
		.984*1	1.969*2	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-G25	●	2	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-G25	●	2	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-G25	●	2	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-G25	●	2	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-G25	●	2	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-G25	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

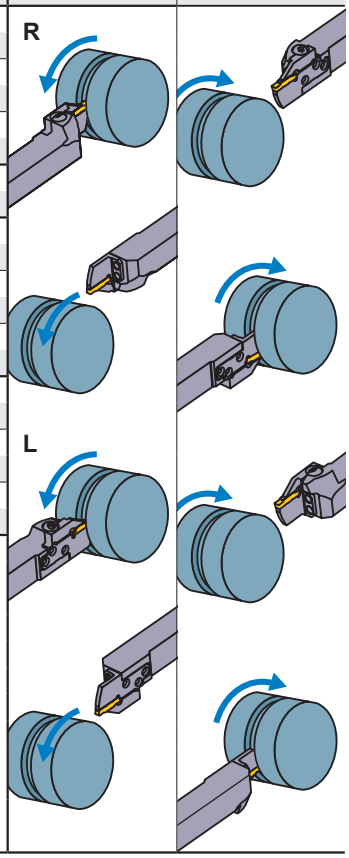
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

	Dimensions (inch) ∗3						Cutting Mode	
	DCON	LF	LH	WF	HF	H	Clockwise	Anticlockwise
	1.575	2.717	1.921	1.063	0	.984	R	
	1.575	2.717	1.921	1.063	0	.984		
	1.969	2.717	1.921	1.378	0	1.063		
	1.969	2.717	1.921	1.378	0	1.063		
	2.480	2.913	2.039	1.772	0	1.378		
	2.480	2.913	2.039	1.772	0	1.378		
	1.260	2.559	1.961	.866	0	.787		
	1.260	2.559	1.961	.866	0	.787		
	1.575	2.953	2.157	1.063	0	.984		
	1.575	2.953	2.157	1.063	0	.984		
	1.969	2.953	2.157	1.378	0	1.063		
	1.969	2.953	2.157	1.378	0	1.063		
	2.480	3.150	2.276	1.772	0	1.378		
	2.480	3.150	2.276	1.772	0	1.378		
	1.575	3.386	2.591	1.063	0	.984		
	1.575	3.386	2.591	1.063	0	.984		
	1.969	3.386	2.591	1.378	0	1.063	L	
	1.969	3.386	2.591	1.378	0	1.063		
	2.480	3.583	2.709	1.772	0	1.378		
	2.480	3.583	2.709	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
G	.157", 4.00 mm	●	●	●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

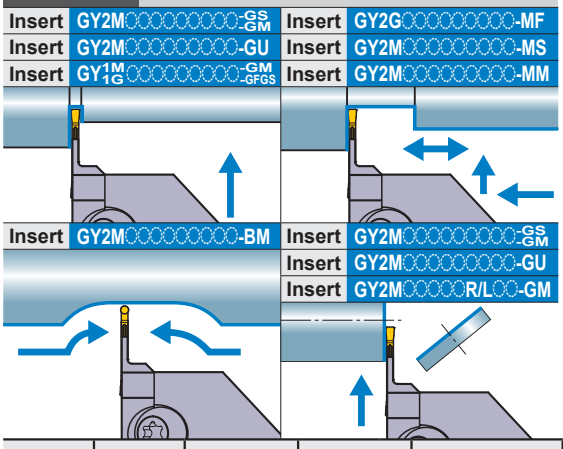
● : Gauge insert shown dimensions

F

GROOVING / CUTTING OFF

GY SERIES (EXTERNAL GROOVING PSC TYPE)

7-1 00° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.

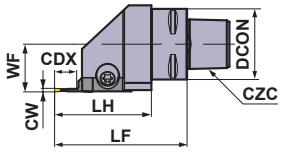
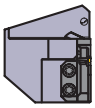


Fig. 1



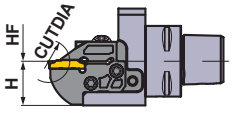
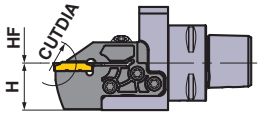


Fig. 2



Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.	CZC
						Holder	Stock	Modular Blade	Stock		
H	.187 .197 .206	.315	.630	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-H08	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-H08	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-H08	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-H08	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-H08	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-H08	●	1	
		.472	.945	Modular	R	C3-GYHRDX00-M20R	●	GYM20RA-H12	●	1	C3
					L	C3-GYHLDX00-M20L	●	GYM20LA-H12	●	1	
		.551	1.102	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-H14	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-H14	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-H14	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-H14	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-H14	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-H14	●	1	
		.984*1	1.969*2	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-H25	●	2	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-H25	●	2	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-H25	●	2	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-H25	●	2	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-H25	●	2	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-H25	●	2	
J	.236 .248 .250	.315	.630	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-J08	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-J08	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-J08	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-J08	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-J08	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-J08	●	1	
		.551	1.102	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-J14	●	1	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-J14	●	1	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-J14	●	1	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-J14	●	1	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-J14	●	1	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-J14	●	1	
		.984*1	1.969*2	Modular	R	C4-GYHREX00-M25R	●	GYM25RA-J25	●	2	C4
					L	C4-GYHLEX00-M25L	●	GYM25LA-J25	●	2	
				Modular	R	C5-GYHREX00-M25R	●	GYM25RA-J25	●	2	C5
					L	C5-GYHLEX00-M25L	●	GYM25LA-J25	●	2	
				Modular	R	C6-GYHRF00-M25R	●	GYM25RA-J25	●	2	C6
					L	C6-GYHLF00-M25L	●	GYM25LA-J25	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

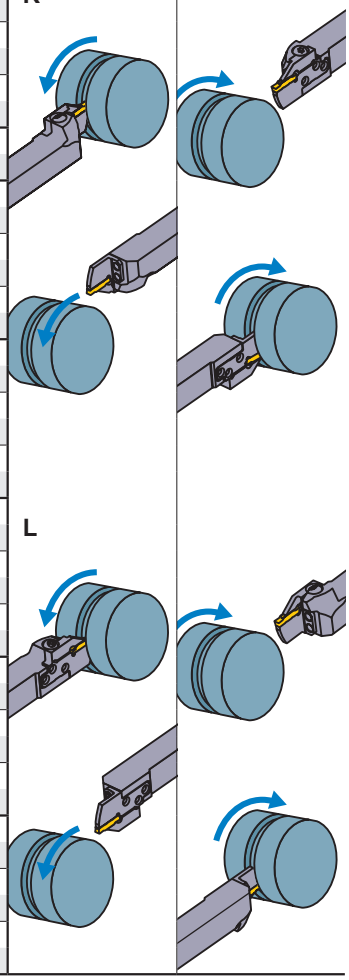
● : **USA Stock**

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LDX00-M20R/L	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LEX00-M25R/L		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LEX00-M25R/L			
C6-GYHR/LF00-M25R/L			

Dimensions (inch) ∗3						Cutting Mode	
DCON	LF	LH	WF	HF	H	Clockwise	Anticlockwise
1.575	2.717	1.921	1.063	0	.984	R	
1.575	2.717	1.921	1.063	0	.984		
1.969	2.717	1.921	1.378	0	1.063		
1.969	2.717	1.921	1.378	0	1.063		
2.480	2.913	2.039	1.772	0	1.378		
2.480	2.913	2.039	1.772	0	1.378		
1.260	2.559	1.961	.866	0	.787		
1.260	2.559	1.961	.866	0	.787		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.575	3.386	2.591	1.063	0	.984		
1.575	3.386	2.591	1.063	0	.984		
1.969	3.386	2.591	1.378	0	1.063		
1.969	3.386	2.591	1.378	0	1.063		
2.480	3.583	2.709	1.772	0	1.378		
2.480	3.583	2.709	1.772	0	1.378		
1.575	2.717	1.921	1.063	0	.984	L	
1.575	2.717	1.921	1.063	0	.984		
1.969	2.717	1.921	1.378	0	1.063		
1.969	2.717	1.921	1.378	0	1.063		
2.480	2.913	2.039	1.772	0	1.378		
2.480	2.913	2.039	1.772	0	1.378		
1.575	2.953	2.157	1.063	0	.984		
1.575	2.953	2.157	1.063	0	.984		
1.969	2.953	2.157	1.378	0	1.063		
1.969	2.953	2.157	1.378	0	1.063		
2.480	3.150	2.276	1.772	0	1.378		
2.480	3.150	2.276	1.772	0	1.378		
1.575	3.386	2.591	1.063	0	.984		
1.575	3.386	2.591	1.063	0	.984		
1.969	3.386	2.591	1.378	0	1.063		
1.969	3.386	2.591	1.378	0	1.063		
2.480	3.583	2.709	1.772	0	1.378		
2.480	3.583	2.709	1.772	0	1.378		



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
H	.187", 4.75 mm	●	●	●	●	
	.197", 5.00 mm	●	●	●	●	●
J	.236", 6.00 mm	●	●	●	●	
	.250", 6.35 mm	●	●	●		

For Multifunctional Grooving ➤ F013, F014

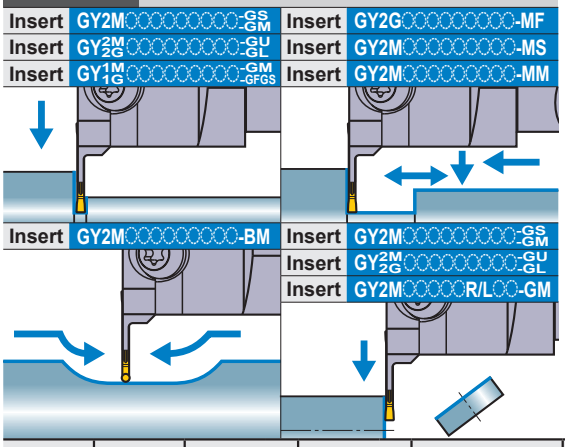
Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➤ F010
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1

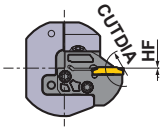
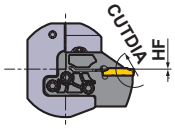
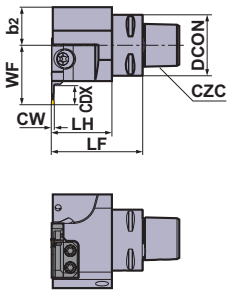


Fig. 2





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.	CZC
D	.079 .088	.236	.472	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-D06	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-D06	●	1	
				Modular	R	C4-GYHRD90-M25L	●	GYM25LA-D06	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-D06	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-D06	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-D06	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-D06	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-D06	●	1	
		.394	.787	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-D10	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-D10	●	1	
		.472	.945	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-D12	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-D12	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-D12	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-D12	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-D12	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-D12	●	1	
		.709*4	1.417	Modular	R	C3-GYHRCX90-M20L	●	GYM20LB-D18	●	2	C3
					L	C3-GYHLCX90-M20R	●	GYM20RB-D18	●	2	
		.787*1	1.575*2	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-D20	●	2	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-D20	●	2	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-D20	●	2	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-D20	●	2	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-D20	●	2	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-D20	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

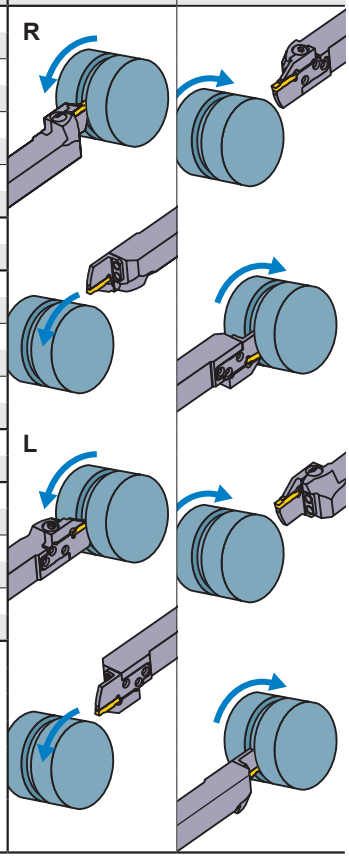
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) ∗3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b_2**	Clockwise	Anticlockwise
1.260	2.165	1.567	1.024	0	.787	R	
1.260	2.165	1.567	1.024	0	.787		
1.575	2.362	1.567	1.220	0	.984		
1.575	2.362	1.567	1.220	0	.984		
1.969	2.362	1.567	1.299	0	1.024		
1.969	2.362	1.567	1.299	0	1.024		
2.480	2.756	1.882	1.575	0	1.319		
2.480	2.756	1.882	1.575	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.260	2.165	1.567	1.496	0	.787	L	
1.260	2.165	1.567	1.496	0	.787		
1.575	2.362	1.567	1.772	0	.984		
1.575	2.362	1.567	1.772	0	.984		
1.969	2.362	1.567	1.850	0	1.024		
1.969	2.362	1.567	1.850	0	1.024		
2.480	2.756	1.882	2.126	0	1.319		
2.480	2.756	1.882	2.126	0	1.319		



Select an Insert

Seat Size	Insert Number
D	GY○○0200/0224D○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
D	.079", 2.00 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
D	.079", 2.00 mm		●	●	●

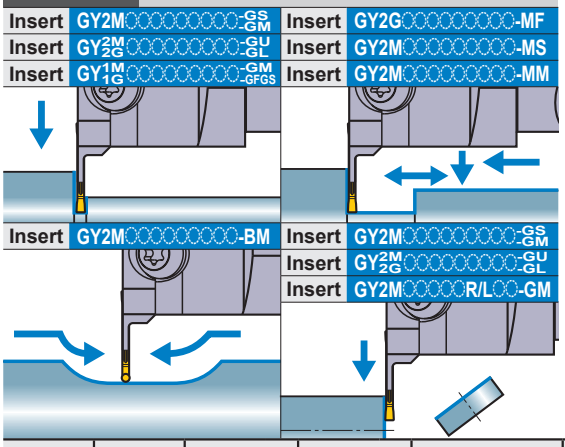
For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
D	.079", 2.00 mm	●	●	●	●
	.088", 2.24 mm	●			

● : Gauge insert shown dimensions

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

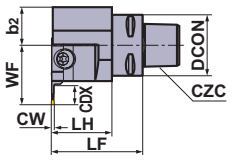


Fig. 1

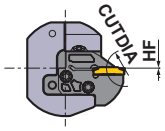
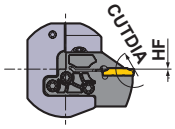
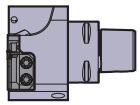


Fig. 2





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.	CZC
E	.094 .098 .108	.236	.472	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-E06	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-E06	●	1	
				Modular	R	C4-GYHRD90-M25L	●	GYM25LA-E06	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-E06	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-E06	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-E06	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-E06	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-E06	●	1	
		.394	.787	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-E10	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-E10	●	1	
		.472	.945	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-E12	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-E12	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-E12	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-E12	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-E12	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-E12	●	1	
		.709*4	1.417	Modular	R	C3-GYHRCX90-M20L	●	GYM20LB-E18	●	2	C3
					L	C3-GYHLCX90-M20R	●	GYM20RB-E18	●	2	
		.787*1	1.575*2	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-E20	●	2	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-E20	●	2	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-E20	●	2	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-E20	●	2	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-E20	●	2	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-E20	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

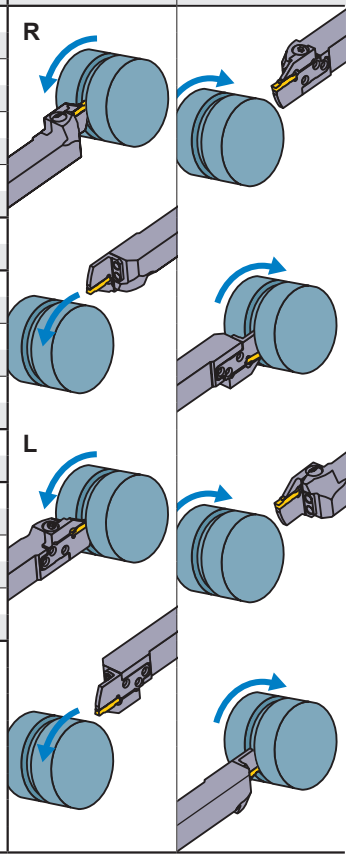
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) ∗3						Cutting Mode	
DCON	LF	LH	WF	HF	b_2	Clockwise	Anticlockwise
1.260	2.165	1.567	1.024	0	.787	R	
1.260	2.165	1.567	1.024	0	.787		
1.575	2.362	1.567	1.220	0	.984		
1.575	2.362	1.567	1.220	0	.984		
1.969	2.362	1.567	1.299	0	1.024		
1.969	2.362	1.567	1.299	0	1.024		
2.480	2.756	1.882	1.575	0	1.319		
2.480	2.756	1.882	1.575	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.260	2.165	1.567	1.496	0	.787	L	
1.260	2.165	1.567	1.496	0	.787		
1.575	2.362	1.567	1.772	0	.984		
1.575	2.362	1.567	1.772	0	.984		
1.969	2.362	1.567	1.850	0	1.024		
1.969	2.362	1.567	1.850	0	1.024		
2.480	2.756	1.882	2.126	0	1.319		
2.480	2.756	1.882	2.126	0	1.319		



Select an Insert

Seat Size	Insert Number
E	GY○○0239/0250/0274E○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
E	.094", 2.39 mm	●	●	●		●
	.098", 2.50 mm	●	●	●	●	●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
E	.098", 2.50 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
E	.094", 2.39 mm	●			
	.098", 2.50 mm	●	●	●	●
	.108", 2.74 mm	●			

● : Gauge insert shown dimensions

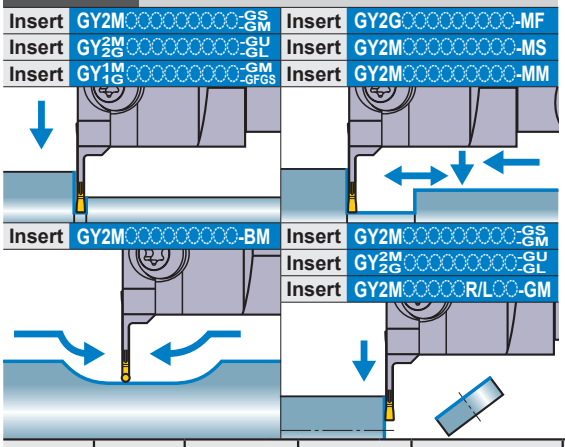
F

GROOVING / CUTTING OFF

IDENTIFICATION ➤ F010
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1

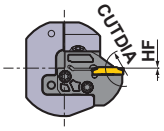
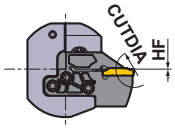
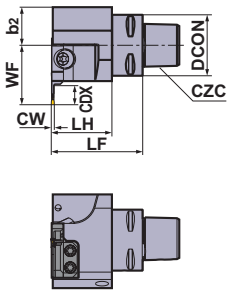


Fig. 2





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number Holder	Stock	Modular Blade	Stock	Fig.	CZC
F	.118 .125 .128	.236	.472	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-F06	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-F06	●	1	
				Modular	R	C4-GYHRD90-M25L	●	GYM25LA-F06	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-F06	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-F06	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-F06	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-F06	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-F06	●	1	
		.394	.787	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-F10	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-F10	●	1	
		.472	.945	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-F12	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-F12	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-F12	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-F12	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-F12	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-F12	●	1	
		.709*4	1.417	Modular	R	C3-GYHRCX90-M20L	●	GYM20LB-F18	●	2	C3
					L	C3-GYHLCX90-M20R	●	GYM20RB-F18	●	2	
		.787*1	1.575*2	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-F20	●	2	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-F20	●	2	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-F20	●	2	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-F20	●	2	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-F20	●	2	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-F20	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

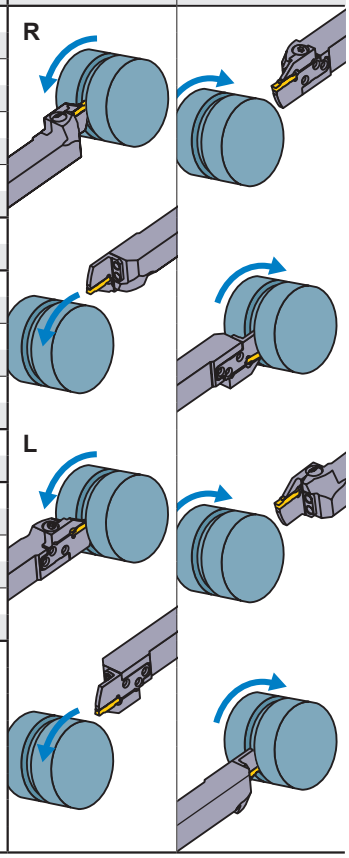
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) ∗3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b_2**	Clockwise	Anticlockwise
1.260	2.165	1.567	1.024	0	.787	R	
1.260	2.165	1.567	1.024	0	.787		
1.575	2.362	1.567	1.220	0	.984		
1.575	2.362	1.567	1.220	0	.984		
1.969	2.362	1.567	1.299	0	1.024		
1.969	2.362	1.567	1.299	0	1.024		
2.480	2.756	1.882	1.575	0	1.319		
2.480	2.756	1.882	1.575	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.260	2.165	1.567	1.496	0	.787	L	
1.260	2.165	1.567	1.496	0	.787		
1.575	2.362	1.567	1.772	0	.984		
1.575	2.362	1.567	1.772	0	.984		
1.969	2.362	1.567	1.850	0	1.024		
1.969	2.362	1.567	1.850	0	1.024		
2.480	2.756	1.882	2.126	0	1.319		
2.480	2.756	1.882	2.126	0	1.319		



Select an Insert

Seat Size	Insert Number
F	GY○○0300/0318/0324F○○○○−Breaker

For Grooving/Cutting off ➤ F011, F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GL (Aluminum Alloy)	GFGS (Hardened steel)
		Neutral	Neutral	Neutral	Neutral	Neutral
F	.118", 3.00 mm	●	●	●	●	●
	.125", 3.18 mm	●	●	●		●

For Cutting off ➤ F012

Seat Size	Breaker / CW	05-GS (Low)	08-GS (Low)	15-GS (Low)	05-GM (Medium)
		R	R	R	R/L
F	.118", 3.00 mm		●	●	●

For Multifunctional Grooving ➤ F013, F014

Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
F	.118", 3.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"			●	
	.125", 3.18 mm				●
	RE .008"	●			
	RE .016"	●			
	.128", 3.24 mm	●			

● : Gauge insert shown dimensions

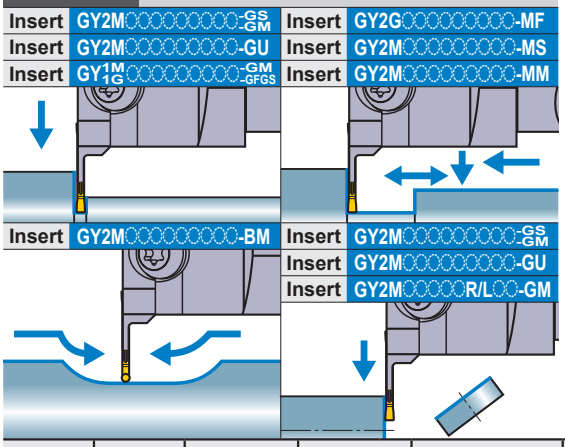
F

GROOVING / CUTTING OFF

IDENTIFICATION ➤ F010
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1

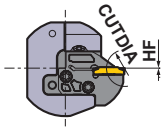
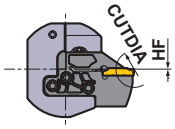
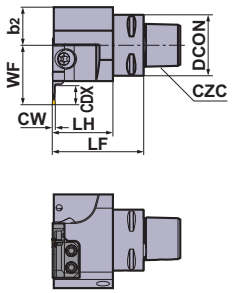


Fig. 2





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number				Fig.	CZC
						Holder	Stock	Modular Blade	Stock		
G	.157 .167	.315	.630	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-G08	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-G08	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-G08	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-G08	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-G08	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-G08	●	1	
		.472	.945	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-G12	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-G12	●	1	
		.551	1.102	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-G14	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-G14	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-G14	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-G14	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-G14	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-G14	●	1	
		.984*1	1.969*2	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-G25	●	2	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-G25	●	2	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-G25	●	2	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-G25	●	2	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-G25	●	2	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-G25	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

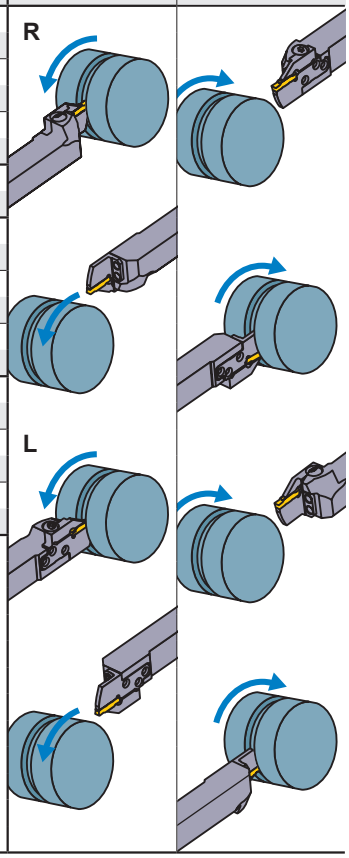
● : USA Stock

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw 5 pcs.	Wrench ∗
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) ∗3						Cutting Mode	
DCON	**LF**	**LH**	**WF**	**HF**	**b_2**	Clockwise	Anticlockwise
1.575	2.362	1.567	1.299	0	.984	R	
1.575	2.362	1.567	1.299	0	.984		
1.969	2.362	1.567	1.378	0	1.024		
1.969	2.362	1.567	1.378	0	1.024		
2.480	2.756	1.882	1.654	0	1.319		
2.480	2.756	1.882	1.654	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.575	2.362	1.567	1.969	0	.984		
1.575	2.362	1.567	1.969	0	.984		
1.969	2.362	1.567	2.047	0	1.024	L	
1.969	2.362	1.567	2.047	0	1.024		
2.480	2.756	1.882	2.323	0	1.319		
2.480	2.756	1.882	2.323	0	1.319		



Select an Insert

Seat Size	Insert Number
G	GY○○0400/0424G○○○○−Breaker

For Grooving/Cutting off ➢ F011—F013

Seat Size	Breaker / CW	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
G	.157", 4.00 mm	●	●	●	●	●

For Multifunctional Grooving ➢ F013, F014

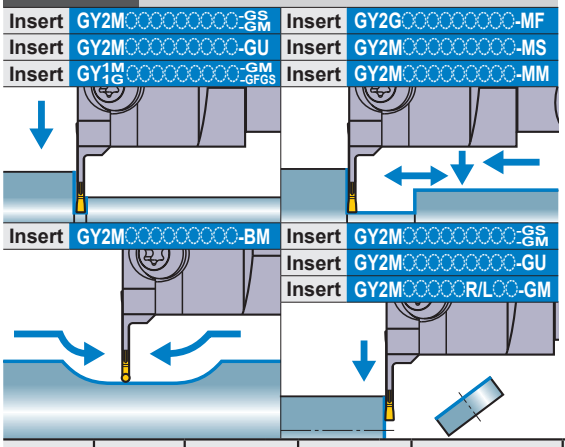
Seat Size	Breaker / CW	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
G	.157", 4.00 mm				●
	RE .008"	●	●	●	
	RE .016"	●	●	●	
	RE .031"	●		●	
	.167", 4.24 mm	●			

● : Gauge insert shown dimensions

IDENTIFICATION ➢ F010
CUTTING CONDITIONS ➢ F194
INSTRUCTION MANUAL ➢ F201

GY SERIES (EXTERNAL GROOVING PSC TYPE)

8-1 90° type holder (Inch)



Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.

Fig. 1

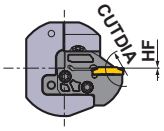
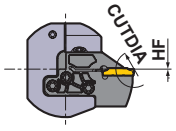
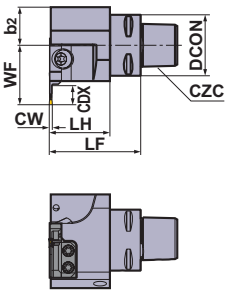


Fig. 2





Right hand tool holder shown.

Seat Size	CW (inch)	CDX (inch)	CUTDIA (inch)	Type	Hand (R/L)	Order Number: Holder	Stock	Order Number: Modular Blade	Stock	Fig.	CZC
H	.187 .197 .206	.315	.630	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-H08	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-H08	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-H08	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-H08	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-H08	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-H08	●	1	
		.472	.945	Modular	R	C3-GYHRCX90-M20L	●	GYM20LA-H12	●	1	C3
					L	C3-GYHLCX90-M20R	●	GYM20RA-H12	●	1	
		.551	1.102	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-H14	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-H14	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-H14	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-H14	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-H14	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-H14	●	1	
		.984*1	1.969*2	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-H25	●	2	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-H25	●	2	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-H25	●	2	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-H25	●	2	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-H25	●	2	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-H25	●	2	
J	.236 .248 .250	.315	.630	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-J08	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-J08	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-J08	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-J08	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-J08	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-J08	●	1	
		.551	1.102	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-J14	●	1	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-J14	●	1	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-J14	●	1	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-J14	●	1	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-J14	●	1	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-J14	●	1	
		.984*1	1.969*2	Modular	R	C4-GYHRD90-M25L	●	GYM25LA-J25	●	2	C4
					L	C4-GYHLD90-M25R	●	GYM25RA-J25	●	2	
				Modular	R	C5-GYHRD90-M25L	●	GYM25LA-J25	●	2	C5
					L	C5-GYHLD90-M25R	●	GYM25RA-J25	●	2	
				Modular	R	C6-GYHRE90-M25L	●	GYM25LA-J25	●	2	C6
					L	C6-GYHLE90-M25R	●	GYM25RA-J25	●	2	

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

*1 The maximum groove depth (**CDX**) varies according to the insert used. Please refer to the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*2 The maximum cut off diameter (**CUTDIA**) varies according to the insert used. The cut off diameter is double the maximum groove depth (**CDX**) of inserts on pages F011 to F015.
*3 Dimensions shown are when the gauge insert is used. If other insert geometries are used then **LF**, **LH** and **LH 2** values may vary.
*4 The maximum groove depth (**CDX**) is limited by the workpiece diameter. For details, please refer to page F196.

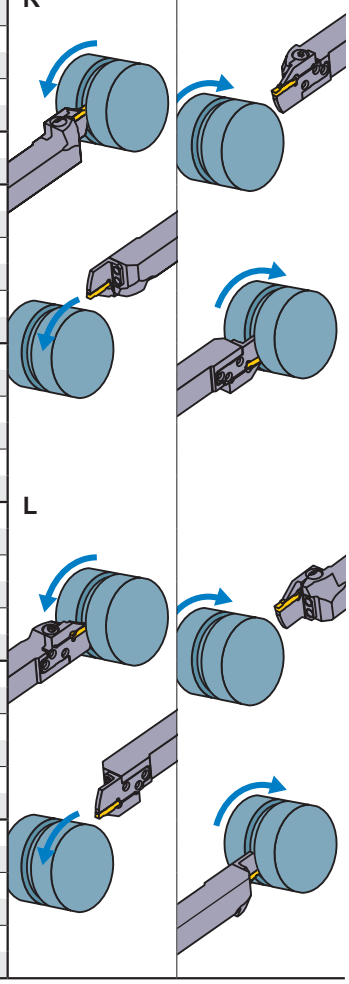
● : **USA Stock**

∗ Wrench : ① : Clamp Screw, ② : Blade Screw

SPARE PARTS

Holder Number	Clamp Screw	Blade Screw (5 pcs.)	Wrench ∗
C3-GYHR/LCX90-M20L/R	GY06013M (Clamp Torque : 53 lbf-in)	TS407 (Clamp Torque : 31 lbf-in)	①TKY30R ②TKY15D
C4-GYHR/LD90-M25L/R		TS55 (Clamp Torque : 44 lbf-in)	①TKY30R ②TKY25D
C5-GYHR/LD90-M25L/R			
C6-GYHR/LE90-M25L/R			

Dimensions (inch) ∗3						Cutting Mode	
DCON	LF	LH	WF	HF	b_2	Clockwise	Anticlockwise
1.575	2.362	1.567	1.299	0	.984	R	
1.575	2.362	1.567	1.299	0	.984		
1.969	2.362	1.567	1.378	0	1.024		
1.969	2.362	1.567	1.378	0	1.024		
2.480	2.756	1.882	1.654	0	1.319		
2.480	2.756	1.882	1.654	0	1.319		
1.260	2.165	1.567	1.260	0	.787		
1.260	2.165	1.567	1.260	0	.787		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.575	2.362	1.567	1.969	0	.984		
1.575	2.362	1.567	1.969	0	.984		
1.969	2.362	1.567	2.047	0	1.024		
1.969	2.362	1.567	2.047	0	1.024		
2.480	2.756	1.882	2.323	0	1.319		
2.480	2.756	1.882	2.323	0	1.319		
1.575	2.362	1.567	1.299	0	.984	L	
1.575	2.362	1.567	1.299	0	.984		
1.969	2.362	1.567	1.378	0	1.024		
1.969	2.362	1.567	1.378	0	1.024		
2.480	2.756	1.882	1.654	0	1.319		
2.480	2.756	1.882	1.654	0	1.319		
1.575	2.362	1.567	1.535	0	.984		
1.575	2.362	1.567	1.535	0	.984		
1.969	2.362	1.567	1.614	0	1.024		
1.969	2.362	1.567	1.614	0	1.024		
2.480	2.756	1.882	1.890	0	1.319		
2.480	2.756	1.882	1.890	0	1.319		
1.575	2.362	1.567	1.969	0	.984		
1.575	2.362	1.567	1.969	0	.984		
1.969	2.362	1.567	2.047	0	1.024		
1.969	2.362	1.567	2.047	0	1.024		
2.480	2.756	1.882	2.323	0	1.319		
2.480	2.756	1.882	2.323	0	1.319		



Select an Insert

Seat Size	Insert Number
H	GY○○0475/0500/0524H○○○○–Breaker
J	GY○○0600/0631/0635J○○○○–Breaker

For Grooving/Cutting off ➤ F011—F013

Seat Size	CW \ Breaker	GU (Gummy Steel)	GS (Low)	GM (Medium)	GFGS (Hardened steel)	05-GM (Cutting off)
		Neutral	Neutral	Neutral	Neutral	Hand
H	.187", 4.75 mm	●	●	●	●	
	.197", 5.00 mm	●	●	●	●	●
J	.236", 6.00 mm	●	●	●	●	
	.250", 6.35 mm	●	●	●		

For Multifunctional Grooving ➤ F013, F014

Seat Size	CW \ Breaker	MF (Finish)	MS (Low)	MM (Medium)	BM (Copying, Recessing)
					Ball nose
H	.187", 4.75 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			
	.197", 5.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.206", 5.24 mm	●			
J	.236", 6.00 mm				●
	RE .008"	●			
	RE .016"	●	●	●	
	RE .031"	●	●	●	
	.248", 6.31 mm	●			
	.250", 6.35 mm				●
	RE .008"	●			
	RE .016"	●			
	RE .031"	●			

● : Gauge insert shown dimensions

F

GROOVING / CUTTING OFF

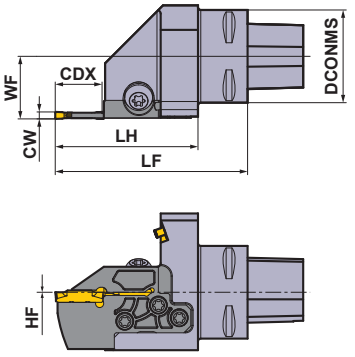
IDENTIFICATION ➤ F010
CUTTING CONDITIONS ➤ F194
INSTRUCTION MANUAL ➤ F201

GY SERIES (EXTERNAL / FACE GROOVING PSC TYPE)

7-2 00° type holder (Metric) NEW

P M K N S H

Note 1) For modular blades and holders, please order separately.
Note 2) Please use right hand modular blade for right hand holder and left hand modular blade for left hand holder.



Right hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM00-M25R	●	R	External	PSC40	40	2.0—6.35
C4-GYHELM00-M25L	●	L	External	PSC40	40	2.0—6.35
C5-GYHERM00-M25R	●	R	External	PSC50	50	2.0—6.35
C5-GYHELM00-M25L	●	L	External	PSC50	50	2.0—6.35
C6-GYHERM00-M25R	●	R	External	PSC63	63	2.0—6.35
C6-GYHELM00-M25L	●	L	External	PSC63	63	2.0—6.35

Set Dimensions with Modular Blades

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C4-GYHER/LM00-M25R/L	GYM25R/L○-D06	2.0	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-D12	2.0	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-D20	2.0	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E06	2.5	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E12	2.5	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-E20	2.5	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F06	3.0	6	27.0	0	69	47.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F12	3.0	12	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-F20	3.0	20	27.0	0	83	61.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G08	4.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G14	4.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-G25	4.0	25	27.0	0	88	66.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H08	5.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H14	5.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-H25	5.0	25	27.0	0	88	66.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J08	6.0	8	27.0	0	71	49.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J14	6.0	14	27.0	0	77	55.6
C4-GYHER/LM00-M25R/L	GYM25R/L○-J25	6.0	25	27.0	0	88	66.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.
Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255A-G GYGW Inserts".

● : USA Stock

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C5-GYHER/LM00-M25R/L	GYM25R/L○-D06	2.0	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-D12	2.0	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-D20	2.0	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-E06	2.5	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-E12	2.5	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-E20	2.5	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-F06	3.0	6	35.0	0	69	47.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-F12	3.0	12	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-F20	3.0	20	35.0	0	83	61.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-G08	4.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-G14	4.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-G25	4.0	25	35.0	0	88	66.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-H08	5.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-H14	5.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-H25	5.0	25	35.0	0	88	66.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-J08	6.0	8	35.0	0	71	49.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-J14	6.0	14	35.0	0	77	55.6
C5-GYHER/LM00-M25R/L	GYM25R/L○-J25	6.0	25	35.0	0	88	66.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-D06	2.0	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-D12	2.0	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-D20	2.0	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-E06	2.5	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-E12	2.5	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-E20	2.5	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-F06	3.0	6	45.0	0	71	47.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-F12	3.0	12	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-F20	3.0	20	45.0	0	85	61.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-G08	4.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-G14	4.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-G25	4.0	25	45.0	0	90	66.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-H08	5.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-H14	5.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-H25	5.0	25	45.0	0	90	66.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-J08	6.0	8	45.0	0	73	49.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-J14	6.0	14	45.0	0	79	55.6
C6-GYHER/LM00-M25R/L	GYM25R/L○-J25	6.0	25	45.0	0	90	66.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.
Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255A-G GYGW Inserts".

SPARE PARTS

*	*				
Clamp Screw	Blade Screw	Plug	Nozzle	Wrench 1	Wrench 2

Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number
GY06013M	1	TS55	5	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R

* Clamp Torque (lbf-in) : GY06013M=53, TS55=44
Nozzle Exchange Key : NZKH050S

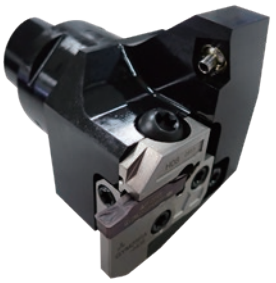
IDENTIFICATION	➤ F010
INSERTS	➤ F011—F015
CUTTING CONDITIONS	➤ F194, F206
INSTRUCTION MANUAL	➤ F201, F208

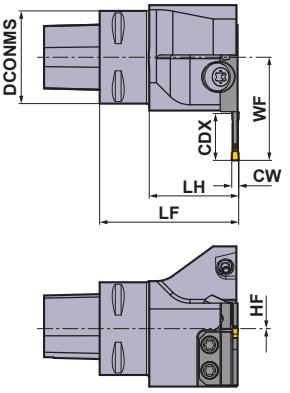
GY SERIES (EXTERNAL / FACE GROOVING PSC TYPE)

8-2 00° type holder (Metric) NEW

P M K N S H

Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.





Left hand tool holder shown.

(mm)

Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM90-M25L	●	R	External	PSC40	40	2.0—6.35
C4-GYHELM90-M25R	●	L	External	PSC40	40	2.0—6.35
C5-GYHERM90-M25L	★	R	External	PSC50	50	2.0—6.35
C5-GYHELM90-M25R	★	L	External	PSC50	50	2.0—6.35
C6-GYHERM90-M25L	★	R	External	PSC63	63	2.0—6.35
C6-GYHELM90-M25R	★	L	External	PSC63	63	2.0—6.35

Set Dimensions with Modular Blades

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C4-GYHER/LM90-M25L/R	GYM25L/R○-D06	2.0	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-D12	2.0	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-D20	2.0	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-E06	2.5	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-E12	2.5	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-E20	2.5	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-F06	3.0	6	30.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-F12	3.0	12	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-F20	3.0	20	44.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-G08	4.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-G14	4.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-G25	4.0	25	49.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-H08	5.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-H14	5.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-H25	5.0	25	49.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-J08	6.0	8	32.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-J14	6.0	14	38.5	0	60	38.6
C4-GYHER/LM90-M25L/R	GYM25L/R○-J25	6.0	25	49.5	0	60	38.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.
Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255A-G GYGW Inserts".

● : USA Stock ★ : Stocked in Japan

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	WF	HF	LF	LH
C5-GYHER/LM90-M25L/R	**GYM25L/R○-D06**	2.0	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-D12**	2.0	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-D20**	2.0	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-E06**	2.5	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-E12**	2.5	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-E20**	2.5	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-F06**	3.0	6	33.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-F12**	3.0	12	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-F20**	3.0	20	47.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-G08**	4.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-G14**	4.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-G25**	4.0	25	52.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-H08**	5.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-H14**	5.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-H25**	5.0	25	52.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-J08**	6.0	8	35.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-J14**	6.0	14	41.0	0	60	38.6
C5-GYHER/LM90-M25L/R	**GYM25L/R○-J25**	6.0	25	52.0	0	60	38.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-D06**	2.0	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-D12**	2.0	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-D20**	2.0	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-E06**	2.5	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-E12**	2.5	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-E20**	2.5	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-F06**	3.0	6	40.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-F12**	3.0	12	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-F20**	3.0	20	54.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-G08**	4.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-G14**	4.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-G25**	4.0	25	59.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-H08**	5.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-H14**	5.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-H25**	5.0	25	59.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-J08**	6.0	8	42.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-J14**	6.0	14	48.0	0	70	46.6
C6-GYHER/LM90-M25L/R	**GYM25L/R○-J25**	6.0	25	59.0	0	70	46.6

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "○" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (GM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255A-G GYGW Inserts".

SPARE PARTS

*	*				
Clamp Screw	Blade Screw	Plug	Nozzle	Wrench 1	Wrench 2

Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number
GY06013M	1	TS55	5	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R

* Clamp Torque (lbf-in) : GY06013M=53, TS55=44
Nozzle Exchange Key : NZKH050S

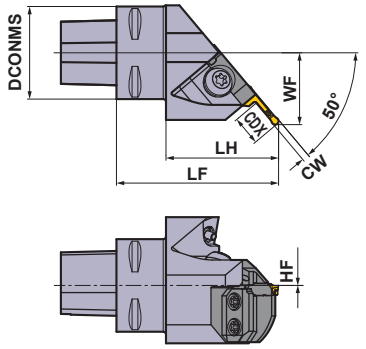
IDENTIFICATION	**➤ F010**
INSERTS	**➤ F011—F015**
CUTTING CONDITIONS	**➤ F194, F206**
INSTRUCTION MANUAL	**➤ F201, F208**

GY SERIES (EXTERNAL RECESSING PSC TYPE)

9-2 50° type holder (Metric) NEW

P M K N S H

Note 1) For modular blades and holders, please order separately.
Note 2) Please use left hand modular blade for right hand holder and right hand modular blade for left hand holder.



Left hand tool holder shown.

(mm)

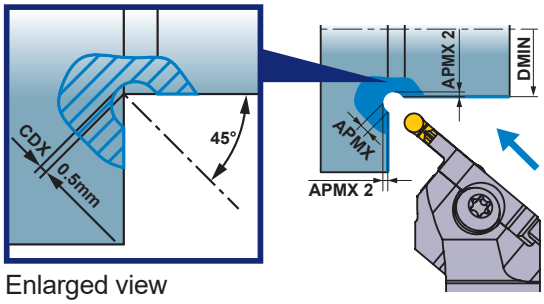
Order Number	Stock	Hand (R/L)	Coolant	Mounting Size	DCONMS	CW
C4-GYHERM50-M25L	●	R	External	PSC40	40	2.0—6.35
C4-GYHELM50-M25R	●	L	External	PSC40	40	2.0—6.35
C5-GYHERM50-M25L	★	R	External	PSC50	50	2.0—6.35
C5-GYHELM50-M25R	★	L	External	PSC50	50	2.0—6.35
C6-GYHERM50-M25L	★	R	External	PSC63	63	2.0—6.35
C6-GYHELM50-M25R	★	L	External	PSC63	63	2.0—6.35

SPARE PARTS

*		*							
Clamp Screw		Blade Screw		Plug		Nozzle		Wrench 1	Wrench 2
Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Pcs.	Order Number	Order Number
GY06013M	1	TS55	4	HSD05004S	1	NZ22042080S	1	TKY25D	TKY30R

* Clamp Torque (lbf-in) : GY06013M=53, TS55=44
Nozzle Exchange Key : NZKH050S

● : USA Stock ★ : Stocked in Japan



Enlarged view

Set Dimensions with Modular Blades

(mm)

Holder Type	Modular Blade Type	Standard CW	CDX	DMIN	APMX	APMX2	WF	HF	LF	LH
C4-GYHER/LM50-M25L/R	**GYM25L/RC-D005**	2.0	0.5	30	1.50	0.646	30.6	0	70.2	48.8
C4-GYHER/LM50-M25L/R	**GYM25L/RC-E005**	2.5	0.5	30	1.75	0.720	30.8	0	70.1	48.7
C4-GYHER/LM50-M25L/R	**GYM25L/RC-F005**	3.0	0.5	30	2.00	0.793	31.0	0	70.0	48.6
C4-GYHER/LM50-M25L/R	**GYM25L/RC-G005**	4.0	0.5	20	2.50	0.939	31.4	0	69.8	48.4
C4-GYHER/LM50-M25L/R	**GYM25L/RC-H005**	5.0	0.5	20	2.88	1.049	31.8	0	69.6	48.2
C4-GYHER/LM50-M25L/R	**GYM25L/RC-J005**	6.0	0.5	20	3.50	1.232	32.4	0	69.4	48.0
C5-GYHER/LM50-M25L/R	**GYM25L/RC-D005**	2.0	0.5	30	1.50	0.646	32.6	0	70.2	48.8
C5-GYHER/LM50-M25L/R	**GYM25L/RC-E005**	2.5	0.5	30	1.75	0.720	32.8	0	70.1	48.7
C5-GYHER/LM50-M25L/R	**GYM25L/RC-F005**	3.0	0.5	30	2.00	0.793	33.0	0	70.0	48.6
C5-GYHER/LM50-M25L/R	**GYM25L/RC-G005**	4.0	0.5	20	2.50	0.939	33.4	0	69.8	48.4
C5-GYHER/LM50-M25L/R	**GYM25L/RC-H005**	5.0	0.5	20	2.88	1.049	33.8	0	69.6	48.2
C5-GYHER/LM50-M25L/R	**GYM25L/RC-J005**	6.0	0.5	20	3.50	1.232	34.4	0	69.4	48.0
C6-GYHER/LM50-M25L/R	**GYM25L/RC-D005**	2.0	0.5	30	1.50	0.646	39.6	0	70.2	46.8
C6-GYHER/LM50-M25L/R	**GYM25L/RC-E005**	2.5	0.5	30	1.75	0.720	39.8	0	70.1	46.7
C6-GYHER/LM50-M25L/R	**GYM25L/RC-F005**	3.0	0.5	30	2.00	0.793	40.0	0	70.0	46.6
C6-GYHER/LM50-M25L/R	**GYM25L/RC-G005**	4.0	0.5	20	2.50	0.939	40.4	0	69.8	46.4
C6-GYHER/LM50-M25L/R	**GYM25L/RC-H005**	5.0	0.5	20	2.88	1.049	40.8	0	69.6	46.2
C6-GYHER/LM50-M25L/R	**GYM25L/RC-J005**	6.0	0.5	20	3.50	1.232	41.4	0	69.4	46.0

DMIN = Min. Cut Diameter

*Modular blade type: Blades for face machining indicate a code for the minimum face grooving diameter. Example) GYM25RD-D12-040
The "◌" symbol is a position to insert the letter "A" for external diameter machining or "D" for face machining.

Note 1) The indicated dimensions are values for standard inserts (BM breakers). If other inserts are mounted, LF and LH may differ. Select the inserts and recommended conditions from "TOOL NEWS B255A-G GYGW Inserts".

IDENTIFICATION ➤ F010
INSERTS ➤ F014
CUTTING CONDITIONS ➤ F200
INSTRUCTION MANUAL ➤ F200

RECOMMENDED CUTTING SPEED (SFM) [For External Grooving / Cutting Off]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820 985 1640
P	Mild Steel	≤160HB	VP20RT	330 – 720
			VP10RT	360 – 755
			NX2525	295 – 690
	Carbon Steel Alloy Steel	160–280HB	VP20RT	260 – 590
			VP10RT	295 – 620
			MY5015	360 – 820
			NX2525	230 – 560
		≥280HB	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
M	Stainless Steel	≤270HB	VP20RT	195 – 460
			VP10RT	230 – 490
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	260 – 590
			VP10RT	295 – 620
			MY5015	460 – 985
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	130 – 330
			MP9025	100 – 295
			VP20RT	100 – 195
			VP10RT / RT9010	130 – 230
H	Hardened steel	≥50HRC	BC8110	260 – 395
N	Aluminum Alloy	Content Si<5%	RT9010	655 – 1640
	Aluminum Alloy	Content 5%≤Si≤10%	RT9010	655 – 1640
	Aluminum Alloy	Content Si>10%	RT9010	330 – 655

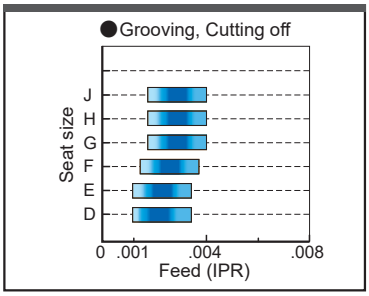
Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

RECOMMENDED CUTTING CONDITIONS [For External Grooving / Cutting Off]

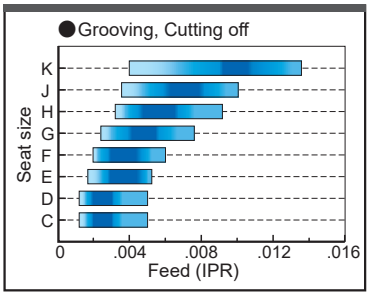
*Below are the recommended cutting conditions when using the modular type holder GYHR/L2525M00/90-M25R/L with the modular blade GYM25R/LA-○○○.

■ Recommended feed rate and depth of cut

GU BREAKER



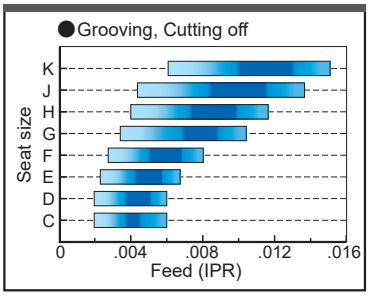
GS BREAKER



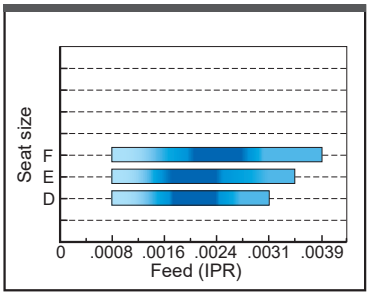
: 1st recommended area

Seat Size			
	Insert Width		Insert Width
C	.059", 1.50 mm	G	.157", 4.00 mm .167", 4.24 mm
D	.079", 2.00 mm .088", 2.24 mm	H	.187", 4.75 mm .197", 5.00 mm .206", 5.24 mm
E	.094", 2.39 mm .098", 2.50 mm .108", 2.74 mm	J	.236", 6.00 mm .248", 6.31 mm .250", 6.35 mm
F	.118", 3.00 mm .125", 3.18 mm .128", 3.24 mm	K	.315", 8.00 mm

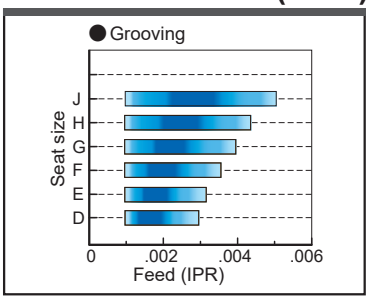
GM BREAKER



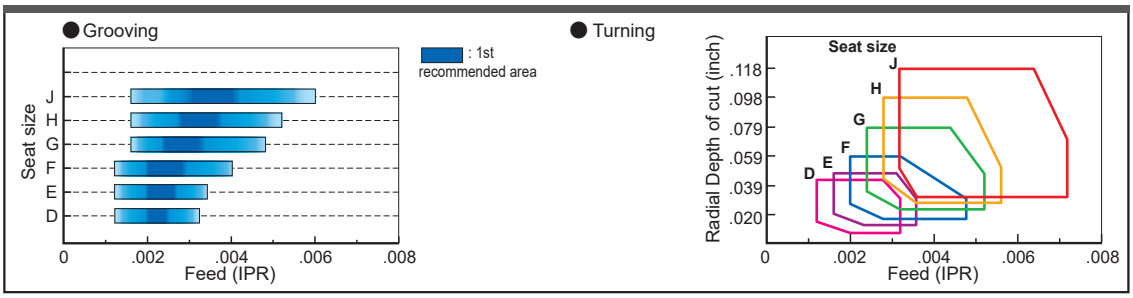
GL BREAKER



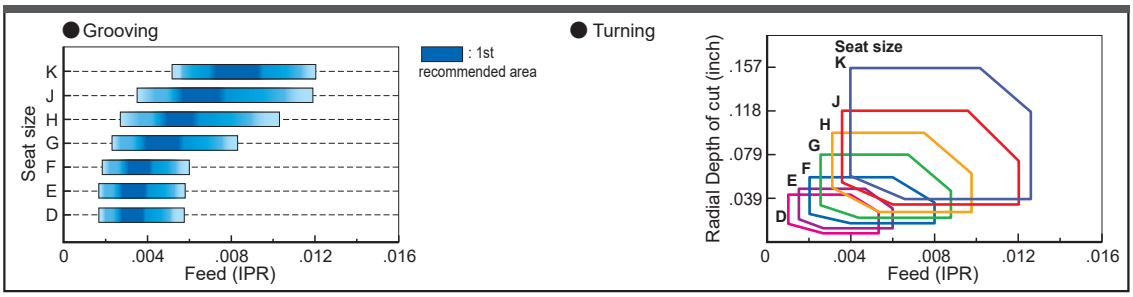
FLAT TOP GFGS (CBN)



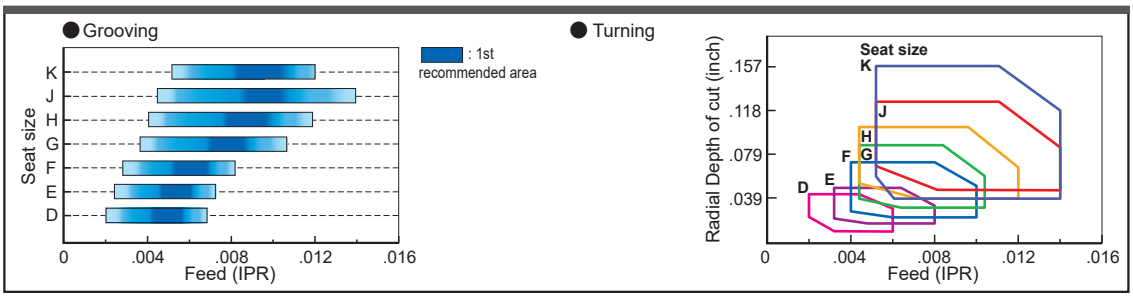
MF BREAKER



MS BREAKER

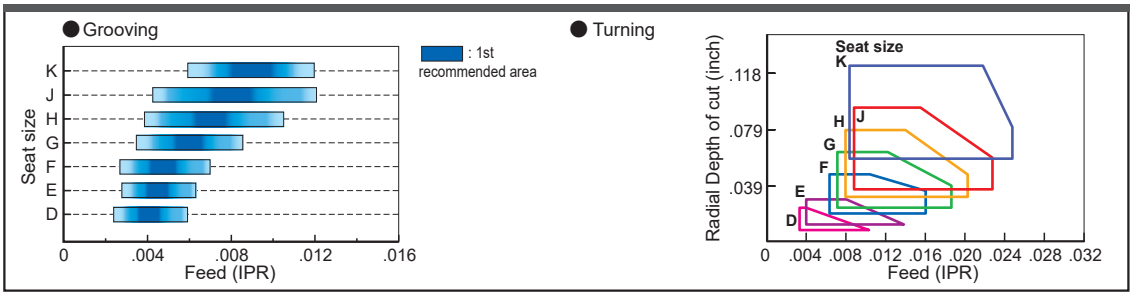


MM BREAKER



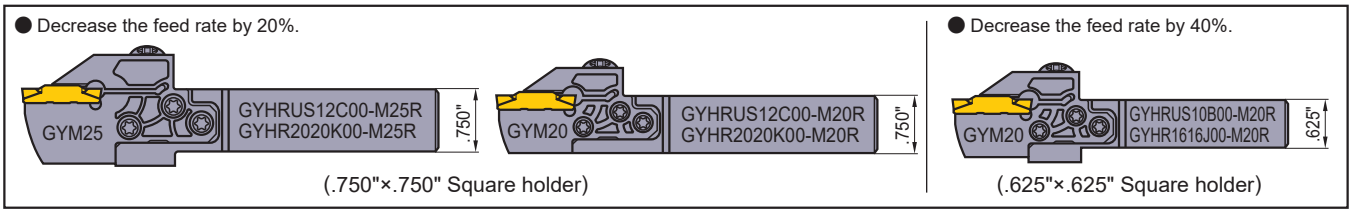
■ Recommended feed rate and depth of cut

BM BREAKER

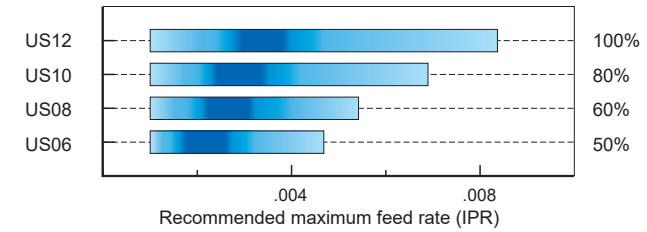


Seat Size	Insert Width
C	.059", 1.50 mm
D	.079", 2.00 mm .088", 2.24 mm
E	.094", 2.39 mm .098", 2.50 mm .108", 2.74 mm
F	.118", 3.00 mm .125", 3.18 mm .128", 3.24 mm
G	.157", 4.00 mm .167", 4.24 mm
H	.187", 4.75 mm .197", 5.00 mm .206", 5.24 mm
J	.236", 6.00 mm .248", 6.31 mm .250", 6.35 mm
K	.315", 8.00 mm

Note 1) When using a combination as shown below, decrease the recommended feed rate by 20% and 40% respectively.



■ For Swiss-type lathes mono block holder

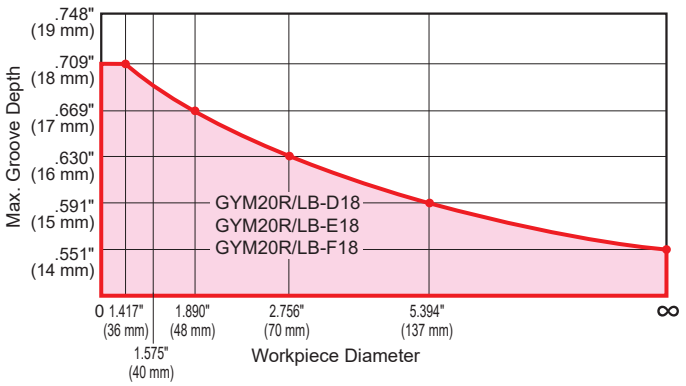


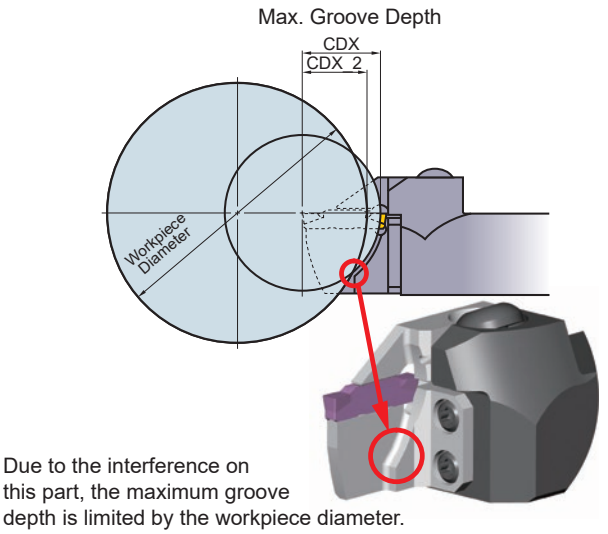
Please refer to the tables of recommended cutting conditions for external grooving.
Apply the percentage ratio shown of each shank size to the values in those tables.

LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

•When using the modular blade GYM○○R/LA-○○○
The maximum groove depth is not limited by the workpiece diameter.

•When using the modular blade GYM○○R/LB-○○○
The maximum groove depth is limited by the workpiece diameter.



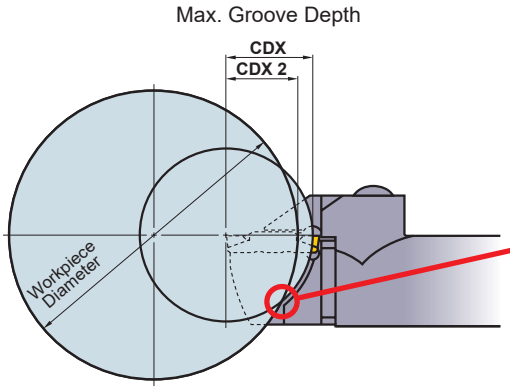


Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

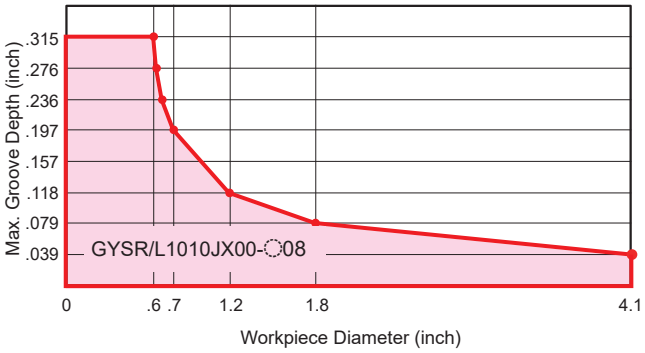
LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

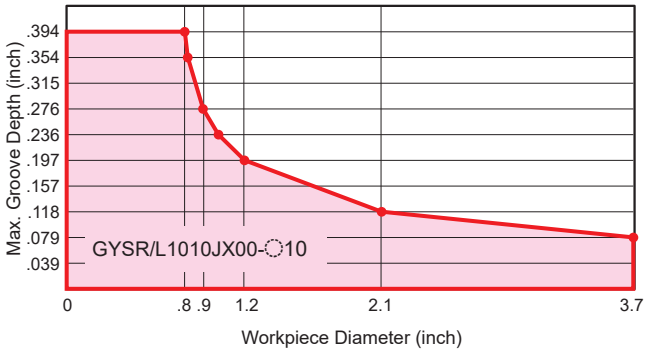
•In The Case of Mono Block Type Holder for Swiss-Type Lathes

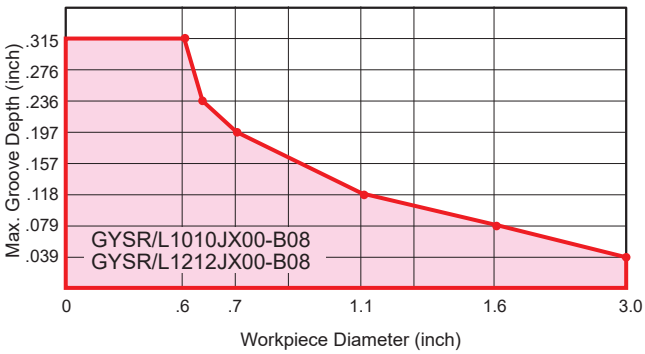
The maximum groove depth is limited by the workpiece diameter.

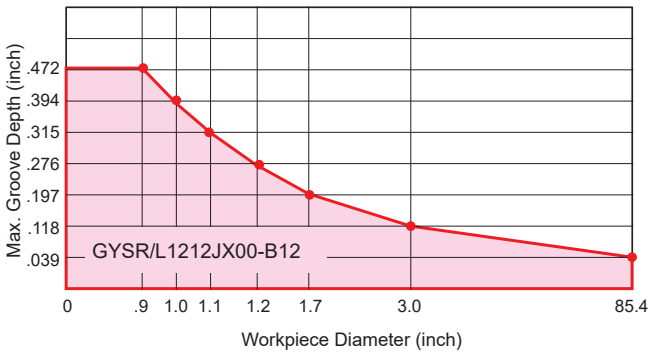


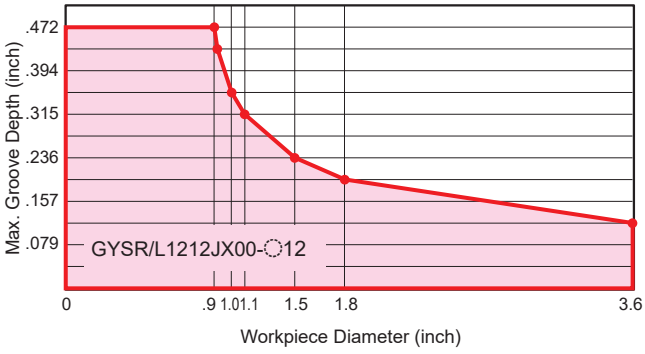
Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

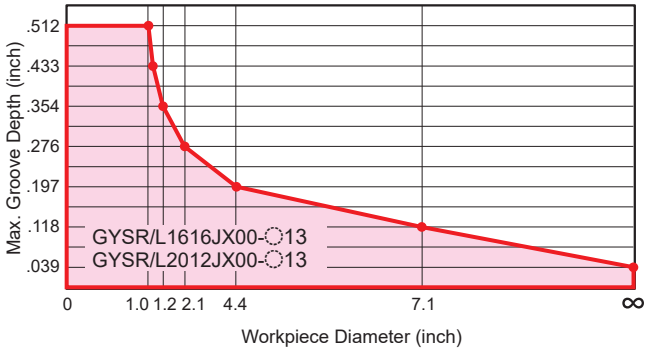


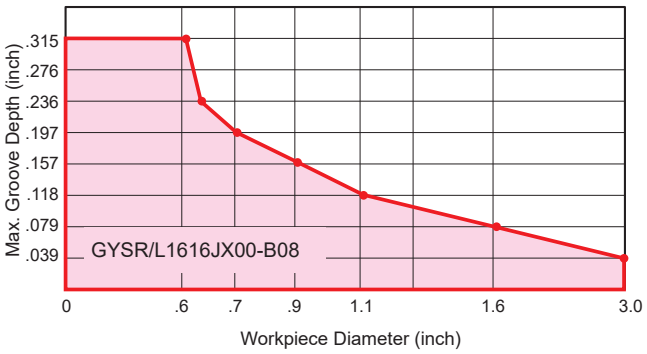


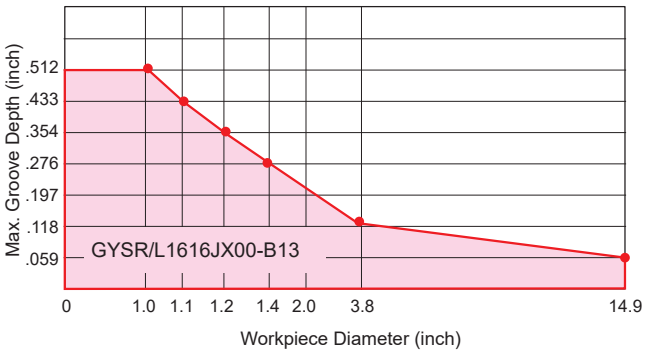


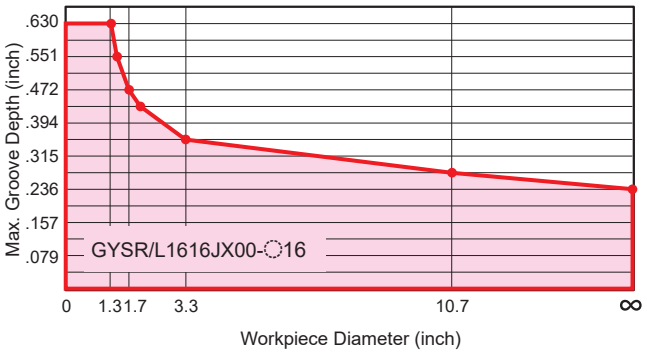


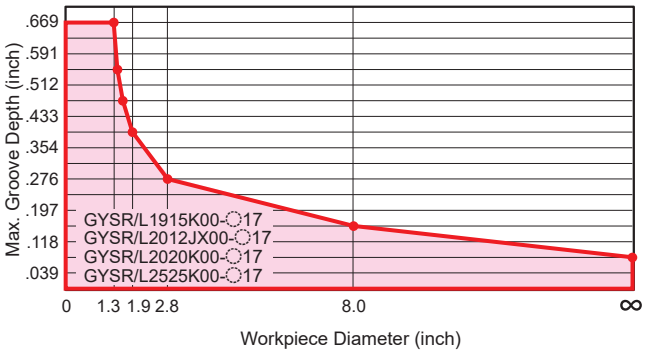





Max. Groove Depth (inch)
.315
.276
.236
.197
.157
.118
.079
.039
GYSR/L1616JX00-B08
0
.6
.7
.9
1.1
1.6
3.0
Workpiece Diameter (inch)


Max. Groove Depth (inch)
.512
.433
.354
.276
.197
.118
.059
GYSR/L1616JX00-B13
0
1.0
1.1
1.2
1.4
2.0
3.8
14.9
Workpiece Diameter (inch)

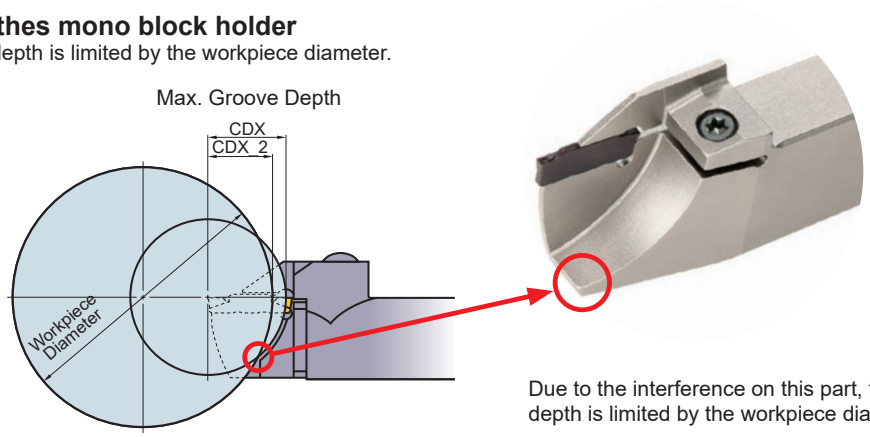

Max. Groove Depth (inch)
.630
.551
.472
.394
.315
.236
.157
.079
GYSR/L1616JX00-○16
0
1.3
1.7
3.3
10.7
∞
Workpiece Diameter (inch)


Max. Groove Depth (inch)
.669
.591
.512
.433
.354
.276
.197
.118
.039
GYSR/L1915K00-○17
GYSR/L2012JX00-○17
GYSR/L2020K00-○17
GYSR/L2525K00-○17
0
1.3
1.9
2.8
8.0
∞
Workpiece Diameter (inch)

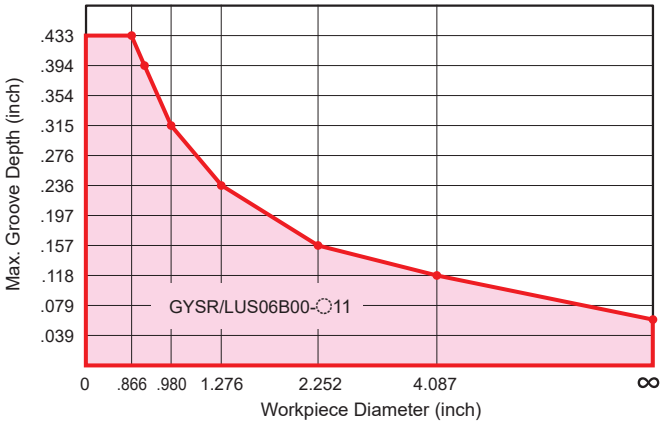
LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

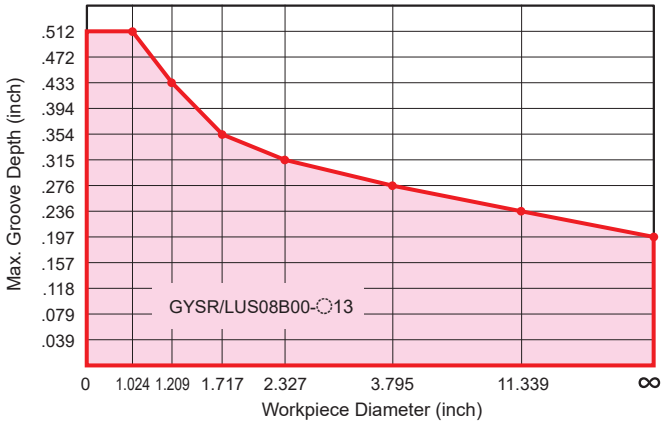
•For Swiss-type lathes mono block holder

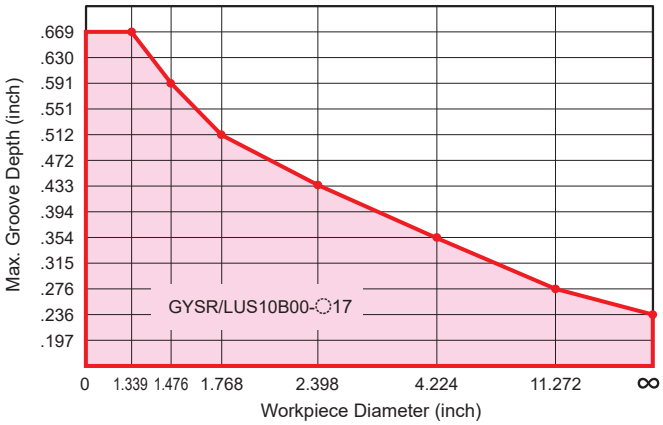
The maximum groove depth is limited by the workpiece diameter.

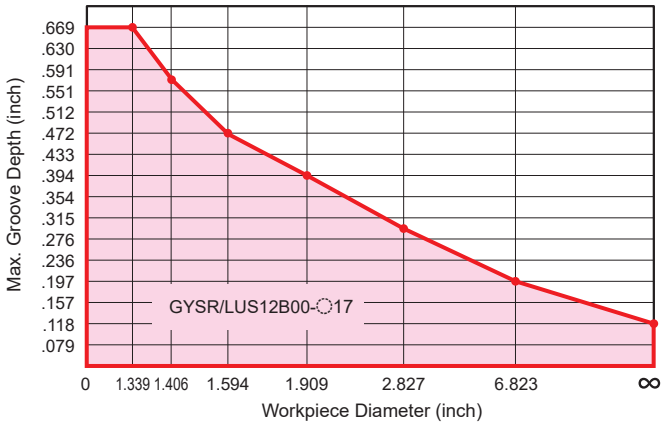


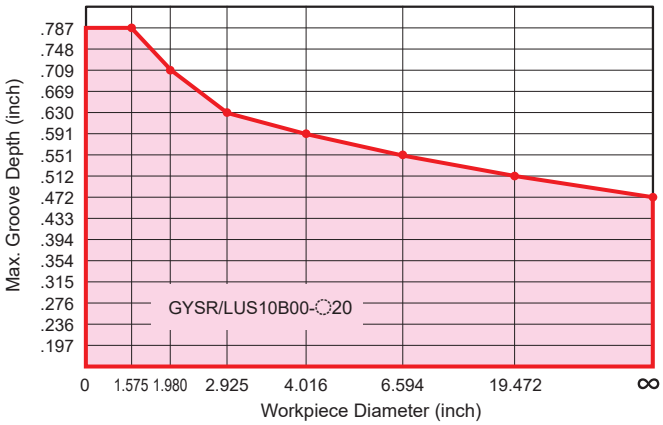
Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

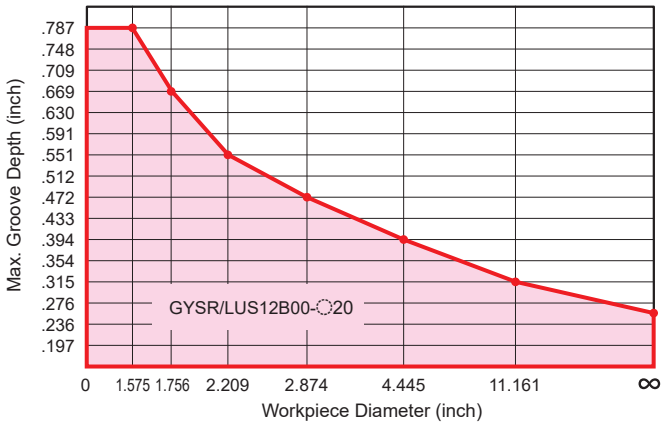










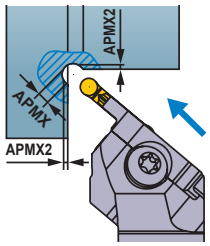


RECOMMENDED CUTTING SPEED (SFM) [For External Recessing]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820
P	Mild Steel	≤180HB	VP20RT	260 – 590
			VP10RT	295 – 620
	Carbon Steel Alloy Steel	180–280HB	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
		280–350HB	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤350HB	VP20RT	165 – 360
			VP10RT	195 – 395
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	130 – 330
			MP9025	100 – 295
			VP20RT	100 – 195
			VP10RT	130 – 230

Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

DISTANCE FROM THE WORKPIECE TO THE RECESS DEPTH

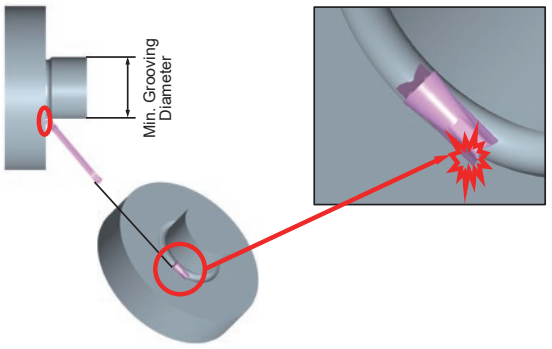


Cutting Width CW	Recessing Depth APMX	Distance workpiece to the recess depth APMX2
.079", 2.00 mm	.059", 1.50 mm	.025", 0.646 mm
.098", 2.50 mm	.069", 1.75 mm	.028", 0.720 mm
.118", 3.00 mm	.079", 2.00 mm	.031", 0.793 mm
.125", 3.18 mm	.082", 2.09 mm	.032", 0.819 mm
.157", 4.00 mm	.098", 2.50 mm	.037", 0.939 mm
.187", 4.75 mm	.113", 2.88 mm	.041", 1.049 mm
.197", 5.00 mm	.118", 3.00 mm	.043", 1.086 mm
.236", 6.00 mm	.138", 3.50 mm	.049", 1.232 mm
.250", 6.35 mm	.145", 3.68 mm	.051", 1.283 mm

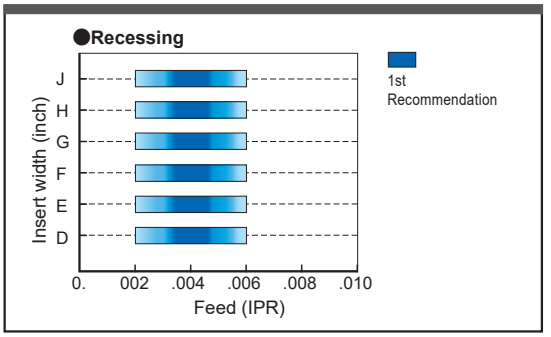
BM BREAKER

Minimum grooving diameter

Ensure the tool is suitable for the diameter being machined. Refer to the Min. Grooving Diameter as shown in the table on the first page to avoid a collision with the workpiece as shown below.

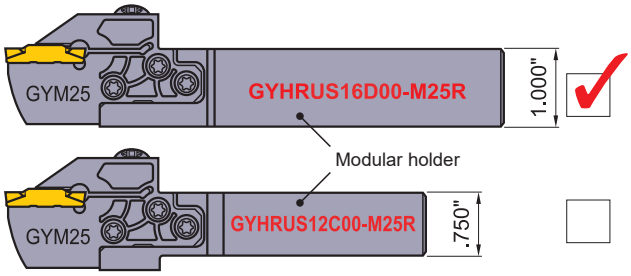


■Recommended feed rate and depth of cut



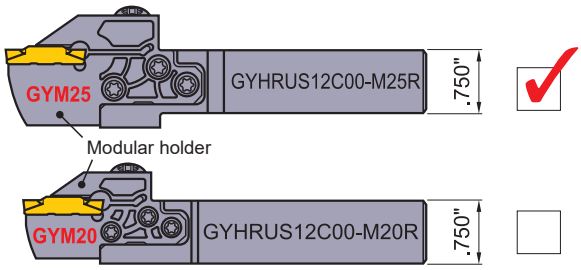
Notes when selecting the tool body

Modular holder



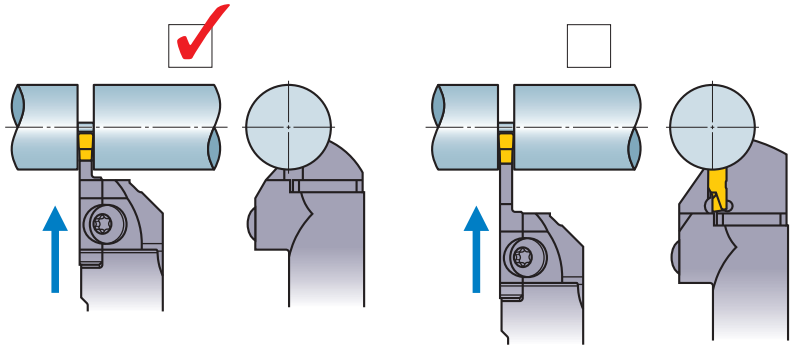
●To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

Modular blade (1)



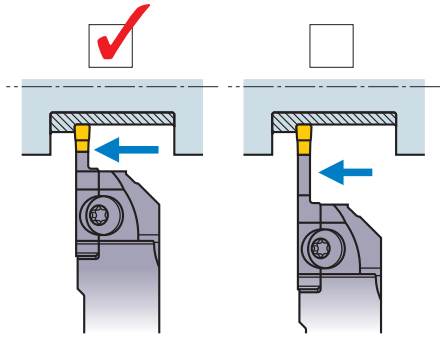
●If there is no restriction for use, select the largest modular blade for the same shank size.

Modular blade (2)



●Select the shortest possible blade suitable for the application.

Modular blade (3)

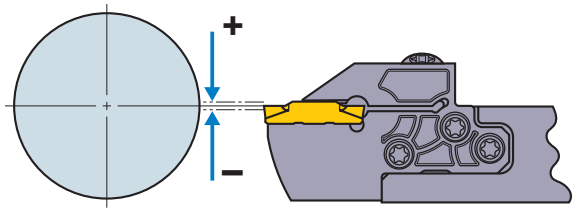


●Select the shortest possible blade suitable for the application.

✓: **Recommended.**

Notes when setting the tool

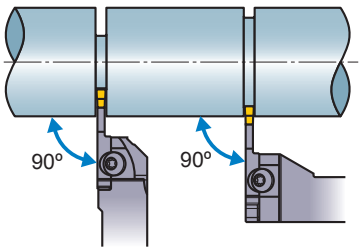
Setting of cutting edge height



<Grooving/Cross-feed machining>
Set the cutting edge height to ±.004" parallel to the central axis.

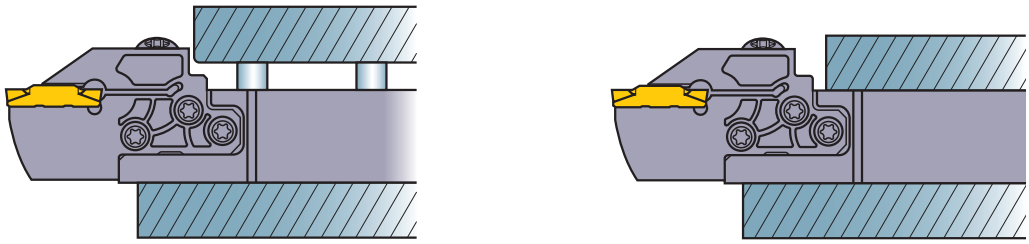
<Cutting off>
Set the cutting edge height to 0–+.008" parallel to the central axis.

Tool body setting angle



●Set the insert perpendicular to the central axis.

Overhang

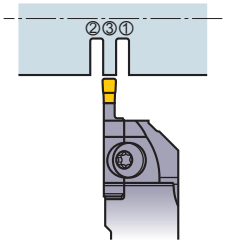


●When setting the tool, ensure that the overhang is as short as possible and avoid the step difference part as above figure shows.

MACHINING RECOMMENDATIONS

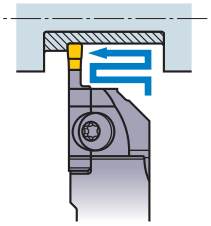
Notes on multi-functional machining (MF·MS and MM breakers)

Machining narrow grooves



●It is recommended to carry out plunging in several passes. Following the steps above makes it difficult for chips to elongate. This also improves the accuracy of workpiece wall surface.

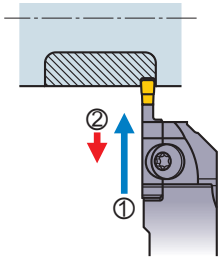
Machining wide grooves



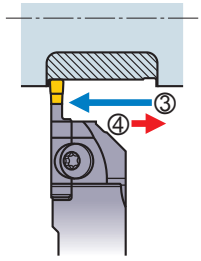
●It is recommended that cross-feed machining is used.

Machining wide grooves

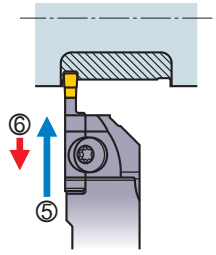
Roughing



①Carry out grooving.
②Retract the tool approx .004".

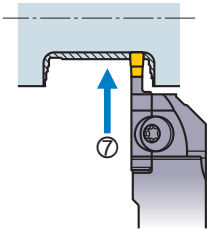


③Carry out cross feed machining.
④Retract the tool approx .004".

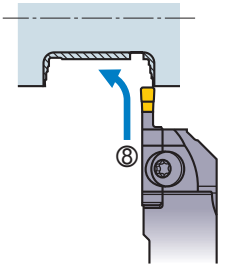


⑤Carry out grooving.
⑥Retract the tool approx .004".
* Repeat the steps ①–⑥.

Finishing

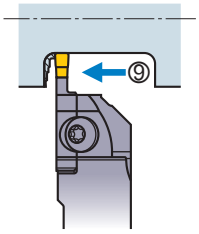


⑦Carry out grooving to the end point of the corner radius.

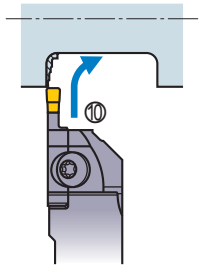


⑧Machining of the wall surface, corner radius and bottom face should be carried out in one process.

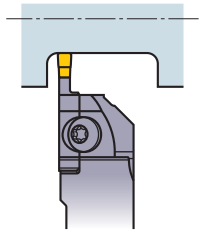
Finishing



⑨Stop at the bottom of the corner radius.

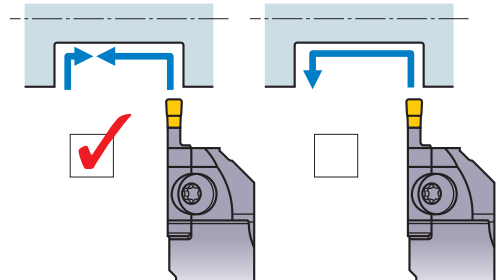


⑩Machine the counter wall to the corner radius in one process.



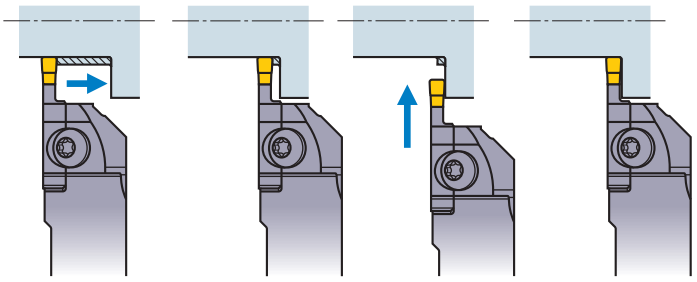
⑪Finish machining.

Precautions when finishing walls



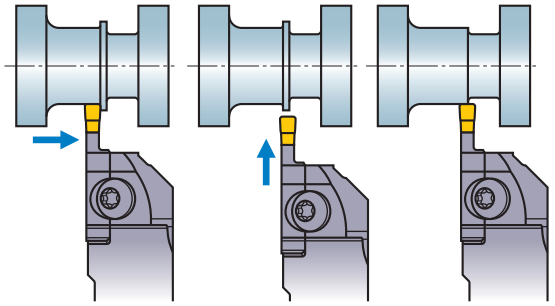
●To produce high accuracy walls using MS or MM breaker insert, do not carry out back turning. Plunging is recommended.

Wall machining



●When machining a wall, chip jamming can occur. In this case, stop cross feed machining just before the wall (at a point less than the insert width) then remove the remaining material by plunging.

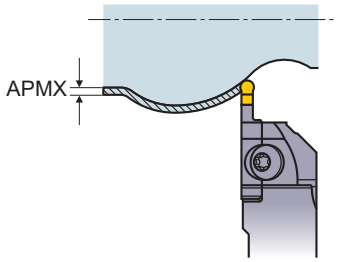
Machining of a ring section



●When a ring remains in a cross feed end process, finish cross feed machining .040"–.059" short of the end point, then remove the ring by plunging.

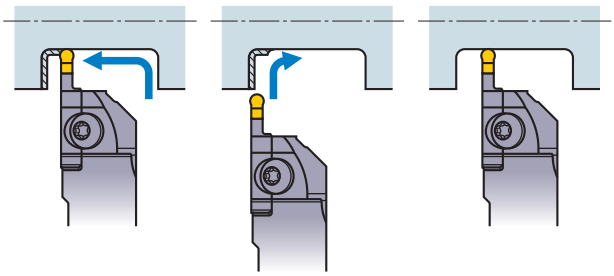
Notes on multi-functional machining (BM breaker)

Copying



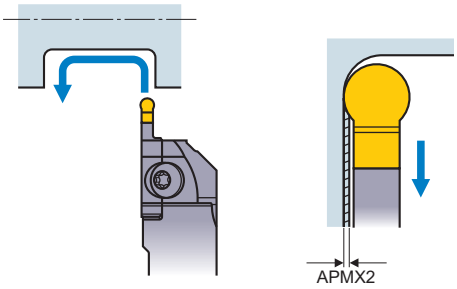
●With the BM breaker insert, 3 dimensional copying is possible.
Set the depth of cut (APMX) to 40% less than the insert width.

Roughing



●Use plunging and cross-feed machining.
When machining the corner, vibration is likely to occur. To avoid this, reduce the feed by 50%.

Finishing



●Carry out finishing in one process.
For the depth of cut (APMX2) when back turning, refer to the table on the right.

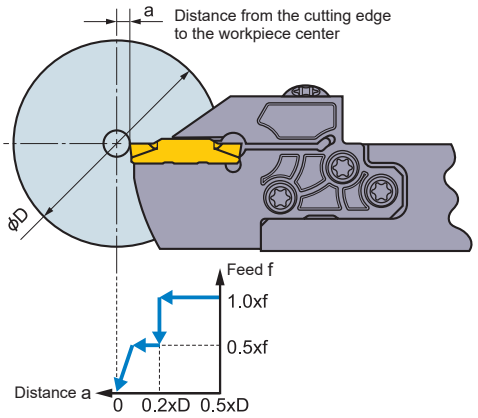
Insert	APMX2 (inch)
GY2M0200D100N-BM	.002
GY2M0250E125N-BM	.004
GY2M0300F150N-BM	.006
GY2M0318F159N-BM	
GY2M0400G200N-BM	.008
GY2M0475H238N-BM	.009
GY2M0500H250N-BM	
GY2M0600J150N-BM	.012
GY2M0635J318N-BM	
GY2M0800K400N-BM	.016

MACHINING RECOMMENDATIONS

Notes for cutting off

feed

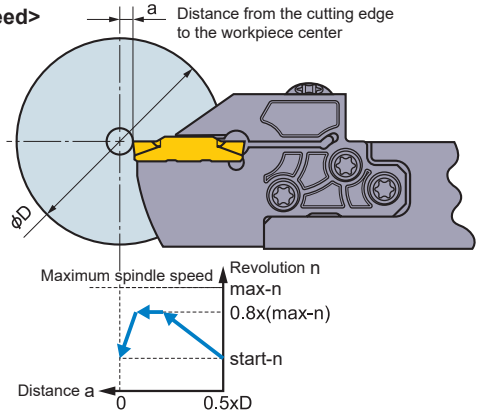
<Feed>



- When the cutting edge approaches the center, reduce the feed by 50%.
- If necessary, stop the feed prior to reaching the center of the workpiece. The part will fall off because of its own weight.

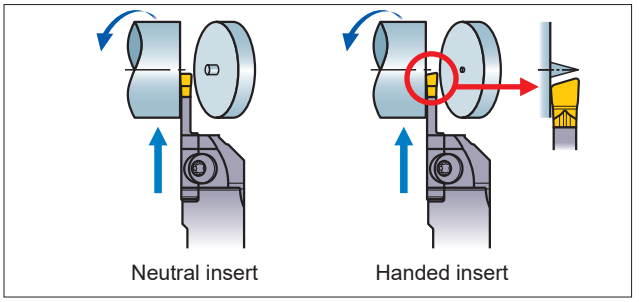
Revolution

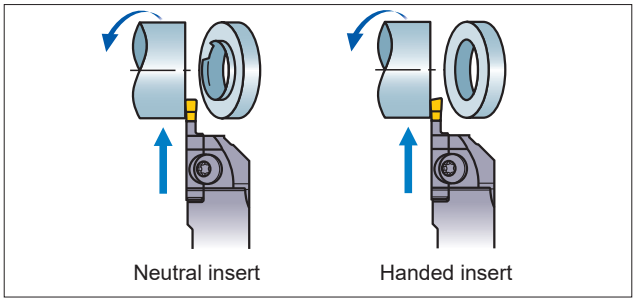
<Spindle speed>



- When using constant cutting speed during a cutting off cycle, it is recommended to limit the spindle speed to 80% of maximum to ensure stability.
- To prevent the workpiece from being expelled, lower the spindle speed before finishing the grooving operation.

insert

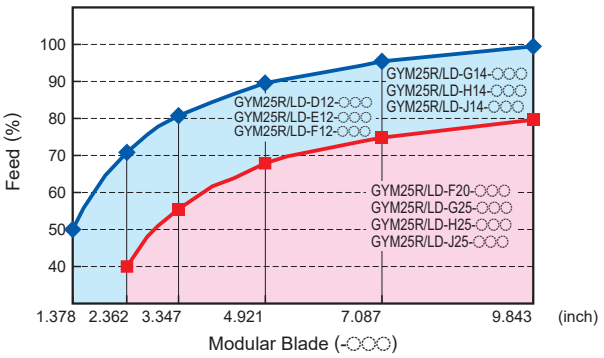




- When there is a center stub on solid bar work or burrs are formed on pipe material, it is possible to decrease them by using a handed insert. With a handed insert, machining tends to be less stable when compared to using a neutral insert. Pay special attention to avoid fracturing of the cutting edge and decrease the feed when necessary.

Memo

RELATIONSHIP BETWEEN THE MODULAR BLADE AND FEED PER ROTATION [For Face Grooving]



Note 1) Adjust the feed per rotation in the cutting conditions to the percentage shown in the table above.

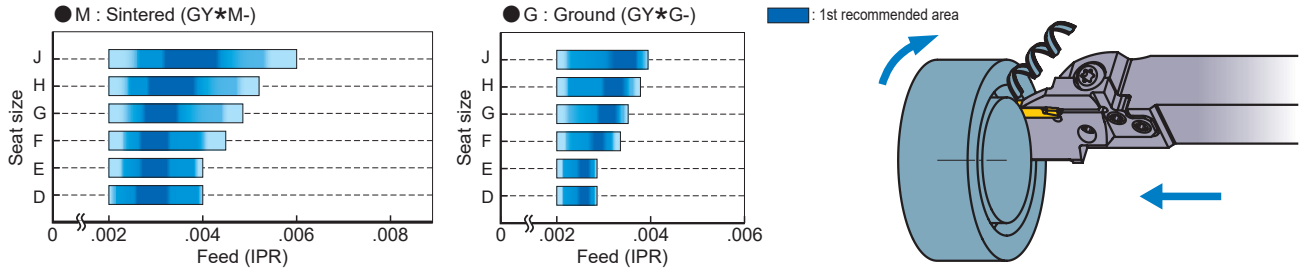
RECOMMENDED CUTTING SPEED (SFM) [For Face Grooving]

	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820 985
P	Mild Steel	≤160HB	VP20RT	260–590
			VP10RT	295–620
			NX2525	230–560
	Carbon Steel Alloy Steel	160–280HB	VP20RT	195–460
			VP10RT	230–490
			MY5015	295–690
			NX2525	180–440
		≥280HB	VP20RT	165–360
			VP10RT	195–395
			MY5015	260–525
			NX2525	150–345
M	Stainless Steel	≤270HB	VP20RT	165–360
			VP10RT	195–395
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	195–460
			VP10RT	230–490
			MY5015	295–690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165–360
			VP10RT	195–395
			MY5015	260–525
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	130–330
			MP9025	100–295
			VP20RT	100–195
			RT9010	130–230
H	Hardened steel	≥50HRC	BC8110	195–330

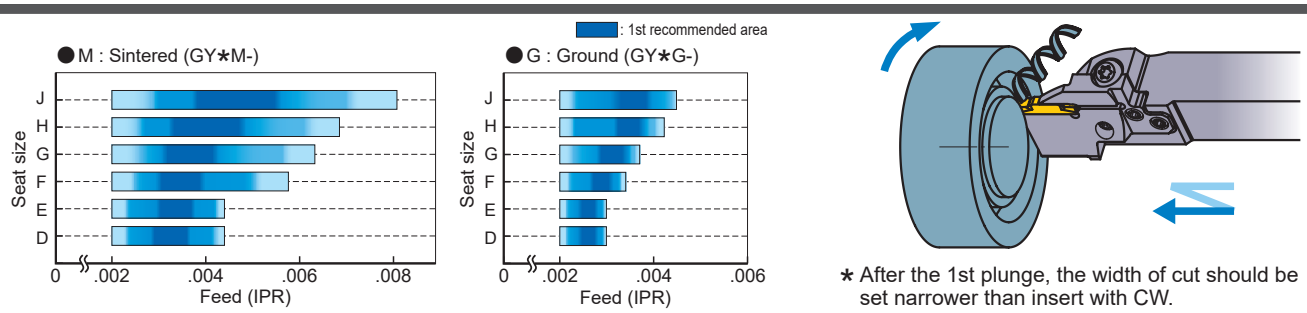
Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

RECOMMENDED CUTTING CONDITIONS [For Face Grooving]

GROOVING

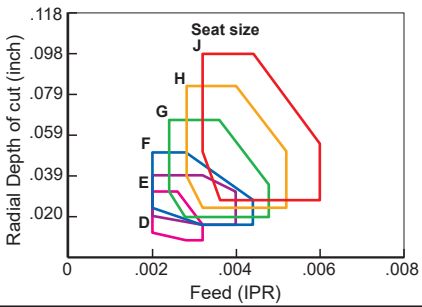


PLUNGING



✱ After the 1st plunge, the width of cut should be set narrower than insert with CW.

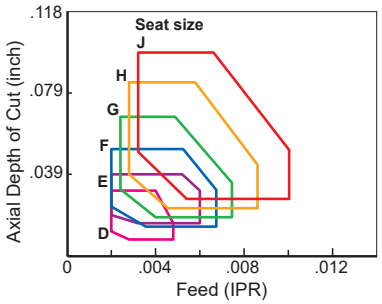
TRAVERSE MACHINING (MF BREAKER)



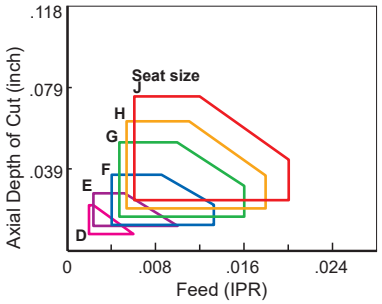
Seat Size	Insert Width
D	.079", 2.00 mm .088", 2.24 mm
E	.094", 2.39 mm .098", 2.50 mm .108",2.74 mm
F	.118",3.00 mm .125", 3.18 mm .128", 3.24 mm

Seat Size	Insert Width
G	.157", 4.00 mm .167", 4.24 mm
H	.187", 4.75 mm .197", 5.00 mm .206", 5.24 mm
J	.236", 6.00 mm .248", 6.31 mm .250", 6.35 mm

TRAVERSE MACHINING (MM/MS BREAKER)



TRAVERSE MACHINING (BM BREAKER)

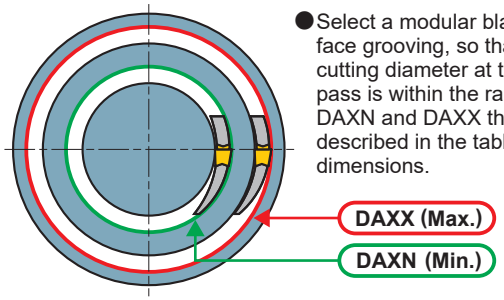


Note 1) GL chip breaker is not recommended for face grooving.

TOOL SELECTION

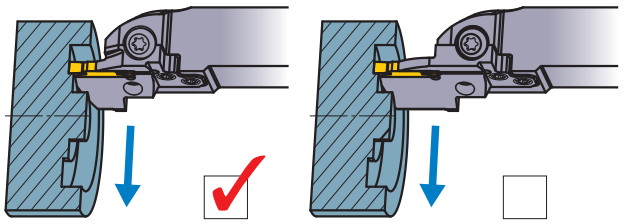
Notes when selecting the tool body

Modular blade (1)



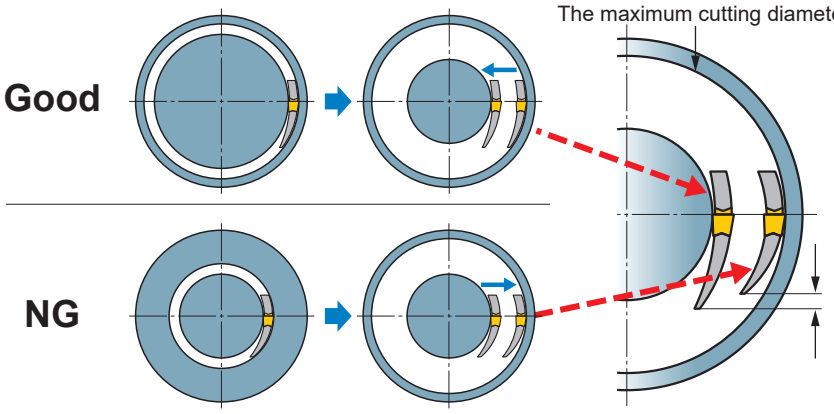
●Select a modular blade for face grooving, so that the cutting diameter at the first pass is within the range of DAXN and DAXX that are described in the table of dimensions.

Modular blade (2)



●Select the shortest possible blade suitable for the application.

Modular blade (3)



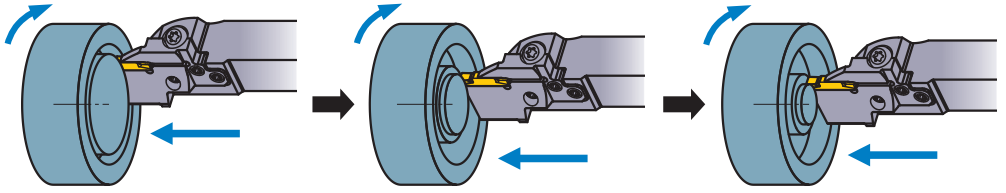
●Select the largest size blade within the maximum cutting diameter of the workpiece.

●Machine from the outer diameter towards the center.

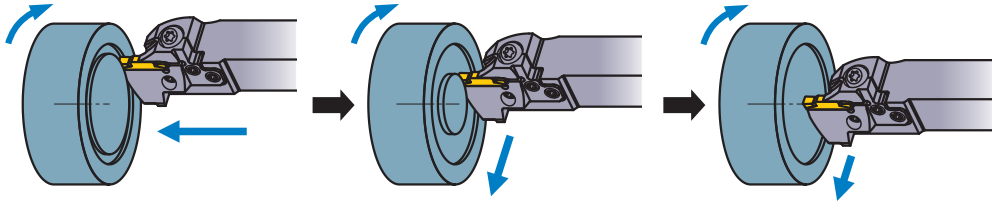
●Increased machining stability and rigidity is possible if a modular blade with the largest possible back metal is used.

●At first, machine the maximum cutting diameter, there is no restriction in the cutting diameter on the remaining process.

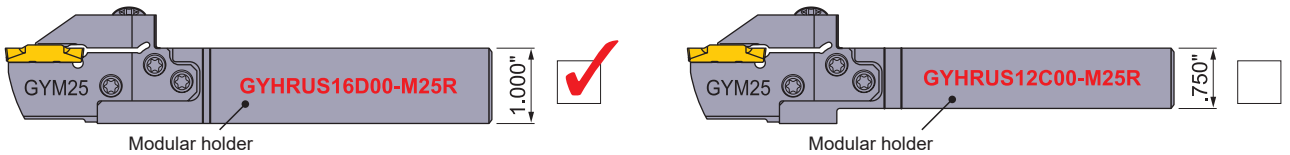
● When plunging in several passes.



● When combining plunging and infeed machining.



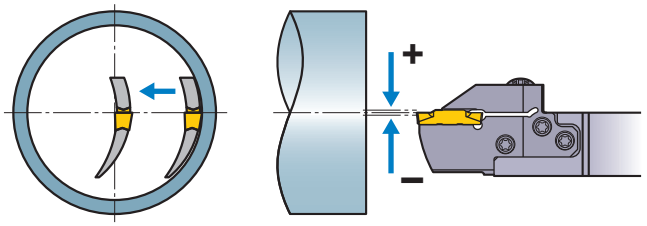
Modular holder



●To ensure sufficient clamping rigidity, select a modular holder with the largest possible shank size.

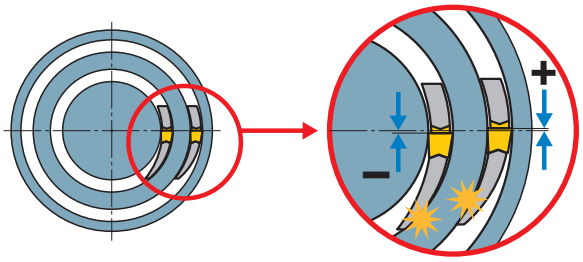
Notes when setting the tool

Setting the cutting edge height



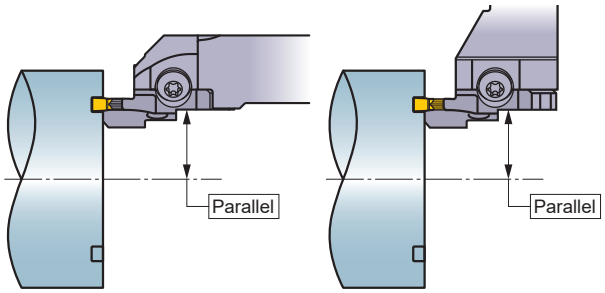
●Set the cutting edge height to ±.004" parallel to the central axis.
●Cutting edge center height check should be done by traverse machining towards the center with a very small depth of cut and ensure that an even surface and no material remains at the center point afterwards.

When interfering the wall of groove and the Modular blade



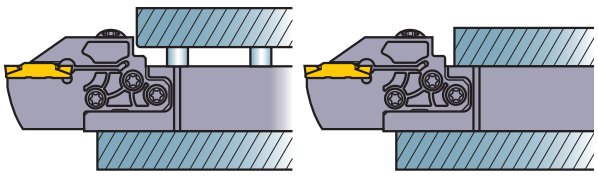
●If interference occurs even when the correct blade is used, the cutting edge height could be incorrect.
When interference occurs on the inner side of the blade, the cutting edge height is set too high.
When interference occurs on the outer side of the blade, the cutting edge height is set too low.

Setting the tool



●Set the insert parallel to the central axis.

Tool overhang



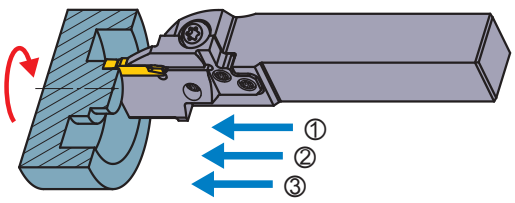
●When setting the tool, ensure that the overhang is as short as possible and avoid the step difference part as above figure shows.

MACHINING RECOMMENDATIONS

Notes when face grooving

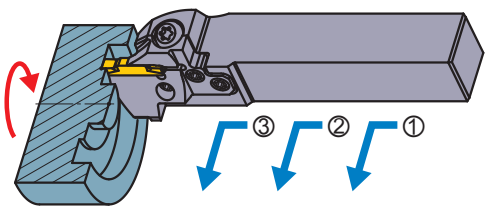
●**Always machine from the outer diameter towards the center.**

Machining narrow grooves



●Plunging in several passes is recommended.

Machining wide grooves

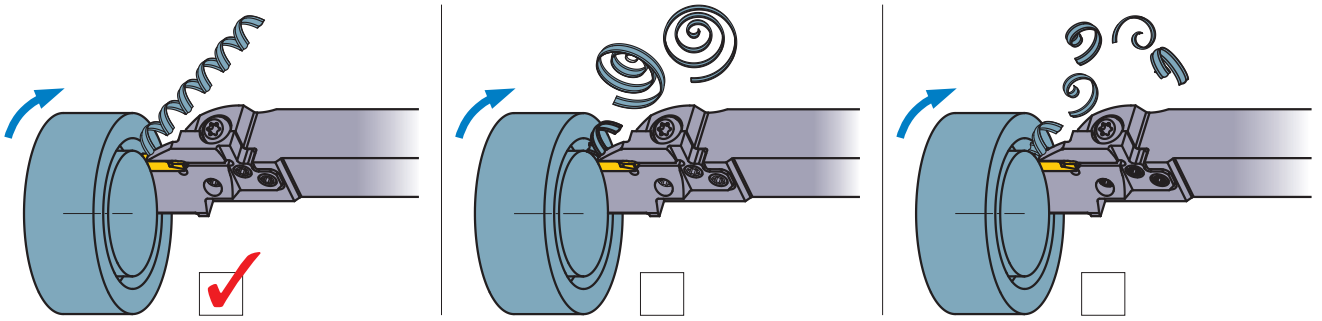


●Cross feed machining is recommended.

MACHINING RECOMMENDATIONS

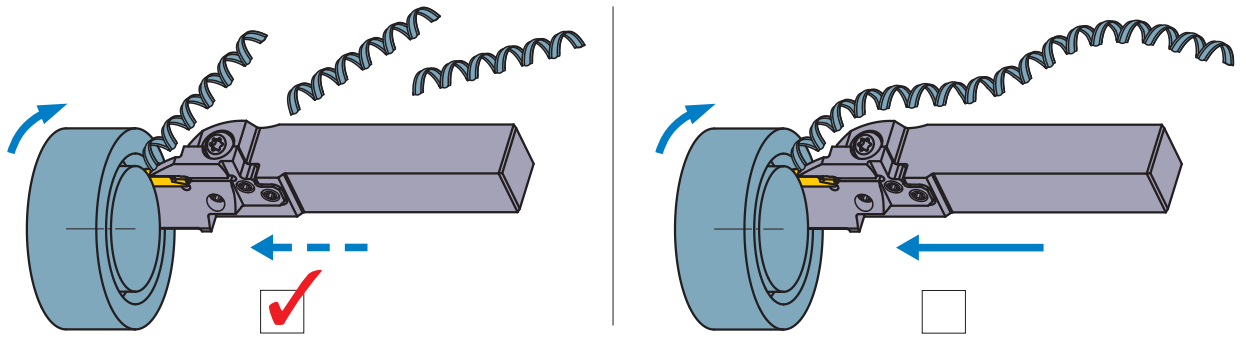
Notes when face grooving

Notes on the first pass (1)



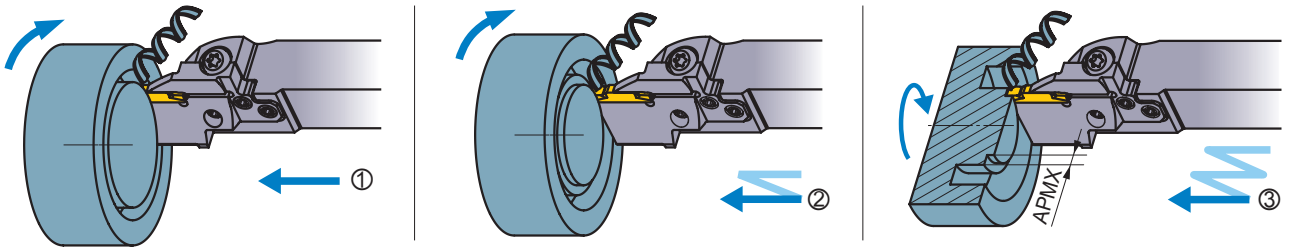
●During the first face grooving pass it is difficult to disperse broken chips and can lead to problems such as a chipped insert. Maintain longer chips that disperse easily by decreasing the feed per rotation.

Notes on the first pass (2)



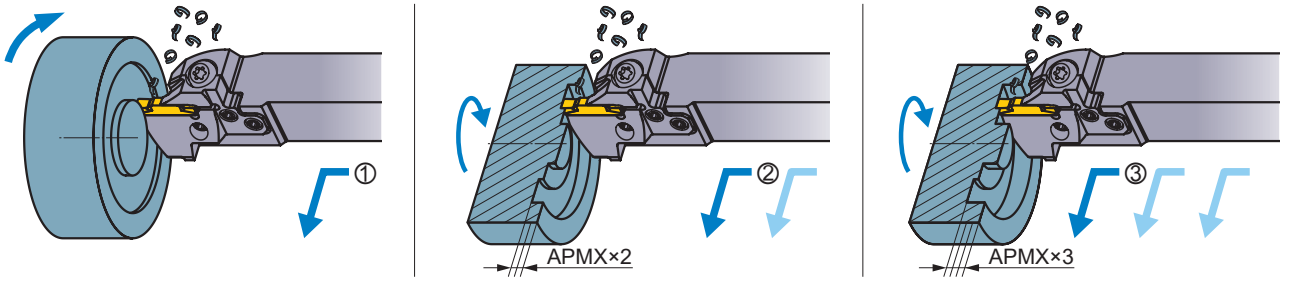
●When chips become too long, use peck feed to break them into a suitable length.

Notes when wide face grooving by plunging in several passes.



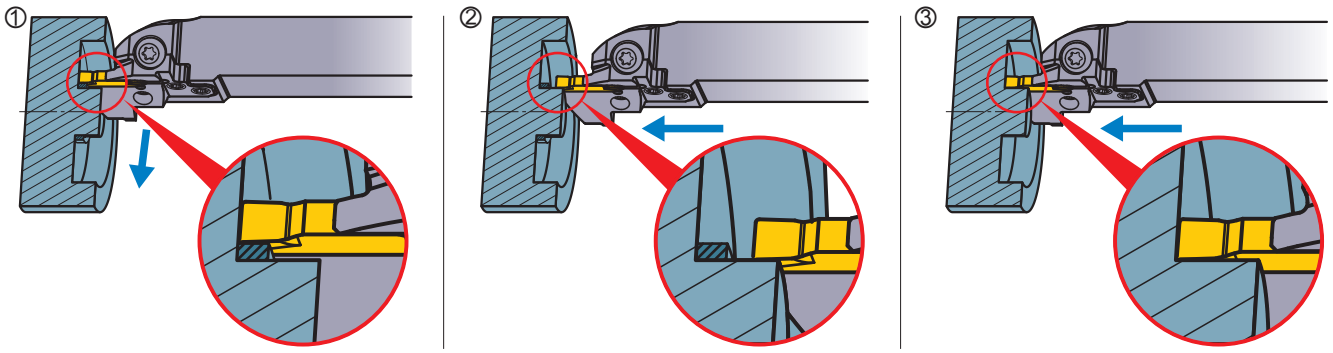
●When machining a face groove in several passes, machine from the outer diameter towards the center so that space for discharging chips is created to prevent insert damage caused by chip jamming.
●Plunging width of cut is recommended to be set at 60 - 80% of the insert width. This enhances the effect of the chipbreaker by enlarging the width of the groove to improve chip dispersal.

Notes when wide face grooving by combination of plunging and traverse machining (1)



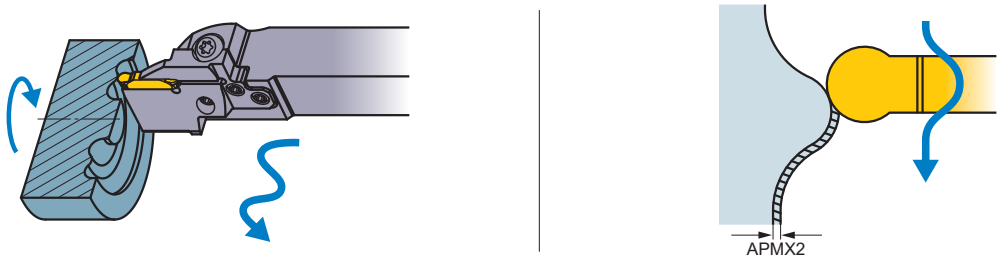
●When face groove machining by using plunge feed and traverse machining, always machine from the outer diameter towards the center to disperse chips outward to avoid chip jamming problems.
●Set the depth of cut within 40% of the insert width.

Notes when wide face grooving by combination of plunging and traverse machining (2)



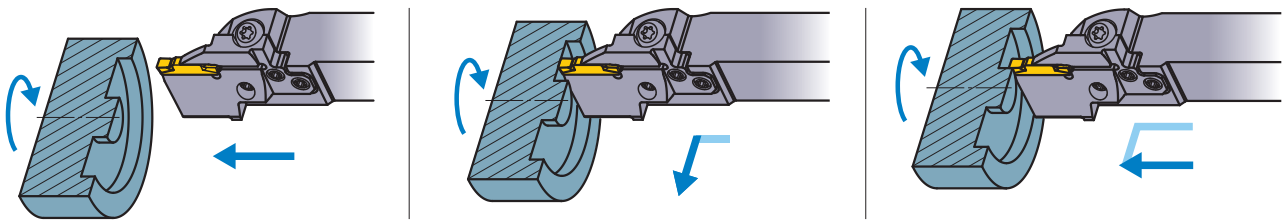
●When infeed machining at the bottom of deep groove, chips may interfere on the cutting edge near the center wall.
In such cases, stop infeed machining just before the center wall (at a point less than the insert width) then remove the remaining material by plunging.

Notes when copying (BM Breaker)



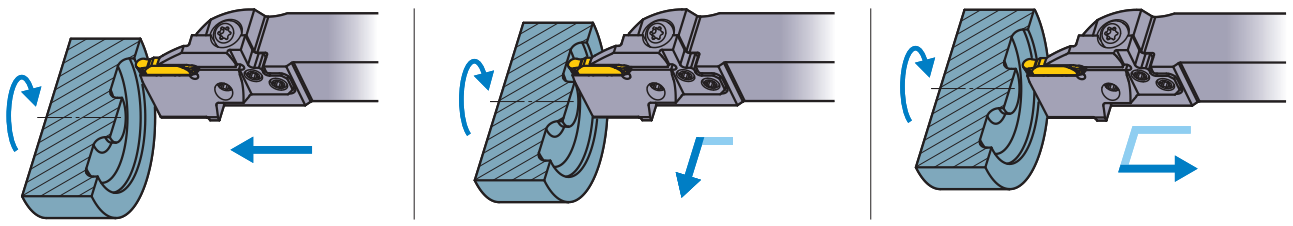
●With the BM breaker insert, 3 dimensional copying is possible. Set the depth of cut (APMX2) to 30% of the insert width.

Finishing (1)

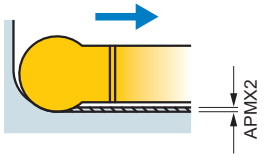


●When finish cutting, machine continuously from the outer wall to the bottom of the groove, then finally plunge cut the center wall.

Finishing (2) (BM Breaker)



●Carry out finishing in one process.
For the depth of cut (APMX2) when back turning, refer to the table on the right.

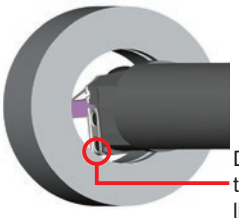


Insert	APMX2 (inch)
GY2M0200D100N-BM	.004
GY2M0250E125N-BM	
GY2M0300F150N-BM	
GY2M0318F159N-BM	
GY2M0400G200N-BM	.006
GY2M0475H238N-BM	.008
GY2M0500H250N-BM	
GY2M0600J150N-BM	.010
GY2M0635J318N-BM	

LIMITATION OF THE MAXIMUM GROOVE DEPTH [For Internal Grooving]

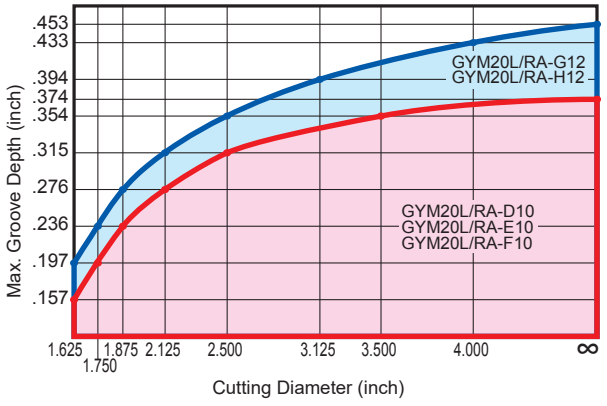
•When using the mono block type
The maximum groove depth is not limited by the cutting diameter.

•When using the modular blade type
The maximum groove depth is limited by the cutting diameter.

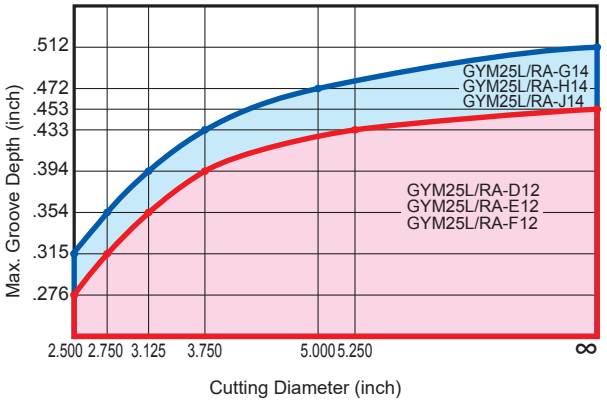


Due to interference of this part, the maximum groove depth is limited by the cutting diameter.

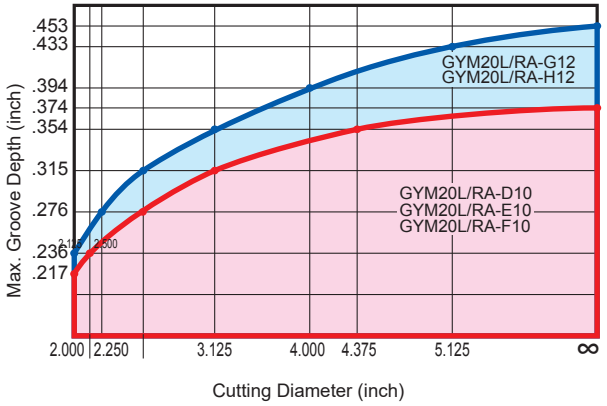
Shank Diameter=1.250 inch (GYM20 Blade)



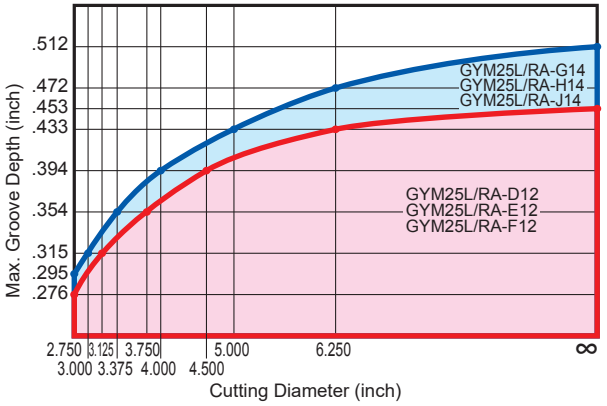
Shank Diameter=1.500 inch (GYM25 Blade)



Shank Diameter=1.500 inch (GYM20 Blade)



Shank Diameter=2.000 inch (GYM25 Blade)

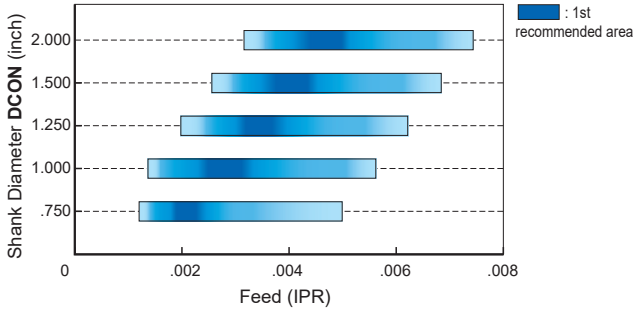


RECOMMENDED CUTTING SPEED (SFM) [For Internal Grooving]

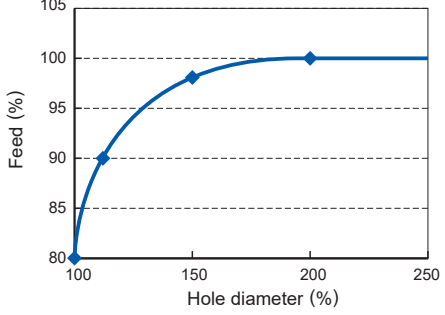
	Work Material	Hardness	Grade	Cutting Speed (SFM) 165 330 490 655 820 985 1310
P	Mild Steel	≤160HB	VP20RT	260 – 590
			VP10RT	295 – 620
			NX2525	230 – 560
	Carbon Steel Alloy Steel	160–280HB	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
			NX2525	180 – 440
		≥280HB	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
			NX2525	150 – 345
M	Stainless Steel	≤270HB	VP20RT	165 – 360
			VP10RT	195 – 395
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	195 – 460
			VP10RT	230 – 490
			MY5015	295 – 690
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	165 – 360
			VP10RT	195 – 395
			MY5015	260 – 525
S	Heat Resistant Alloy Titanium Alloy	–	MP9015	130 – 330
			MP9025	100 – 295
			VP20RT	100 – 195
			VP10RT / RT9010	130 – 230
H	Hardened steel	≥50HRC	BC8110	195 – 330
N	Aluminum Alloy	Content Si<5%	RT9010	490 – 1310
	Aluminum Alloy	Content 5%≤Si≤10%	RT9010	490 – 1310
	Aluminum Alloy	Content Si>10%	RT9010	260 – 525

Note 1) For MP9015, MP9025, VP10RT, VP20RT and MY5015, wet cutting is recommended.

GROOVING

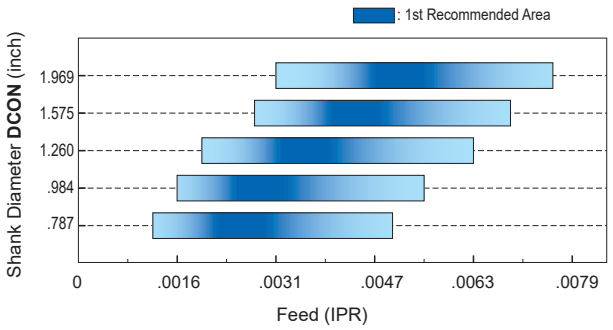


Note 1) The cutting diameter 100% represents the minimum cutting diameter (DMIN).
Note 2) The graph on the left shows the cutting conditions when setting the feed to 100%.

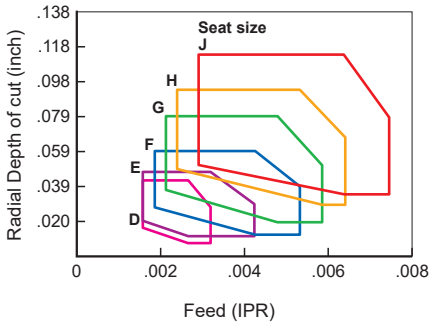


RECOMMENDED CUTTING CONDITIONS [For Internal Grooving]

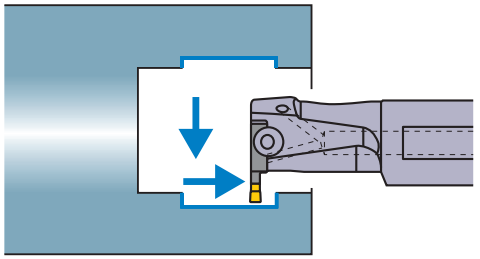
GROOVING (GL BREAKER)



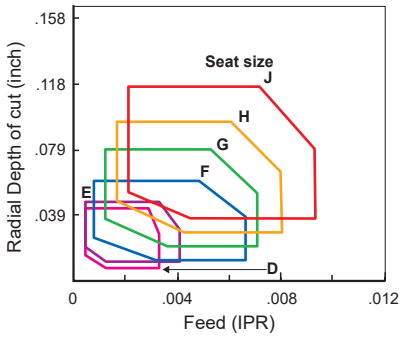
TRAVERSE MACHINING (MF BREAKER)



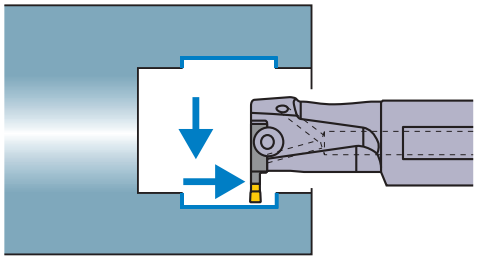
●When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



TRAVERSE MACHINING (MM/MS BREAKER)

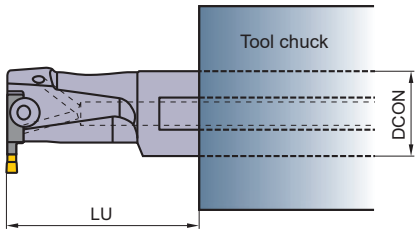


●When traverse machining a blind hole, it is recommended to carry out back turning considering chip disposal.



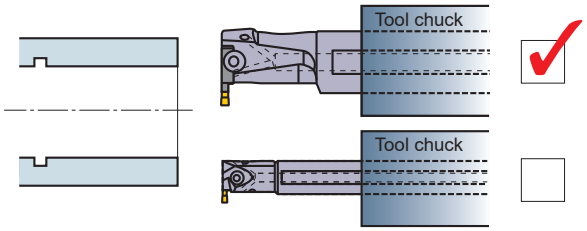
Note 1) The above cutting conditions are for when using the tool overhang (LU) 1.6-2.0 times larger than the shank diameter (DCON). (L/D=1.6-2.0)
When using L/D larger than 2.0, reduce the cutting conditions.

Seat Size / Insert Width	
D	.079", 2.00 mm .088", 2.24 mm
E	.094", 2.39 mm .098", 2.50 mm .108", 2.74 mm
F	.118", 3.00 mm .125", 3.18 mm .128", 3.24 mm
G	.157", 4.00 mm .167", 4.24 mm
H	.187", 4.75 mm .197", 5.00 mm .206", 5.24 mm
J	.236", 6.00 mm .248", 6.31 mm .250", 6.35 mm



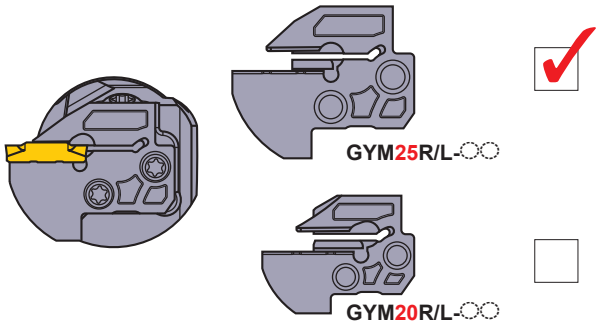
Notes when selecting the tool body

Holder



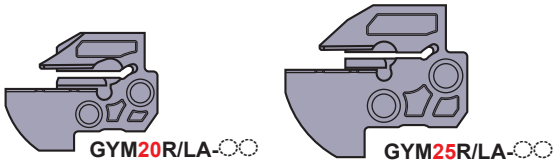
●When the overhang is the same, select a holder with the largest possible shank size to ensure sufficient clamping rigidity.

Modular blade (1)



●For a ø1.5" & ø40 mm shank holder, if there is no restriction for use, select a holder suitable for GYM25 blade.

Modular blade (2)

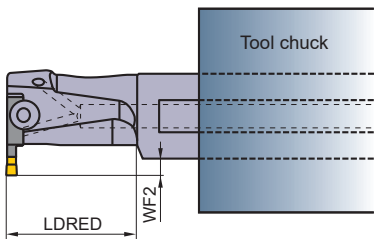


GYM20R/LA-D10	GYM25R/LA-D12
GYM20R/LA-E10	GYM25R/LA-E12
GYM20R/LA-F10	GYM25R/LA-F12
GYM20R/LA-G12	GYM25R/LA-G14
GYM20R/LA-H12	GYM25R/LA-H14
	GYM25R/LA-J14

●For an internal holder, select a modular blade listed above.

Notes when setting the tool

Overhang



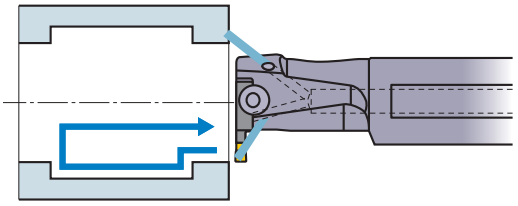
●The maximum groove depth is limited to the dimension LDRED. When machining with longer overhangs, refer to the dimension WF2 of the tool used.

MACHINING RECOMMENDATIONS

Notes on multi-function machining (MF, MS and MM breakers)

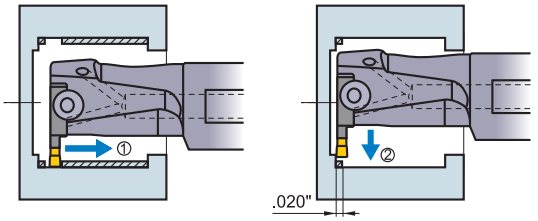
For internal grooving, the machining methods for external grooving (F202 – F203) can be used, but please note the following precautions.

Coolant



●Supply large amounts of coolant for effective chip disposal during cutting. Maintain supply until the tool has been retracted completely for improved chip disposal.

Machining blind holes

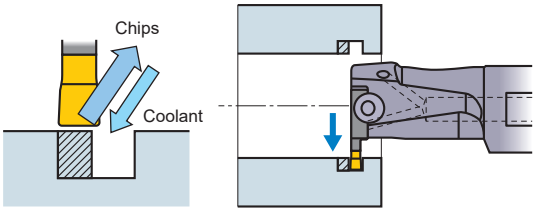


●As continuous chips tend to elongate at the back of the bore, the above operation is recommended.
The recommended width of cut for ② is .020 inch.

Machining Wide Grooves

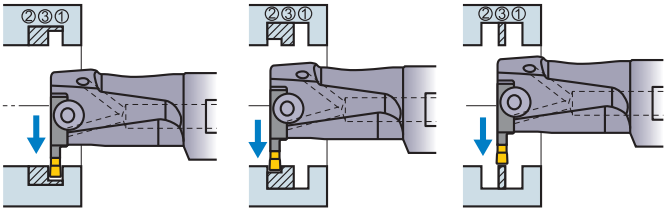
Grooving

●When the insert width is x 2 ≥ groove width



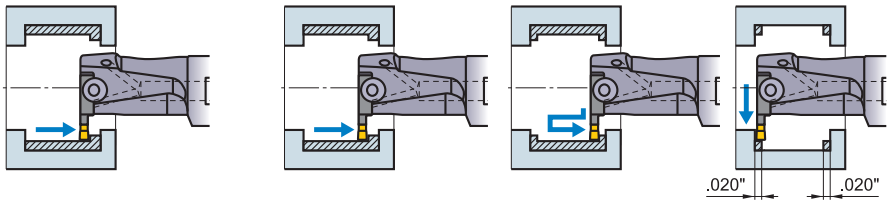
●When the depth of cut is shallower than the insert width, continuous chips are usually produced. When plunging in several passes, it is recommended to carry out machining in the steps above. This ensures that coolant reaches the cutting edge and chips are easily discharged.

●When the insert width is x 2 < groove width



●When the groove depth is larger than the insert width, carry out plunging in the steps above to break up chips efficiently.

Turning

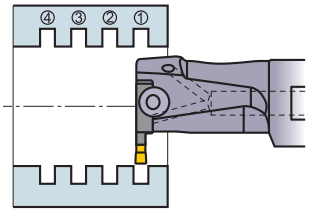


●When chip breaking and disposal are especially important, cross-feed machining is recommended.

●Wide face grooving when the corner R of the workpiece is equal to the corner R of the insert, machine as shown above. (When corner R of the workpiece is larger than corner R of the insert, refer to the description of external wide grooving.)

●If the groove depth exceeds a given level, chips may elongate at the wall. In such a case, increase the feed and carry out machining as shown above.

Machining instruction



●It is recommended to carry out grooving from the front end of the workpiece. This reduces workpiece deflection.

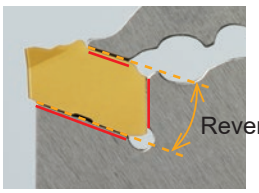
Memo

GW Series
Easy to Utilize Configuration that Improves Tool Handling

Clamp

Simple insert clamping method offering high rigidity.

To prevent the insert from being pulled out during machining a reverse taper angle has been designed from the front of the insert. Additionally the design also includes 3 large locating faces between the insert and the blade offering increased cutting edge reliability. The blade itself is made from a special alloy steel to suit this application.
In respect to insert indexing, a unique wrench is supplied to ensure ease when changing the insert.



Reverse Taper Angle

Voice of Developer

Just how easy is it to set an insert?

With the use of a unique wrench, it is possible to locate and remove the insert with one simple action making it easier for use in the workplace.

Through Coolant Blade

Increased wear resistance due to the use of 2 through coolant ejection holes.

2 through coolant holes supply the coolant to both the rake and flank face, leading to effective cutting edge cooling and increased wear resistance.
Additionally this blade can also be used for both low pressure and high pressure coolant (1000 PSI).

Voice of Developer

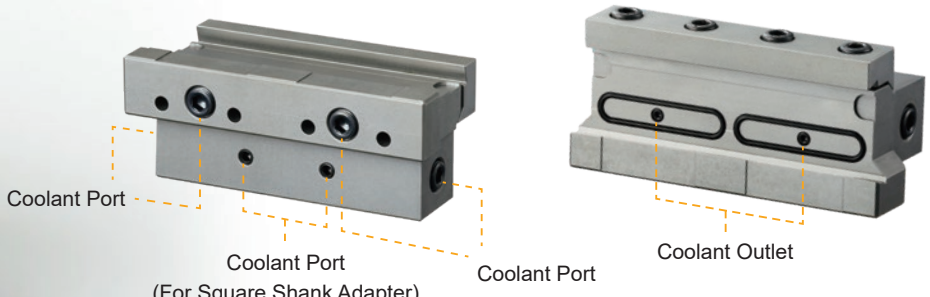
How is it possible to reduce heat generation?

The 2 coolant holes used in the blade are capable of using high coolant pressures of up to (1000 PSI). This is achieved by using as large as possible through coolant hole diameter.
The ejection holes are located close to the cutting edge to improve the cutting edge cooling effect and increasing wear resistance.

Coolant Ports

Flexible set up possible with the use of 6 coolant ports.

There are 6 coolant ports designed into the tool block. This makes it easier for the end user to set up the tool block and blade to a configuration that suits their needs. If necessary it is also possible to use coolant hose. The ejection type coolant also improves cutting edge cooling and chip evacuation.



Voice of Developer

Possible set up to suit the requirements of the workplace environment.

One of the objectives of this product is to respond to the customers complaints that “the product did not fit and could not be used”. Starting with the coolant outlet that prevents leaks even when oil quantity or overhangs change.
Everything from the material and the shape of the O-ring, to the length of the hose has been tailored to the effective use in the workplace.

Chip Breaker

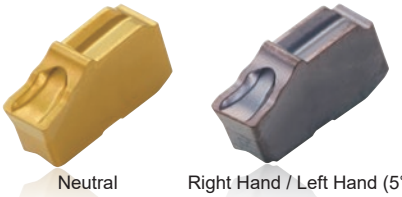
Breaker System Offering Excellent Chip Disposal Properties

Low Feeds

Neutral | Right Hand (5°) | Right Hand (8°)

GS Breaker

Medium Feeds



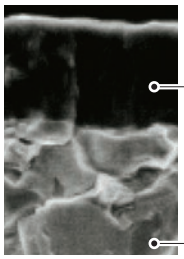
Neutral | Right Hand / Left Hand (5°)

GM Breaker

Insert Grades

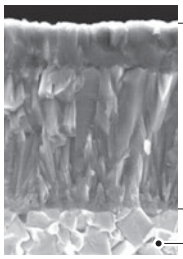
Work Material / Machining Condition	P Steel	M Stainless Steel	K Cast Iron	S Heat Resistant Alloy / Titanium Alloy
Stable ↑ Machining Condition ↓ Unstable	MY5015	VP10RT	MY5015	VP10RT
	VP10RT	VP20RT	VP10RT	VP20RT
	VP20RT	VP30RT	VP20RT	
	VP30RT			

VP20RT (1st Recommendation)



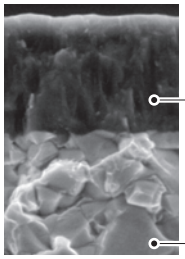
● PVD coated grade suitable for a wide range of applications. The combination of a special tough cemented carbide substrate with MIRACLE coating provides an excellent balance of wear and fracture resistance.

MY5015



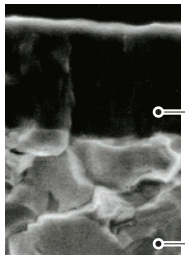
● MY5015 is a CVD coated grade with excellent wear resistance even at high temperatures. It provides longer tool life when machining cast and ductile cast iron. Also suitable for high speed continuous cutting of steels.

VP10RT



● PVD coated grade with a cemented carbide substrate harder than VP20RT. For use on difficult-to-cut materials and for extending tool life.

VP30RT



● A combination of a tough, special cemented carbide substrate and MIRACLE coating. Ideal for heavy interrupted cutting of stainless and general steels.

IDENTIFICATION OF GW SERIES

■ Insert / Blade / Tool Block

● Insert

①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩
GW	1	M	0300	F	030	R	05	– G	M

①Series Description

②Number of Teeth

1	1 Edge Type

③Peripheral

M	Sintered

④Groove Width

0200	.079 inch 2.00 mm
0239	.094 inch 2.39 mm
0300	.118 inch 3.00 mm
0400	.157 inch 4.00 mm
0500	.197 inch 5.00 mm

⑤Seat Size ✶1

D	.079 inch 2.00 mm
E	.094 inch 2.39 mm
F	.118 inch 3.00 mm
G	.157 inch 4.00 mm
H	.197 inch 5.00 mm

⑥Corner Radius

010	.004 inch
:	:
040	.016 inch

⑦Hand

N	Neutral
R	Right
L	Left

⑧Handed Angle

05	5°
08	8°

⑨Application 1

G	Grooving/Cutting Off

⑩Application 2

S	Low Feeds
M	Medium Feeds

● Blade

①	②	③	④	⑤	⑥	⑦	⑧
GW	B32	N	A	2 –	F	60 –	C

①Series Description

②Blade Size ✶2

B26
B32

③Hand

N	Neutral

④Blade Geometry

A	Standard Type

⑤No. of Corners

2	2 Corner

⑥Seat Size ✶3

D	.079 inch 2.00 mm
F	.118 inch 3.00 mm
G	.157 inch 4.00 mm
H	.197 inch 5.00 mm

⑦Max. Groove Depth

36	1.417 inch
60	2.362 inch

⑧Coolant Hole

Standard	Without Coolant Hole
C	With Coolant Hole

✶1 Select seat size with the same symbol as that of blade.
✶2 Select blade size with the same symbol as that of tool block.
✶3 Select seat size with the same symbol of the insert.
✶4 Select blade size with the same symbol as that of blade.

● Tool Block

(Inch)

(Metric)

①	②	③	④		⑤		⑥
GW	TB	N	US12	–	B32	–	C
			2525				

①Series Description

②Tool Block

③Hand

N	Neutral

④Shank Size (H x W)

Inch		Metric	
US12	.750" × .750"	2020	20 mm × 20 mm
US16	1.000" × 1.000"	2525	25 mm × 25 mm

⑤Blade Size *4

B26
B32

⑥Coolant Hole

Standard	Without Coolant Hole
C	With Coolant Hole

● MONO BLOCK HOLDER

(Metric)

①	②	③	④	⑤	⑥		⑦	⑧
GW	S	R	2525	M	00	–	D	42

①Series Description

②Holder Type

S	Mono Block Holder for Swiss-type Lathe

③Hand of Holder

R	Right
L	Left

④Shank Diameter(H x W)

1616	16x16mm
1915	19.05x15.875mm
2012	20x12mm
2020	20x20mm
2525	25x25mm

⑤Holder Length LF

JX	120mm
K	125mm
M	150mm

⑥Angle

00	0°

⑦Seat Size *3

D	2.00mm
E	2.39mm
F	3.00mm
G	4.00mm

⑧Max. Cut Off Diameter (CUTDIA)

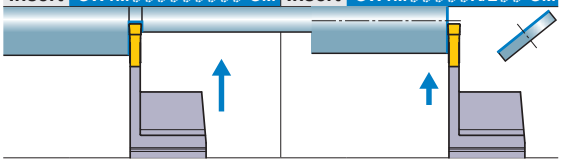
38	38mm
42	42mm
51	51mm
65	65mm
76	76mm

*1 Select seat size with the same symbol as that of blade.
*2 Select blade size with the same symbol as that of tool block.
*3 Select seat size with the same symbol of the insert.
*4 Select blade size with the same symbol as that of blade.

GW SERIES (External for Swiss-type lathes)

1-2 00° type holder (Metric) NEW

Insert GW1M○○○○○○○○○○-GS Insert GW1M○○○○○R○○-GS
Insert GW1M○○○○○○○○○○-GM Insert GW1M○○○○○R/L○○-GM



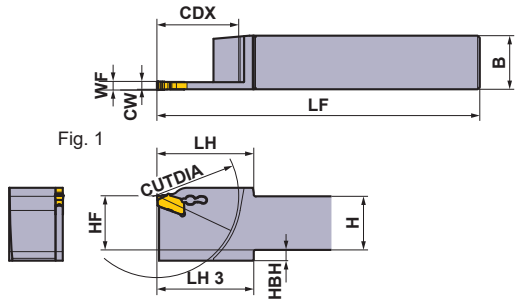


Fig. 1

Right hand tool holder shown.

Seat Size	CW (mm)	CDX (mm)	CUTDIA (mm)	Type	Hand (R/L)	Order Number Holder	Stock	Fig.
D	2.00	19	38	Mono Block	R	GWSR1616JX00-D38	★	1
					L	GWSL1616JX00-D38	★	1
			38	Mono Block	R	GWSR1915K00-D38	★	1
					L	GWSL1915K00-D38	★	1
		21	42	Mono Block	R	GWSR2020K00-D42	★	1
					L	GWSL2020K00-D42	★	1
				Mono Block	R	GWSR2012K00-D42	★	1
					L	GWSL2012K00-D42	★	1
				Mono Block	R	GWSR2525M00-D42	★	2
					L	GWSL2525M00-D42	★	2
E	2.39	19	38	Mono Block	R	GWSR1915K00-E38	★	1
					L	GWSL1915K00-E38	★	1
		21	42	Mono Block	R	GWSR2020K00-E42	★	1
					L	GWSL2020K00-E42	★	1
				Mono Block	L	GWSL2020K00-E42-M	★	3
				Mono Block	R	GWSR2012K00-E42	★	1
					L	GWSL2012K00-E42	★	1
				Mono Block	R	GWSR2525M00-E42	★	2
					L	GWSL2525M00-E42	★	2
F	3.00	19	38	Mono Block	R	GWSR1915K00-F38	●	1
					L	GWSL1915K00-F38	●	1
		21	42	Mono Block	R	GWSR2012K00-F42	●	1
					L	GWSL2012K00-F42	●	1
				Mono Block	R	GWSR2020K00-F42	●	1
					L	GWSL2020K00-F42	●	1
				Mono Block	L	GWSL2020K00-F42-M	●	3
		25.5	51	Mono Block	R	GWSR2020K00-F51	●	1
					L	GWSL2020K00-F51	●	1
				Mono Block	L	GWSL2020K00-F51-M	●	3
				Mono Block	R	GWSR2525M00-F51	●	1
					L	GWSL2525M00-F51	●	1
		32.5	65	Mono Block	R	GWSR2020M00-F65	●	1
					L	GWSL2020M00-F65	●	1
		38	76	Mono Block	R	GWSR2525M00-F76	●	1
					L	GWSL2525M00-F76	●	1
G	4.00	38	76	Mono Block	R	GWSR2525M00-G76	★	1
					L	GWSL2525M00-G76	★	1

CW = Cutting Width **CDX =** Max. Groove Depth **CUTDIA =** Max. Cut Off Diameter

● : USA Stock ★ : Stocked in Japan

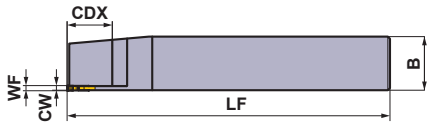
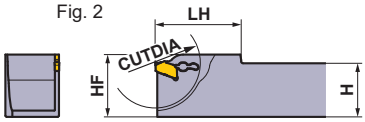


Fig. 2



Right hand tool holder shown.

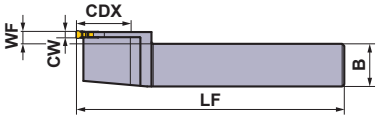
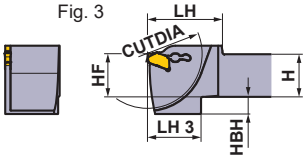


Fig. 3

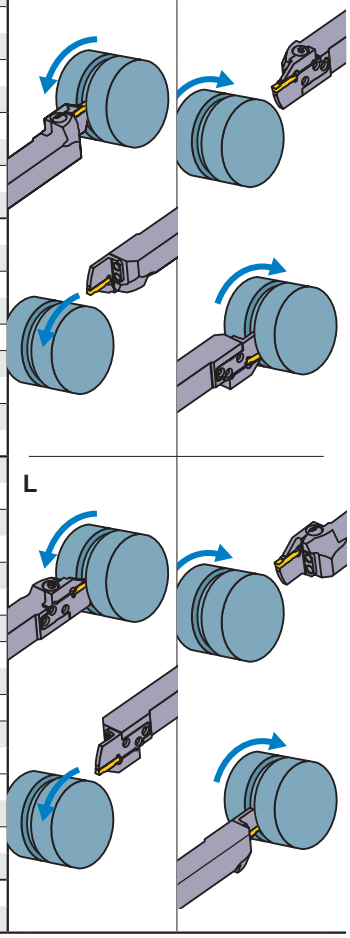


Left hand tool holder shown.

SPARE PARTS

Holder	Wrench
GWSR/L1616JX00-D38	GWY39L
GWSR/L○○○○○00-○○○	
GWSR/L2020K00-○○○-M	

Dimensions (mm)								Cutting Mode	
H	B	LF	LH	LH 3	HF	WF	HBH	Clockwise	Anticlockwise
16	16	120	30	30	16	0.3	6	R	
16	16	120	30	30	16	0.3	6		
19.05	15.875	125	35	35	19.05	0.3	3		
19.05	15.875	125	35	35	19.05	0.3	3		
20	20	125	35	25	20	0.3	4		
20	20	125	35	25	20	0.3	4		
20	12	125	35	25	20	0.3	4		
20	12	125	35	25	20	0.3	4		
25	25	150	40	—	25	0.3	—		
25	25	150	40	—	25	0.3	—		
19.05	15.875	125	35	35	19.05	0.2	3		
19.05	15.875	125	35	35	19.05	0.2	3		
20	20	125	35	25	20	0.2	4		
20	20	125	35	25	20	0.2	4		
20	20	125	35	25	20	5.7	8		
20	12	125	35	25	20	0.2	4		
20	12	125	35	25	20	0.2	4		
25	25	150	40	—	25	0.2	—		
25	25	150	40	—	25	0.2	—		
19.05	15.875	125	35	35	19.05	0.3	3	L	
19.05	15.875	125	35	35	19.05	0.3	3		
20	12	125	35	25	20	0.3	4		
20	12	125	35	25	20	0.3	4		
20	20	125	35	25	20	0.3	4		
20	20	125	35	25	20	0.3	4		
20	20	125	35	25	20	5.8	8		
20	20	125	35	25	20	0.3	8		
20	20	125	35	25	20	0.3	8		
20	20	125	35	25	20	5.8	8		
25	25	150	40	40	25	0.3	3		
25	25	150	40	40	25	0.3	3		
20	20	150	40	33	20	0.3	10		
20	20	150	40	33	20	0.3	10		
25	25	150	45	45	25	0.3	5		
25	25	150	45	45	25	0.3	5		
25	25	150	45	45	25	0.4	5		
25	25	150	45	45	25	0.4	5		



Select an Insert

Seat Size	Insert Number
D	GW1M0200D○○○N−Breaker
	GW1M0200D○○○R/L○○−Breaker
E	GW1M0239E○○○N−Breaker
	GW1M0239E○○○R/L○○−Breaker
F	GW1M0300F○○○N−Breaker
	GW1M0300F○○○R/L○○−Breaker
G	GW1M0400G○○○N−Breaker
	GW1M0400G○○○R/L○○−Breaker

For grooving/cutting off breaker ➢ F229

Seat Size	Breaker / CW	GS (Low)	GM (Medium)	05-GS (Low)	08-GS (Low)	05-GM (Cutting off)
		Neutral	Neutral	Hand	Hand	Hand
D	.079", 2.00 mm	●	●	●	●	●
E	.094", 2.39 mm	●	●	●	●	●
F	.118", 3.00 mm	●	●	●	●	●
G	.157", 4.00 mm	●	●			●

● : Standard insert with dimensions

IDENTIFICATION ➢ F222
INSERTS ➢ F229
CUTTING CONDITIONS ➢ F231
INSTRUCTION MANUAL ➢ F233

GW BLADE

- Simple insert clamping method offering high rigidity.
- The blade is possible to use with both external or through coolant.
- Groove Depth CW .079－.197 inch

GW — For External Cutting Off / Grooving

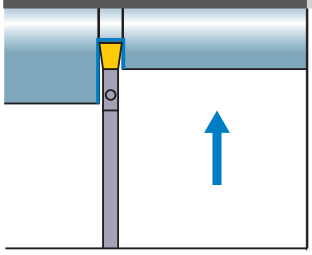


Fig.1

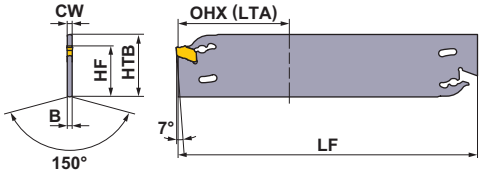
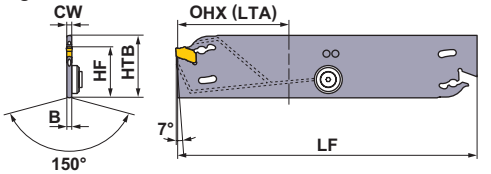


Fig.2



Without Coolant Hole

(inch)

Seat Size	CW	∗1 CUTDIA	Order Number	Stock	∗2 OHN	∗3 OHX (LTA)	B	LF	HTB	HF	Fig.	Insert Type	Wrench	Tool Block Type
D	.079	2.835	**GWB26NA2-D36**	●	.630	1.417	.061	4.331	1.024	.843	1	GW1M0200D	GWY39L	GWTBN-B26
		4.724	**GWB32NA2-D60**	●	.630	2.362	.061	5.906	1.260	.984	1	GW1M0200D	GWY39L	GWTBN-B32
F	.118	2.835	**GWB26NA2-F36**	●	.630	1.417	.096	4.331	1.024	.843	1	GW1M0300F	GWY39L	GWTBN-B26
		4.724	**GWB32NA2-F60**	●	.630	2.362	.096	5.906	1.260	.984	1	GW1M0300F	GWY39L	GWTBN-B32
G	.157	2.835	**GWB26NA2-G36**	●	.748	1.417	.132	4.331	1.024	.843	1	GW1M0400G	GWY39L	GWTBN-B26
		4.724	**GWB32NA2-G60**	●	.748	2.362	.132	5.906	1.260	.984	1	GW1M0400G	GWY39L	GWTBN-B32
H	.197	2.835	**GWB26NA2-H36**	●	.748	1.417	.167	4.331	1.024	.843	1	GW1M0500H	GWY39L	GWTBN-B26
		4.724	**GWB32NA2-H60**	●	.748	2.362	.167	5.906	1.260	.984	1	GW1M0500H	GWY39L	GWTBN-B32

With Coolant Hole

(inch)

Seat Size	CW	∗1 CUTDIA	Order Number	Stock	∗2 OHN	∗3 OHX (LTA)	B	LF	HTB	HF	Fig.	Insert Type	Wrench	Tool Block Type
D	.079	2.835	**GWB26NA2-D36-C**	●	.630	1.417	.061	4.331	1.024	.843	2	GW1M0200D	GWY39L	GWTBN-B26-C
		4.724	**GWB32NA2-D60-C**	●	.630	2.362	.061	5.906	1.260	.984	2	GW1M0200D	GWY39L	GWTBN-B32-C
F	.118	2.835	**GWB26NA2-F36-C**	●	.630	1.417	.096	4.331	1.024	.843	2	GW1M0300F	GWY39L	GWTBN-B26-C
		4.724	**GWB32NA2-F60-C**	●	.630	2.362	.096	5.906	1.260	.984	2	GW1M0300F	GWY39L	GWTBN-B32-C
G	.157	2.835	**GWB26NA2-G36-C**	●	.748	1.417	.132	4.331	1.024	.843	2	GW1M0400G	GWY39L	GWTBN-B26-C
		4.724	**GWB32NA2-G60-C**	●	.748	2.362	.132	5.906	1.260	.984	2	GW1M0400G	GWY39L	GWTBN-B32-C
H	.197	2.835	**GWB26NA2-H36-C**	●	.748	1.417	.167	4.331	1.024	.843	2	GW1M0500H	GWY39L	GWTBN-B26-C
		4.724	**GWB32NA2-H60-C**	●	.748	2.362	.167	5.906	1.260	.984	2	GW1M0500H	GWY39L	GWTBN-B32-C

∗1 CUTDIA : Maximum Cut Off Diameter ∗2 OHN : Minimum Overhang Length ∗3 OHX(LTA) : Maximum Overhang Length

Note 1) Recommended Maximum Coolant Pressure 1000PSI

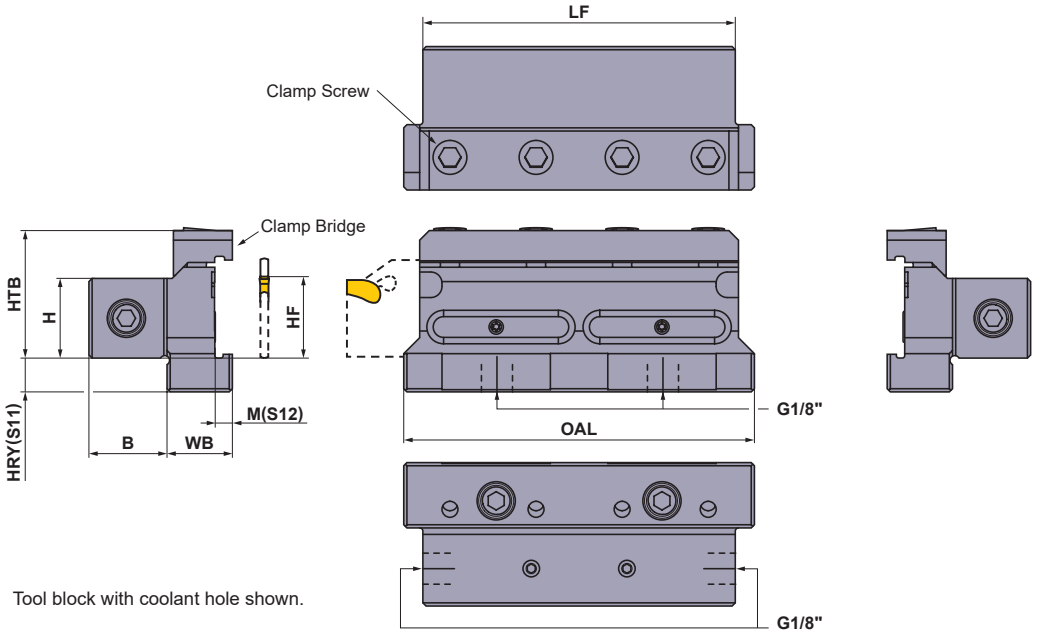
Spare Parts for Blades with Coolant Hole

(inch)

Order Number	CW	① ② Washer	Clamp Screw	Plug Wrench
GWB26NA2-D36-C	.079	①GWW04038	GW04005F	HKY20R
GWB32NA2-D60-C	.079	①GWW04038	GW04005F	HKY20R
GWB26NA2-F36-C	.118	①GWW04038	GW04005F	HKY20R
GWB32NA2-F60-C	.118	①GWW04038	GW04005F	HKY20R
GWB26NA2-G36-C	.157	②GWW04026	GW04005F	HKY20R
GWB32NA2-G60-C	.157	②GWW04026	GW04005F	HKY20R
GWB26NA2-H36-C	.197	②GWW04026	GW04005F	HKY20R
GWB32NA2-H60-C	.197	②GWW04026	GW04005F	HKY20R

 ● : USA Stock

■ TOOL BLOCK (INCH)



Tool block with coolant hole shown.

Without Coolant Hole

(inch)

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	① ② Clamp Bridge	* Clamp Screw	Wrench
GWTBNUS12-B26	●	.750	.750	1.28	.470	.730	.790	.200	2.950	3.350	①GWCW1	HSC06020	HKY50R
GWTBNUS12-B32	●	.750	.750	1.34	.650	.730	.810	.220	3.940	4.330	②GWCW2	HSC06020	HKY50R
GWTBNUS16-B26	●	1.000	1.000	1.53	.220	.980	.790	.200	2.950	3.350	①GWCW1	HSC06020	HKY50R
GWTBNUS16-B32	●	1.000	1.000	1.59	.400	.980	.810	.220	3.940	4.330	②GWCW2	HSC06020	HKY50R

With Coolant Hole

(inch)

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	① ② Clamp Bridge	* Clamp Screw	Wrench
GWTBNUS12-B26-C	●	.750	.750	1.28	.470	.730	.790	.200	2.950	3.350	①GWCW1	HSC06020	HKY50R
GWTBNUS12-B32-C	●	.750	.750	1.34	.650	.730	.810	.220	3.940	4.330	②GWCW2	HSC06020	HKY50R
GWTBNUS16-B26-C	●	1.000	1.000	1.53	.220	.980	.790	.200	2.950	3.350	①GWCW1	HSC06020	HKY50R
GWTBNUS16-B32-C	●	1.000	1.000	1.59	.400	.980	.810	.220	3.940	4.330	②GWCW2	HSC06020	HKY50R

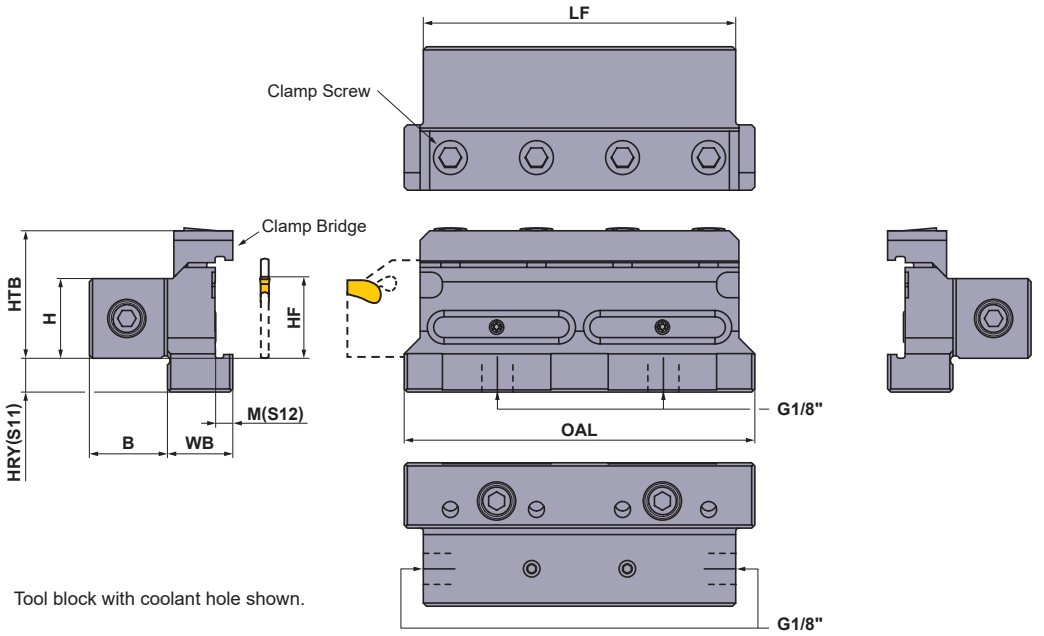
* Clamp Torque (lbf-in) : HSC06020=62

Note 1) Recommended Maximum Coolant Pressure 1000 PSI

Spare Parts for Tool Block with Coolant Hole

Order Number	① ② O-ring	Plug	Plug	Wrench	Plug	Wrench
GWTBNUS12-B26-C	①ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBNUS12-B32-C	②ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBNUS16-B26-C	①ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBNUS16-B32-C	②ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R

■ TOOL BLOCK (METRIC)



Tool block with coolant hole shown.

Without Coolant Hole

(mm)

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	① ② Clamp Bridge	* Clamp Screw	Wrench
GWTBN2020-B26	★	20	20	33.5	11	19.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2020-B32	★	20	20	35.0	15.6	19.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R
GWTBN2525-B26	★	25	25	38.5	6	24.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2525-B32	★	25	25	40.0	10.6	24.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R

With Coolant Hole

(mm)

Order Number	Stock	H	HF	HTB	HRY (S11)	B	WB	M (S12)	LF	OAL	① ② Clamp Bridge	* Clamp Screw	Wrench
GWTBN2020-B26-C	★	20	20	33.5	11	19.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2020-B32-C	★	20	20	35.0	15.6	19.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R
GWTBN2525-B26-C	★	25	25	38.5	6	24.5	20.0	5.0	75	85	①GWCW1	HSC06020	HKY50R
GWTBN2525-B32-C	★	25	25	40.0	10.6	24.5	20.5	5.5	100	110	②GWCW2	HSC06020	HKY50R

* Clamp Torque (N • m) : HSC06020=7.0

Note 1) Recommended Maximum Coolant Pressure 7MPa

Spare Parts for Tool Block with Coolant Hole

Order Number	① ② O-ring	Plug	Plug	Wrench	Plug	Wrench
GWTBN2020-B26-C	①ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBN2020-B32-C	②ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBN2525-B26-C	①ORGW332N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R
GWTBN2525-B32-C	②ORGW457N9	HGJ-PT1/8	HSD05004S	HKY25R	CS300590T	TKY08R

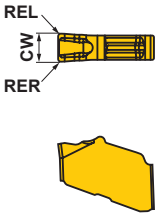
● : USA Stock ★ : Stocked in Japan

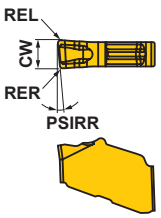
<10 inserts in one case>

■ INSERTS

(inch)

Application	Order Number	Stock Coating MY5015	VP10RT	VP20RT	VP30RT	Seat Size	CW Cutting Width inch	CW Cutting Width (mm)	CW Tolerance	RER REL	PSIRR PSIRL	Geometry
Grooving, Cutting Off	**GW1M0200D020N-GS**		●	●	●	D	.079	(2.00)	±.0012	.008	—	
Grooving, Cutting Off	NEW **GW1M0239E020N-GS**		●	●	●	E	.094	(2.39)	±.0012	.008	—	
Grooving, Cutting Off	**GW1M0300F020N-GS**		●	●	●	F	.118	(3.00)	±.0012	.008	—	
Grooving, Cutting Off	**GW1M0400G020N-GS**		●	●	●	G	.157	(4.00)	±.0016	.008	—	
Grooving, Cutting Off	**GW1M0500H030N-GS**		●	●	●	H	.197	(5.00)	±.0016	.012	—	
Grooving, Cutting Off	**GW1M0200D020N-GM**	●	●	●	●	D	.079	(2.00)	±.0012	.008	—	
Grooving, Cutting Off	NEW **GW1M0239E020N-GM**	●	●	●	●	E	.094	(2.39)	±.0012	.008	—	
Grooving, Cutting Off	**GW1M0300F030N-GM**	●	●	●	●	F	.118	(3.00)	±.0012	.012	—	
Grooving, Cutting Off	**GW1M0400G030N-GM**	●	●	●	●	G	.157	(4.00)	±.0016	.012	—	
Grooving, Cutting Off	**GW1M0500H040N-GM**	●	●	●	●	H	.197	(5.00)	.0016	.016	—	
Cutting off, Low Feed	NEW **GW1M0200D020R05-GS**		●	●	●	D	.079	(2.00)	±.0012	.008	5	
Cutting off, Low Feed	NEW **GW1M0239E020R05-GS**		●	●	●	E	.094	(2.39)	±.0012	.008	5	
Cutting off, Low Feed	NEW **GW1M0300F020R05-GS**		●	●	●	F	.118	(3.00)	±.0012	.008	5	
Cutting off Low Feed, Lead Angle 8°	NEW **GW1M0200D003R08-GS**		●	●	●	D	.079	(2.00)	±.0012	.0012	8	
Cutting off Low Feed, Lead Angle 8°	NEW **GW1M0239E003R08-GS**		●	●	●	E	.094	(2.39)	±.0012	.0012	8	
Cutting off Low Feed, Lead Angle 8°	NEW **GW1M0300F003R08-GS**		●	●	●	F	.118	(3.00)	±.0012	.0012	8	
Cutting Off	**GW1M0200D020R05-GM**		●	●	●	D	.079	(2.00)	±.0012	.008	5	
Cutting Off	**GW1M0200D020L05-GM**		●	●	●	D	.079	(2.00)	±.0012	.008	5	
Cutting Off	NEW **GW1M0239E020R05-GM**		●	●	●	E	.094	(2.39)	±.0012	.008	5	
Cutting Off	NEW **GW1M0239E020L05-GM**		●	●	●	E	.094	(2.39)	±.0012	.008	5	
Cutting Off	**GW1M0300F030R05-GM**		●	●	●	F	.118	(3.00)	±.0012	.012	5	
Cutting Off	**GW1M0300F030L05-GM**		●	●	●	F	.118	(3.00)	±.0012	.012	5	
Cutting Off	**GW1M0400G030R05-GM**		●	●	●	G	.157	(4.00)	±.0016	.012	5	
Cutting Off	**GW1M0400G030L05-GM**		●	●	●	G	.157	(4.00)	±.0016	.012	5	
Cutting Off	**GW1M0500H040R05-GM**		●	●	●	H	.197	(5.00)	±.0016	.016	5	
Cutting Off	**GW1M0500H040L05-GM**		●	●	●	H	.197	(5.00)	±.0016	.016	5	





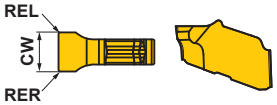
Right hand insert shown.

● = NEW

Blank Inserts

(inch)

Geometry	Order Number	Carbide RT9010	Carbide RT9020	Seat Size	CW Grooving Width inch	CW Grooving Width (mm)	CW Tolerance	RER	REL
1 Edge Type	**GW1B0320D020N**	★	★	D	.128	(3.24)	±0.10	.008	.008
	GW1B0440F020N	★	★	F	.175	(4.44)	±0.10	.008	.008
	GW1B0540G020N	★	★	G	.214	(5.44)	±0.10	.008	.008
	GW1B0640H020N	★	★	H	.254	(6.44)	±0.10	.008	.008



★ Insert blank is not suitable for machining without grinding.

Proper Use of GW Series Right Hand Inserts

First Recommended

Improved Fracture Resistance

GM Breaker
PSIRR=5°
RE=0.20

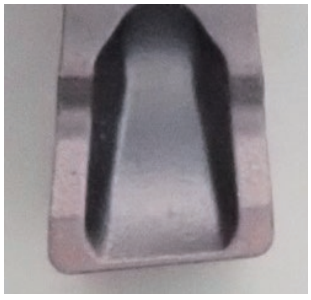
Reduction of Cutting Resistance

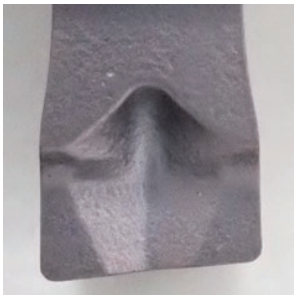
GS Breaker
PSIRR=5°
RE=0.20

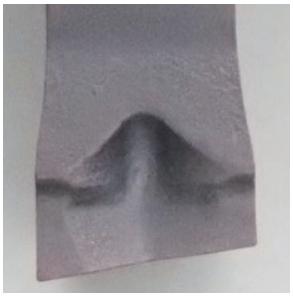
Reduction of Burrs and Core Residue

Improved Fracture Resistance

GS Breaker
PSIRR=8°
RE=0.03







■ Coolant Hose Kit

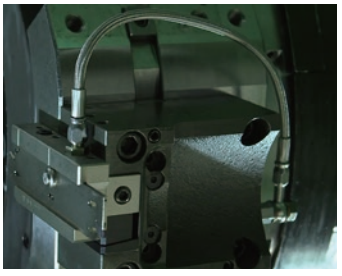
(inch)

Connector Type	Order Number	Stock	Hose Length	Kit Details								
				Hose	Banjo Adapter		Banjo Bolt		Adapter		Washer	
				Code No.	Code No.	QTY.	Code No.	QTY.	Code No.	QTY.	Code No.	QTY.
Straight	**CS-1/8-150SS**	●	5.91	HOSE-1/8-150	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	**CS-1/8-200SS**	●	7.87	HOSE-1/8-200	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	**CS-1/8-250SS**	●	9.84	HOSE-1/8-250	—	—	—	—	AD-G1/8	2	WA-M10	2
Straight	**CS-1/8-300SS**	●	11.81	HOSE-1/8-300	—	—	—	—	AD-G1/8	2	WA-M10	2
Elbow Straight	**CS-1/8-150BS**	●	5.91	HOSE-1/8-150	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	**CS-1/8-200BS**	●	7.87	HOSE-1/8-200	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	**CS-1/8-250BS**	●	9.84	HOSE-1/8-250	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow Straight	**CS-1/8-300BS**	●	11.81	HOSE-1/8-300	AD-BM10	1	BB-G1/8	1	AD-G1/8	1	WA-M10	3
Elbow	**CS-1/8-150BB**	●	5.91	HOSE-1/8-150	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	**CS-1/8-200BB**	●	7.87	HOSE-1/8-200	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	**CS-1/8-250BB**	●	9.84	HOSE-1/8-250	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4
Elbow	**CS-1/8-300BB**	●	11.81	HOSE-1/8-300	AD-BM10	2	BB-G1/8	2	—	—	WA-M10	4

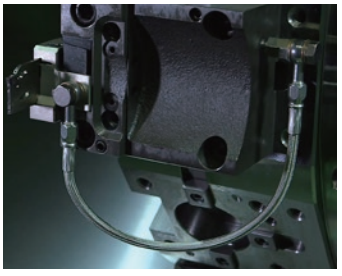
Connection Screw Size = G1/8"

Mounting Example

Elbow Straight Type



Elbow Type



● : USA Stock

RECOMMENDED CUTTING CONDITIONS

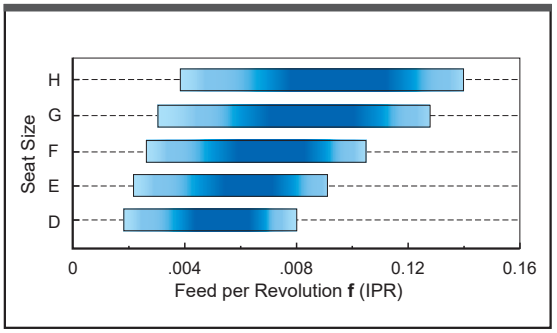
■ CUTTING SPEED

	Work Material	Properties	Grade	Cutting Speed **vc** (SFM) 165 330 490 655 820 985
P	Mild Steel	≤160HB	VP20RT	330 – 785
			VP10RT	360 – 820
	Carbon Steel Alloy Steel	160–280HB	VP20RT	260 – 655
			VP10RT	295 – 690
			VP30RT	195 – 590
			MY5015	360 – 820
		≥280HB	VP20RT	195 – 525
			VP10RT	230 – 560
			VP30RT	130 – 460
			MY5015	295 – 690
M	Stainless Steel	≤270HB	VP20RT	195 – 590
			VP10RT	230 – 620
			VP30RT	130 – 525
K	Gray Cast Iron	Tensile Strength ≤300MPa	VP20RT	260 – 655
			VP10RT	295 – 690
			MY5015	460 – 985
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP20RT	195 – 525
			VP10RT	230 – 560
			MY5015	295 – 690
S	Heat Resistant Alloy Titanium Alloy	–	VP20RT	100 – 195
			VP10RT	130 – 230

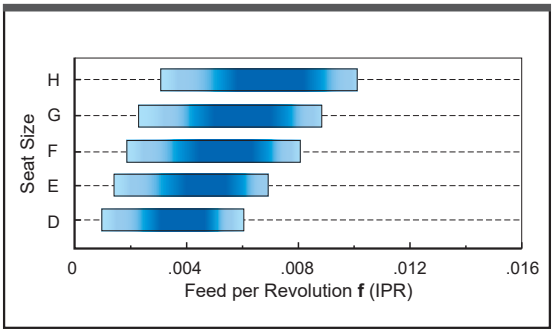
Note 1) VP20RT is the first recommended grade for materials.
Note 2) For VP10RT, VP20RT, VP30RT and MY5015, wet cutting is recommended.

■ FEED PER REVOLUTION

GM Breaker



GS Breaker



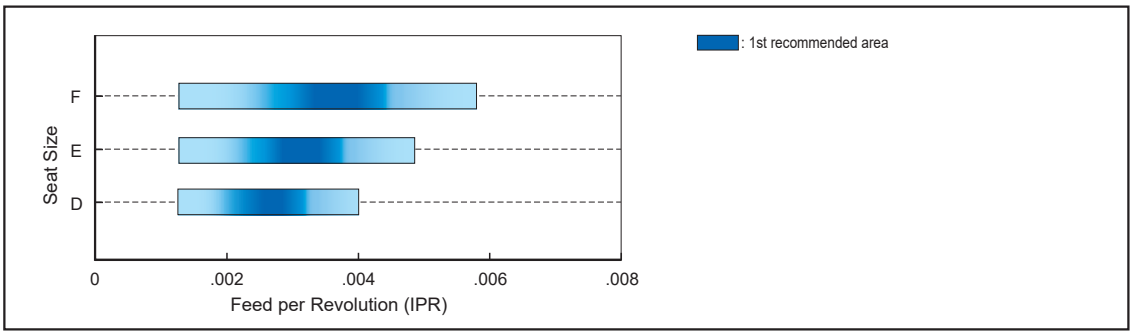
: 1st recommended area

Seat Size	Insert Width
D	.079", 2.0 mm
E	.094", 2.39 mm
F	.118", 3.0 mm
G	.157", 4.0 mm
H	.197", 5.0 mm

Chip Breaker	Feed per Revolution **f** (IPR)				
	Seat Size D	Seat Size E	Seat Size F	Seat Size G	Seat Size H
GM Breaker	.002–.008	.0024 – .0091	.003–.010	.003–.013	.004–.014
GS Breaker	.001–.006	.0016 – .0067	.002–.008	.002–.009	.003–.010

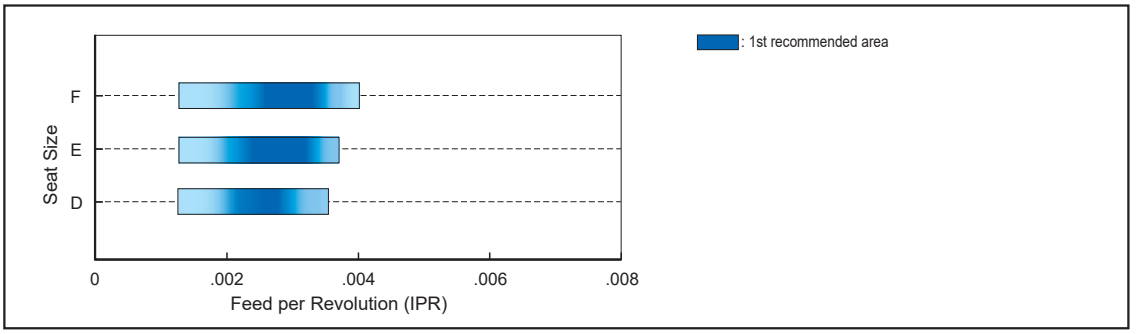
■CUTTING OFF FEED PER REVOLUTION

R05-GS Breaker

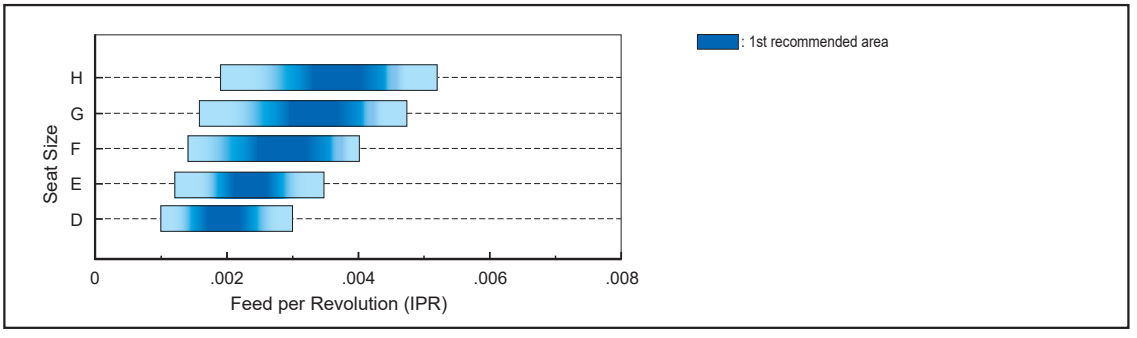


Seat Size	Insert Width
D	.079", 2.0 mm
E	.094", 2.39 mm
F	.118", 3.0 mm
G	.157", 4.0 mm
H	.197", 5.0 mm

R08-GS Breaker



R/L05-GM Breaker

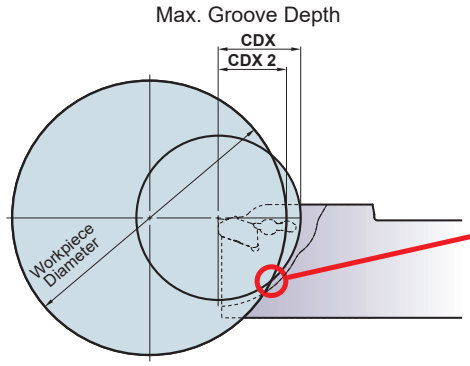


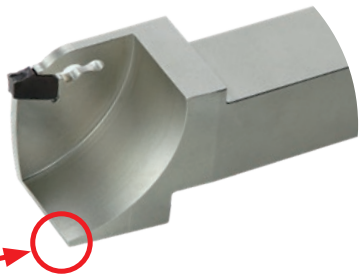
Chip Breaker	PSIPR	Hand	Feed per Revolution (IPR)				
			Seat Size D	Seat Size E	Seat Size F	Seat Size G	Seat Size H
R05-GS	5°	R	.0012 – .0039	.0012 – .0047	.0012 – .0055	–	–
R08-GS	8°	R	.0012 – .0031	.0012 – .0035	.0012 – .0055	–	–
R05-GM	5°	R/L	.0020 – .0059	.0024 – .0067	.0028 – .0079	.0031 – .0091	.0039 – .0102

LIMITATION OF THE MAXIMUM GROOVE DEPTH [For External Grooving]

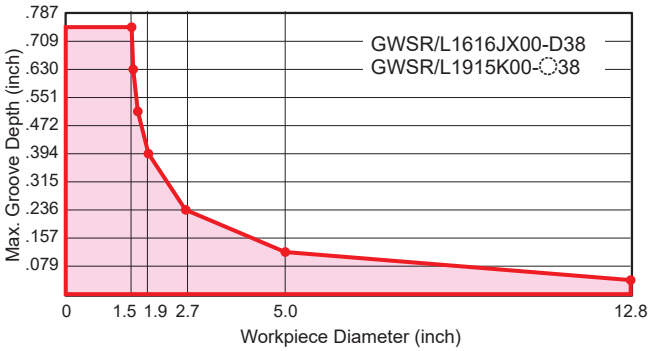
•For Swiss-type lathes mono block holder

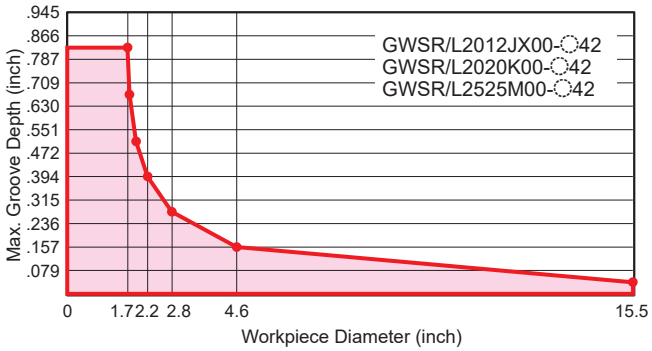
The maximum groove depth is limited by the workpiece diameter.

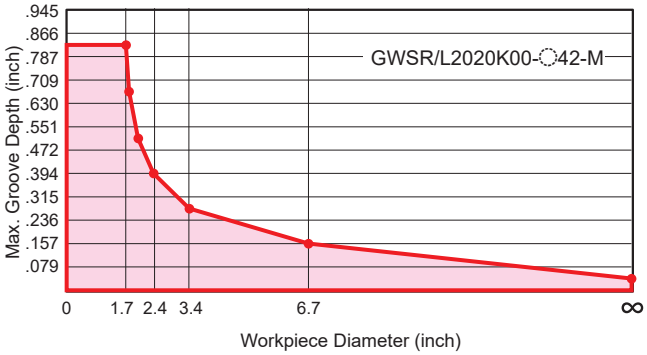


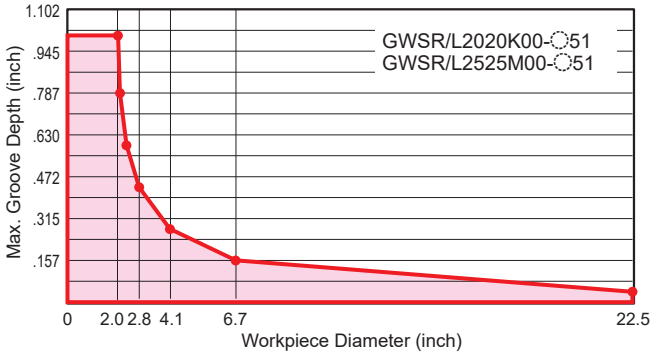


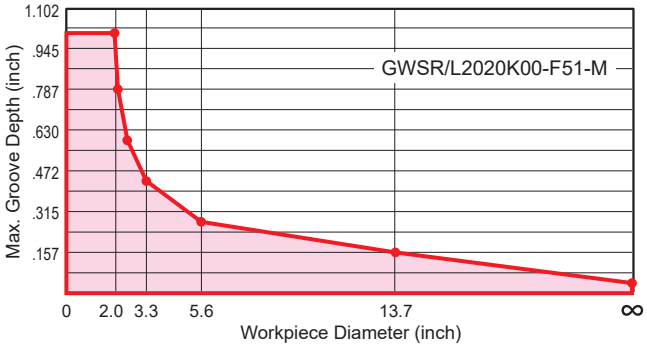
Due to the interference on this part, the maximum groove depth is limited by the workpiece diameter.

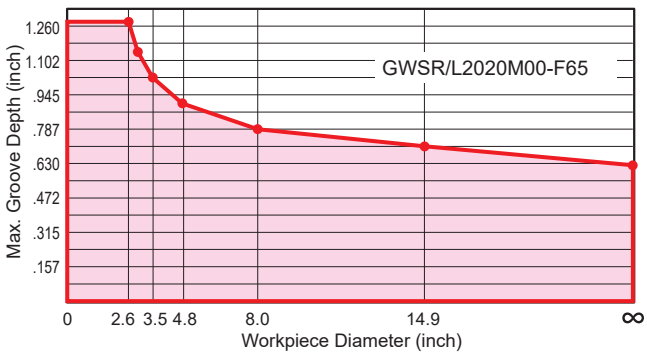


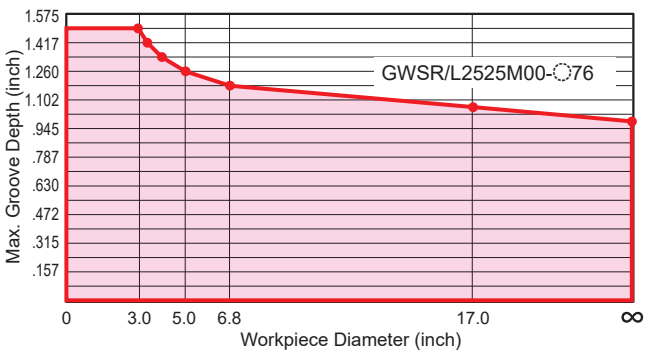










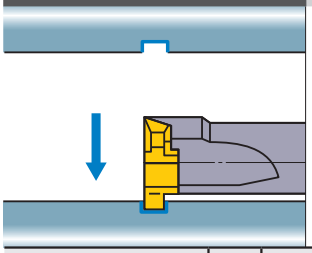


F TYPE BORING BAR

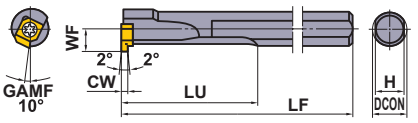
- Min. cutting diameter 10 mm.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: 3 mm.

FSL51

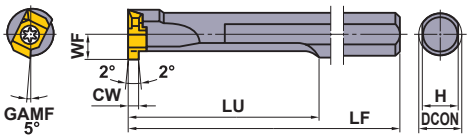
Internal grooving, Threading



1 Corner type (FSL5108R,5110R)



2 Corner type (FSL5112R,5114R,5116R)



Metric Standard

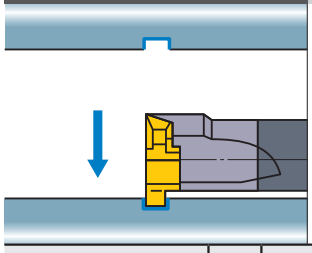
Right hand tool holder only.

Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW	DMIN*			
FSL5108R	★	MLG	10○○L	MLT	1001L	8	7	125	30	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5110R	★		10○○L		1001L	10	9	150	40	5.8		**12**	1.0	TS25	TKY08F
FSL5112R	★	MLG	14○○L	MLT	1401L	12	10.8	180	50	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5114R	★		14○○L		1401L	14	12.4	180	60	7.8		**16**	2.0	TS32	TKY08F
FSL5116R	★	MLG	20○○L	MLT	2001L	16	14	200	70	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

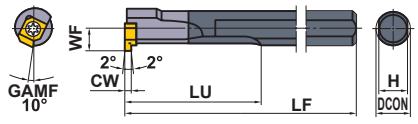
*DMIN : Min. Cutting Diameter

FSL52

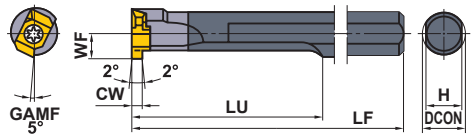
(Carbide shank) Internal grooving, Threading



1 Corner type (FSL5208R,5210R)



2 Corner type (FSL5212R,5214R,5216R)



Metric Standard

Right hand tool holder only.

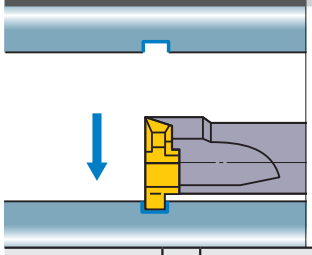
Order Number	Stock	Insert Number				Dimensions (mm)							Max. Groove Depth (mm)	Clamp Screw	Wrench
	R	Grooving		Threading		DCON	H	LF	LU	WF	CW	DMIN*			
FSL5208R	★	MLG	10○○L	MLT	1001L	8	7	125	60	4.8	1.2 1.5 2.0	**10**	1.0	TS25	TKY08F
FSL5210R	★		10○○L		1001L	10	9	150	70	5.8		**12**	1.0	TS25	TKY08F
FSL5212R	★	MLG	14○○L	MLT	1401L	12	10.8	180	80	6.8	1.5 2.0 3.0	**14**	2.0	TS32	TKY08F
FSL5214R	★		14○○L		1401L	14	12.4	180	85	7.8		**16**	2.0	TS32	TKY08F
FSL5216R	★	MLG	20○○L	MLT	2001L	16	14	200	115	9.7	2.0 3.0 4.0	**20**	3.0	TS43	TKY15F

*DMIN : Min. Cutting Diameter

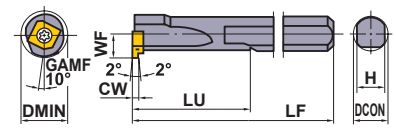
● : USA Stock ★ : Stocked in Japan

S-SL5N

Internal grooving, Threading, Boring

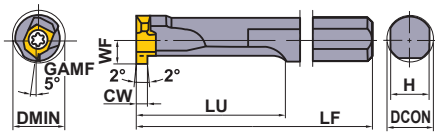


1 Corner type (S-SL5NR05 / 06)



(Min.Bore)

2 Corner type (S-SL5NR08 / 10 / 12)



(Min.Bore)

Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)								
	R	Grooving	Threading	DCON	H	LF	LU	WF	CW	DMIN	Clamp Screw	Wrench
S-SL5NR05	●	MLG10W○○○L	MLT1001L	.313	.283	5.000	1.250	.188	.062" 1.2 mm	.390	TS25	TKY08F
S-SL5NR06	●	MLG10W○○○L	MLT1001L	.375	.340	6.000	1.500	.219	1.5 mm 2.0 mm	.449	TS25	TKY08F
S-SL5NR08	●	MLG14W○○○L	MLT1401L	.500	.460	7.000	2.000	.281	.062" 1.5 mm 2.0 mm 3.0 mm	.579	TS32	TKY08F
S-SL5NR10	●	MLG20W○○○L	MLT2001L	.625	.560	8.000	3.000	.375	2.0 mm 3.0 mm	.791	TS43	TKY15F
S-SL5NR12	●	MLG20W○○○L	MLT2001L	.750	.700	10.000	4.000	.438	4.0 mm	.902	TS43	TKY15F

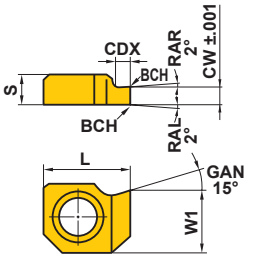
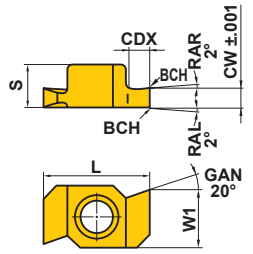
RECOMMENDED CUTTING CONDITIONS

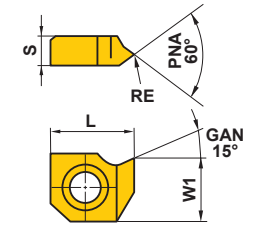
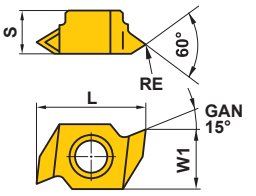
Work Material		Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel Alloy Steel	180—280HB	**UP20M ▪ UTi20T**	295 (195—390)	.002 (.0008—.003)
		280—350HB	**UP20M ▪ UTi20T**	260 (165—330)	.001 (.0008—.0015)

INSERTS ➤ F236
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

F TYPE

INSERTS

Application		CW (inch)	Order Number	Carbide UTi20T	Carbide HTi10	L	W1	CDX	S	BCH	Geometry
Grooving	Inch	.062	**MLG10W062L**		●	.276	.197	.039	.094	.004	**MLG...L (1 Corner type)** 
	Metric	.047 (1.2 mm)	**MLG1012L**	●		.276	.197	.039	.094	.004	
		.059 (1.5 mm)	**MLG1015L**	●		.276	.197	.039	.094	.004	
		.079 (2.0 mm)	**MLG1020L**	●		.276	.197	.039	.094	.004	
	Metric	.059 (1.5 mm)	**MLG1415L**	●		.465	.256	.079	.187	.004	**MLG...L (2 Corner type)** 
		.079 (2.0 mm)	**MLG1420L**	●		.465	.256	.079	.187	.004	
		.118 (3.0 mm)	**MLG1430L**	●		.465	.256	.079	.187	.004	
		.079 (2.0 mm)	**MLG2020L**	●		.661	.356	.118	.250	.004	
		.118 (3.0 mm)	**MLG2030L**	●		.661	.356	.118	.250	.004	
		.157 (4.0 mm)	**MLG2040L**	●		.661	.356	.118	.250	.004	

Application	Pitch	Order Number	Coated UP20M	Carbide UTi20T	L	W1	S	RE	Geometry
Threading	13T.P.I	**MLT1001L**	●	●	.276	.197	.094	.004	**MLT1001L (1 Corner type)** 
	11T.P.I	**MLT1401L**	●	●	.465	.256	.187	.004	
	8T.P.I	**MLT2001L**	●	●	.661	.356	.250	.004	**MLT1401L /2001L (2 Corner type)** 

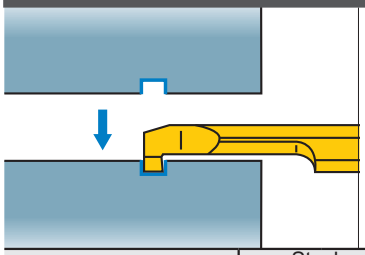
● : USA Stock

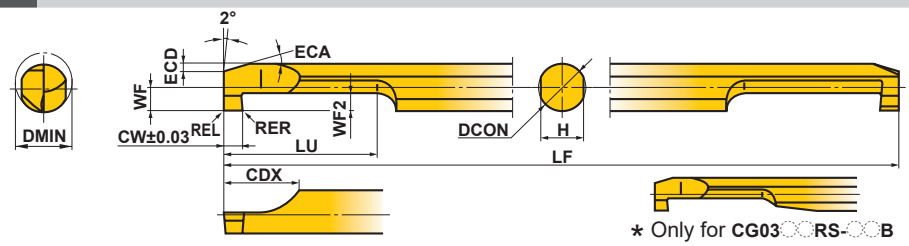
<10 inserts in one case> <1 MICRO-MINI TWIN in one case>

MICRO-MINI TWIN

CG

Internal grooving





Order Number	Stock		Breaker	Dimensions (mm)											
	Micro Grain Carbide	Coated													
	TF15	VP15TF		DMIN	CW	WF2	RER/L	DCON	LF	LU	CDX	WF	H	ECA	ECD
CG0305RS-10	●	●	Without	3	1	1	0.05	3	50	5	6	1.3	2.7	15°	0.3
CG0305RS-10B	●	●	With	3	1	1	0.05	3	50	5	6	1.3	2.7	15°	0.3
CG0306RS-20	●	●	Without	3	2	1	0.1	3	50	6	6	1.3	2.7	15°	0.3
CG0306RS-20B	●	●	With	3	2	1	0.1	3	50	6	6	1.3	2.7	15°	0.3
CG03RS-10	●	●	Without	3	1	1	0.05	3	50	10	6	1.3	2.7	15°	0.3
CG03RS-10B	●	●	With	3	1	1	0.05	3	50	10	6	1.3	2.7	15°	0.3
CG03RS-20	●	●	Without	3	2	1	0.1	3	50	11	6	1.3	2.7	15°	0.3
CG03RS-20B	●	●	With	3	2	1	0.1	3	50	11	6	1.3	2.7	15°	0.3
CG0407RS-10	●	●	Without	4	1	1.5	0.05	4	60	7	7	1.8	3.6	15°	0.5
CG0407RS-10B	●	●	With	4	1	1.5	0.05	4	60	7	7	1.8	3.6	15°	0.5
CG0408RS-20	●	●	Without	4	2	1.5	0.1	4	60	8	7	1.8	3.6	15°	0.5
CG0408RS-20B	●	●	With	4	2	1.5	0.1	4	60	8	7	1.8	3.6	15°	0.5
CG04RS-10	●	●	Without	4	1	1.5	0.05	4	60	15	7	1.8	3.6	15°	0.5
CG04RS-10B	●	●	With	4	1	1.5	0.05	4	60	15	7	1.8	3.6	15°	0.5
CG04RS-20	●	●	Without	4	2	1.5	0.1	4	60	16	7	1.8	3.6	15°	0.5
CG04RS-20B	●	●	With	4	2	1.5	0.1	4	60	16	7	1.8	3.6	15°	0.5
CG0510RS-10	●	●	Without	5	1	2	0.05	5	70	10	8	2.3	4.5	15°	0.7
CG0510RS-10B	●	●	With	5	1	2	0.05	5	70	10	8	2.3	4.5	15°	0.7
CG0511RS-20	●	●	Without	5	2	2	0.1	5	70	11	8	2.3	4.5	15°	0.7
CG0511RS-20B	●	●	With	5	2	2	0.1	5	70	11	8	2.3	4.5	15°	0.7
CG05RS-10	●	●	Without	5	1	2	0.05	5	70	20	8	2.3	4.5	15°	0.7
CG05RS-10B	●	●	With	5	1	2	0.05	5	70	20	8	2.3	4.5	15°	0.7
CG05RS-20	●	●	Without	5	2	2	0.1	5	70	21	8	2.3	4.5	15°	0.7
CG05RS-20B	●	●	With	5	2	2	0.1	5	70	21	8	2.3	4.5	15°	0.7
CG0610RS-10	●	●	Without	6	1	2	0.05	6	75	10	8	2.8	5.4	15°	0.7
CG0610RS-10B	●	●	With	6	1	2	0.05	6	75	10	8	2.8	5.4	15°	0.7
CG0611RS-20	●	●	Without	6	2	2	0.1	6	75	11	8	2.8	5.4	15°	0.7
CG0611RS-20B	●	●	With	6	2	2	0.1	6	75	11	8	2.8	5.4	15°	0.7
CG06RS-10	●	●	Without	6	1	2	0.05	6	75	20	8	2.8	5.4	15°	0.7
CG06RS-10B	●	●	With	6	1	2	0.05	6	75	20	8	2.8	5.4	15°	0.7
CG06RS-20	●	●	Without	6	2	2	0.1	6	75	21	8	2.8	5.4	15°	0.7
CG06RS-20B	●	●	With	6	2	2	0.1	6	75	21	8	2.8	5.4	15°	0.7
CG0712RS-10	●	●	Without	7	1	2	0.05	7	85	12	8	3.3	6.4	15°	0.7
CG0712RS-10B	●	●	With	7	1	2	0.05	7	85	12	8	3.3	6.4	15°	0.7
CG0713RS-20	●	●	Without	7	2	2	0.1	7	85	13	8	3.3	6.4	15°	0.7
CG0713RS-20B	●	●	With	7	2	2	0.1	7	85	13	8	3.3	6.4	15°	0.7
CG07RS-10	●	●	Without	7	1	2	0.05	7	85	25	8	3.3	6.4	15°	0.7
CG07RS-10B	●	●	With	7	1	2	0.05	7	85	25	8	3.3	6.4	15°	0.7
CG07RS-20	●	●	Without	7	2	2	0.1	7	85	26	8	3.3	6.4	15°	0.7
CG07RS-20B	●	●	With	7	2	2	0.1	7	85	26	8	3.3	6.4	15°	0.7

HOLDER ➤ E034, E036, E037
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

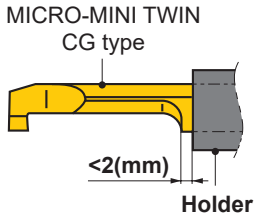
HOLDER

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

Holder			Stock	MICRO-MINI TWIN	Machine Makers
Type		Order Number *1		CG	
Round Type Holder ϕ.625 inch	ID : Metric Type	**RBH10189A**	●	030□RS-□□(B), 03RS-□□(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH10252A	●	040□RS-□□(B), 04RS-□□(B)	
		RBH10315A	●	051□RS-□□(B), 05RS-□□(B)	
		RBH10378A	●	061□RS-□□(B), 06RS-□□(B)	
		RBH10441A	●	071□RS-□□(B), 07RS-□□(B)	
Round Type Holder ϕ.750 inch	ID : Metric Type	**RBH19030N**	●	030□RS-□□(B), 03RS-□□(B)	Citizen Precision Machinery Co., Ltd.
		RBH19040N	●	040□RS-□□(B), 04RS-□□(B)	
		RBH19050N	●	051□RS-□□(B), 05RS-□□(B)	
		RBH19060N	●	061□RS-□□(B), 06RS-□□(B)	
		RBH19070N	●	071□RS-□□(B), 07RS-□□(B)	
Round Type Holder ϕ1.000 inch	ID : Metric Type	**RBH16189A**	●	030□RS-□□(B), 03RS-□□(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH16252A	●	040□RS-□□(B), 04RS-□□(B)	
		RBH16315A	●	051□RS-□□(B), 05RS-□□(B)	
		RBH16378A	●	061□RS-□□(B), 06RS-□□(B)	
		RBH16441A	●	071□RS-□□(B), 07RS-□□(B)	

∗ Mitsubishi Materials obtained the makers' approval before entering their names in the list.
∗1 For holder details, refer to Boring Bar Section, page E034—E038.

■RECOMMENDED TOOL OVERHANG



Note 1) For LU, refer to page F237.

RECOMMENDED CUTTING CONDITIONS

Work Material		Hardness	Cutting Speed (SFM)	Feed (IPR)	
				03RS/04RS	**05RS/06RS/07RS**
P	Carbon Steel · Alloy Steel	180—280HB	130—395	.0004—.001	.0004—.002
M	Stainless Steel	≤200HB	130—395	.0004—.001	.0004—.002
K	Gray Cast Iron	Tensile Strength ≤350MPa	130—395	.0004—.002	.0004—.002
N	Non-Ferrous Metal	—	260—525	.0004—.002	.0004—.003

Note 1) Recommend wet machining.

● : USA Stock ★ : Stocked in Japan

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

Holder		Stock	MICRO-MINI TWIN	Machine Makers
Type	Order Number*1		CG	
Round Type Holder ϕ16 mm	**RBH1630N**	●	030□RS-□□(B), 03RS-□□(B)	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH1640N	●	040□RS-□□(B), 04RS-□□(B)	
	RBH1650N	●	051□RS-□□(B), 05RS-□□(B)	
	RBH1660N	●	061□RS-□□(B), 06RS-□□(B)	
	RBH1670N	●	071□RS-□□(B), 07RS-□□(B)	
Round Type Holder ϕ20 mm	**RBH2030N**	●	030□RS-□□(B), 03RS-□□(B)	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH2040N	●	040□RS-□□(B), 04RS-□□(B)	
	RBH2050N	●	051□RS-□□(B), 05RS-□□(B)	
	RBH2060N	●	061□RS-□□(B), 06RS-□□(B)	
	RBH2070N	●	071□RS-□□(B), 07RS-□□(B)	
Round Type Holder ϕ22 mm	**RBH2230N**	●	030□RS-□□(B), 03RS-□□(B)	STAR MICRONICS CO., LTD.
	RBH2240N	●	040□RS-□□(B), 04RS-□□(B)	
	RBH2250N	●	051□RS-□□(B), 05RS-□□(B)	
	RBH2260N	●	061□RS-□□(B), 06RS-□□(B)	
	RBH2270N	●	071□RS-□□(B), 07RS-□□(B)	
Round Type Holder ϕ25 mm	**RBH2530N**	●	030□RS-□□(B), 03RS-□□(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH2540N	●	040□RS-□□(B), 04RS-□□(B)	
	RBH2550N	●	051□RS-□□(B), 05RS-□□(B)	
	RBH2560N	●	061□RS-□□(B), 06RS-□□(B)	
	RBH2570N	●	071□RS-□□(B), 07RS-□□(B)	
Square Type Holder □10 mm	**SBH1030R**	★	030□RS-□□(B), 03RS-□□(B)	NC lathes
	SBH1040R	★	040□RS-□□(B), 04RS-□□(B)	
	SBH1050R	★	051□RS-□□(B), 05RS-□□(B)	
	SBH1060R	★	061□RS-□□(B), 06RS-□□(B)	
	SBH1070R	★	071□RS-□□(B), 07RS-□□(B)	

★ Mitsubishi Materials obtained the makers' approval before entering their names in the list.
*1 For holder details, refer to Boring Bar Section, page E034—E038.

HOW TO READ THE STANDARD OF THREADING

●How this section page is organized

①Classified according to external or internal applications.
②Sub-classified according to product series.
(Refer to the index on the next page.)

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict the available machining applications, such as external and internal threading.

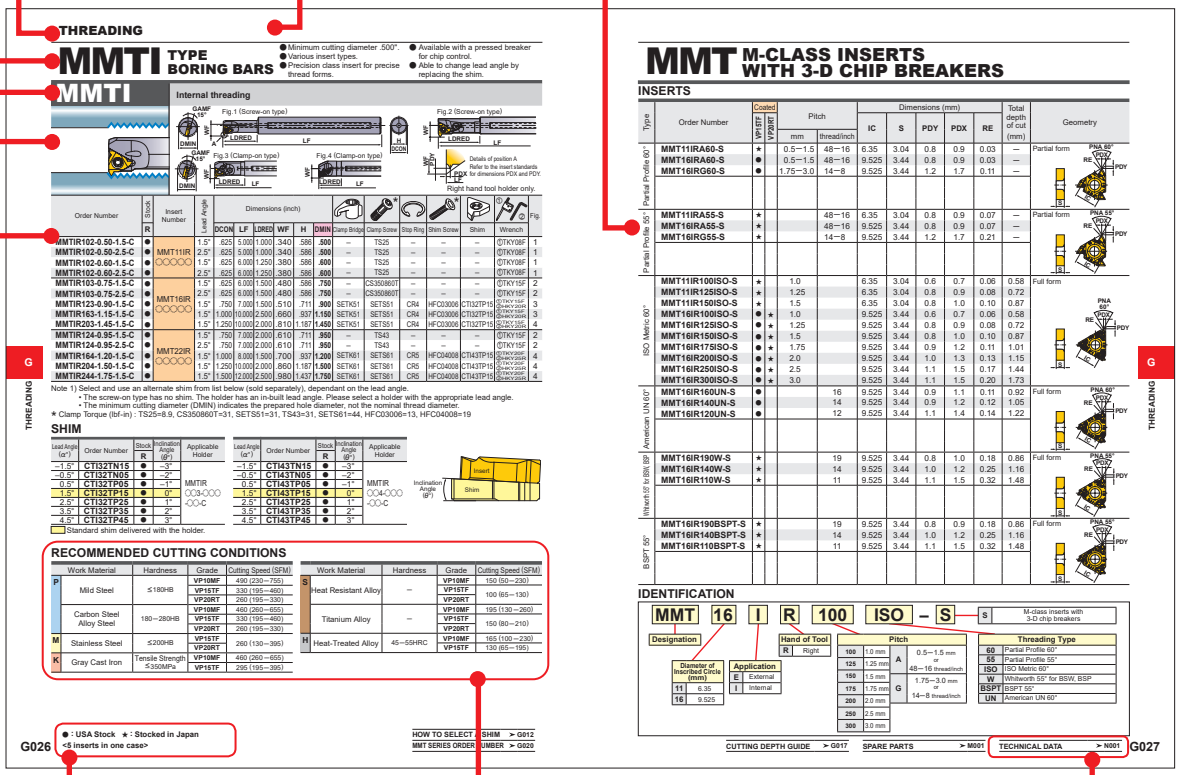
TYPE OF TOOL HOLDER
indicates the initial letters for the order number and cutting applications.

TITLE OF PRODUCT

PRODUCT SECTION

INDICATION OF EXTERNAL /INTERNAL APPLICATION

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PAGE REFERENCE
·SPARE PARTS
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, stock status (per right/left hand), applicable inserts, holder dimensions, and spare parts.

RECOMMENDED CUTTING CONDITIONS
for each work material classification, indicates recommended cutting conditions according to the ISO categories for cutting grades, P, M, K, S, and H.

●To Order : For holder, please specify order number and hand of tool (right/left).
For insert, please specify insert number and grade.

TURNING TOOLS

THREADING

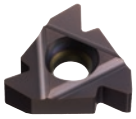
CLASSIFICATION (EXTERNAL THREADING) ···· G002
CLASSIFICATION (INTERNAL THREADING)····· G003
CROSS REFERENCE OF THREAD PITCHES
EXTERNAL ····· G004
INTERNAL ····· G006
STANDARD THREAD AND CORRESPONDING INSERT ··· G008
PIPE THREADS AND TOOL SELECTION ····· G009

STANDARD OF THREADING TOOLS
MMT SERIES
FEATURES ····· G010
CUTTING CONDITIONS····· G012
STANDARD OF DEPTH OF CUT····· G014
EXTERNAL THREADING
MMTE HOLDER ····· G021
INTERNAL THREADING
MMTI TYPE BORING BARS····· G026
FSL5 TYPE BORING BARS ····· G031
SL5N TYPE BORING BARS····· G032
MICRO-MINI TWIN(CT) BORING BARS ····· G034

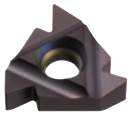
*Arranged by Alphabetical order

G034 **CT**
G031 **FSL51**
G031 **FSL52**
G033 **MLG (INTERNAL INSERTS)**
G033 **MLT (INTERNAL INSERTS)**
G022 **MMT (EXTERNAL INSERTS)**
G027 **MMT (INTERNAL INSERTS)**
G021 **MMTE**
G026 **MMTI**
G032 **S-SL5N**

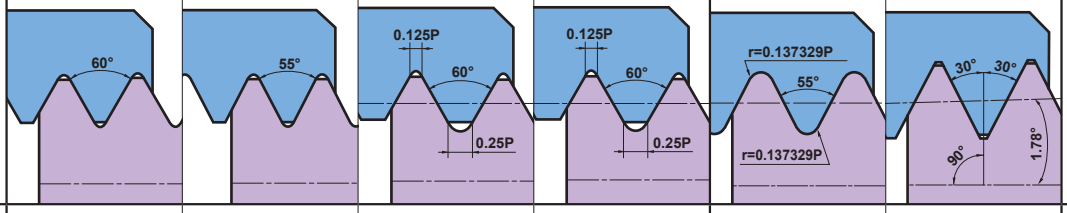
CLASSIFICATION (EXTERNAL THREADING)

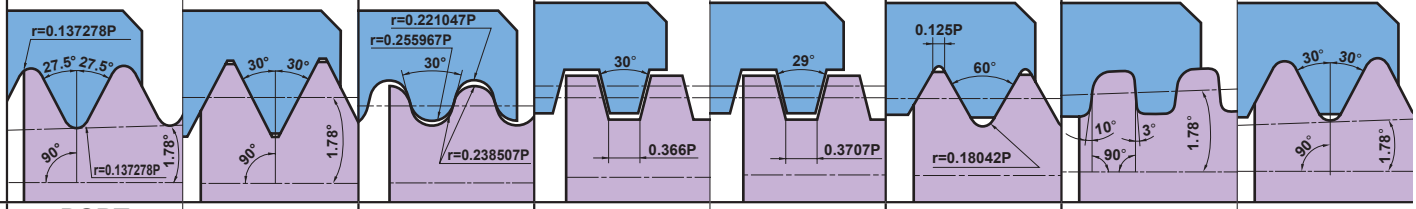
Name of Tool Holder	Insert Shape	Features
MMTE Holder G021		● Various insert types. ● Precision class insert for precise thread forms. ● Available with a pressed breaker for chip control. ● Able to change lead angle by replacing the shim.

CLASSIFICATION (INTERNAL THREADING)

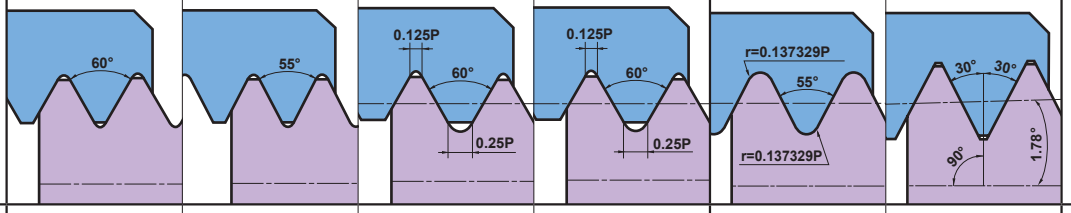
Name of Tool Holder	Insert Shape	Features
MMTI **Boring Bars** G026		● Minimum cutting diameter .500 inch. ● Various insert types. ● Precision class insert for precise thread forms. ● Available with a pressed breaker for chip control. ● Able to change lead angle by replacing the shim.
FSL5 **S-SL5** **Boring Bars** G031 G032		● Screw-on type. ● Precision class insert. ● Holder is capable of performing both grooving and threading. ● Maximum groove depth .118 inch.
MICRO-MINI TWIN **Boring Bars** G034	–	● Solid carbide type. ● Economical due to single holder with two cutting edges.
MICRO-MINI **Boring Bars** E031	–	● Solid carbide type. ● Insert can be ground to suit the application.

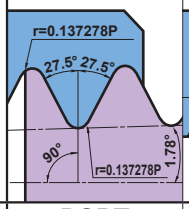
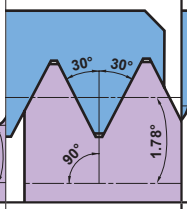
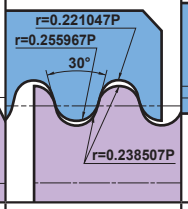
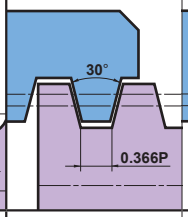
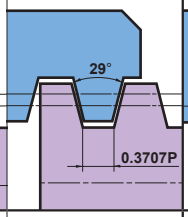
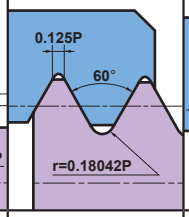
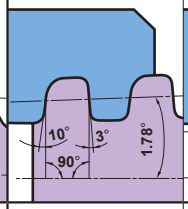
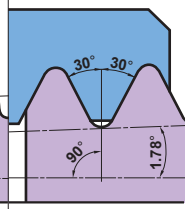
CROSS REFERENCE OF THREAD PITCHES (EXTERNAL)

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric 60°	American UN 60°	Parallel Pipe Thread Whitworth 55° for BSW, BSP	American NPT 60°
							
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) Rp(PS) W	NPT
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
MMT Holder G021	Full form	–	–	0.5 2.5 0.75 3.0 1.0 3.5 1.25 4.0 1.5 4.5 1.75 5.0 2.0	32 12 28 11 24 10 20 9 18 8 16 7 14 6 13 5	28 11 26 10 20 9 19 8 18 7 16 6 14 5 12	27 18 14 11.5 8
	Partial form	0.5 –1.5(48–16) 1.75–3.0(14– 8) 0.5 –3.0(48– 8) 3.5 –5.0(07– 5)	48–16 14– 8 48– 8 7– 5	0.5 –1.5 1.75–3.0 0.5 –3.0 3.5 –5.0	48–16 14– 8 48– 8 7– 5	–	–

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmission		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT 55°	American NPTF 60°	Round DIN 405 30°	ISO Trapezoidal 30°	American ACME 29°	UNJ	API Buttress Casing	API Round 60° Casing & Tubing
								
	BSPT R(PT) Rc(RT) Rp	NPTF	Rd	Tr (TM)	ACME (TW)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	28 19 14 11	27 18 14 11.5 8	10 8 6 4	1.5 2.0 3.0 4.0 5.0	12 10 8 6 5	32 16 28 14 24 12 20 10 18 8	5	10 8
	–	–	–	–	–	–	–	–

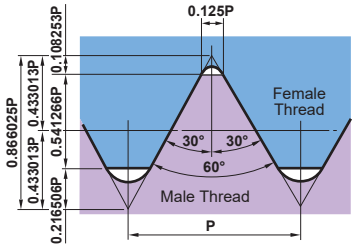
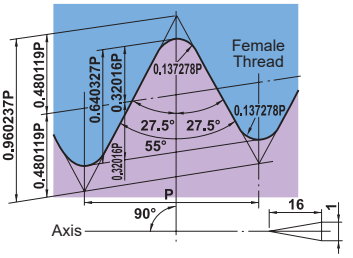
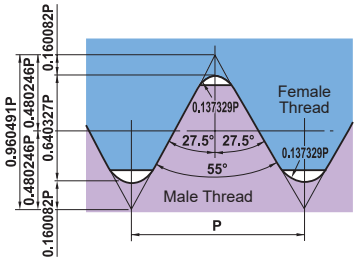
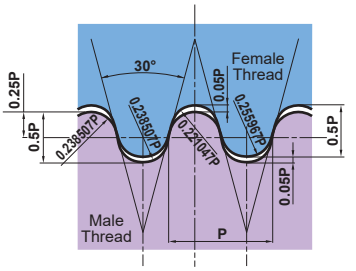
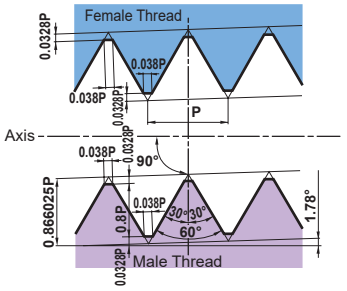
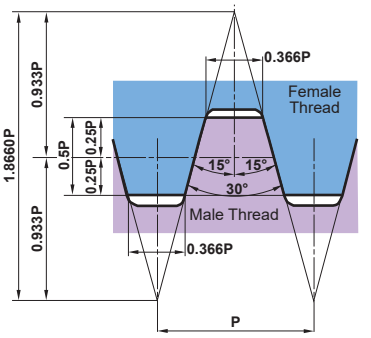
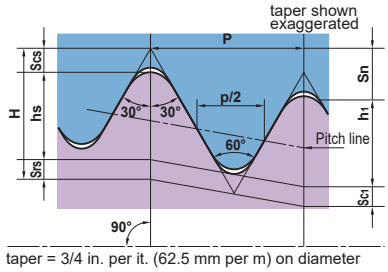
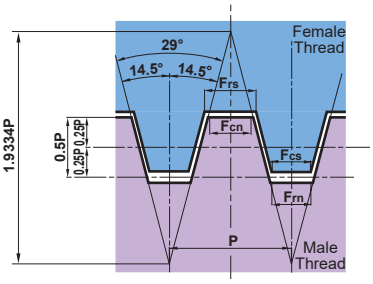
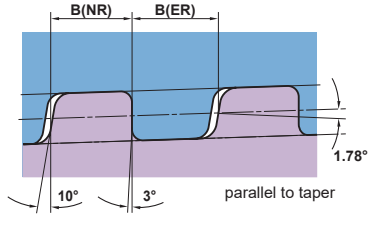
CROSS REFERENCE OF THREAD PITCHES (INTERNAL)

Application		General machining				Pipe fittings and couplings for gas and water	
Type		Partial Profile 60°	Partial Profile 55°	ISO Metric 60°	American UN 60°	Parallel Pipe Thread Whitworth 55° for BSW, BSP	American NPT 60°
							
Symbol		M UNC UNF	W	M	UNC UNF	G(PF) Rp(PS) W	NPT
Holder	Pitch	mm (thread/inch)	thread/inch	mm	thread/inch	thread/inch	thread/inch
MMT Boring Bars G026	Full form	–	–	0.5 2.5 0.75 3.0 1.0 3.5 1.25 4.0 1.5 4.5 1.75 5.0 2.0	32 12 28 11 24 10 20 9 18 8 16 7 14 6 13 5	28 11 26 10 20 9 19 8 18 7 16 6 14 5 12	27 18 14 11.5 8
	Partial form	0.5 –1.5(48–16) 1.75–3.0(14– 8) 0.5 –3.0(48– 8) 3.5 –5.0(07– 5)	48–16 14– 8 48– 8 7– 5	0.5 –1.5 1.75–3.0 0.5 –3.0 3.5 –5.0	48–16 14– 8 48– 8 7– 5	–	–
FSL5 SL5N Boring Bars G031 G032	Partial form	1.5–2.0(16–13) 1.5–2.5(16–11) 1.5–3.5(16– 7)	–	1.5–2.0 1.5–2.5 1.5–3.5	16–13 16–11 16– 7	–	–
MICRO-MINI TWIN G034	Partial form	0.5 –1.0 (36–24) 0.75–1.25(28–20) 0.75–1.5 (24–18) 0.75–1.75(24–16)	–	0.5 -1.0 0.75-1.25 0.75-1.5 0.75-1.75	36–24 28–20 24–18 24–16		

	Steam, gas and water pipes		Pipe couplings for food and fire fighting industries	Motion transmission		Aircraft and aerospace	Oil and gas	
	Taper Pipe Thread BSPT 55°	American NPTF 60°	Round DIN 405 30°	ISO Trapezoidal 30°	American ACME 29°	UNJ	API Buttress Casing	API Round 60° Casing & Tubing
								
	BSPT R(PT) Rc(PT) Rp	NPTF	Rd	Tr (TM)	ACME (TW)	UNJ	BCSG	CSG LCSG
	thread/inch	thread/inch	thread/inch	mm	thread/inch	thread/inch	thread/inch	thread/inch
	19 14 11	14 11.5 8	10 8 6 4	1.5 2.0 3.0 4.0 5.0	12 10 8 6 5	* –	5	10 8
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

* When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with 60° American UN 60°. In this case, a full form type insert cannot be used.

STANDARD THREAD AND CORRESPONDING INSERT

Thread Name	Standard Thread Type	Symbol	Thread Name	Standard Thread Type	Symbol
ISO Metric 60° / American UN 60°		M UNC UNF	BSPT 55°		BSPT R (PT) Rc (PT) Rp
Parallel Pipe Thread Whitworth 55° for BSW, BSP		W G (PF) Rp (PS)	Round DIN 405		Rd
American NPT 60°		NPT	ISO Trapezoidal 30°		Tr (TM)
API Round 60° Casing & Tubing		CSG LCSG	American ACME 29°		ACME (TW)
API Buttress Casing		BCSG			

PIPE THREADS AND TOOL SELECTION

● Parallel Pipe Threads G(PF)

Thread Type	Number of threads	Standard internal diameter
G1/16	28	.258"
G1/8		.337"
G1/4	19	.451"
G3/8		.589"
G1/2	14	.734"
G5/8		.811"
G3/4		.949"
G7/8		1.098"
G1	11	1.193"
G1·1/8		1.376"
G1·1/4		1.534"

Note 1) Same as PF.

● Taper Pipe Threads R(PT), Rc(PT)

Thread Type	Number of threads	Standard internal diameter
R1/16	28	.258"
R1/8		.337"
R1/4	19	.451"
R3/8		.589"
R1/2	14	.734"
–	–	–
R3/4	14	.949"
–	–	–
R1	11	1.193"
–	–	–
R1·1/4	11	1.534"

Note 1) Same as Rc and PT.

· The pitch is pre-determined for each nominal diameter. Note the minimum machining diameter especially when internal threading.

FEATURES OF MMT SERIES

■A WIDE VARIETY OF CHOICES

Mitsubishi Miracle Threading (MMT) series contains 297 inserts and 23 holders.

M-CLASS INSERTS WITH 3-D CHIP BREAKERS

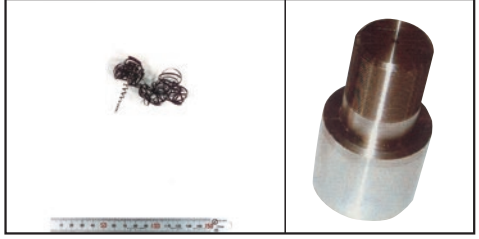
G-CLASS GROUND INSERTS

■IDEAL CHIP CONTROL EVEN IN THE LATTER HALF OF PASSES WHEN CONTINUOUS CHIPS ARE USUALLY PRODUCED. (M-CLASS INSERTS WITH 3-D CHIP BREAKERS)

ISO metric external thread pitch 1.5 mm Final pass (6th pass)

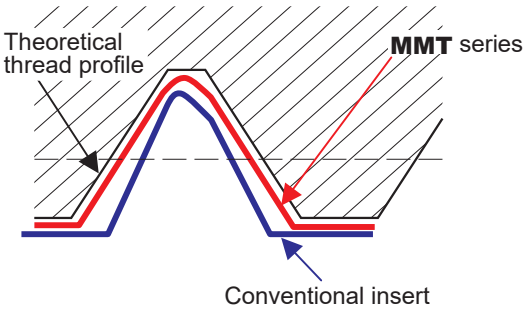
Competitor

MMT



<Cutting Conditions>
Work Material : AISI 4140
Insert : MMT16ER150ISO-S
Grade : VP15TF
Cutting speed : 395 SFM
Cutting method : Radial Infeed
Depth of cut : Fixed cut area
Pass : 6 times
Coolant : Wet

■A HIGHER LEVEL OF PRECISION THAN CONVENTIONAL INSERTS (G-CLASS GROUND INSERTS)

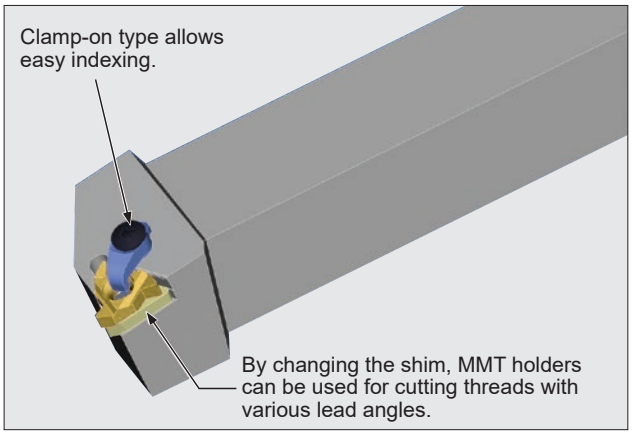


High precision threading can be achieved by using MMT inserts that feature a ground rake face and peripheral cutting edge.

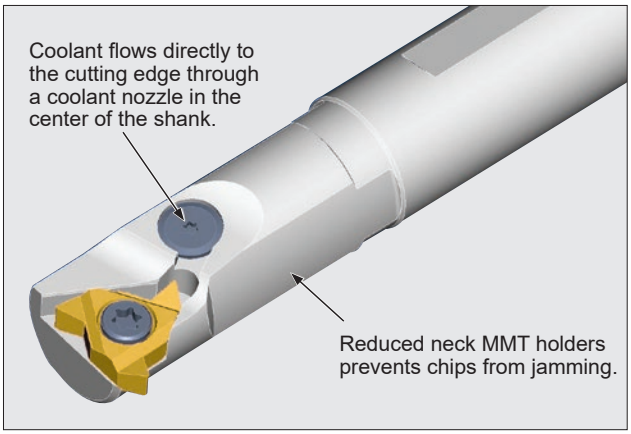
Thread Type	Threading Tolerance
ISO Metric 60°	6g / 6H
American UN 60°	2A / 2B
Whitworth 55° for BSW, BSP	Medium Class A
BSPT 55°	Standard BSPT
Round DIN 405 30°	7h / 7H
ISO Trapezoidal 30°	7e / 7H
American ACME 29°	3G
UNJ	3A
API Buttress Casing	Standard API
API Round 60° Casing & Tubing 60°	Standard API RD
American NPT 60°	Standard NPT
American NPTF 60°	Class2

■HOLDER (Use of special surface treatment)

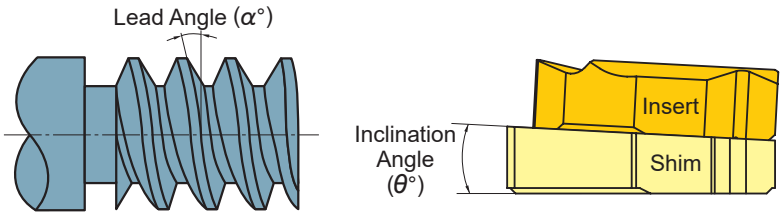
External



Internal



■SUITABLE FOR THREADING WITH A LARGE LEAD ANGLE



By changing only the shim, MMT holders can be used for turning of threads with various lead angles as well as the turning of left hand threads.

Lead Angle (α°)	Inclination Angle (θ°)
−1.5°	−3°
−0.5°	−2°
0.5°	−1°
1.5°	0°
2.5°	1°
3.5°	2°
4.5°	3°

Standard shim delivered with the holder.

■GRADE

VP10MF (G-class ground insert only)

●Superior wear and plastic deformation resistance

- High wear and plastic deformation resistance for threading when maintaining the thread form is important. Suitable for continuous high precision machining with extensive tool life.
- Effective in combination with G-class inserts for high precision threading.

VP15TF (G-class ground insert, M-class insert with 3-D chip breakers)

●Wide versatility

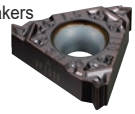
- High fracture resistance during low rigidity applications such as bar feed machining. Able to withstand harsh conditions for long periods where conventional inserts would be liable to breakage.
- Effective combination of high cost performance M-class inserts with 3-D chip breakers.

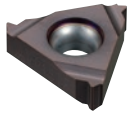
VP20RT (M-class insert with 3-D chip breakers)

●Excellent fracture resistance

- Suitable for stainless steel boring and unstable machining where inserts are vulnerable to fracturing.
- Effective combination of high cost performance M-class inserts with 3-D chip breakers.

■CHOOSING M-CLASS INSERTS WITH 3-D CHIP BREAKERS OR G-CLASS INSERTS

Insert	Chip control	Precision of thread
M-class inserts with 3-D chip breakers 	◎	○

Insert	Chip control	Precision of thread
G-class inserts 	○	◎

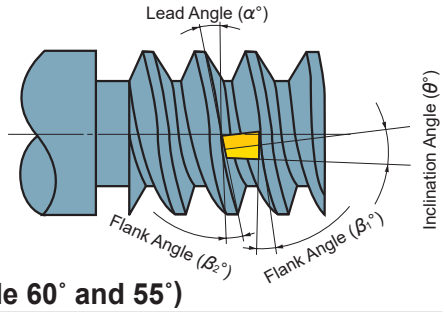
- For ideal chip control and a high cost performance ratio, M-class inserts with 3-D chip breakers are recommended.
- G-class inserts are recommended where higher precision is required.

CUTTING CONDITIONS OF MMT SERIES

SELECTING A SHIM FOR THE MMT SERIES

■FLANK ANGLE AND LEAD ANGLE

Lead angle (α) depends on a combination of thread diameter and pitch. Select a shim so that the lead angle of the thread can coincide with the flank angles of the thread and insert (β_1, β_2). No need to change a shim for general threading with an MMT holder. When threading with a small diameter or large pitch, change the shim depending on the lead angle, referring to the table and graph below. When threading left hand threads, change to a shim with a negative inclination angle.



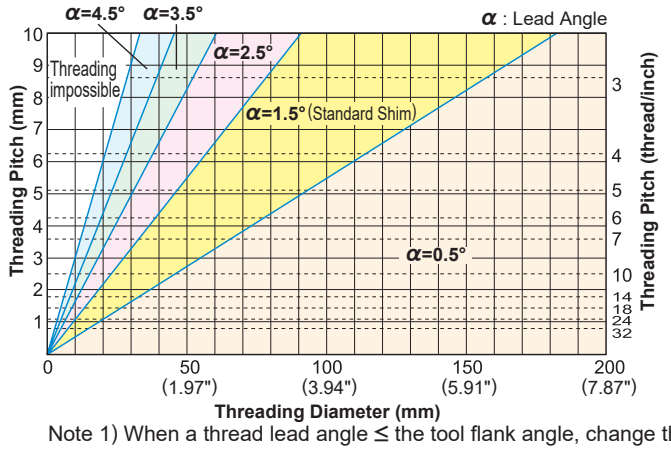
■SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 60˚ and 55˚)

Lead Angle / Pitch (mm)	Right Hand Thread (mm)						Left Hand Thread (mm) *		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.7	ϕ1.7 − ϕ2.3	ϕ2.3 − ϕ3.0	ϕ3.0 − ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1	≤ϕ3.6	ϕ3.6 − ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.5	ϕ2.5 − ϕ3.4	ϕ3.4 − ϕ4.6	ϕ4.6 − ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7	≤ϕ5.5	ϕ5.5 − ϕ13.7	≥ϕ13.7
1	≤ϕ3.3	ϕ3.3 − ϕ4.6	ϕ4.6 − ϕ6.1	ϕ6.1 − ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2	≤ϕ7.3	ϕ7.3 − ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.1	ϕ4.1 − ϕ5.7	ϕ5.7 − ϕ7.6	ϕ7.6 − ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8	≤ϕ9.1	ϕ9.1 − ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.0	ϕ5.0 − ϕ6.8	ϕ6.8 − ϕ9.1	ϕ9.1 − ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4	≤ϕ10.9	ϕ10.9 − ϕ27.4	≥ϕ27.4
1.75	≤ϕ5.8	ϕ5.8 − ϕ8.0	ϕ8.0 − ϕ10.6	ϕ10.6 − ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9	≤ϕ12.8	ϕ12.8 − ϕ31.9	≥ϕ31.9
2	≤ϕ6.6	ϕ6.6 − ϕ9.1	ϕ9.1 − ϕ12.1	ϕ12.1 − ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5	≤ϕ14.6	ϕ14.6 − ϕ36.5	≥ϕ36.5
2.5	≤ϕ8.3	ϕ8.3 − ϕ11.4	ϕ11.4 − ϕ15.2	ϕ15.2 − ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6	≤ϕ18.2	ϕ18.2 − ϕ45.6	≥ϕ45.6
3	≤ϕ9.9	ϕ9.9 − ϕ13.7	ϕ13.7 − ϕ18.2	ϕ18.2 − ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7	≤ϕ21.9	ϕ21.9 − ϕ54.7	≥ϕ54.7
3.5	≤ϕ11.6	ϕ11.6 − ϕ15.9	ϕ15.9 − ϕ21.3	ϕ21.3 − ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8	≤ϕ25.5	ϕ25.5 − ϕ63.8	≥ϕ63.8
4	≤ϕ13.2	ϕ13.2 − ϕ18.2	ϕ18.2 − ϕ24.3	ϕ24.3 − ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9	≤ϕ29.2	ϕ29.2 − ϕ72.9	≥ϕ72.9
4.5	≤ϕ14.9	ϕ14.9 − ϕ20.5	ϕ20.5 − ϕ27.3	ϕ27.3 − ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1	≤ϕ32.8	ϕ32.8 − ϕ82.1	≥ϕ82.1
5	≤ϕ16.5	ϕ16.5 − ϕ22.8	ϕ22.8 − ϕ30.4	ϕ30.4 − ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2	≤ϕ36.5	ϕ36.5 − ϕ91.2	≥ϕ91.2

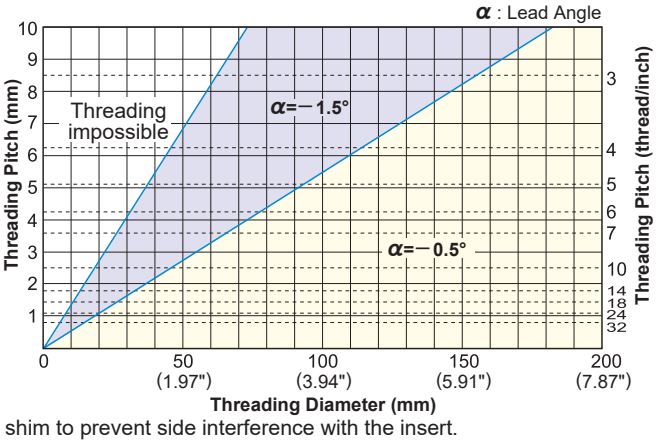
* Back turning in the case of left hand threads.

■SHIM REFERENCE GRAPH (Thread angle 60˚ and 55˚)

Right Hand Thread



Left Hand Thread



Note 1) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table on page G013 for the calculation of thread lead angle and tool flank angle.)

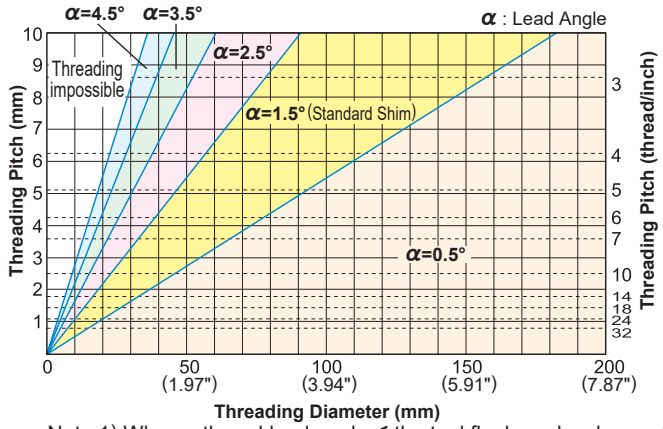
■SHIM REFERENCE TABLE (THREADING DIAMETER) (Thread angle 30˚ and 29˚)

Lead Angle / Pitch (mm)	Right Hand Thread (mm)						Left Hand Thread (mm) *		
	Threading impossible	4.5°	3.5°	2.5°	1.5°	0.5°	Threading impossible	−1.5°	−0.5°
0.5	≤ϕ1.8	ϕ1.8 − ϕ2.3	ϕ2.3 − ϕ3.0	ϕ3.0 − ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1	≤ϕ4.6	ϕ4.6 − ϕ9.1	≥ϕ9.1
0.75	≤ϕ2.7	ϕ2.7 − ϕ3.4	ϕ3.4 − ϕ4.6	ϕ4.6 − ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7	≤ϕ6.8	ϕ6.8 − ϕ13.7	≥ϕ13.7
1	≤ϕ3.6	ϕ3.6 − ϕ4.6	ϕ4.6 − ϕ6.1	ϕ6.1 − ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2	≤ϕ9.1	ϕ9.1 − ϕ18.2	≥ϕ18.2
1.25	≤ϕ4.5	ϕ4.5 − ϕ5.7	ϕ5.7 − ϕ7.6	ϕ7.6 − ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8	≤ϕ11.4	ϕ11.4 − ϕ22.8	≥ϕ22.8
1.5	≤ϕ5.5	ϕ5.5 − ϕ6.8	ϕ6.8 − ϕ9.1	ϕ9.1 − ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4	≤ϕ13.7	ϕ13.7 − ϕ27.4	≥ϕ27.4
1.75	≤ϕ6.4	ϕ6.4 − ϕ8.0	ϕ8.0 − ϕ10.6	ϕ10.6 − ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9	≤ϕ16.0	ϕ16.0 − ϕ31.9	≥ϕ31.9
2	≤ϕ7.3	ϕ7.3 − ϕ9.1	ϕ9.1 − ϕ12.1	ϕ12.1 − ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5	≤ϕ18.2	ϕ18.2 − ϕ36.5	≥ϕ36.5
2.5	≤ϕ9.1	ϕ9.1 − ϕ11.4	ϕ11.4 − ϕ15.2	ϕ15.2 − ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6	≤ϕ22.8	ϕ22.8 − ϕ45.6	≥ϕ45.6
3	≤ϕ10.9	ϕ10.9 − ϕ13.7	ϕ13.7 − ϕ18.2	ϕ18.2 − ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7	≤ϕ27.3	ϕ27.3 − ϕ54.7	≥ϕ54.7
3.5	≤ϕ12.7	ϕ12.7 − ϕ15.9	ϕ15.9 − ϕ21.3	ϕ21.3 − ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8	≤ϕ31.9	ϕ31.9 − ϕ63.8	≥ϕ63.8
4	≤ϕ14.6	ϕ14.6 − ϕ18.2	ϕ18.2 − ϕ24.3	ϕ24.3 − ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9	≤ϕ36.5	ϕ36.5 − ϕ72.9	≥ϕ72.9
4.5	≤ϕ16.4	ϕ16.4 − ϕ20.5	ϕ20.5 − ϕ27.3	ϕ27.3 − ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1	≤ϕ41.0	ϕ41.0 − ϕ82.1	≥ϕ82.1
5	≤ϕ18.2	ϕ18.2 − ϕ22.8	ϕ22.8 − ϕ30.4	ϕ30.4 − ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2	≤ϕ45.6	ϕ45.6 − ϕ91.2	≥ϕ91.2

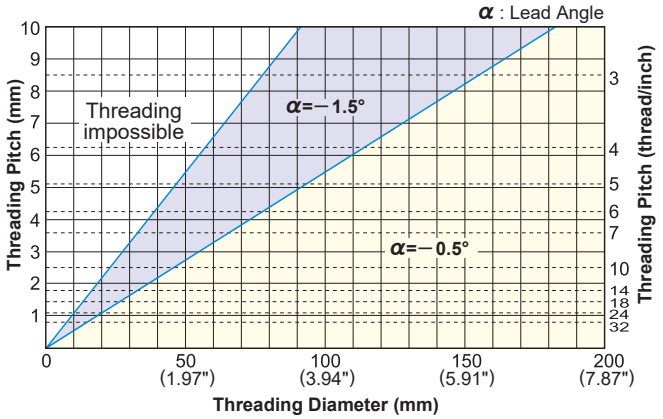
* Back turning in the case of left hand threads.

■ SHIM REFERENCE GRAPH (Thread angle 30˚ and 29˚)

Right Hand Thread



Left Hand Thread



Note 1) When a thread lead angle ≤ the tool flank angle, change the shim to prevent side interference with the insert.
(Refer to the table below for the calculation of thread lead angle and tool flank angle.)

■ Selection table

Lead Angle	Opening angle 60°/55° Right Hand Thread		Opening angle 60°/55°* Left Hand Thread		Opening angle 30°/29° Right Hand Thread		Opening angle 30°/29°* Left Hand Thread	
0	P05	P05	N05	N05	P05	P05	N05	N05
0.5	P05	P05	N05	N05	P05	P05	N05	N05
1	P15	P15	N15	N15	P15	P15	N15	N15
1.5	P15	P15	N15	N15	P15	P15	N15	N15
2	P25	P25	N15	N15	P25	P25	Not Available	Not Available
2.5	P25	P25	Not Available	Not Available	P25	P25	Not Available	Not Available
3	P35	P35	Not Available	Not Available	P35	P35	Not Available	Not Available
3.5	P35	P35	Not Available	Not Available	P35	P35	Not Available	Not Available
4	P45	P45	Not Available	Not Available	P45	P45	Not Available	Not Available
4.5	P45	P45	Not Available	Not Available	P45	P45	Not Available	Not Available
5	P45	P45	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
5.5	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available

* Back turning in the case of left hand threads.

When replacing a shim, check if the difference between the thread lead angle and shim inclination angle is within:
2.5°−0.5° where thread helix angle is 60° (55°)
2°−1° where thread helix angle is 30° (29°)
∗ Inclination angle of a standard shim is 0°.
∗ The holder has a 1.5° lead angle.

■ CALCULATION OF THREAD LEAD ANGLE

$$\tan\alpha = \frac{l}{\pi d} = \frac{nP}{\pi d}$$

α: Lead angle
l : Lead
n : Number of threads
P : Pitch
d : Effective diameter of thread

■ EXAMPLE OF SELECTING A SHIM

• When the thread lead angle is 2.2°
①In the case when the thread helix angle is 60°
(2.2° lead angle) − (2.5°−0.5°) = -0.3°−1.7° shim inclination angle is appropriate.
Threading with a standard shim (0° inclination angle) is possible. But, replacing with a shim with a 1° inclination angle is recommended, refer to Standard Shim List on pages G021 and G026.
②In the case when the thread helix angle is 30°
(2.2° lead angle) − (2°−1°) = -0.2°−1.2° shim inclination angle is appropriate.
Replacing with a shim with a 1° inclination angle is recommended, referring to Standard Shim List on pages G021 and G026.

■ RELIEF ANGLE OF AN INSERT SET ON A HOLDER

Thread Helix Angle	Internal Relief Angle	External Relief Angle
60°	8.8°	5.8°
55°	7.9°	5.2°
30°	4.1°	2.7°
29°	4°	2.6°

• Relief angles (β_2, β_1) of an insert become small when the thread helix angle of a trapezoidal, round, or other thread is small. Take care when selecting a shim.

MMT STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEED)

ISO Metric 60°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
0.5	0.31	0.10	0.08	0.07	0.06											MMT16ER050ISO	–
0.75	0.46	0.16	0.14	0.10	0.06											MMT16ER075ISO	–
1.0	0.61	0.18	0.15	0.12	0.10	0.06										MMT16ER100ISO	MMT16ER100ISO-S
1.25	0.77	0.19	0.17	0.14	0.11	0.10	0.06									MMT16ER125ISO	MMT16ER125ISO-S
1.5	0.92	0.22	0.21	0.17	0.14	0.12	0.06									MMT16ER150ISO	MMT16ER150ISO-S
1.75	1.07	0.22	0.21	0.16	0.13	0.11	0.09	0.09	0.06							MMT16ER175ISO	MMT16ER175ISO-S
2.0	1.23	0.24	0.23	0.17	0.16	0.14	0.12	0.11	0.06							MMT16ER200ISO	MMT16ER200ISO-S
2.5	1.53	0.26	0.23	0.19	0.17	0.15	0.13	0.12	0.11	0.11	0.06					MMT16ER250ISO	MMT16ER250ISO-S
3.0	1.84	0.27	0.25	0.20	0.18	0.16	0.14	0.13	0.12	0.12	0.11	0.10	0.06			MMT16ER300ISO	MMT16ER300ISO-S
3.5	2.15	0.33	0.30	0.24	0.21	0.18	0.17	0.15	0.14	0.14	0.12	0.11	0.06			MMT22ER350ISO	–
4.0	2.45	0.34	0.31	0.24	0.22	0.19	0.17	0.16	0.14	0.14	0.13	0.12	0.12	0.11	0.06	MMT22ER400ISO	–
4.5	2.76	0.38	0.34	0.28	0.24	0.22	0.20	0.18	0.16	0.16	0.15	0.14	0.13	0.12	0.06	MMT22ER450ISO	–
5.0	3.07	0.42	0.38	0.32	0.27	0.24	0.22	0.20	0.18	0.18	0.17	0.16	0.15	0.12	0.06	MMT22ER500ISO	–

American UN 60°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
32	.019	.007	.006	.004	.002											MMT16ER320UN	–
28	.022	.007	.006	.004	.003	.002										MMT16ER280UN	–
24	.026	.007	.006	.006	.005	.002										MMT16ER240UN	–
20	.031	.008	.007	.005	.005	.004	.002									MMT16ER200UN	–
18	.034	.009	.008	.006	.005	.004	.002									MMT16ER180UN	–
16	.038	.009	.008	.006	.005	.004	.004	.002								MMT16ER160UN	MMT16ER160UN-S
14	.044	.009	.008	.006	.005	.005	.005	.004	.002							MMT16ER140UN	MMT16ER140UN-S
13	.047	.010	.009	.007	.006	.005	.005	.003	.002							MMT16ER130UN	–
12	.051	.011	.009	.007	.006	.006	.005	.005	.002							MMT16ER120UN	MMT16ER120UN-S
11	.056	.011	.009	.007	.006	.006	.006	.005	.004	.002						MMT16ER110UN	–
10	.061	.011	.009	.007	.006	.006	.006	.005	.005	.004	.002					MMT16ER100UN	–
9	.068	.013	.011	.009	.007	.006	.006	.005	.005	.004	.002					MMT16ER090UN	–
8	.077	.014	.012	.009	.007	.006	.006	.006	.006	.005	.004	.002				MMT16ER080UN	–
7	.087	.015	.013	.011	.009	.008	.007	.006	.006	.005	.005	.002				MMT22ER070UN	–
6	.102	.017	.014	.011	.010	.008	.007	.007	.006	.006	.005	.005	.004	.002		MMT22ER060UN	–
5	.123	.017	.015	.012	.011	.009	.009	.008	.007	.007	.007	.007	.006	.006	.002	MMT22ER050UN	–

Whitworth 55° for BSW, BSP

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts	M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002										MMT16ER280W	–
26	.025	.007	.006	.005	.005	.002										MMT16ER260W	–
20	.032	.008	.007	.006	.005	.004	.002									MMT16ER200W	–
19	.034	.008	.007	.006	.006	.005	.002									MMT16ER190W	MMT16ER190W-S
18	.035	.010	.007	.006	.005	.005	.002									MMT16ER180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							MMT16ER160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT16ER140W	MMT16ER140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							MMT16ER120W	–
11	.058	.011	.009	.008	.007	.006	.006	.005	.005	.002						MMT16ER110W	MMT16ER110W-S
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					MMT16ER100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				MMT16ER090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			MMT16ER080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			MMT22ER070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22ER060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	MMT22ER050W	–

Note 1) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

■BSPT 55°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes												Insert Type	
		1	2	3	4	5	6	7	8	9				G-class ground inserts	M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002								MMT16ER280BSPT	–
19	.034	.009	.007	.006	.005	.005	.002							MMT16ER190BSPT	MMT16ER190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002					MMT16ER140BSPT	MMT16ER140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002				MMT16ER110BSPT	MMT16ER110BSPT-S

■Round DIN 405 30°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
10	.050	.009	.008	.008	.007	.006	.005	.005	.002							MMT16ER100RD
8	.063	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002					MMT16ER080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002			MMT16ER060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002	MMT22ER040RD

■ISO Trapezoidal 30°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06									MMT16ER150TR
2.0	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06								MMT16ER200TR
3.0	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						MMT16ER300TR
4.0	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22ER400TR
5.0	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06	MMT22ER500TR

■American ACME 29°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
12	.047	.011	.009	.008	.007	.006	.004	.002								MMT16ER120ACME
10	.060	.011	.010	.008	.007	.006	.006	.005	.005	.002						MMT16ER100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002				MMT16ER080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.004	.005	.002		MMT22ER060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22ER050ACME

■UNJ

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11				G-class ground inserts
32	.018	.006	.006	.004	.002											MMT16ER320UNJ
28	.020	.006	.005	.004	.003	.002										MMT16ER280UNJ
24	.024	.007	.006	.006	.003	.002										MMT16ER240UNJ
20	.029	.007	.006	.005	.005	.004	.002									MMT16ER200UNJ
18	.032	.009	.007	.006	.004	.004	.002									MMT16ER180UNJ
16	.036	.010	.008	.006	.005	.004	.003									MMT16ER160UNJ
14	.041	.010	.009	.007	.005	.004	.004	.002								MMT16ER140UNJ
12	.048	.011	.011	.008	.007	.005	.004	.002								MMT16ER120UNJ
10	.058	.012	.011	.008	.006	.005	.005	.005	.004	.002						MMT16ER100UNJ
8	.072	.012	.012	.009	.007	.006	.006	.005	.005	.004	.004	.002				MMT16ER080UNJ

■API Buttress Casing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11				G-class ground inserts
5	.061	.010	.009	.007	.006	.005	.005	.005	.004	.004	.004	.002				MMT22ER050APBU

Note 1) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT STANDARD OF DEPTH OF CUT EXTERNAL (RADIAL INFEED)

■API Round 60° Casing & Tubing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12				G-class ground inserts
10	.056	.010	.009	.006	.006	.005	.005	.005	.004	.004	.002						MMT16ER100APRD
8	.071	.010	.009	.007	.006	.006	.006	.005	.005	.005	.005	.005	.002				MMT16ER080APRD

■American NPT 60°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.026	.006	.005	.005	.004	.004	.002										MMT16ER270NPT
18	.040	.008	.006	.006	.005	.005	.004	.004	.002								MMT16ER180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						MMT16ER140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				MMT16ER115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16ER080NPT

■American NPTF 60°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.025	.006	.006	.004	.004	.003	.002										MMT16ER270NPTF
18	.039	.007	.006	.006	.005	.005	.004	.004	.002								MMT16ER180NPTF
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						MMT16ER140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				MMT16ER115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16ER080NPTF

Note 1) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFEED)

ISO Metric 60°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers	
0.5	0.29	0.09	0.07	0.07	0.06											MMT11IR050ISO	MMT16IR050ISO	–	–
0.75	0.43	0.15	0.13	0.09	0.06											MMT11IR075ISO	MMT16IR075ISO	–	–
1.0	0.58	0.17	0.15	0.11	0.09	0.06										MMT11IR100ISO	MMT16IR100ISO	MMT11IR100ISO-S	MMT16IR100ISO-S
1.25	0.72	0.18	0.16	0.12	0.11	0.09	0.06									MMT11IR125ISO	MMT16IR125ISO	MMT11IR125ISO-S	MMT16IR125ISO-S
1.5	0.87	0.21	0.20	0.16	0.13	0.11	0.06									MMT11IR150ISO	MMT16IR150ISO	MMT11IR150ISO-S	MMT16IR150ISO-S
1.75	1.01	0.21	0.20	0.15	0.12	0.10	0.09	0.08	0.06							MMT11IR175ISO	MMT16IR175ISO	–	MMT16IR175ISO-S
2.0	1.15	0.24	0.22	0.18	0.14	0.12	0.10	0.09	0.06							MMT11IR200ISO	MMT16IR200ISO	–	MMT16IR200ISO-S
2.5	1.44	0.25	0.24	0.21	0.15	0.13	0.12	0.10	0.09	0.09	0.06					–	MMT16IR250ISO	–	MMT16IR250ISO-S
3.0	1.73	0.26	0.25	0.22	0.17	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.06			–	MMT16IR300ISO	–	MMT16IR300ISO-S
3.5	2.02	0.32	0.30	0.23	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.10	0.06			–	MMT22IR350ISO	–	–
4.0	2.31	0.33	0.31	0.24	0.22	0.18	0.15	0.14	0.13	0.12	0.12	0.11	0.10	0.10	0.06	–	MMT22IR400ISO	–	–
4.5	2.60	0.36	0.33	0.28	0.24	0.21	0.19	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0.06	–	MMT22IR450ISO	–	–
5.0	2.89	0.41	0.38	0.32	0.27	0.24	0.21	0.18	0.16	0.15	0.14	0.13	0.12	0.12	0.06	–	MMT22IR500ISO	–	–

American UN 60°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers
32	.018	.006	.006	.004	.002											MMT11IR320UN	MMT16IR320UN	–
28	.020	.006	.005	.004	.003	.002										MMT11IR280UN	MMT16IR280UN	–
24	.024	.007	.006	.005	.004	.002										MMT11IR240UN	MMT16IR240UN	–
20	.029	.007	.006	.005	.005	.004	.002									MMT11IR200UN	MMT16IR200UN	–
18	.032	.008	.007	.006	.005	.004	.002									MMT11IR180UN	MMT16IR180UN	–
16	.036	.008	.007	.006	.005	.004	.004	.002								MMT11IR160UN	MMT16IR160UN	MMT16IR160UN-S
14	.041	.008	.007	.006	.005	.005	.004	.004	.002							MMT11IR140UN	MMT16IR140UN	MMT16IR140UN-S
13	.044	.009	.007	.006	.006	.005	.005	.004	.002							–	MMT16IR130UN	–
12	.048	.009	.009	.007	.006	.005	.005	.005	.002							–	MMT16IR120UN	MMT16IR120UN-S
11	.052	.009	.009	.008	.006	.005	.005	.004	.004	.002						–	MMT16IR110UN	–
10	.058	.010	.009	.008	.006	.005	.005	.005	.004	.004	.002					–	MMT16IR100UN	–
9	.064	.012	.009	.008	.007	.006	.006	.005	.005	.004	.002					–	MMT16IR090UN	–
8	.072	.012	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	MMT16IR080UN	–
7	.082	.014	.012	.009	.008	.007	.007	.006	.006	.006	.005	.002				–	MMT22IR070UN	–
6	.096	.016	.013	.010	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002		–	MMT22IR060UN	–
5	.115	.016	.014	.012	.010	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002	–	MMT22IR050UN	–

Whitworth 55° for BSW, BSP

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts		M-class inserts with 3-D chip breakers
28	.023	.007	.006	.004	.004	.002										–	MMT16IR280W	–
26	.025	.007	.006	.005	.005	.002										–	MMT16IR260W	–
20	.032	.008	.007	.006	.005	.004	.002									–	MMT16IR200W	–
19	.034	.008	.007	.006	.006	.005	.002									MMT11IR190W	MMT16IR190W	MMT16IR190W-S
18	.035	.010	.007	.006	.005	.005	.002									–	MMT16IR180W	–
16	.040	.008	.007	.006	.005	.004	.004	.004	.002							–	MMT16IR160W	–
14	.046	.009	.008	.007	.006	.005	.005	.004	.002							MMT11IR140W	MMT16IR140W	MMT16IR140W-S
12	.054	.011	.010	.008	.006	.006	.006	.005	.002							–	MMT16IR120W	MMT16IR120W-S
11	.058	.011	.009	.008	.007	.006	.006	.005	.004	.002						–	MMT16IR110W	–
10	.064	.011	.010	.008	.007	.006	.006	.005	.005	.004	.002					–	MMT16IR100W	–
9	.071	.011	.010	.008	.007	.006	.006	.006	.005	.005	.005	.002				–	MMT16IR090W	–
8	.080	.012	.011	.009	.007	.007	.006	.006	.006	.005	.005	.004	.002			–	MMT16IR080W	–
7	.091	.013	.013	.010	.009	.008	.007	.007	.006	.006	.006	.004	.002			–	MMT22IR070W	–
6	.107	.014	.013	.011	.009	.008	.008	.007	.007	.006	.006	.006	.005	.005	.002	–	MMT22IR060W	–
5	.128	.017	.016	.014	.011	.010	.009	.009	.008	.007	.007	.007	.006	.005	.002	–	MMT22IR050W	–

Note 1) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT STANDARD OF DEPTH OF CUT INTERNAL (RADIAL INFEED)

■BSPT 55°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes									Insert Type		
		1	2	3	4	5	6	7	8	9	G-class ground inserts		M-class inserts with 3-D chip breakers
19	.034	.009	.007	.006	.005	.005	.002				MMT11IR190BSPT	MMT16IR190BSPT	MMT16IR190BSPT-S
14	.046	.009	.008	.007	.006	.005	.005	.004	.002		MMT11IR140BSPT	MMT16IR140BSPT	MMT16IR140BSPT-S
11	.058	.010	.009	.008	.007	.006	.006	.005	.005	.002	–	MMT16IR110BSPT	MMT16IR110BSPT-S

■Round DIN 405 30°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
10	.050	.009	.008	.008	.007	.006	.005	.005	.002							MMT16IR100RD
8	.063	.009	.008	.008	.007	.007	.006	.006	.005	.005	.002					MMT16IR080RD
6	.083	.010	.010	.009	.009	.008	.007	.007	.006	.006	.005	.004	.002			MMT16IR060RD
4	.125	.013	.013	.013	.012	.011	.010	.009	.009	.008	.007	.007	.006	.005	.002	MMT22IR040RD

■ISO Trapezoidal 30°

(mm)

Pitch (mm)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
1.5	0.90	0.23	0.21	0.16	0.13	0.11	0.06									MMT16IR150TR
2	1.25	0.29	0.26	0.21	0.17	0.14	0.12	0.06								MMT16IR200TR
3	1.75	0.32	0.31	0.24	0.19	0.18	0.17	0.15	0.13	0.06						MMT16IR300TR
4	2.25	0.33	0.32	0.24	0.22	0.21	0.17	0.16	0.15	0.14	0.13	0.12	0.06			MMT22IR400TR
5	2.75	0.35	0.32	0.26	0.24	0.22	0.21	0.19	0.19	0.17	0.15	0.14	0.13	0.12	0.06	MMT22IR500TR

■American ACME 29°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes														Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	G-class ground inserts
12	.047	.011	.009	.008	.007	.006	.004	.002								MMT16IR120ACME
10	.060	.011	.010	.008	.007	.006	.006	.005	.005	.002						MMT16IR100ACME
8	.072	.012	.010	.009	.007	.006	.006	.006	.005	.005	.004	.002				MMT16IR080ACME
6	.093	.013	.012	.011	.009	.008	.007	.006	.006	.005	.005	.005	.004	.002		MMT22IR060ACME
5	.110	.014	.013	.012	.010	.009	.008	.007	.007	.006	.006	.006	.005	.005	.002	MMT22IR050ACME

■API Buttress Casing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes											Insert Type
		1	2	3	4	5	6	7	8	9	10	11	G-class ground inserts
5	.061	.010	.009	.007	.006	.005	.005	.005	.004	.004	.004	.002	MMT22IR050APBU

■API Round 60° Casing & Tubing

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes												Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	G-class ground inserts
10	.056	.010	.009	.006	.006	.005	.005	.005	.004	.004	.002			MMT16IR100APRD
8	.071	.010	.009	.007	.006	.006	.006	.005	.005	.005	.005	.005	.002	MMT16IR080APRD

Note 1) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

American NPT 60°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
27	.026	.006	.005	.005	.004	.004	.002										MMT16IR270NPT
18	.040	.008	.006	.006	.005	.005	.004	.004	.002								MMT16IR180NPT
14	.052	.009	.007	.006	.006	.005	.005	.004	.004	.004	.002						MMT16IR140NPT
11.5	.065	.009	.007	.007	.006	.006	.005	.005	.005	.005	.004	.004	.002				MMT16IR115NPT
8	.095	.013	.011	.009	.008	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16IR080NPT

American NPTF 60°

(inch)

Pitch (thread/ inch)	Total Cutting Depth	Number of Passes															Insert Type
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	G-class ground inserts
14	.053	.009	.008	.006	.006	.005	.005	.004	.004	.004	.002						MMT16IR140NPTF
11.5	.064	.009	.009	.007	.006	.005	.005	.005	.004	.004	.004	.004	.002				MMT16IR115NPTF
8	.094	.013	.011	.009	.007	.007	.006	.006	.006	.005	.005	.005	.004	.004	.004	.002	MMT16IR080NPTF

Note 1) · Set the finishing allowance on a diameter at approx. .004 inch when using a full form insert.
· Please note the cutting depth and the number of passes when a nose radius of a partial or semi-full form insert or of an internal threading insert is small to prevent damage to the insert nose.
· Please set the cutting depth sufficiently deep enough on materials such as hardened steel or austenitic stainless steel to help prevent premature wear and chipping caused by the outer layer of the material.

MMT SERIES ORDER NUMBER

HOLDERS

EXTERNAL

MMT E R 08 3 – SM

Designation
MMT

Application	
E	External

Hand of Tool	
R	Right

Tool Size (inch) (Height and Width)			
06	.375	12	.750
08	.500	16	1.000
10	.625	20	1.250

Insert Size	
3	MMT16
4	MMT22

Tool Type	
SM	Non-offset

INTERNAL

MMT I R 10 2 – 0.50 – 1.5 – C

Designation
MMT

Application	
I	Internal

Hand of Tool	
R	Right

Shank Diameter (inch)	
10	.625
12	.750
16	1.000
20	1.250
24	1.500

Insert Size	
2	MMT11
3	MMT16
4	MMT22

Min. Cutting Diameter (inch)			
0.50	.500	1.15	1.150
0.60	.600	1.20	1.200
0.75	.750	1.45	1.450
0.90	.900	1.50	1.500
0.95	.950	1.75	1.750

Lead Angle	
1.5	1.5°
2.5	2.5°

Coolant	
C	With

INSERTS

M-CLASS

MMT 16 E R 100 ISO – S

S	M-class inserts with 3-D chip breakers

Designation
MMT

Diameter of Inscribed Circle (mm)	
11	6.35
16	9.525

Application	
E	External
I	Internal

Hand of Tool	
R	Right

Pitch			
100	1.0 mm	A	0.5—1.5 mm or 48—16 thread/inch
125	1.25 mm		
150	1.5 mm	G	1.75—3.0 mm or 14—8 thread/inch
175	1.75 mm		
200	2.0 mm		
250	2.5 mm		
300	3.0 mm		

Threading Type	
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric 60°
W	Whitworth 55° for BSW, BSP
BSPT	BSPT 55°
UN	American UN 60°

G-CLASS

MMT 16 E R 050 ISO

Designation
MMT

Diameter of Inscribed Circle (mm)	
11	6.35
16	9.525
22	12.7

Application	
E	External
I	Internal

Hand of Tool	
R	Right

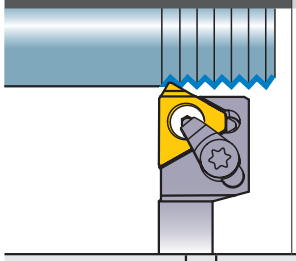
Pitch			
050	0.5 mm	A	0.5—1.5 mm or 48—16 thread/inch
075	0.75 mm		
100	1.0 mm		
125	1.25 mm	G	1.75—3.0 mm or 14—8 thread/inch
150	1.5 mm		
175	1.75 mm		
200	2.0 mm	AG	0.5—3.0 mm or 48—8 thread/inch
250	2.5 mm		
300	3.0 mm		
350	3.5 mm		
400	4.0 mm	N	3.5—5.0 mm or 7—5 thread/inch
450	4.5 mm		
500	5.0 mm		

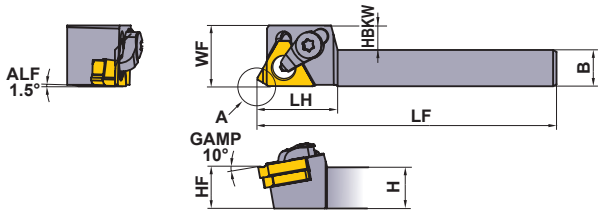
Threading Type	
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric 60°
W	Whitworth 55° for BSW, BSP
BSPT	BSPT 55°
UN	American UN 60°
RD	Round DIN 405 30°
TR	ISO Trapezoidal 30°
ACME	American ACME 29°
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round 60° Casing&Tubing
NPT	NPT 60°
NPTF	NPTF 60°

MMTE HOLDER

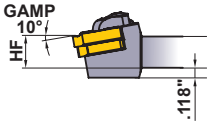
- Various insert types.
- Precision class insert for precise thread forms.
- Available with a pressed breaker for chip control.
- Able to change lead angle by replacing the shim.

MMTE — External threading





Details of position A
Refer to the insert standards for dimensions PDX and PDY.



MMTER-063SM

Right hand tool holder only.

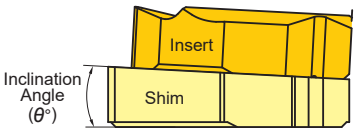
Order Number	Stock	Insert Number	Dimensions (inch)							Clamp Bridge	Clamp Screw *	Stop Ring	Shim Screw *	Shim	Wrench
	R		H	B	LF	LH	HF	WF	HBKW						
MMTER-063SM	●	MMT16ER ○○○○○	.375	.375	4.724	.875	.375	.625	.250	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-083SM	●		.500	.500	4.724	.875	.500	.625	.125	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-083	●		.500	.500	4.000	1.000	.500	.625	—	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-103	●		.625	.625	4.000	1.000	.625	.750	—	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-123	●		.750	.750	5.000	1.000	.750	1.000	—	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-163	●		1.000	1.000	6.000	1.000	1.000	1.250	—	SETK51	SETS51	CR4	HFC03008	CTE32TP15	①TKY15F ②HKY20R
MMTER-124	●	MMT22ER ○○○○○	.750	.750	5.000	1.250	.750	1.000	—	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER-164	●		1.000	1.000	6.000	1.250	1.000	1.250	—	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R
MMTER-204	●		1.250	1.250	6.000	1.250	1.250	1.500	—	SETK61	SETS61	CR5	HFC04010	CTE43TP15	①TKY20F ②HKY25R

Note 1) Select and use an alternate shim from list below (sold separately), dependant on the lead angle.
* Clamp Torque (lbf-in) : SETS51=31, SETS61=44, HFC03008=13, HFC04010=19

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE32TN15**	●	–3°	MMTER -○○3
–0.5°	**CTE32TN05**	●	–2°	
0.5°	**CTE32TP05**	●	–1°	
1.5°	**CTE32TP15**	●	0°	
2.5°	**CTE32TP25**	●	1°	
3.5°	**CTE32TP35**	●	2°	
4.5°	**CTE32TP45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTE43TN15**	●	–3°	MMTER -○○4
–0.5°	**CTE43TN05**	●	–2°	
0.5°	**CTE43TP05**	●	–1°	
1.5°	**CTE43TP15**	●	0°	
2.5°	**CTE43TP25**	●	1°	
3.5°	**CTE43TP35**	●	2°	
4.5°	**CTE43TP45**	●	3°	



Standard shim delivered with the holder.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**VP10MF**	490 (230—755)
			VP15TF	330 (195—460)
			VP20RT	260 (195—330)
	Carbon Steel Alloy Steel	180—280HB	**VP10MF**	460 (260—655)
			VP15TF	330 (195—460)
			VP20RT	260 (195—330)
M	Stainless Steel	≤200HB	**VP15TF**	260 (130—395)
			VP20RT	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	460 (260—655)
			VP15TF	295 (195—395)

	Work Material	Hardness	Grade	Cutting Speed (SFM)
S	Heat Resistant Alloy	—	**VP10MF**	150 (50—230)
			VP15TF	100 (65—130)
			VP20RT	
	Titanium Alloy	—	**VP10MF**	195 (130—260)
			VP15TF	150 (80—210)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	**VP10MF**	165 (100—230)
			VP15TF	130 (65—195)

● : USA Stock

HOW TO SELECT A SHIM ➤ G012
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	**MMT16ERA60-S**	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.06	—	Partial form PNA 60°
	MMT16ERG60-S	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.23	—	
Partial Profile 55°	**MMT16ERA55-S**	★			48—16	9.525	3.44	0.8	0.9	0.07	—	Partial form PNA 55°
	MMT16ERG55-S	★			14—8	9.525	3.44	1.2	1.7	0.23	—	
ISO Metric 60°	**MMT16ER100ISO-S**	●	★	1.0		9.525	3.44	0.7	0.7	0.13	0.61	Full form PNA 60°
	MMT16ER125ISO-S	●	★	1.25		9.525	3.44	0.8	0.9	0.16	0.77	
	MMT16ER150ISO-S	●	★	1.5		9.525	3.44	0.8	1.0	0.20	0.92	
	MMT16ER175ISO-S	●	★	1.75		9.525	3.44	0.9	1.2	0.22	1.07	
	MMT16ER200ISO-S	●	★	2.0		9.525	3.44	1.0	1.3	0.26	1.23	
	MMT16ER250ISO-S	●	★	2.5		9.525	3.44	1.1	1.5	0.33	1.53	
	MMT16ER300ISO-S	●	★	3.0		9.525	3.44	1.2	1.6	0.40	1.84	
American UN 60°	**MMT16ER160UN-S**	●			16	9.525	3.44	0.9	1.1	0.23	0.97	Full form PNA 60°
	MMT16ER140UN-S	●			14	9.525	3.44	1.0	1.2	0.26	1.11	
	MMT16ER120UN-S	●			12	9.525	3.44	1.1	1.4	0.30	1.30	
Whitworth 55° for BSW, BSP	**MMT16ER190W-S**	★			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form PNA 55°
	MMT16ER140W-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110W-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT 55°	**MMT16ER190BSPT-S**	★			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form PNA 55°
	MMT16ER140BSPT-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16ER110BSPT-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

IDENTIFICATION

MMT **16** **E** **R** **100** **ISO** – **S**

S	M-class inserts with 3-D chip breakers

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

100	1.0 mm	A	0.5—1.5 mm or 48—16 thread/inch
125	1.25 mm		
150	1.5 mm	G	1.75—3.0 mm or 14—8 thread/inch
175	1.75 mm		
200	2.0 mm		
250	2.5 mm		
300	3.0 mm		

Threading Type

60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric 60°
W	Whitworth 55° for BSW, BSP
BSPT	BSPT 55°
UN	American UN 60°

● : USA Stock ★ : Stocked in Japan
<5 inserts in one case>

MMT G-CLASS GROUND INSERTS

INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	—	**MMT16ERA60**	★	★	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form PNA 60°
		MMT16ERG60	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.27	—	
		MMT16ERAG60	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.08	—	
		MMT22ERN60	★		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.53	—	
Partial Profile 55°	—	**MMT16ERA55**	★	★		48—16	9.525	3.44	0.8	0.9	0.05	—	Partial form PNA 55°
		MMT16ERG55	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16ERAG55	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22ERN55	★			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric 60°	6g	**MMT16ER050ISO**	●		0.5		9.525	3.44	0.6	0.4	0.06	0.31	Full form PNA 60°
		MMT16ER075ISO	●		0.75		9.525	3.44	0.6	0.6	0.10	0.46	
		MMT16ER100ISO	●	★	1.0		9.525	3.44	0.7	0.7	0.16	0.61	
		MMT16ER125ISO	●	★	1.25		9.525	3.44	0.8	0.9	0.19	0.77	
		MMT16ER150ISO	●	★	1.5		9.525	3.44	0.8	1.0	0.23	0.92	
		MMT16ER175ISO	●	★	1.75		9.525	3.44	0.9	1.2	0.21	1.07	
		MMT16ER200ISO	●	★	2.0		9.525	3.44	1.0	1.3	0.31	1.23	
		MMT16ER250ISO	●	★	2.5		9.525	3.44	1.1	1.5	0.32	1.53	
		MMT16ER300ISO	●	★	3.0		9.525	3.44	1.2	1.6	0.46	1.84	
		MMT22ER350ISO	★		3.5		12.7	4.64	1.6	2.3	0.45	2.15	
		MMT22ER400ISO	★		4.0		12.7	4.64	1.6	2.3	0.52	2.45	
		MMT22ER450ISO	★		4.5		12.7	4.64	1.7	2.4	0.58	2.76	
		MMT22ER500ISO	★		5.0		12.7	4.64	1.7	2.5	0.63	3.07	

IDENTIFICATION

MMT **16** **E** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

050	0.5 mm	**A**	0.5—1.5 mm or 48—16 thread/inch
075	0.75 mm		
100	1.0 mm		
125	1.25 mm	**G**	1.75—3.0 mm or 14—8 thread/inch
150	1.5 mm		
175	1.75 mm		
200	2.0 mm	**AG**	0.5—3.0 mm or 48—8 thread/inch
250	2.5 mm		
300	3.0 mm		
350	3.5 mm	**N**	3.5—5.0 mm or 7—5 thread/inch
400	4.0 mm		
450	4.5 mm		
500	5.0 mm		

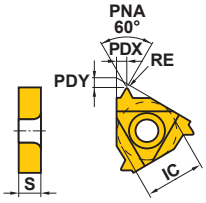
Threading Type

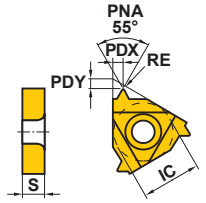
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric 60°
W	Whitworth 55° for BSW, BSP
BSPT	BSPT 55°
UN	American UN 60°
RD	Round DIN 405 30°
TR	ISO Trapezoidal 30°
ACME	American ACME 29°
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round 60° Casing&Tubing
NPT	NPT 60°
NPTF	NPTF 60°

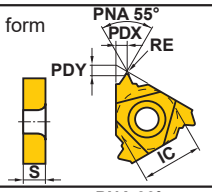
MMT G-CLASS GROUND INSERTS

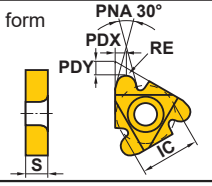
INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
American UN 60°	2A	**MMT16ER320UN**	●			32	9.525	3.44	0.6	0.6	0.09	0.49	Full form
		MMT16ER280UN	●			28	9.525	3.44	0.6	0.7	0.10	0.56	
		MMT16ER240UN	●			24	9.525	3.44	0.7	0.8	0.16	0.65	
		MMT16ER200UN	●			20	9.525	3.44	0.8	0.9	0.19	0.78	
		MMT16ER180UN	●			18	9.525	3.44	0.8	1.0	0.21	0.87	
		MMT16ER160UN	●	★		16	9.525	3.44	0.9	1.1	0.24	0.97	
		MMT16ER140UN	●	★		14	9.525	3.44	1.0	1.2	0.22	1.11	
		MMT16ER130UN	●			13	9.525	3.44	1.0	1.3	0.24	1.20	
		MMT16ER120UN	●	★		12	9.525	3.44	1.1	1.4	0.32	1.30	
		MMT16ER110UN	●			11	9.525	3.44	1.1	1.5	0.29	1.42	
		MMT16ER100UN	●			10	9.525	3.44	1.1	1.5	0.32	1.56	
		MMT16ER090UN	●			9	9.525	3.44	1.2	1.7	0.35	1.73	
		MMT16ER080UN	●			8	9.525	3.44	1.2	1.6	0.48	1.95	
		MMT22ER070UN	●			7	12.7	4.64	1.6	2.3	0.47	2.22	
		MMT22ER060UN	●			6	12.7	4.64	1.6	2.3	0.53	2.60	
		MMT22ER050UN	●			5	12.7	4.64	1.7	2.5	0.64	3.12	
Whitworth 55° for BSW, BSP	Medium Class A	**MMT16ER280W**	★			28	9.525	3.44	0.6	0.7	0.09	0.58	Full form
		MMT16ER260W	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16ER200W	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16ER190W	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16ER180W	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16ER160W	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16ER140W	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16ER110W	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16ER100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16ER090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16ER080W	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22ER070W	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22ER060W	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22ER050W	★			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT 55°	Standard BSPT	**MMT16ER280BSPT**	★			28	9.525	3.44	0.6	0.6	0.09	0.58	Full form
		MMT16ER190BSPT	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16ER140BSPT	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16ER110BSPT	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405 30°	7h	**MMT16ER100RD**	★			10	9.525	3.44	1.1	1.2	0.60	1.27	Full form
		MMT16ER080RD	★			8	9.525	3.44	1.4	1.3	0.75	1.59	
		MMT16ER060RD	★			6	9.525	3.44	1.5	1.7	1.00	2.12	
		MMT22ER040RD	★			4	9.525	3.44	2.2	2.3	1.51	3.18	

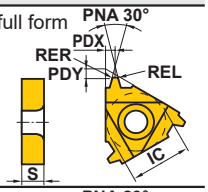
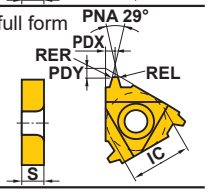
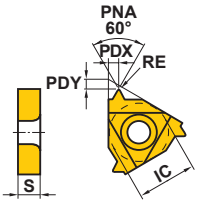
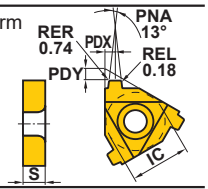
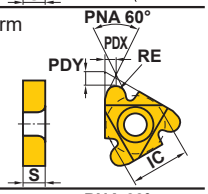
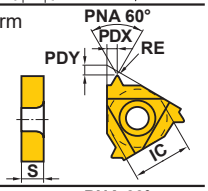
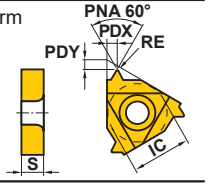








● : USA Stock ★ : Stocked in Japan
<5 inserts in one case>

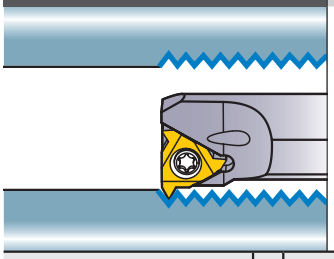
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7e	**MMT16ER150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form 
		MMT16ER200TR	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16ER300TR	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22ER400TR	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22ER500TR	★		5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME 29°	3G	**MMT16ER120ACME**	●			12	9.525	3.44	1.1	1.2	0.08	1.19	Semi-full form 
		MMT16ER100ACME	●			10	9.525	3.44	1.3	1.4	0.08	1.52	
		MMT16ER080ACME	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22ER060ACME	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22ER050ACME	●			5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ	3A	**MMT16ER320UNJ**	●			32	9.525	3.44	0.6	0.7	0.13	0.46	Full form 
		MMT16ER280UNJ	●			28	9.525	3.44	0.7	0.7	0.14	0.52	
		MMT16ER240UNJ	●			24	9.525	3.44	0.7	0.8	0.17	0.61	
		MMT16ER200UNJ	●			20	9.525	3.44	0.8	0.9	0.20	0.73	
		MMT16ER180UNJ	●			18	9.525	3.44	0.8	1.0	0.22	0.81	
		MMT16ER160UNJ	●			16	9.525	3.44	0.9	1.1	0.25	0.92	
		MMT16ER140UNJ	●			14	9.525	3.44	1.0	1.2	0.29	1.05	
		MMT16ER120UNJ	●			12	9.525	3.44	1.1	1.3	0.33	1.22	
		MMT16ER100UNJ	●			10	9.525	3.44	1.2	1.5	0.40	1.47	
		MMT16ER080UNJ	●			8	9.525	3.44	1.2	1.6	0.51	1.83	
API Buttress Casing	Standard API	**MMT22ER050APBU**	★			5	12.7	4.64	3.1	1.9	0.18	1.55	Full form 
API Round 60° Casing & Tubing	Standard API RD	**MMT16ER100APRD**	●			10	9.525	3.44	1.2	1.4	0.34	1.41	Full form 
		MMT16ER080APRD	●			8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT 60°	Standard NPT	**MMT16ER270NPT**	●			27	9.525	3.44	0.7	0.8	0.04	0.66	Full form 
		MMT16ER180NPT	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16ER140NPT	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16ER115NPT	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16ER080NPT	●			8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF 60°	Class 2	**MMT16ER270NPTF**	★			27	9.525	3.44	0.7	0.8	0.04	0.64	Full form 
		MMT16ER180NPTF	★			18	9.525	3.44	0.8	1.0	0.04	1.00	
		MMT16ER140NPTF	★			14	9.525	3.44	0.9	1.2	0.04	1.35	
		MMT16ER115NPTF	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16ER080NPTF	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

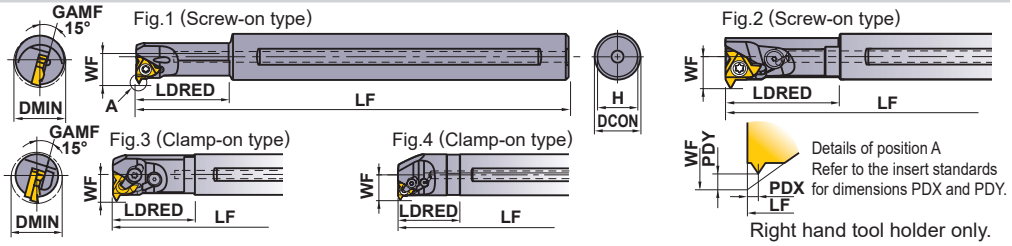
MMTI TYPE BORING BARS

- Minimum cutting diameter .500".
- Various insert types.
- Precision class insert for precise thread forms.
- Available with a pressed breaker for chip control.
- Able to change lead angle by replacing the shim.

MMTI

Internal threading





Right hand tool holder only.

Order Number	Stock	Insert Number	Lead Angle	Dimensions (inch)						Clamp Bridge	Clamp Screw *	Stop Ring	Shim Screw *	Shim	Wrench ①②	Fig.
	R			DCON	LF	LDRED	WF	H	DMIN							
MMTIR102-0.50-1.5-C	●	MMT11IR	1.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
MMTIR102-0.50-2.5-C	●		2.5°	.625	5.000	1.000	.340	.586	**.500**	–	TS25	–	–	–	①TKY08F	1
MMTIR102-0.60-1.5-C	●	○○○○○	1.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
MMTIR102-0.60-2.5-C	●		2.5°	.625	6.000	1.250	.380	.586	**.600**	–	TS25	–	–	–	①TKY08F	1
MMTIR103-0.75-1.5-C	●	MMT16IR	1.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
MMTIR103-0.75-2.5-C	●		2.5°	.625	6.000	1.500	.480	.586	**.750**	–	CS350860T	–	–	–	①TKY15F	2
MMTIR123-0.90-1.5-C	●	○○○○○	1.5°	.750	7.000	1.500	.510	.711	**.900**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR163-1.15-1.5-C	●		1.5°	1.000	10.000	2.500	.660	.937	**1.150**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	3
MMTIR203-1.45-1.5-C	●		1.5°	1.250	10.000	2.000	.810	1.187	**1.450**	SETK51	SETS51	CR4	HFC03006	CTI32TP15	①TKY15F ②HKY20R	4
MMTIR124-0.95-1.5-C	●	MMT22IR	1.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
MMTIR124-0.95-2.5-C	●		2.5°	.750	7.000	2.000	.610	.711	**.950**	–	TS43	–	–	–	①TKY15F	2
MMTIR164-1.20-1.5-C	●	○○○○○	1.5°	1.000	8.000	1.500	.700	.937	**1.200**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR204-1.50-1.5-C	●		1.5°	1.250	10.000	2.000	.860	1.187	**1.500**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4
MMTIR244-1.75-1.5-C	●		1.5°	1.500	12.000	2.500	.980	1.437	**1.750**	SETK61	SETS61	CR5	HFC04008	CTI43TP15	①TKY20F ②HKY25R	4

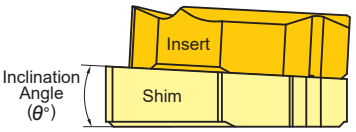
Note 1) Select and use an alternate shim from list below (sold separately), dependant on the lead angle.
- The screw-on type has no shim. The holder has an in-built lead angle. Please select a holder with the appropriate lead angle.
- The minimum cutting diameter (DMIN) indicates the prepared hole diameter, not the nominal thread diameter.

* Clamp Torque (lbf-in) : TS25=8.9, CS350860T=31, SETS51=31, TS43=31, SETS61=44, HFC03006=13, HFC04008=19

SHIM

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI32TN15**	●	–3°	MMTIR ○○3-○○○ -○○-C
–0.5°	**CTI32TN05**	●	–2°	
0.5°	**CTI32TP05**	●	–1°	
1.5°	**CTI32TP15**	●	0°	
2.5°	**CTI32TP25**	●	1°	
3.5°	**CTI32TP35**	●	2°	
4.5°	**CTI32TP45**	●	3°	

Lead Angle (α°)	Order Number	Stock R	Inclination Angle (θ°)	Applicable Holder
–1.5°	**CTI43TN15**	●	–3°	MMTIR ○○4-○○○ -○○-C
–0.5°	**CTI43TN05**	●	–2°	
0.5°	**CTI43TP05**	●	–1°	
1.5°	**CTI43TP15**	●	0°	
2.5°	**CTI43TP25**	●	1°	
3.5°	**CTI43TP35**	●	2°	
4.5°	**CTI43TP45**	●	3°	



Standard shim delivered with the holder.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**VP10MF**	490 (230—755)
			VP15TF	330 (195—460)
			VP20RT	260 (195—330)
	Carbon Steel Alloy Steel	180—280HB	**VP10MF**	460 (260—655)
			VP15TF	330 (195—460)
			VP20RT	260 (195—330)
M	Stainless Steel	≤200HB	**VP15TF**	260 (130—395)
			VP20RT	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	460 (260—655)
			VP15TF	295 (195—395)

	Work Material	Hardness	Grade	Cutting Speed (SFM)
S	Heat Resistant Alloy	—	**VP10MF**	150 (50—230)
			VP15TF	100 (65—130)
			VP20RT	
	Titanium Alloy	—	**VP10MF**	195 (130—260)
			VP15TF	150 (80—210)
			VP20RT	
H	Heat-Treated Alloy	45—55HRC	**VP10MF**	165 (100—230)
			VP15TF	130 (65—195)

● : USA Stock ★ : Stocked in Japan
<5 inserts in one case>

HOW TO SELECT A SHIM ➤ G012
MMT SERIES ORDER NUMBER ➤ G020

MMT M-CLASS INSERTS WITH 3-D CHIP BREAKERS

INSERTS

Type	Order Number	Coated VP15TF	Coated VP20RT	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	**MMT11IRA60-S**	★		0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.03	—	Partial form, PNA 60°
	MMT16IRA60-S	●		0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.03	—	
	MMT16IRG60-S	●		1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.11	—	
Partial Profile 55°	**MMT11IRA55-S**	★			48—16	6.35	3.04	0.8	0.9	0.07	—	Partial form, PNA 55°
	MMT16IRA55-S	★			48—16	9.525	3.44	0.8	0.9	0.07	—	
	MMT16IRG55-S	★			14—8	9.525	3.44	1.2	1.7	0.21	—	
ISO Metric 60°	**MMT11IR100ISO-S**	★		1.0		6.35	3.04	0.6	0.7	0.06	0.58	Full form, PNA 60°
	MMT11IR125ISO-S	★		1.25		6.35	3.04	0.8	0.9	0.08	0.72	
	MMT11IR150ISO-S	★		1.5		6.35	3.04	0.8	1.0	0.10	0.87	
	MMT16IR100ISO-S	●	★	1.0		9.525	3.44	0.6	0.7	0.06	0.58	
	MMT16IR125ISO-S	●	★	1.25		9.525	3.44	0.8	0.9	0.08	0.72	
	MMT16IR150ISO-S	●	★	1.5		9.525	3.44	0.8	1.0	0.10	0.87	
	MMT16IR175ISO-S	●	★	1.75		9.525	3.44	0.9	1.2	0.11	1.01	
	MMT16IR200ISO-S	●	★	2.0		9.525	3.44	1.0	1.3	0.13	1.15	
	MMT16IR250ISO-S	●	★	2.5		9.525	3.44	1.1	1.5	0.17	1.44	
	MMT16IR300ISO-S	●	★	3.0		9.525	3.44	1.1	1.5	0.20	1.73	
American UN 60°	**MMT16IR160UN-S**	●			16	9.525	3.44	0.9	1.1	0.11	0.92	Full form, PNA 60°
	MMT16IR140UN-S	●			14	9.525	3.44	0.9	1.2	0.12	1.05	
	MMT16IR120UN-S	●			12	9.525	3.44	1.1	1.4	0.14	1.22	
Whitworth 55° for BSW, BSP	**MMT16IR190W-S**	★			19	9.525	3.44	0.8	1.0	0.18	0.86	Full form, PNA 55°
	MMT16IR140W-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110W-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	
BSPT 55°	**MMT16IR190BSPT-S**	★			19	9.525	3.44	0.8	0.9	0.18	0.86	Full form, PNA 55°
	MMT16IR140BSPT-S	★			14	9.525	3.44	1.0	1.2	0.25	1.16	
	MMT16IR110BSPT-S	★			11	9.525	3.44	1.1	1.5	0.32	1.48	

IDENTIFICATION

MMT **16** **I** **R** **100** **ISO** – **S**

S	M-class inserts with 3-D chip breakers

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

100	1.0 mm	A	0.5—1.5 mm or 48—16 thread/inch
125	1.25 mm		
150	1.5 mm	G	1.75—3.0 mm or 14—8 thread/inch
175	1.75 mm		
200	2.0 mm		
250	2.5 mm		
300	3.0 mm		

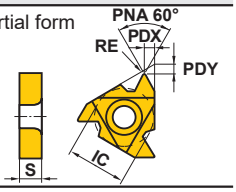
Threading Type

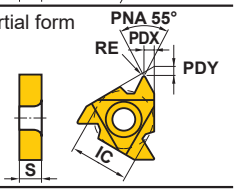
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric 60°
W	Whitworth 55° for BSW, BSP
BSPT	BSPT 55°
UN	American UN 60°

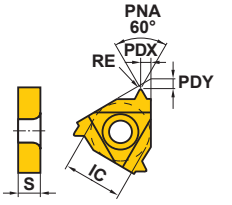
MMT G-CLASS GROUND INSERTS

INSERTS

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
Partial Profile 60°	I	MMT11IRA60	★	★	0.5—1.5	48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA60	★	★	0.5—1.5	48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG60	★	★	1.75—3.0	14—8	9.525	3.44	1.2	1.7	0.16	—	
		MMT16IRAG60	★		0.5—3.0	48—8	9.525	3.44	1.2	1.7	0.05	—	
		MMT22IRN60	★		3.5—5.0	7—5	12.7	4.64	1.7	2.5	0.30	—	
Partial Profile 55°	I	MMT11IRA55	★	★		48—16	6.35	3.04	0.8	0.9	0.05	—	Partial form
		MMT16IRA55	★	★		48—16	9.525	3.44	0.8	0.9	0.05	—	
		MMT16IRG55	★	★		14—8	9.525	3.44	1.2	1.7	0.21	—	
		MMT16IRAG55	★			48—8	9.525	3.44	1.2	1.7	0.07	—	
		MMT22IRN55	★			7—5	12.7	4.64	1.7	2.5	0.44	—	
ISO Metric 60°	6H	MMT11IR050ISO	★		0.5		6.35	3.04	0.6	0.4	0.03	0.29	Full form
		MMT11IR075ISO	★		0.75		6.35	3.04	0.6	0.6	0.04	0.43	
		MMT11IR100ISO	★	★	1.0		6.35	3.04	0.6	0.7	0.10	0.58	
		MMT11IR125ISO	★	★	1.25		6.35	3.04	0.8	0.9	0.12	0.72	
		MMT11IR150ISO	★	★	1.5		6.35	3.04	0.8	1.0	0.14	0.87	
		MMT11IR175ISO	★		1.75		6.35	3.04	0.9	1.1	0.10	1.01	
		MMT11IR200ISO	★		2.0		6.35	3.04	0.9	1.1	0.18	1.15	
		MMT16IR050ISO	★		0.5		9.525	3.44	0.6	0.4	0.03	0.29	
		MMT16IR075ISO	★		0.75		9.525	3.44	0.6	0.6	0.04	0.43	
		MMT16IR100ISO	●	★	1.0		9.525	3.44	0.6	0.7	0.10	0.58	
		MMT16IR125ISO	●	★	1.25		9.525	3.44	0.8	0.9	0.12	0.72	
		MMT16IR150ISO	●	★	1.5		9.525	3.44	0.8	1.0	0.14	0.87	
		MMT16IR175ISO	●	★	1.75		9.525	3.44	0.9	1.2	0.10	1.01	
		MMT16IR200ISO	●	★	2.0		9.525	3.44	1.0	1.3	0.18	1.15	
		MMT16IR250ISO	●	★	2.5		9.525	3.44	1.1	1.5	0.15	1.44	
		MMT16IR300ISO	●	★	3.0		9.525	3.44	1.1	1.5	0.26	1.73	
		MMT22IR350ISO	★		3.5		12.7	4.64	1.6	2.3	0.22	2.02	
		MMT22IR400ISO	★		4.0		12.7	4.64	1.6	2.3	0.25	2.31	
		MMT22IR450ISO	★		4.5		12.7	4.64	1.6	2.4	0.28	2.60	
		MMT22IR500ISO	★		5.0		12.7	4.64	1.6	2.3	0.32	2.89	







IDENTIFICATION

MMT **16** **I** **R** **050** **ISO**

Designation

Diameter of Inscribed Circle (mm)

11	6.35
16	9.525
22	12.7

Application

E	External
I	Internal

Hand of Tool

R	Right

Pitch

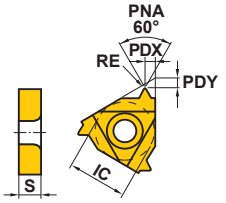
050	0.5 mm	A	0.5—1.5 mm or 48—16 thread/inch
075	0.75 mm		
100	1.0 mm		
125	1.25 mm	G	1.75—3.0 mm or 14—8 thread/inch
150	1.5 mm		
175	1.75 mm		
200	2.0 mm	AG	0.5—3.0 mm or 48—8 thread/inch
250	2.5 mm		
300	3.0 mm		
350	3.5 mm		
400	4.0 mm	N	3.5—5.0 mm or 7—5 thread/inch
450	4.5 mm		
500	5.0 mm		

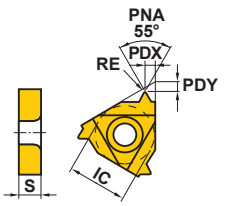
Threading Type

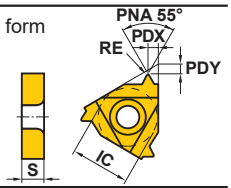
60	Partial Profile 60°
55	Partial Profile 55°
ISO	ISO Metric 60°
W	Whitworth 55° for BSW, BSP
BSPT	BSPT 55°
UN	American UN 60°
RD	Round DIN 405 30°
TR	ISO Trapezoidal 30°
ACME	American ACME 29°
UNJ	UNJ
APBU	API Buttress Casing
APRD	API Round 60° Casing&Tubing
NPT	NPT 60°
NPTF	NPTF 60°

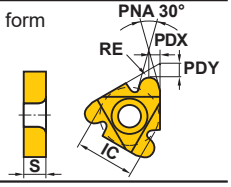
● : USA Stock ★ : Stocked in Japan
<5 inserts in one case>

Type	Thread Tolerance	Order Number	Coated VP10MF	Coated VP15TF	Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE	Total depth of cut (mm)	Geometry
American UN 60°	2B	**MMT11IR320UN**	●			32	6.35	3.04	0.6	0.6	0.04	0.46	Full form
		MMT11IR280UN	●			28	6.35	3.04	0.6	0.7	0.05	0.52	
		MMT11IR240UN	●			24	6.35	3.04	0.7	0.8	0.09	0.61	
		MMT11IR200UN	●			20	6.35	3.04	0.8	0.9	0.11	0.73	
		MMT11IR180UN	●			18	6.35	3.04	0.8	1.0	0.12	0.81	
		MMT11IR160UN	●			16	6.35	3.04	0.9	1.1	0.14	0.92	
		MMT11IR140UN	●			14	6.35	3.04	0.9	1.1	0.11	1.05	
		MMT16IR320UN	●			32	9.525	3.44	0.6	0.6	0.04	0.46	
		MMT16IR280UN	●			28	9.525	3.44	0.6	0.7	0.05	0.52	
		MMT16IR240UN	●			24	9.525	3.44	0.7	0.8	0.09	0.61	
		MMT16IR200UN	●			20	9.525	3.44	0.8	0.9	0.11	0.73	
		MMT16IR180UN	●			18	9.525	3.44	0.8	1.0	0.12	0.81	
		MMT16IR160UN	●	★		16	9.525	3.44	0.9	1.1	0.14	0.92	
		MMT16IR140UN	●	★		14	9.525	3.44	0.9	1.2	0.11	1.05	
		MMT16IR130UN	●			13	9.525	3.44	1.0	1.3	0.10	1.13	
		MMT16IR120UN	●	★		12	9.525	3.44	1.1	1.4	0.18	1.22	
		MMT16IR110UN	●			11	9.525	3.44	1.1	1.5	0.13	1.33	
		MMT16IR100UN	●			10	9.525	3.44	1.1	1.5	0.15	1.47	
		MMT16IR090UN	●			9	9.525	3.44	1.2	1.7	0.17	1.63	
		MMT16IR080UN	●			8	9.525	3.44	1.1	1.5	0.27	1.83	
		MMT22IR070UN	●			7	12.7	4.64	1.6	2.3	0.23	2.09	
		MMT22IR060UN	●			6	12.7	4.64	1.6	2.3	0.26	2.44	
		MMT22IR050UN	●			5	12.7	4.64	1.6	2.3	0.32	2.93	
Whitworth 55° for BSW, BSP	Medium Class A	**MMT11IR190W**	★			19	6.35	3.04	0.8	1.0	0.19	0.86	Full form
		MMT11IR140W	★			14	6.35	3.04	0.9	1.1	0.26	1.16	
		MMT16IR280W	★			28	9.525	3.44	0.6	0.7	0.09	0.58	
		MMT16IR260W	★			26	9.525	3.44	0.7	0.8	0.10	0.63	
		MMT16IR200W	★			20	9.525	3.44	0.8	0.9	0.18	0.81	
		MMT16IR190W	★	★		19	9.525	3.44	0.8	1.0	0.19	0.86	
		MMT16IR180W	★			18	9.525	3.44	0.8	1.0	0.20	0.90	
		MMT16IR160W	★			16	9.525	3.44	0.9	1.1	0.23	1.02	
		MMT16IR140W	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR120W	★			12	9.525	3.44	1.1	1.4	0.30	1.36	
		MMT16IR110W	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
		MMT16IR100W	★			10	9.525	3.44	1.1	1.5	0.37	1.63	
		MMT16IR090W	★			9	9.525	3.44	1.2	1.7	0.34	1.81	
		MMT16IR080W	★			8	9.525	3.44	1.2	1.5	0.39	2.03	
		MMT22IR070W	★			7	12.7	4.64	1.6	2.3	0.46	2.32	
		MMT22IR060W	★			6	12.7	4.64	1.6	2.3	0.53	2.71	
		MMT22IR050W	★			5	12.7	4.64	1.7	2.4	0.66	3.25	
BSPT 55°	Standard BSPT	**MMT11IR190BSPT**	★			19	6.35	3.04	0.8	0.9	0.14	0.86	Full form
		MMT11IR140BSPT	★			14	6.35	3.04	0.9	1.0	0.26	1.16	
		MMT16IR190BSPT	★	★		19	9.525	3.44	0.8	0.9	0.14	0.86	
		MMT16IR140BSPT	★	★		14	9.525	3.44	1.0	1.2	0.26	1.16	
		MMT16IR110BSPT	★	★		11	9.525	3.44	1.1	1.5	0.33	1.48	
Round DIN 405 30°	7H	**MMT16IR100RD**	★			10	9.525	3.44	1.1	1.2	0.55	1.27	Full form
		MMT16IR080RD	★			8	9.525	3.44	1.4	1.4	0.70	1.59	
		MMT16IR060RD	★			6	9.525	3.44	1.4	1.5	0.93	2.12	
		MMT22IR040RD	★			4	12.7	4.64	2.2	2.3	1.40	3.18	





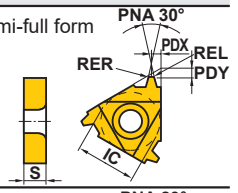


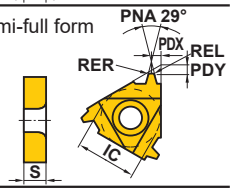


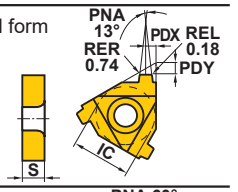
MMT G-CLASS GROUND INSERTS

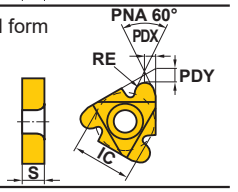
INSERTS

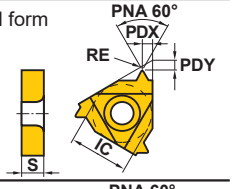
Type	Thread Tolerance	Order Number	Coated VP10MF		Pitch mm	Pitch thread/inch	Dimensions (mm) IC	S	PDY	PDX	RE RER/L	Total depth of cut (mm)	Geometry
ISO Trapezoidal 30°	7H	**MMT16IR150TR**	★		1.5		9.525	3.44	1.0	1.1	0.08	0.90	Semi-full form
		MMT16IR200TR	★		2.0		9.525	3.44	1.1	1.3	0.15	1.25	
		MMT16IR300TR	★		3.0		9.525	3.44	1.3	1.5	0.15	1.75	
		MMT22IR400TR	★		4.0		12.7	4.64	1.7	1.9	0.15	2.25	
		MMT22IR500TR	★		5.0		12.7	4.64	2.1	2.5	0.15	2.75	
American ACME 29°	3G	**MMT16IR120ACME**	●			12	9.525	3.44	1.2	1.3	0.05	1.19	Semi-full form
		MMT16IR100ACME	●			10	9.525	3.44	1.2	1.3	0.08	1.52	
		MMT16IR080ACME	●			8	9.525	3.44	1.4	1.5	0.10	1.84	
		MMT22IR060ACME	●			6	12.7	4.64	1.8	2.1	0.10	2.37	
		MMT22IR050ACME	●			5	12.7	4.64	2.0	2.3	0.10	2.79	
UNJ		When machining an internal UNJ thread, cut an internal hole with the appropriate diameter. Then machine with American UN 60°. In this case, a full form type insert cannot be used.											
API Buttress Casing	Standard API	**MMT22IR050APBU**	★			5	12.7	4.64	2.8	1.9	0.74/0.8	1.55	Full form
API Round 60° Casing & Tubing	Standard API RD	**MMT16IR100APRD**	●			10	9.525	3.44	1.2	1.4	0.34	1.41	Full form
		MMT16IR080APRD	●			8	9.525	3.44	1.3	1.5	0.41	1.81	
American NPT 60°	Standard NPT	**MMT16IR270NPT**	●			27	9.525	3.44	0.7	0.8	0.04	0.66	Full form
		MMT16IR180NPT	●			18	9.525	3.44	0.8	1.0	0.08	1.01	
		MMT16IR140NPT	●			14	9.525	3.44	0.9	1.2	0.09	1.33	
		MMT16IR115NPT	●			11.5	9.525	3.44	1.1	1.5	0.11	1.64	
		MMT16IR080NPT	●			8	9.525	3.44	1.3	1.8	0.14	2.42	
American NPTF 60°	Class 2	**MMT16IR140NPTF**	★			14	9.525	3.44	0.9	1.2	0.04	1.35	Full form
		MMT16IR115NPTF	★			11.5	9.525	3.44	1.1	1.5	0.04	1.63	
		MMT16IR080NPTF	★			8	9.525	3.44	1.3	1.8	0.04	2.38	

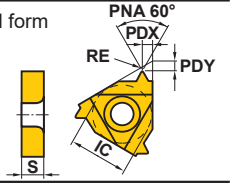












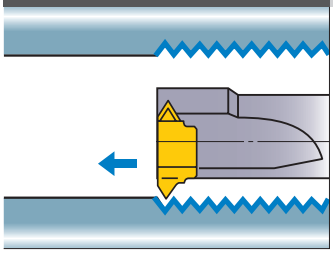
● : USA Stock ★ : Stocked in Japan
<5 inserts in one case>

CUTTING DEPTH GUIDE ➤ G017

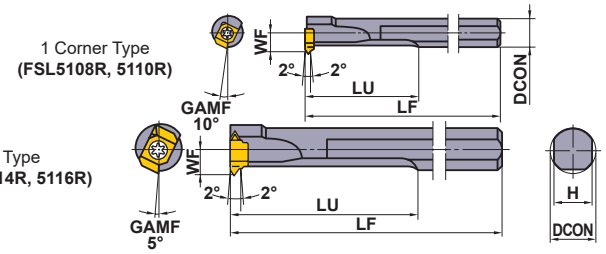
F TYPE BORING BARS

- Minimum cutting diameter 10 mm.
- Screw-on type.
- Applicable to threading, grooving.
- Thread pitch 1.5—3.5 mm.

FSL51 Internal threading, Grooving



Note 1) Cutting in the opposite direction is not possible.

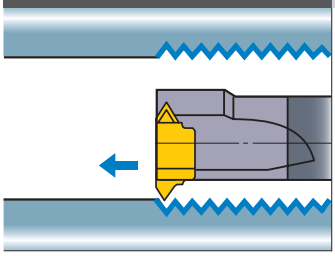


Right hand tool holder only.

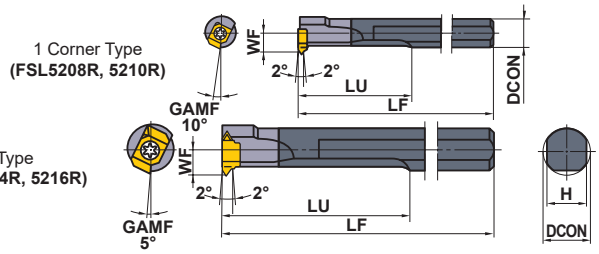
Order Number	Stock	Insert Number		Dimensions (mm)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN*1	Clamp Screw	Wrench
FSL5108R	★	MLT1001L	MLG10□□L	8	125	30	4.8	7	**10**	TS25	TKY08F
FSL5110R	★	MLT1001L	MLG10□□L	10	150	40	5.8	9	**12**	TS25	TKY08F
FSL5112R	★	MLT1401L	MLG14□□L	12	180	50	6.8	10.8	**14**	TS32	TKY08F
FSL5114R	★	MLT1401L	MLG14□□L	14	180	60	7.8	12.4	**16**	TS32	TKY08F
FSL5116R	★	MLT2001L	MLG20□□L	16	200	70	9.7	14	**20**	TS43	TKY15F

*1 DMIN : Min.Cutting Diameter
*2 Clamp Torque (lbf-in) : TS25=8.9, TS32=18, TS43=31

FSL52 (Carbide shank) Internal threading, Grooving



Note 1) Cutting in the opposite direction is not possible.



Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (mm)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN*1	Clamp Screw	Wrench
FSL5208R	★	MLT1001L	MLG10□□L	8	125	60	4.8	7	**10**	TS25	TKY08F
FSL5210R	★	MLT1001L	MLG10□□L	10	150	70	5.8	9	**12**	TS25	TKY08F
FSL5212R	★	MLT1401L	MLG14□□L	12	180	80	6.8	11	**14**	TS32	TKY08F
FSL5214R	★	MLT1401L	MLG14□□L	14	180	85	7.8	12	**16**	TS32	TKY08F
FSL5216R	★	MLT2001L	MLG20□□L	16	200	115	9.7	14	**20**	TS43	TKY15F

*1 DMIN : Min.Cutting Diameter
*2 Clamp Torque (lbf-in) : TS25=8.9, TS32=18, TS43=31

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**UP20M**	460 (330—590)
			UTi20T	395 (330—490)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	395 (330—490)
			UTi20T	330 (230—395)

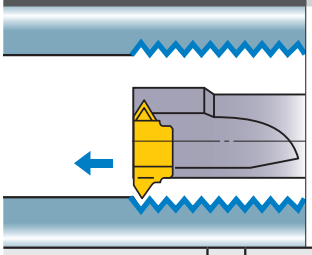
	Work Material	Hardness	Grade	Cutting Speed (SFM)
M	Stainless Steel	≤200HB	**UP20M**	395 (260—490)
			UTi20T	330 (230—425)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	260 (195—330)
			UTi20T	260 (195—330)

INSERTS ➤ G033
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

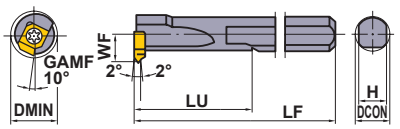
F TYPE BORING BARS

- Min. cutting diameter .390 inch.
- Screw-on type.
- Usable for various applications.
- Max. groove depth: .118 inch.

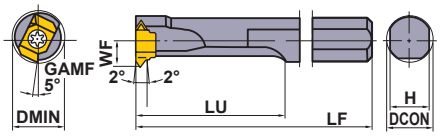
S-SL5N — Internal threading, Grooving



1 Corner type (S-SL5NR05 / 06)



2 Corner type (S-SL5NR08 / 10 / 12)



Right hand tool holder only.

Order Number	Stock	Insert Number		Dimensions (inch)						*2	
	R	Threading	Grooving	DCON	LF	LU	WF	H	DMIN *1	Clamp Screw	Wrench
S-SL5NR05	●	MLT1001L	MLG10□□□L MLG10W□□□L	.313	5.000	1.250	.188	.283	.390	TS25	TKY08F
S-SL5NR06	●	MLT1001L	MLG10□□□L MLG10W□□□L	.375	6.000	1.500	.219	.340	.449	TS25	TKY08F
S-SL5NR08	●	MLT1401L	MLG14□□□L	.500	7.000	2.000	.281	.460	.579	TS32	TKY08F
S-SL5NR10	●	MLT2001L	MLG20□□□L	.625	8.000	3.000	.375	.560	.791	TS43	TKY15F
S-SL5NR12	●	MLT2001L	MLG20□□□L	.750	10.000	4.000	.438	.700	.902	TS43	TKY15F

*1 DMIN : Min. Cutting Diameter
*2 Clamp Torque (lbf-in) : TS25=8.9, TS32=18, TS43=31

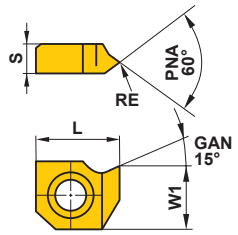
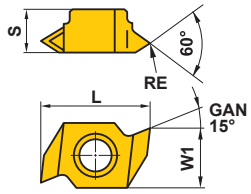
RECOMMENDED CUTTING CONDITIONS

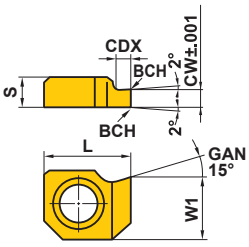
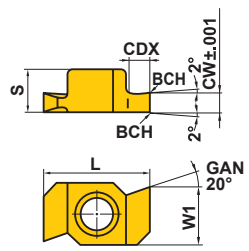
	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**UP20M**	460 (330—590)
			UTi20T	395 (330—490)
	Carbon Steel Alloy Steel	180—280HB	**UP20M**	395 (330—490)
			UTi20T	330 (230—395)

	Work Material	Hardness	Grade	Cutting Speed (SFM)
M	Stainless Steel	≤200HB	**UP20M**	395 (260—490)
			UTi20T	330 (230—425)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	260 (195—330)
			UTi20T	260 (195—330)

● : USA Stock
<10 inserts in one case>

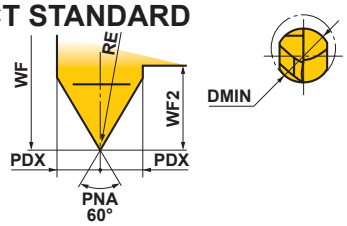
INSERTS

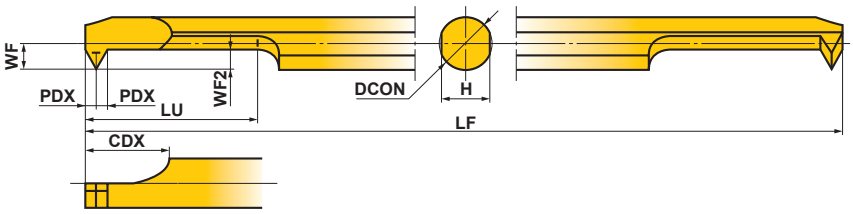
Application	Order Number	Coated UP20M	Carbide UTi20T	Pitch (inch)	Dimensions (inch) L	W1	S	RE	Geometry
Threading	**MLT1001L**	●	●	.059—.079	.276	.197	.094	.004	**MLT1001L (1 Corner type)** 
	MLT1401L	●	●	.059—.098	.465	.256	.187	.004	
	MLT2001L	●	●	.059—.138	.661	.356	.250	.004	**MLT1401L /2001L (2 Corner type)** 

Application	Order Number	Carbide UTi20T	Carbide HTi10		CW (inch)	Dimensions (inch) L	W1	CDX	S	BCH	Geometry
Grooving	**MLG10W062L**		●	Inch	.062	.276	.197	.039	.094	.004	**MLG...L (1 Corner type)** 
	MLG1012L	●		Metric	.047 (1.2 mm)	.276	.197	.039	.094	.004	
	MLG1015L	●			.059 (1.5 mm)	.276	.197	.039	.094	.004	
	MLG1020L	●			.079 (2.0 mm)	.276	.197	.039	.094	.004	
	MLG1415L	●		Metric	.059 (1.5 mm)	.465	.256	.079	.187	.004	**MLG...L (2 Corner type)** 
	MLG1420L	●			.079 (2.0 mm)	.465	.256	.079	.187	.004	
	MLG1430L	●			.118 (3.0 mm)	.465	.256	.079	.187	.004	
	MLG2020L	●			.079 (2.0 mm)	.661	.356	.118	.250	.004	
	MLG2030L	●			.118 (3.0 mm)	.661	.356	.118	.250	.004	
	MLG2040L	●			.157 (4.0 mm)	.661	.356	.118	.250	.004	

MICRO-MINI TWIN

■CT STANDARD





Order Number	Stock		Breaker	Threads				Dimensions (mm)									
	Micro Grain Carbide	Coated		Metric Screw		Unified Coarse Screw											
	TF15	VP15TF		Thread	Pitch (mm)	Thread	Pitch (thread/inch)	DMIN	RE	DCON	LF	LU	CDX	WF	PDX	WF2	H
CT0305RS-M4	●	●	Without	≥M4	0.5−1.0	≥NO.8-32UNC	36−24	**3**	0.03	3	50	5.2	6	1.3	0.6	1.2	2.7
CT03RS-M4	●	●	Without	≥M4	0.5−1.0	≥NO.8-36UNF	36−24	**3**	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT03RS-M4B	●	●	With	≥M4	0.5−1.0		36−24	**3**	0.03	3	50	10.2	6	1.3	0.6	1.2	2.7
CT0407RS-M6	●	●	Without	≥M6	0.75−1.25	≥1/4-20UNC	28−20	**4.5**	0.05	4	60	7.6	7	1.8	0.8	1.7	3.6
CT04RS-M6	●	●	Without	≥M6	0.75−1.25	≥1/4-28UNF	28−20	**4.5**	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT04RS-M6B	●	●	With	≥M6	0.75−1.25		28−20	**4.5**	0.05	4	60	15.6	7	1.8	0.8	1.7	3.6
CT0511RS-M8	●	●	Without	≥M8	0.75−1.5	≥5/16-18UNC	24−18	**6**	0.05	5	70	11	8	2.3	1	2.2	4.5
CT05RS-M8	●	●	Without	≥M8	0.75−1.5	≥5/16-24UNF	24−18	**6**	0.05	5	70	21	8	2.3	1	2.2	4.5
CT05RS-M8B	●	●	With	≥M8	0.75−1.5		24−18	**6**	0.05	5	70	21	8	2.3	1	2.2	4.5
CT0611RS-M10	●	●	Without	≥M10	0.75−1.75	≥3/8-16UNC	24−16	**7**	0.05	6	75	11	8	2.8	1	2.2	5.4
CT06RS-M10	●	●	Without	≥M10	0.75−1.75	≥3/8-24UNF	24−16	**7**	0.05	6	75	21	8	2.8	1	2.2	5.4
CT06RS-M10B	●	●	With	≥M10	0.75−1.75		24−16	**7**	0.05	6	75	21	8	2.8	1	2.2	5.4

THREAD PITCH FOR THE CT TYPE

Order Number	Metric Thread P (mm)								Unified Thread P (thread/inch)						
	0.50	0.70	0.75	0.80	1.00	1.25	1.50	1.75	36	32	28	24	20	18	16
CT03RS-M4/M4B	○	○	○	○	○	–	–	–	○	○	○	○	–	–	–
CT04RS-M6/M6B	–	–	○	–	○	○	–	–	–	–	○	○	○	–	–
CT05RS-M8/M8B	–	–	○	–	○	○	○	–	–	–	–	○	○	○	–
CT06RS-M10/M10B	–	–	○	–	○	○	○	○	–	–	–	○	○	○	○

Note 1) For internal threads that are larger than the minimum diameter of the Micro Mini Twin (CT type) it is possible to machining the above thread pitches. For the minimum diameter please refer to the standards.

DEPTH OF CUT FOR THE CT TYPE

●Metric Thread

P (pitch)		0.5	0.7	0.75		0.8	1		1.25	1.5	1.75
D.O.C. (mm)		0.3	0.43	0.46	0.44	0.49	0.62	0.6	0.76	0.92	1.09
Re* (Corner radius)		0.03	0.03	0.03	0.05	0.03	0.03	0.05	0.05	0.05	0.05
Number of Passes	1	0.06	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
	2	0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.07	0.07	0.07
	3	0.05	0.06	0.06	0.05	0.06	0.06	0.06	0.07	0.07	0.07
	4	0.04	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07	0.07
	5	0.04	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.07	0.07
	6	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.07
	7	0.03	0.04	0.04	0.04	0.04	0.05	0.05	0.06	0.06	0.06
	8		0.04	0.04	0.03	0.04	0.04	0.04	0.05	0.06	0.06
	9		0.03	0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06
	10			0.03	0.03	0.03	0.04	0.04	0.05	0.05	0.06
	11					0.03	0.03	0.03	0.04	0.05	0.05
	12						0.03	0.03	0.04	0.05	0.05
	13						0.03		0.04	0.04	0.05
	14								0.03	0.04	0.05
	15									0.04	0.04
	16									0.04	0.04
	17									0.03	0.04
	18										0.04
	19										0.04
	20										0.03

●Unified Thread

P (thread/inch)		36	32	28		24		20	18	16
D.O.C. (inch)		.0169	.0193	.0220	.0213	.0260	.0252	.0307	.0343	.0386
Re* (Corner radius)		.0012	.0012	.0012	.0020	.0012	.0020	.0020	.0020	.0020
Number of Passes	1	.0024	.0024	.0028	.0024	.0028	.0028	.0028	.0028	.0028
	2	.0024	.0024	.0024	.0024	.0028	.0028	.0028	.0028	.0028
	3	.0024	.0024	.0024	.0024	.0024	.0024	.0028	.0028	.0028
	4	.0020	.0020	.0024	.0020	.0024	.0024	.0024	.0028	.0028
	5	.0020	.0020	.0020	.0020	.0024	.0024	.0024	.0028	.0028
	6	.0016	.0016	.0020	.0020	.0020	.0020	.0024	.0024	.0024
	7	.0016	.0016	.0016	.0016	.0020	.0020	.0024	.0024	.0024
	8	.0016	.0016	.0016	.0016	.0016	.0020	.0020	.0024	.0024
	9	.0012	.0012	.0016	.0016	.0016	.0016	.0020	.0020	.0024
	10		.0012	.0012	.0012	.0016	.0016	.0020	.0020	.0024
	11		.0012	.0012	.0012	.0012	.0012	.0016	.0020	.0020
	12			.0012	.0012	.0012	.0012	.0016	.0020	.0020
	13					.0012	.0012	.0016	.0016	.0020
	14					.0012		.0012	.0016	.0016
	15							.0012	.0012	.0016
	16								.0012	.0016
	17									.0012
	18									.0012
	19									
	20									

* Even though the pitch may be the same, the depth of cut varies according to the corner radius. For the Micro Mini Twin CT type CT03RS-M4, and CT03RS-M4B the corner radius is 0.03 mm(.0012 inch), for other types it is 0.05 mm(.0020 inch). For further details please refer to the standards section.

● : USA Stock

<MICRO-MINI TWIN is available in 1 piece in one pack>

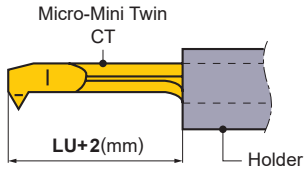
HOLDER

HOLDER CROSS REFERENCE LIST OF INCH SHANK STANDARD

Holder			Stock	MICRO-MINI TWIN	Machine Makers
Type		Order Number *1		CT	
Round Type Holder ϕ.625 inch	ID : Metric Type	**RBH10189A**	●	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH10252A	●	0407RS-M6, 04RS-M6(B)	
		RBH10315A	●	0511RS-M8, 05RS-M8(B)	
		RBH10378A	●	0611RS-M10, 06RS-M10(B)	
Round Type Holder ϕ.750 inch	ID : Metric Type	**RBH19030N**	●	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd.
		RBH19040N	●	0407RS-M6, 04RS-M6(B)	
		RBH19050N	●	0511RS-M8, 05RS-M8(B)	
		RBH19060N	●	0611RS-M10, 06RS-M10(B)	
Round Type Holder ϕ1.000 inch	ID : Metric Type	**RBH16189A**	●	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. NC lathes
		RBH16252A	●	0407RS-M6, 04RS-M6(B)	
		RBH16315A	●	0511RS-M8, 05RS-M8(B)	
		RBH16378A	●	0611RS-M10, 06RS-M10(B)	

*1 For holder details, refer to Boring Bar Section page E034—E038.
Note 1) Mitsubishi Materials obtained the makers' approval before entering their names in the list.

RECOMMENDED CUTTING CONDITIONS

	Work Material	Cutting Speed (SFM)	Recommended Tool Overhang (mm)
P	Carbon Steel Alloy Steel	100—260	
M	Stainless Steel	100—260	
K	Cast Iron	100—260	
N	Non-Ferrous Metal	165—330	

Note 1) Wet cutting is recommended.
Note 2) Pay special attention to machining of small diameters at high revolutions as the feed rate cannot keep up with the speed.

HOLDER CROSS REFERENCE LIST OF METRIC SHANK STANDARD

Holder		Stock	MICRO-MINI TWIN	Machine Makers
Type	Order Number *1		CT	
Round Type Holder ϕ16 mm	**RBH1630N**	●	0305RS-M4, 03RS-M4(B)	MIYANO MACHINERY JAPAN INC. NC lathes
	RBH1640N	●	0407RS-M6, 04RS-M6(B)	
	RBH1650N	●	0511RS-M8, 05RS-M8(B)	
	RBH1660N	●	0611RS-M10, 06RS-M10(B)	
Round Type Holder ϕ20 mm	**RBH2030N**	●	0305RS-M4, 03RS-M4(B)	Citizen Precision Machinery Co., Ltd. Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH2040N	●	0407RS-M6, 04RS-M6(B)	
	RBH2050N	●	0511RS-M8, 05RS-M8(B)	
	RBH2060N	●	0611RS-M10, 06RS-M10(B)	
Round Type Holder ϕ22 mm	**RBH2230N**	●	0305RS-M4, 03RS-M4(B)	STAR MICRONICS CO., LTD.
	RBH2240N	●	0407RS-M6, 04RS-M6(B)	
	RBH2250N	●	0511RS-M8, 05RS-M8(B)	
	RBH2260N	●	0611RS-M10, 06RS-M10(B)	
Round Type Holder ϕ25 mm	**RBH2530N**	●	0305RS-M4, 03RS-M4(B)	Tsugami Corporation MIYANO MACHINERY JAPAN INC. NC lathes
	RBH2540N	●	0407RS-M6, 04RS-M6(B)	
	RBH2550N	●	0511RS-M8, 05RS-M8(B)	
	RBH2560N	●	0611RS-M10, 06RS-M10(B)	
Square Type Holder □10 mm	**SBH1030R**	★	0305RS-M4, 03RS-M4(B)	NC lathes
	SBH1040R	★	0407RS-M6, 04RS-M6(B)	
	SBH1050R	★	0511RS-M8, 05RS-M8(B)	
	SBH1060R	★	0611RS-M10, 06RS-M10(B)	

Note 1) Mitsubishi Materials obtained the makers' approval before entering their names in the list.
*1 For holder details, refer to Boring Bar Section page E034—E038.

Memo

HOW TO READ THE STANDARD OF HSK-T TOOLS

●How this section page is organized

①Organized by application. (Refer to the index on the next page.)

PRODUCT TYPE
indicates the first four letters of the order number, as well as cutting applications.

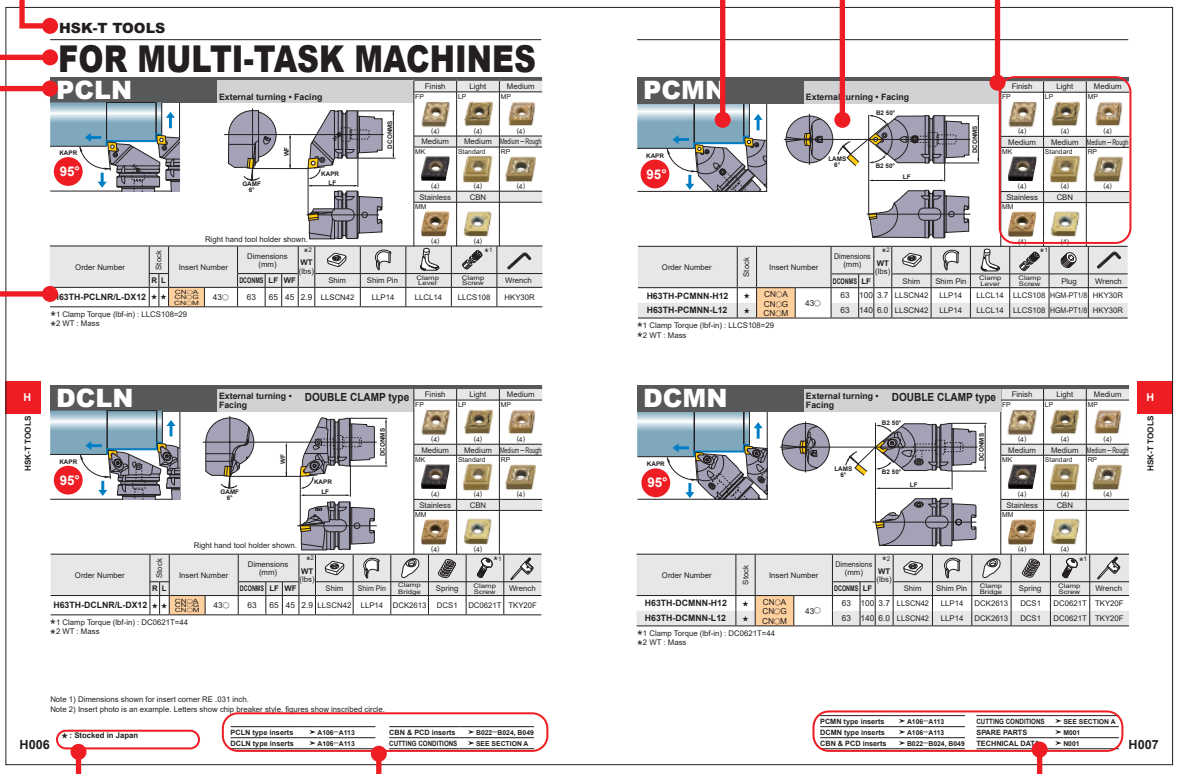
TITLE OF PRODUCT SERIES

PRODUCT SECTION

FIGURE SHOWING THE TOOLING APPLICATION
uses illustrations and arrows to depict available machining applications along with cutting edge lead angles.

GEOMETRY

CHIP BREAKER BY CUTTING APPLICATION



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

REFERENCE PAGE FOR APPLICABLE INSERTS
indicates reference pages for details of inserts that are applicable to the title product.

PAGE REFERENCE
·SPARE PARTS
·TECHNICAL DATA
indicates reference pages, including the above, on the right hand page of each double-page spread.

PRODUCT STANDARDS
Indicates order numbers, stock status (per right/left hand), applicable inserts, dimensions, and spare parts.

●To Order : Please specify order number and hand of tool (right/left).

HSK-T TOOLS

OVERVIEW OF HSK-T TOOLS ····· H002
CLASSIFICATION OF HSK-T TOOLS ····· H004
HSK-T TOOL STANDARDS

EXTERNAL TURNING • FACING
CN○○ INSERTS TOOL HOLDERS ····· H006
DN○○ INSERTS TOOL HOLDERS ····· H011

EXTERNAL TURNING • FACING • BORING
CN○○ INSERTS TOOL HOLDERS ····· H008

EXTERNAL TURNING • COPYING
DN○○ INSERTS TOOL HOLDERS ····· H009

EXTERNAL TURNING • FACING • COPYING
RC○○ INSERTS TOOL HOLDERS ····· H012

FACING • COPYING
VB○○ INSERTS TOOL HOLDERS ····· H013

GROOVING
MG INSERTS TOOL HOLDERS ····· H014

THREADING
MMT INSERTS TOOL HOLDERS ····· H016
MT INSERTS TOOL HOLDERS ····· H017

EXTERNAL TURNING TOOL HOLDERS ··· H019
BORING BAR HOLDERS ····· H021
BORING BAR SLEEVES ····· H022

*Arranged by Alphabetical order

H022 **H100TH-B○○-○○○**
H020 **H100TH-EN3232R/L-130**
H019 **H100TH-EV3232R/L-180**
H008 **H63TH-A○○○DCLNR/L12**
H021 **H63TH-B○○-○○**
H008 **H63TH-DCLNL-L12-3**
H006 **H63TH-DCLNR/L-DX12**
H007 **H63TH-DCMNN-H/L12**
H011 **H63TH-DDJNL-L15-3**
H009 **H63TH-DDJNR/L-DX15**
H010 **H63TH-DDNNN-H/L15**
H020 **H63TH-EN2525R/L-115**
H021 **H63TH-EV2020R/L-105-3**
H019 **H63TH-EV2525R/L-112**
H014 **H63TH-MGHR/L-DX43○○**
H016 **H63TH-MMTENR-H/L16**
H016 **H63TH-MMTER-DX16**
H017 **H63TH-MTHR/L-DX43**
H006 **H63TH-PCLNR/L-DX12**
H007 **H63TH-PCMNN-H/L12**
H009 **H63TH-PDJNR/L-DX15**
H010 **H63TH-PDNNN-H/L15**
H012 **H63TH-PRDCN-H/L12**
H012 **H63TH-PRGCR/L-DX12**
H013 **H63TH-SVPBR/L-DX16**
H013 **H63TH-SVVBN-H/L16**
H022 **SL32○○-90**

Tooling system
for turning on
multi-task machines

HSK-T TOOLS

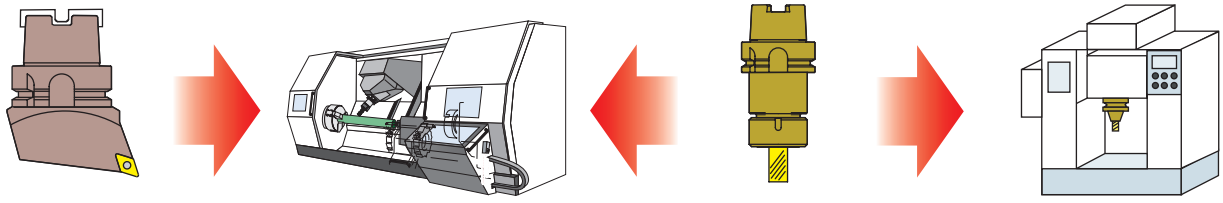
HSK-T System

HSK-T is a new HSK system designed for turning on multi-task machines that are compatible with HSK-A type (ISO standard: ISO12164-1:2001).
The HSK system was developed by a consortium of 17 Japanese manufacturers and registered in ISO standard (ISO12164-3:2008) under the name HSK-T type in 2008 and JIS standard (JIS B6064-3) in 2013.

High accuracy cutting edge positioning

The HSK-T type has a closer tolerance between the spindle key and tool holder keyway than the HSK-A type. This results in higher cutting edge positional accuracies. For milling, the conventional HSK-A type tools can be still used.

Compatible with both multi-task machines and machining centers



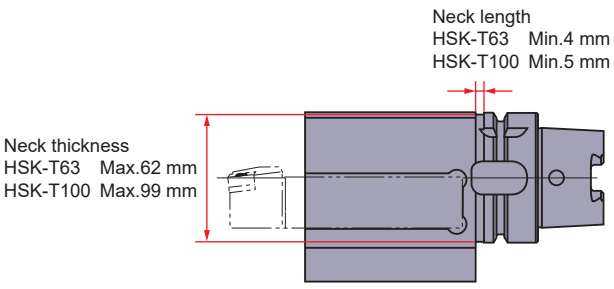
HSK-T
Turning tool holder

HSK-T spindle
Multi-task machines

HSK-A
Rotating tool holder

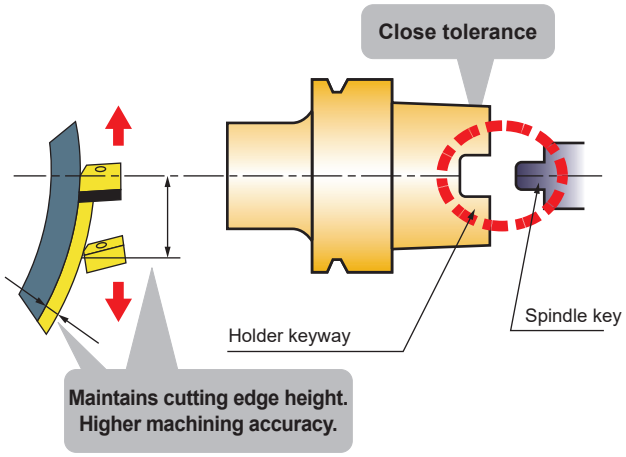
HSK-A spindle
Machining center

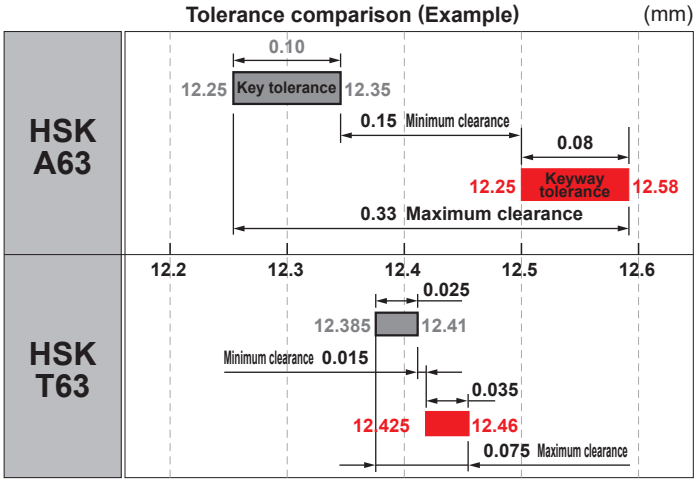
*Note
Short neck length from the flange with thick body of the HSK-T turning tool as shown in the figure at the left.
Because there are machines which cannot be mounted depending on the ATC specifications of the multi-task machine (HSK-A type), please check beforehand.
Also be careful of interference of the magazine with adjacent tools.



HSK-T turning tool standard (Example)

Improved keyway tolerance



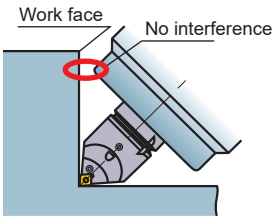


High accuracy and rigidity HSK-T type tooling system developed for use on multi-task machines.

Straight type tools suitable for use on multi-task machines

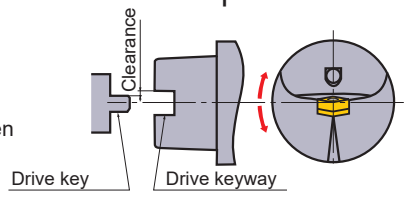
Avoid workpiece interference with improved tool accessibility.

By tilting the machines B spindle (main axis of the tool) at 45 degrees, interference between the spindle, holder, workpiece and chuck can be avoided.



Improve centering height by positioning the cutting edge at the center of the spindle.

Increased stability and accuracy can be achieved because the cutting edge centering height is not affected by the gap between the spindle and the key.



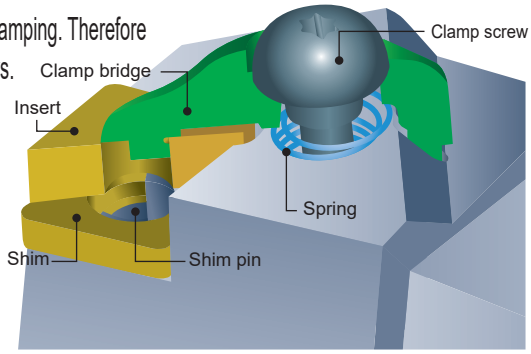
New single-action double clamp series

The double clamp mechanism offers high rigidity, accuracy and reliability that ensures secure insert clamping. Therefore making it suitable for turning of difficult to machine materials such as stainless and heat resistant alloys.

Handed type for turning and facing

Straight type for turning and facing

For turning, facing and boring



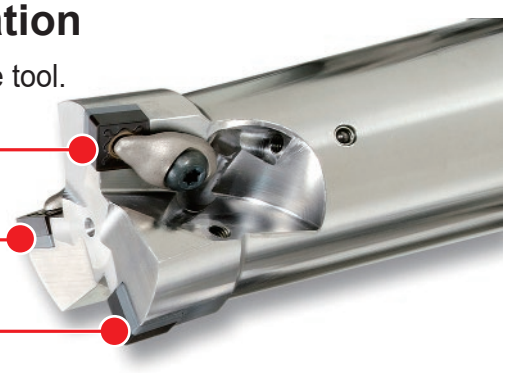
3 on 1 tool for process and tool consolidation

3 turning inserts of the same geometry can be installed on a single tool.

The same type of inserts can be installed for quick change with spare tools.

Different types of inserts can be installed for different applications (roughing, semi finishing and finishing)

Inserts in different grade types can be installed to cover various kinds of workpieces.



New HSK-T100 size for large workpieces

Larger tool holder sizes for high efficiency machining.

Square shank holder type

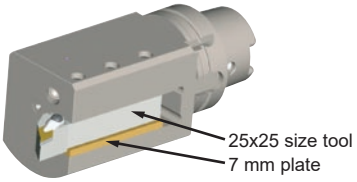
Boring bar / Drill type

Sleeve

A single tool can be used with different sized tool holders.

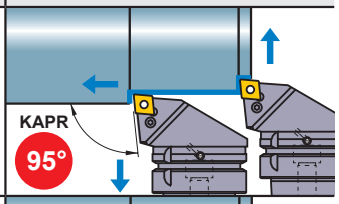
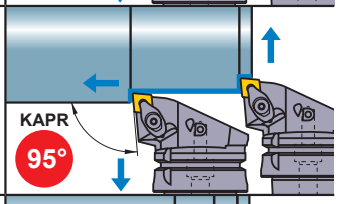
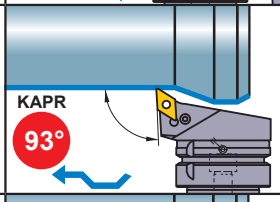
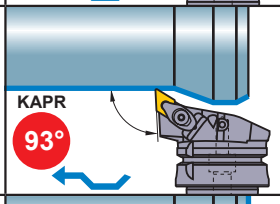
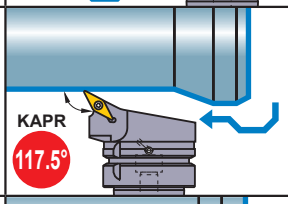
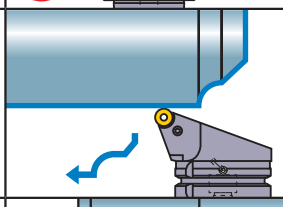
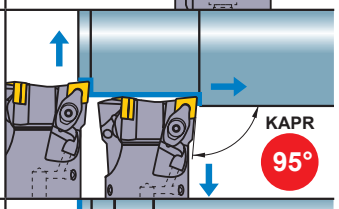
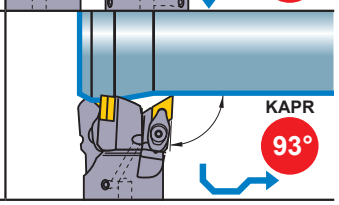
- Available for use with JIS B4126 (ISO 5610) 32x32 and 32x25 tools.
- Possible to fit a 25x25 tool by using a 7 mm plate.
  Possible to fit a 1"x1" tool by using a 6.6 mm plate.

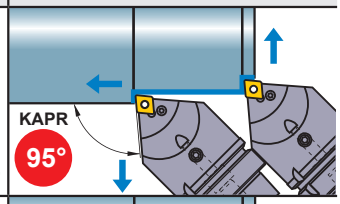
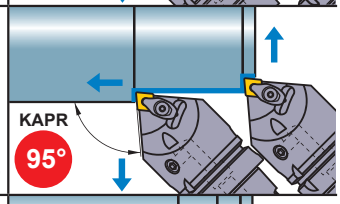
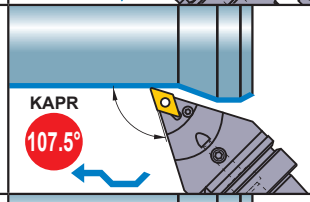
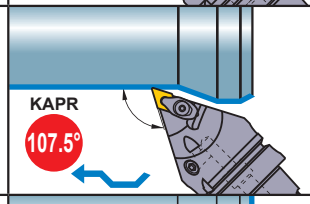
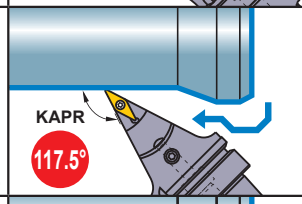
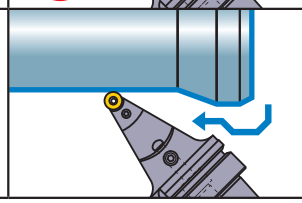
*Please prepare a plate on your own.



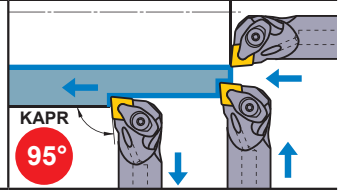
CLASSIFICATION OF HSK-T TOOLS

EXTERNAL TURNING • FACING • COPYING

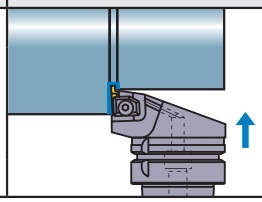
Order Number	Cutting Mode
H63TH-PCLNR/L-DX12 H006	
H63TH-DCLNR/L-DX12 H006	
H63TH-PDJNR/L-DX15 H009	
H63TH-DDJNR/L-DX15 H009	
H63TH-SVPBR/L-DX16 H013	
H63TH-PRGCR/L-DX12 H012	
H63TH-DCLNL-L12-3 H008	
H63TH-DDJNL-L15-3 H011	

Order Number	Cutting Mode
H63TH-PCMNN-H/L12 H007	
H63TH-DCMNN-H/L12 H007	
H63TH-PDNNN-H/L15 H010	
H63TH-DDNNN-H/L15 H010	
H63TH-SVVBN-H/L16 H013	
H63TH-PRDCN-H/L12 H012	

EXTERNAL TURNING • FACING • BORING

Order Number	Cutting Mode
H63TH-A25KDCLNR/L12 **H63TH-A32LDCLNR/L12** H008	

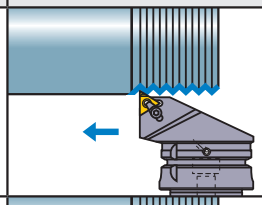
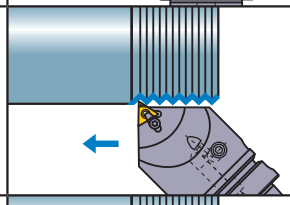
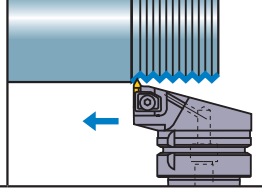
GROOVING

Order Number	Cutting Mode
H63TH-MGHR/L-DX43○○ ➲H014	

EXTERNAL TURNING TOOL HOLDERS

Order Number	Holder
H63TH-EV2525R/L-112 ➲H019	
H100TH-EV3232R/L-180 ➲H019	
H63TH-EN2525R/L-115 *1 ➲H020	
H100TH-EN3232R/L-130 *1 ➲H020	
H63TH-EV2020R/L-105-3 ➲H021	

THREADING

Order Number	Cutting Mode
H63TH-MMTER-DX16 ➲H016	
H63TH-MMTENR-H/L16 ➲H016	
H63TH-MTHR/L-DX43 ➲H017	

BORING BAR HOLDERS

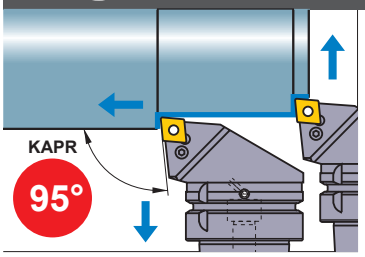
Order Number	Holder
H63TH-B○○-○○ ➲H021	
H100TH-B○○-○○○ ➲H022	
SL32○○-90 (Sleeve) *2 ➲H022	

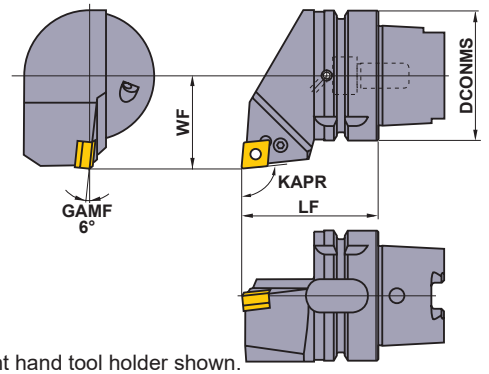
*1 Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI Co., LTD. under Japan Patent No.3720202.
*2 The SL32○○-90 sleeve is only for use with H100TH-B32-135.
Note 1) The HSK63A shank type has a built-in coolant thru pipe for installation.

FOR MULTI-TASK MACHINES

PCLN

External turning • Facing





Right hand tool holder shown.

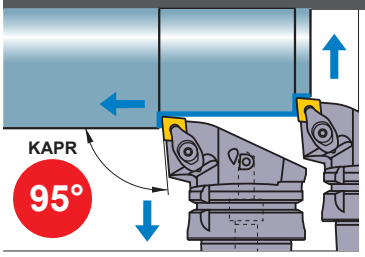
Finish	Light	Medium
FP (4)	LP (4)	MP (4)
Medium	**Medium**	**Medium – Rough**
MK (4)	Standard (4)	RP (4)
Stainless	**CBN**	
MM (4)	(4)	

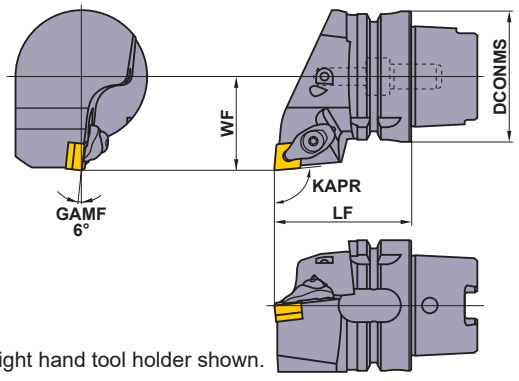
Order Number	Stock R	Stock L	Insert Number	Dimensions (mm) DCONMS	LF	WF	*2 WT (lbs)	Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Wrench
H63TH-PCLNR/L-DX12	★	★	CNMA CNMG CNMM 43○	63	65	45	2.9	LLSCN42	LLP14	LLCL14	LLCS108	HKY30R

*1 Clamp Torque (lbf-in) : LLCS108=29
*2 WT : Mass

DCLN

External turning • Facing **DOUBLE CLAMP type**





Right hand tool holder shown.

Finish	Light	Medium
FP (4)	LP (4)	MP (4)
Medium	**Medium**	**Medium – Rough**
MK (4)	Standard (4)	RP (4)
Stainless	**CBN**	
MM (4)	(4)	

Order Number	Stock R	Stock L	Insert Number	Dimensions (mm) DCONMS	LF	WF	*2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench
H63TH-DCLNR/L-DX12	★	★	CNMA CNMG CNMM 43○	63	65	45	2.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (lbf-in) : DC0621T=44
*2 WT : Mass

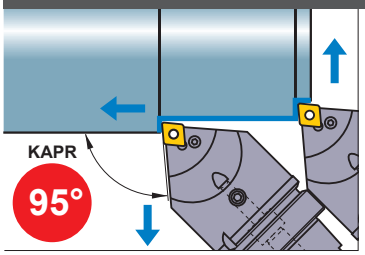
Note 1) Dimensions shown for insert corner RE .031 inch.
Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

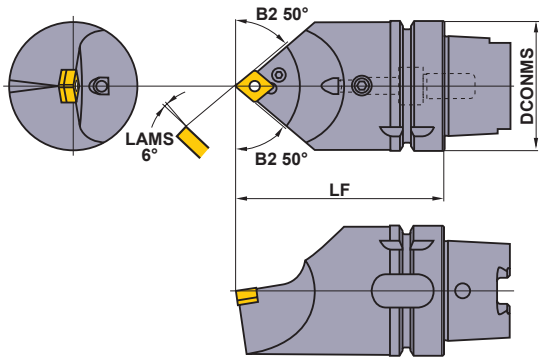
★ : Stocked in Japan

PCLN type inserts	➤ A106–A113	CBN & PCD inserts	➤ B022–B024, B049
DCLN type inserts	➤ A106–A113	CUTTING CONDITIONS	➤ SEE SECTION A

PCMN

External turning • Facing





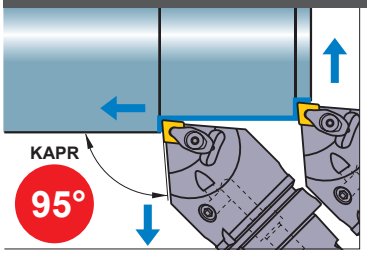
Finish	Light	Medium
FP	LP	MP
(4)	(4)	(4)
Medium	**Medium**	**Medium – Rough**
MK	Standard	RP
(4)	(4)	(4)
Stainless	**CBN**	
MM		
(4)	(4)	

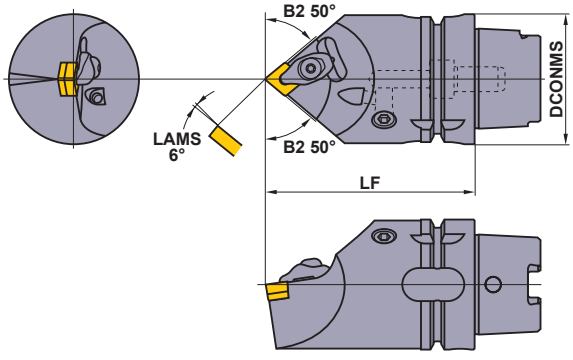
Order Number	Stock	Insert Number		Dimensions (mm)		*2 WT (lbs)	Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Plug	Wrench
				DCONMS	LF							
H63TH-PCMNN-H12	★	CN○A CN○G CN○M	43○	63	100	3.7	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R
H63TH-PCMNN-L12	★			63	140	6.0	LLSCN42	LLP14	LLCL14	LLCS108	HGM-PT1/8	HKY30R

*1 Clamp Torque (lbf-in) : LLCS108=29
*2 WT : Mass

DCMN

External turning • Facing DOUBLE CLAMP type





Finish	Light	Medium
FP	LP	MP
(4)	(4)	(4)
Medium	**Medium**	**Medium – Rough**
MK	Standard	RP
(4)	(4)	(4)
Stainless	**CBN**	
MM		
(4)	(4)	

Order Number	Stock	Insert Number		Dimensions (mm)		*2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench
				DCONMS	LF							
H63TH-DCMNN-H12	★	CN○A CN○G CN○M	43○	63	100	3.7	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DCMNN-L12	★			63	140	6.0	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

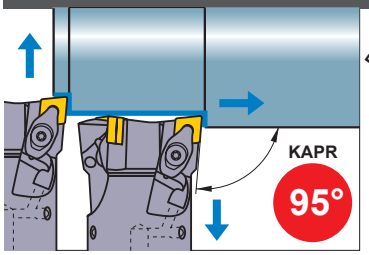
*1 Clamp Torque (lbf-in) : DC0621T=44
*2 WT : Mass

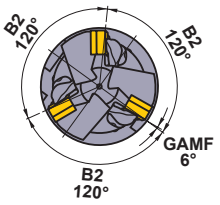
PCMN type inserts	➤ A106–A113	CUTTING CONDITIONS	➤ SEE SECTION A
DCMN type inserts	➤ A106–A113	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B022–B024, B049	TECHNICAL DATA	➤ N001

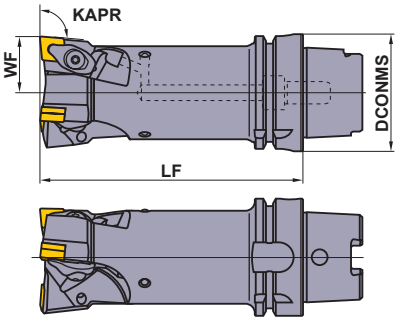
FOR MULTI-TASK MACHINES

DCLN

External turning • Facing **DOUBLE CLAMP type**







Left hand tool holder only.

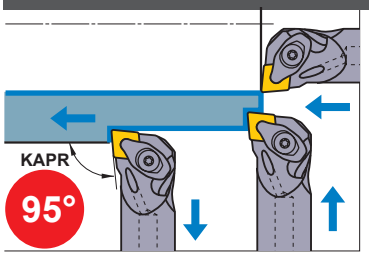
Finish	Light	Medium
FP (4)	LP (4)	MP (4)
Medium	**Medium**	**Medium – Rough**
MK (4)	Standard (4)	RP (4)
Stainless	**CBN**	
MM (4)	(4)	

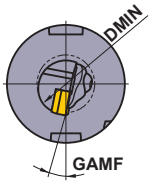
Order Number	Stock	Insert Number		Dimensions (mm)			*2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench
	L			DCONMS	LF	WF							
H63TH-DCLNL-L12-3	★	CN○A CN○G CN○M	43○	63	140	30	4.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

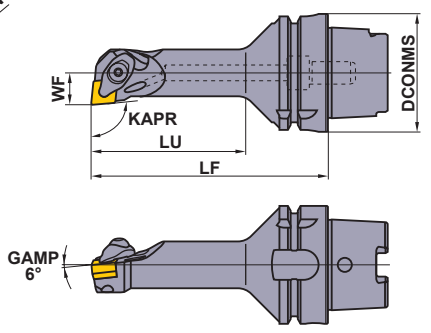
*1 Clamp Torque (lbf-in) : DC0621T=44
*2 WT : Mass

DCLN

External turning • Facing • Boring **DOUBLE CLAMP type**







Right hand tool holder shown.

Finish	Light	Medium
FP (4)	LP (4)	MP (4)
Medium	**Medium**	**Medium – Rough**
MK (4)	Standard (4)	RP (4)
Stainless	**CBN**	
MM (4)	(4)	

Order Number	Stock		Insert Number		Dimensions (mm)					DMIN (mm)	*2 WT (lbs)	Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench
	R	L			DCONMS	LF	LU	WF	GAMF								
H63TH-A25KDCLNR/L12	★	★	CN○A CN○G	43○	63	125	82	17	11°	32	2.4	LLSCP42	LLP14	DCK2613	DCS1	DC0621T	TKY20F
H63TH-A32LDCLNR/L12	★	★	CN○M		63	140	100	22	13°	40	3.9	LLSCN42	LLP14	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (lbf-in) : DC0621T=44
*2 WT : Mass

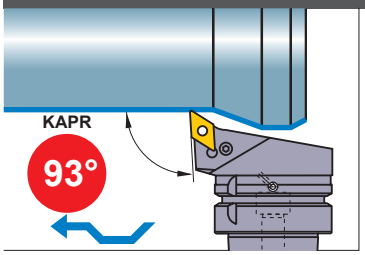
Note 1) Dimensions shown for insert corner RE .031 inch.
Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

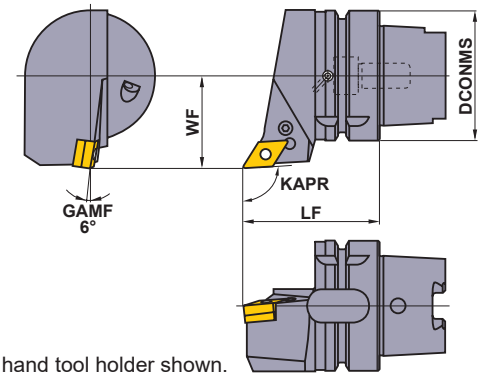
★ : Stocked in Japan

DCLN type inserts	➤ A106–A113
CBN & PCD inserts	➤ B022–B024, B049
CUTTING CONDITIONS	➤ SEE SECTION A

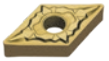
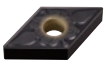
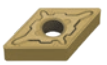
PDJN

External turning • Copying





Right hand tool holder shown.

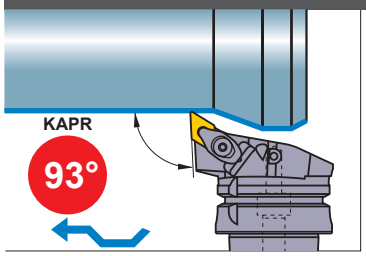
Finish	Light	Medium
FP	LP	MP
		
(4)	(4)	(4)
Medium	**Medium – Rough**	**Stainless**
MK	RP	MM
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
(4)	(4)	

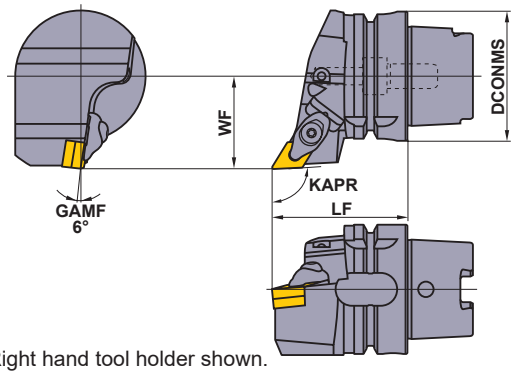
Order Number	Stock		Insert Number		Dimensions (mm)			*3 WT (lbs)	*2			*1	
	R	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
H63TH-PDJNR/L-DX15	★	★	DN○A DN○G DN○M DNMX	43○	63	65	45	2.6	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HKY30R

*1 Clamp Torque (lbf-in) : LLCS108=29
*2 Please use shim no. LLSDN42 with .25 inch thick inserts. When using .25 inch thick inserts, the shim should be ordered separately.
*3 WT : Mass

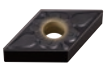
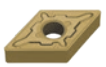
DDJN

External turning • Copying DOUBLE CLAMP type





Right hand tool holder shown.

Finish	Light	Medium
FP	LP	MP
(4)	(4)	(4)
Medium	**Medium – Rough**	**Stainless**
MK	RP	MM
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
(4)	(4)	

Order Number	Stock		Insert Number		Dimensions (mm)			*3 WT (lbs)	*2				*1	
	R	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNR/L-DX15	★	★	DN○A DN○G DN○M DNMX	43○	63	65	45	2.6	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

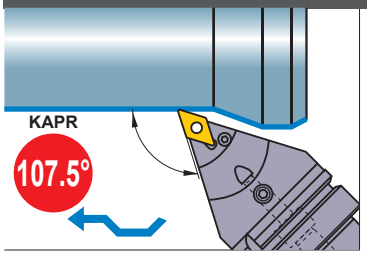
*1 Clamp Torque (lbf-in) : DC0621T=44
*2 Please use shim no. LLSDN42 with .25 inch thick inserts. When using .25 inch thick inserts, the shim should be ordered separately.
*3 WT : Mass

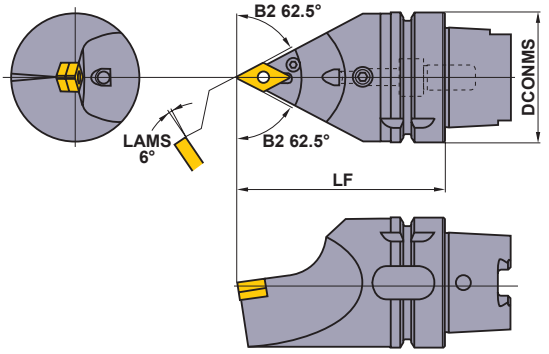
PDJN type inserts	➤ A114–A121	CUTTING CONDITIONS	➤ SEE SECTION A
DDJN type inserts	➤ A114–A121	SPARE PARTS	➤ M001
CBN & PCD inserts	➤ B025–B028, B049	TECHNICAL DATA	➤ N001

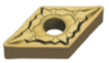
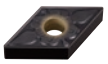
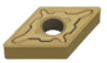
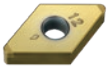
FOR MULTI-TASK MACHINES

PDNN

External turning • Copying





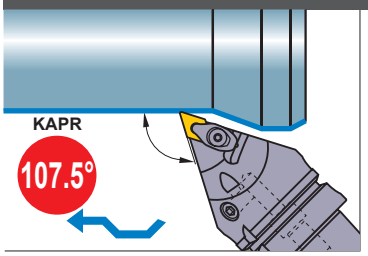
Finish	Light	Medium
FP	LP	MP
		
(4)	(4)	(4)
Medium	**Medium – Rough**	**Stainless**
MK	RP	MM
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

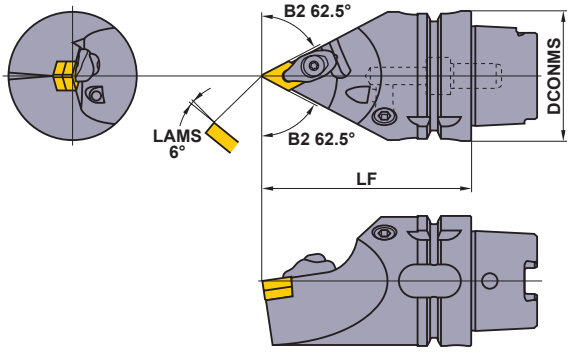
Order Number	Stock	Insert Number		Dimensions (mm) DCONMS	LF	*3 WT (lbs)	*2 Shim	Shim Pin	Clamp Lever	*1 Clamp Screw	Plug	Wrench
H63TH-PDNNN-H15	★	DN○A DN○G DN○M	43○	63	100	3.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R
H63TH-PDNNN-L15	★			63	140	5.5	LLSDN43 (LLSDN42)	LLP14	LLCL24	LLCS108	HGM-PT1/8	HKY30R

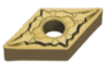
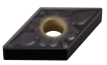
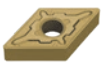
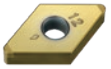
*1 Clamp Torque (lbf-in) : LLCS108=29
*2 Please use shim no. LLSDN42 with .25 inch thick inserts. When using .25 inch thick inserts, the shim should be ordered separately.
*3 WT : Mass

DDNN

External turning • Copying **DOUBLE CLAMP type**





Finish	Light	Medium
FP	LP	MP
		
(4)	(4)	(4)
Medium	**Medium – Rough**	**Stainless**
MK	RP	MM
		
(4)	(4)	(4)
G Class	**CBN**	
R/L		
		
(4)	(4)	

Order Number	Stock	Insert Number		Dimensions (mm) DCONMS	LF	*3 WT (lbs)	*2 Shim	Shim Pin	Clamp Bridge	Spring	*1 Clamp Screw	Wrench
H63TH-DDNNN-H15	★	DN○A DN○G DN○M	43○	63	100	3.5	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F
H63TH-DDNNN-L15	★			63	140	5.5	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (lbf-in) : DC0621T=44
*2 Please use shim no. LLSDN42 with .25 inch thick inserts. When using .25 inch thick inserts, the shim should be ordered separately.
*3 WT : Mass

Note 1) Dimensions shown for insert corner RE .031 inch.
Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

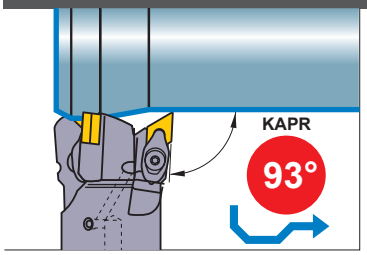
★ : Stocked in Japan

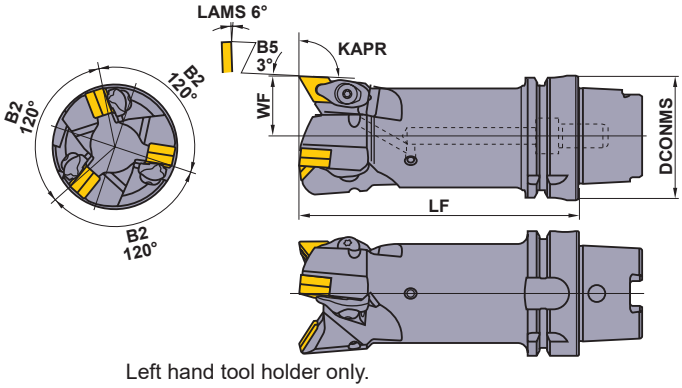
PDNN type inserts	➤ A114–A121
DDNN type inserts	➤ A114–A121
CBN & PCD inserts	➤ B025–B028, B049
CUTTING CONDITIONS	➤ SEE SECTION A

DDJN

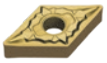
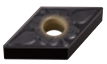
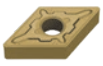
External turning • Facing

DOUBLE CLAMP type





Left hand tool holder only.

Finish	Light
FP	LP
	
(4)	(4)
Medium	**Medium**
MP	MK
	
(4)	(4)
Medium – Rough	**Stainless**
RP	MM
	
(4)	(4)

Order Number	Stock	Insert Number		Dimensions (mm)			*3 WT (lbs)	*2				*1	
	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Bridge	Spring	Clamp Screw	Wrench
H63TH-DDJNL-L15-3	★	DN○A DN○G DN○M DNMX	43○	63	140	30	4.9	LLSDN43 (LLSDN42)	LLP24	DCK2613	DCS1	DC0621T	TKY20F

*1 Clamp Torque (lbf-in) : DC0621T=44
*2 Please use shim no. LLSDN42 with .25 inch thick inserts. When using .25 inch thick inserts, the shim should be ordered separately.
*3 WT : Mass
Note 1) Dimensions shown for insert corner RE .031 inch.

DDJN type inserts	➢ A114–A121
CBN & PCD inserts	➢ B025–B028, B049

CUTTING CONDITIONS	➢ SEE SECTION A
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

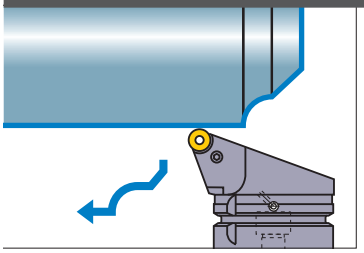
FOR MULTI-TASK MACHINES

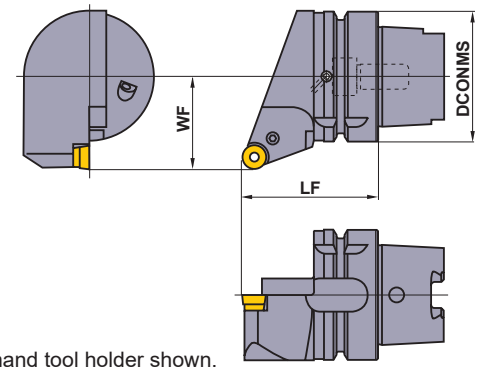
PRGC

External turning • Facing • Copying

Medium

(12)





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)			*2 WT (lbs)				*1	
	R	L			DCONMS	LF	WF		Shim	Shim Pin	Clamp Lever	Clamp Screw	Wrench
H63TH-PRGCR/L-DX12	★	★	RCMX	1204M0	63	65	45	2.6	LLSRN123	LLP13	LLCL112	LLCS106	HKY25R

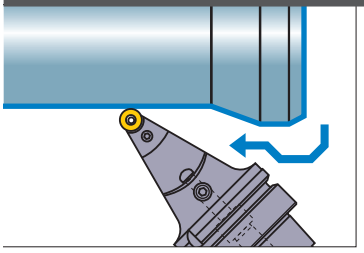
*1 Clamp Torque (lbf-in) : LLCS106=19
*2 WT : Mass

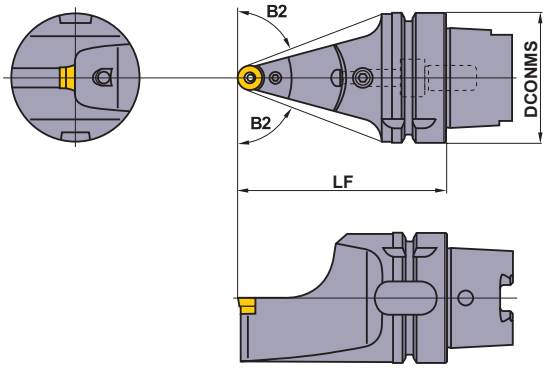
PRDC

External turning • Facing • Copying

Medium

(12)





Order Number	Stock	Insert Number		Dimensions (mm)			*2 WT (lbs)				*1		
				DCONMS	LF	B2		Shim	Shim Pin	Clamp Lever	Clamp Screw	Plug	Wrench
H63TH-PRDCN-H12	★	RCMX	1204M0	63	100	69°	3.1	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R
H63TH-PRDCN-L12	★			63	140	75°	5.1	LLSRN123	LLP13	LLCL112	LLCS106	HGM-PT1/8	HKY25R

*1 Clamp Torque (lbf-in) : LLCS106=19
*2 WT : Mass

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Chip Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Medium Cutting	**Standard**	**MC6115**	805—1540
	Carbon Steel • Alloy Steel	180HB—350HB	Medium Cutting	**Standard**	**MC6115**	590—1150
M	Stainless Steel	≤200HB	Medium Cutting	**Standard**	**US735**	230—425

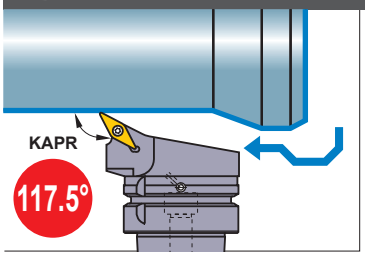
Note 1) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

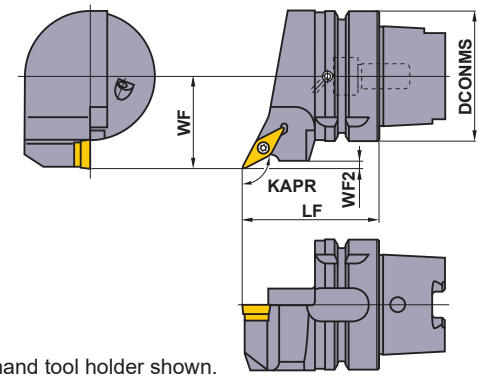
★ : **Stocked in Japan**

PRGC type inserts ➤ A173
PRDC type inserts ➤ A173

SVPB

Facing • Copying





Right hand tool holder shown.

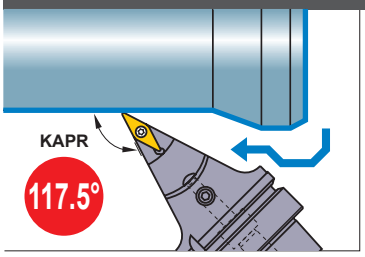
Finish	Light
R/L-F	SV
(3)	(3)
Medium	**Medium**
MV	MP
(3)	(3)
CBN	
(3)	

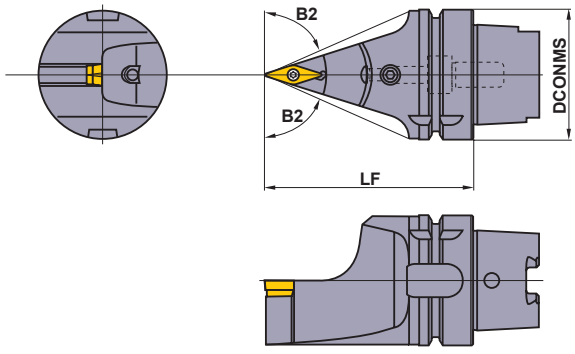
Order Number	Stock		Insert Number		Dimensions (mm)				*2 WT (lbs)			*1	
	R	L			DCONMS	LF	WF	WF2		Shim	Shim Pin	Clamp Screw	Wrench
H63TH-SVPBR/L-DX16	★	★	VB○T VB○W	33○	63	65	45	3.8	2.4	SPSVN32	BCP141	TS35D	TKY15F

*1 Clamp Torque (lbf-in) : TS35D=31
*2 WT : Mass

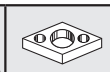
SVVB

Facing • Copying





Finish	Light
R/L-F	SV
(3)	(3)
Medium	**Medium**
MV	MP
(3)	(3)
CBN	
(3)	

Order Number	Stock	Insert Number		Dimensions (mm)			*2 WT (lbs)			*1		
				DCONMS	LF	B2		Shim	Shim Pin	Clamp Screw	Plug	Wrench
H63TH-SVVBN-H16	★	VB○T VB○W	33○	63	100	66.5°	2.9	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F
H63TH-SVVBN-L16	★			63	140	72.5°	4.9	SPSVN32	BCP141	TS35D	HGM-PT1/8	TKY15F

*1 Clamp Torque (lbf-in) : TS35D=31
*2 WT : Mass

RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Cutting Mode	Chip Breaker	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	Finish Cutting	**F**	**AP25N**	820 (490—985)
			Medium Cutting	**MP**	**MC6125**	1050 (785—1310)
	Carbon Steel Alloy Steel	180HB—350HB	Finish Cutting	**F**	**AP25N**	690 (490—850)
			Medium Cutting	**MP**	**MC6125**	820 (655—985)
M	Stainless Steel	≤200HB	Medium Cutting	**MM**	**MP7035**	330 (230—395)
K	Gray Cast Iron	Tensile Strength ≤350MPa	Medium Cutting	**MK**	**MC5015**	670 (510—840)

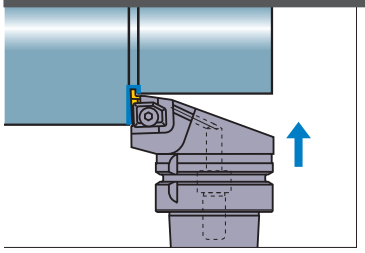
Note 1) Dimensions shown for insert corner RE .031 inch.
Note 2) Insert photo is an example. Letters show chip breaker style, figures show inscribed circle.

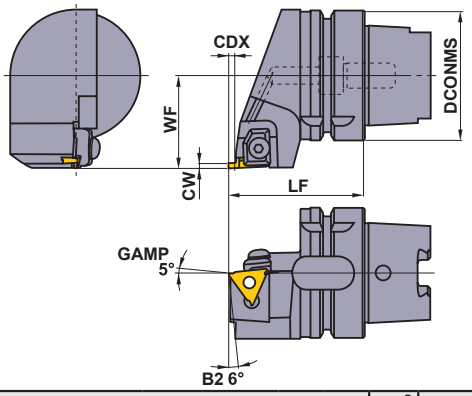
SVPB type inserts ➤ A186—A189
SVVB type inserts ➤ A186—A189
CBN & PCD inserts ➤ B045, B058
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR MULTI-TASK MACHINES

MG

Grooving





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)					*2 WT (lbs)	Clamp Bridge	*1 Clamp Screw	Spring	Wrench
	R	L			CW	CDX	DCONMS	LF	WF					
H63TH-MGHR/L-DX4315	★	★	MGTR/L	43125 I 43470	1.25	1.2	63	65	45	2.6	MTK1R/L	HBH06020	MES3	HKY40R
					1.45	1.5								
					1.5≤CW≤2.3	3								
H63TH-MGHR/L-DX4323	★	★			2.3<CW≤3.3	4.5								
H63TH-MGHR/L-DX4333	★	★			3.3<CW≤4.7	4.5								

*1 Clamp Torque (lbf-in) : HBH06020=62
*2 WT : Mass

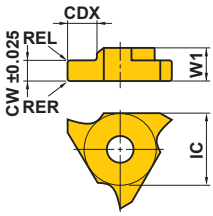
RECOMMENDED CUTTING CONDITIONS

	Work Material	Hardness	Grade	Cutting Speed (SFM)	Feed (IPR)
P	Carbon Steel Alloy Steel	180—350HB	**VP20MF**	390 (330—460)	.0039 (.0012—.0071)
			NX2525	425 (330—525)	.0047 (.0012—.0079)
M	Stainless Steel	≤200HB	**VP20MF**	390 (330—460)	.0039 (.0012—.0071)
K	Gray Cast Iron	Tensile Strength≤350MPa	**VP20MF**	390 (330—460)	.0039 (.0012—.0071)

★ : Stocked in Japan
<10 inserts in one case>

INSERTS FOR MG TYPE

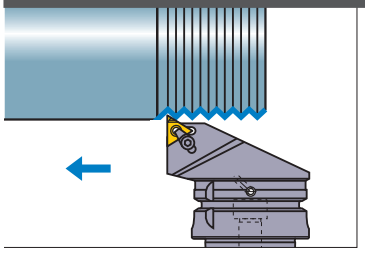
Order Number	Stock						Dimensions (mm)						Geometry
	Coated		Cermet		Carbide								
	VP20MF		NX2525		UTi20T		CW	CDX	IC	W1	RER/L	LE	
	R	L	R	L	R	L							
MGTR/L43125	★	★	★	★	★	★	1.25	1.2	12.7	4.76	0.2	2.7	**MGTR/L...**
MGTR/L43145	★	★		★	★	★	1.45	1.5	12.7	4.76	0.2	–	
MGTR/L43150	★	★	★	★	★	★	1.5	3	12.7	4.76	0.2	2.7	
MGTR/L43175	★	★	★	★	★	★	1.75	3	12.7	4.76	0.2	–	
MGTR/L43200	★	★	★	★	★	★	2	3	12.7	4.76	0.2	2.7	
MGTR/L43230	★	★	★	★	★	★	2.3	3	12.7	4.76	0.2	–	
MGTR/L43250	★	★	★	★	★	★	2.5	4.5	12.7	4.76	0.3	2.7	
MGTR/L43260	★	★	★		★	★	2.6	4.5	12.7	4.76	0.3	–	
MGTR/L43270	★	★			★	★	2.7	4.5	12.7	4.76	0.3	–	
MGTR/L43280		★		★	★	★	2.8	4.5	12.7	4.76	0.3	–	
MGTR/L43300	★	★	★	★	★	★	3	4.5	12.7	4.76	0.3	2.7	
MGTR/L43320	★				★	★	3.2	4.5	12.7	4.76	0.3	–	
MGTR/L43330		★		★	★	★	3.3	4.5	12.7	4.76	0.3	–	
MGTR/L43350	★	★	★	★	★	★	3.5	4.5	12.7	4.76	0.3	2.7	
MGTR/L43400	★	★	★		★	★	4	4.5	12.7	4.76	0.3	2.7	
MGTR/L43420	★	★	★		★	★	4.2	4.5	12.7	4.76	0.4	–	
MGTR/L43430	★	★	★		★	★	4.3	4.5	12.7	4.76	0.4	–	
MGTR/L43450	★	★	★	★	★	★	4.5	4.5	12.7	4.76	0.4	–	
MGTR/L43470	★	★	★	★	★	★	4.7	4.5	12.7	4.76	0.4	–	Right hand insert shown.

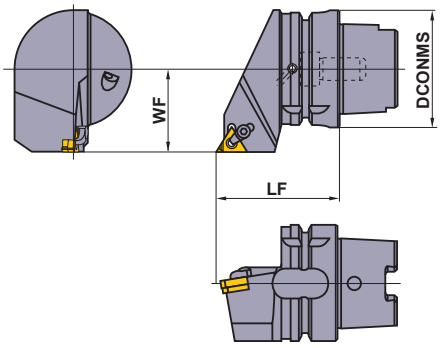


FOR MULTI-TASK MACHINES

MMTE

Threading





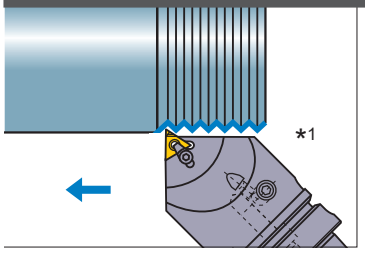
Right hand tool holder only.

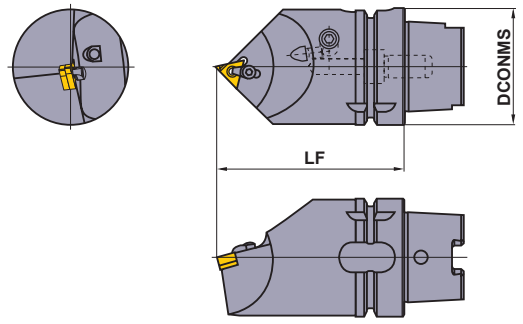
Order Number	Stock	Insert Number	Dimensions (mm)			*2 WT (lbs)	Clamp Bridge	Clamp Screw *1	Stop Ring	Shim	Shim Screw *1	F R Wrench
	R		DCONMS	LF	WF							
H63TH-MMTER-DX16	★	MMT16ER ○○○○○	63	65	45	2.6	SETK51	SETS51	CR4	CTE32TP15	HFC03008	TKY15F HKY20R

*1 Clamp Torque (lbf-in) : SETS51=31, HFC03008=13
*2 WT : Mass

MMTEN

Threading





Tool holder for right hand insert only.

Order Number	Stock	Insert Number	Dimensions (mm)		*3 WT (lbs)	Clamp Bridge	Clamp Screw *2	Stop Ring	Shim	Shim Screw *2	Plug	F R Wrench
			DCONMS	LF								
H63TH-MMTENR-H16	★	MMT16ER ○○○○○	63	100	3.7	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	TKY15F HKY20R
H63TH-MMTENR-L16	★		63	140	6.0	SETK51	SETS51	CR4	CTE32TP15	HFC03008	HGM-PT1/8	TKY15F HKY20R

*1 For use with B axis tilted at 45 degrees.
*2 Clamp Torque (lbf-in) : SETS51=31, HFC03008=13
*3 WT : Mass

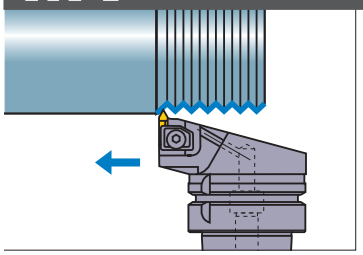
RECOMMENDED CUTTING CONDITIONS

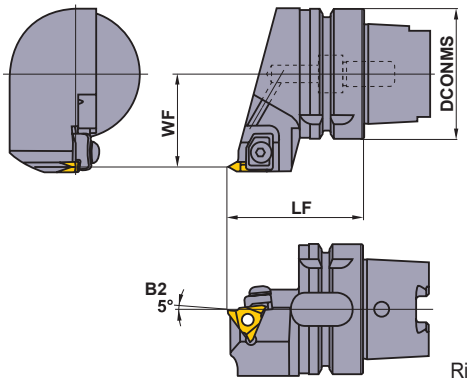
	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**VP10MF**	490 (230—755)
			VP15TF	330 (195—460)
	Carbon Steel Alloy Steel	180—350HB	**VP10MF**	460 (260—655)
			VP15TF	330 (195—460)
M	Stainless Steel	≤200HB	**VP10MF**	425 (260—590)
			VP15TF	260 (130—390)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP10MF**	460 (260—655)
			VP15TF	295 (195—390)

MMT type inserts ➤ G022—G025

MT

Threading





Right hand tool holder shown.

Order Number	Stock		Insert Number		Dimensions (mm)			*2 WT (lbs)	Clamp Bridge	*1 Clamp Screw	Spring	Wrench
	R	L			DCONMS	LF	WF					
H63TH-MTHR/L-DX43	★	★	MTTR/L	43○○○○	63	65	45	2.6	MTK1R/L	HBH06020	MES3	HKY40R

*1 Clamp Torque (lbf-in) : HBH06020=62
*2 WT : Mass

H

HSK-T TOOLS

RECOMMENDED CUTTING CONDITIONS

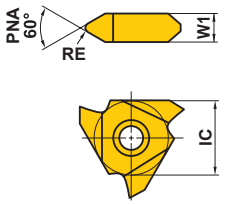
	Work Material	Hardness	Grade	Cutting Speed (SFM)
P	Mild Steel	≤180HB	**UP20M**	460 (330−590)
			NX2525	655 (490−820)
			UTi20T	390 (330−490)
	Carbon Steel Alloy Steel	180HB−350HB	**UP20M**	390 (330−490)
			NX2525	555 (490−655)
			UTi20T	330 (230−390)
M	Stainless Steel	≤200HB	**UP20M**	390 (260−490)
			UTi20T	330 (230−425)
K	Gray Cast Iron	Tensile Strength ≤350MPa	**UP20M**	260 (195−330)
			UTi20T	260 (195−330)
			HTi10	330 (230−425)

MT type inserts ➤ **H018**
SPARE PARTS ➤ **M001**
TECHNICAL DATA ➤ **N001**

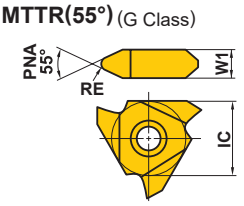
FOR MULTI-TASK MACHINES

INSERTS FOR MT TYPE

Type	Order Number	Class	Coated	Cermet		Carbide		ISO Pitch mm (thread / inch)	Dimensions (mm)			Geometry
			UP20M	NX2525		UTi20T	HTi10		IC	W1	RE	
General 60°	**MTTR436000**	G		★		★		−0.8	12.7	4.76	0	**MTTR/L(60°)** (G Class)
	MTTR436001	G	★	★		★	★	1.0−1.75	12.7	4.76	0.1	
	MTTL436001	G	★			★	★	1.0−1.75	12.7	4.76	0.1	
	MTTR436002	G	★	★		★	★	2.0−2.5	12.7	4.76	0.2	
	MTTL436002	G		★		★		2.0−2.5	12.7	4.76	0.2	
	MTTR436003	G	★	★		★	★	3.0−3.5	12.7	4.76	0.3	
	MTTL436003	G		★		★		3.0−3.5	12.7	4.76	0.3	
	MTTR436004	G		★		★		4.0−4.5	12.7	4.76	0.4	
General 55°	**MTTR435501**	G		★		★		(28−10)	12.7	4.76	0.1	**MTTR(55°)** (G Class)
	MTTR435502	G		★		★		(16−8)	12.7	4.76	0.2	
	MTTR435503	G		★		★		(11−8)	12.7	4.76	0.3	



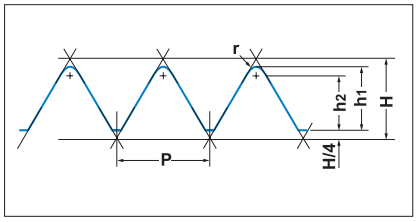
Right hand insert shown.



Right hand insert shown.

■ STANDARD OF DEPTH OF CUT

- The chart on the right shows the cutting depths when machining external ISO metric screw threads.
- When using cermet grades or cutting stainless steel, please increase the number of passes by 2 or 3 extra passes.



●Metric Screw Thread

Unit : mm

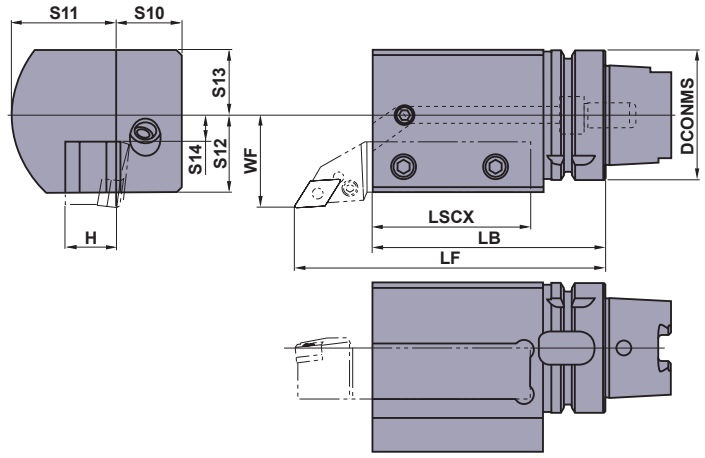
P (Pitch)		0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00	3.50	4.00	4.50
h_1		0.46	0.61	0.77	0.92	1.07	1.23	1.53	1.84	2.15	2.45	2.76
h_2		0.35	0.47	0.59	0.70	0.82	0.94	1.17	1.41	1.65	1.87	2.11
r (Corner Radius)		0.11	0.14	0.18	0.22	0.25	0.29	0.36	0.43	0.50	0.58	0.65
Number of Passes	1	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35	0.35	0.40
	2	0.13	0.15	0.18	0.20	0.20	0.25	0.25	0.25	0.30	0.30	0.35
	3	0.10	0.10	0.12	0.15	0.20	0.20	0.20	0.25	0.25	0.25	0.30
	4	0.05	0.10	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.25	0.25
	5		0.06	0.10	0.10	0.12	0.15	0.15	0.20	0.20	0.25	0.25
	6			0.05	0.07	0.10	0.10	0.10	0.15	0.20	0.20	0.20
	7					0.05	0.08	0.10	0.15	0.15	0.20	0.20
	8						0.05	0.10	0.10	0.15	0.15	0.15
	9							0.08	0.10	0.10	0.15	0.15
	10							0.05	0.09	0.10	0.10	0.15
	11								0.05	0.10	0.10	0.10
	12									0.05	0.10	0.10
	13										0.05	0.10
	14											0.06

Note 1) The first pass causes a high load on the cutting edge.
In order to avoid damage, keep the depth of cut to 0.4−0.5 mm maximum.

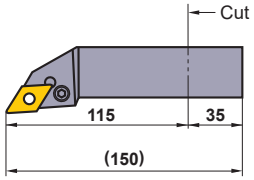
★ : Stocked in Japan
<10 inserts in one case>

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.



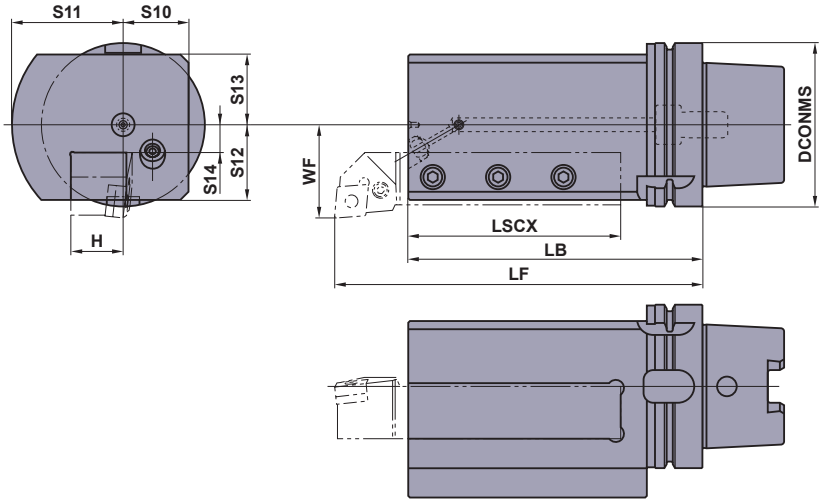
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)											WT* (lbs)
	R	L	DCONMS	LF	LB	LSCX	H	S10	S11	WF	S14	S12	S13	
H63TH-EV2525R/L-112	★	★	63	150	112	77	25	32	53	45	13	38	32	8.6

* WT : Mass

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 32×32 and 32×25 size tools.

Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)											WT* (lbs)
	R	L	DCONMS	LF	LB	LSCX	H	S10	S11	WF	S14	S12	S13	
H100TH-EV3232R/L-180	★	★	100	220	180	130	32	40	68	57	17	46	43	25.8

* WT : Mass

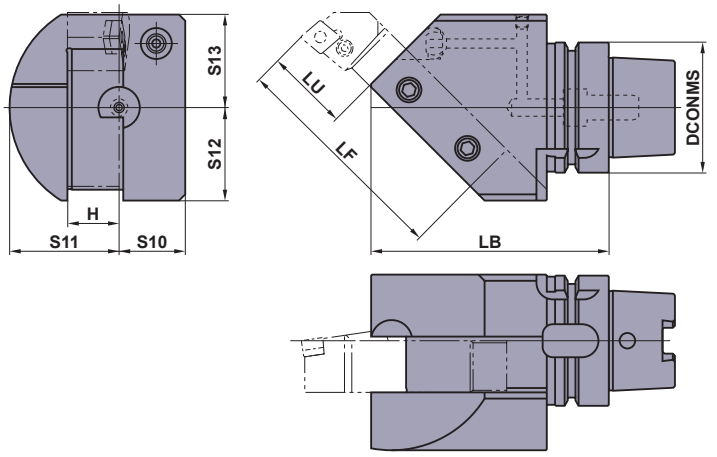
Note 1) Possible to fit a 25 x 25 tool by using a 7 mm plate.
Possible to fit a 1" x 1" tool by using a 6.6 mm plate.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

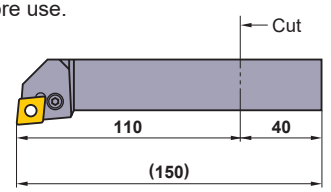
FOR MULTI-TASK MACHINES

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 25×25 size tools.
Please shorten the tool as shown below before use.



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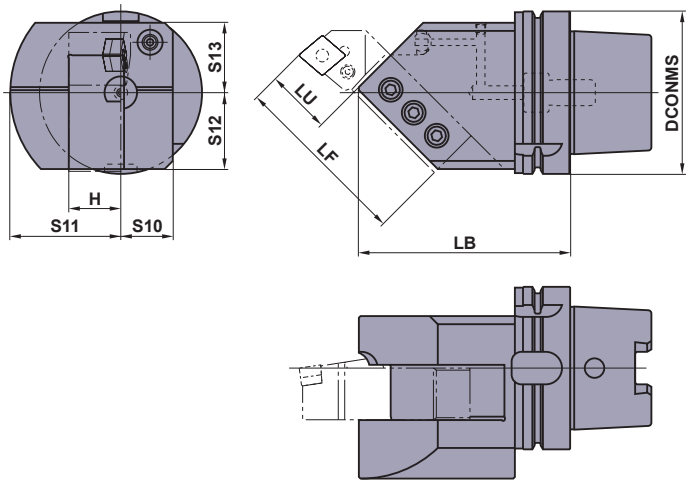
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									WT* (lbs)
	R	L	DCONMS	LB	LU	LF	H	S10	S11	S12	S13	
H63TH-EN2525R/L-115	★	★	63	115	40	110	25	32	53	45	45	8.2

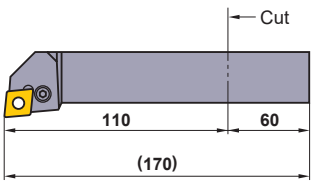
* WT : Mass

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 32×32 and 32×25 size tools.
Please shorten the tool as shown below before use.



Mitsubishi Materials is licensed for production and distribution of these tools from MORI SEIKI CO., LTD under Patent No.3720202.

Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									WT* (lbs)
	R	L	DCONMS	LB	LU	LF	H	S10	S11	S12	S13	
H100TH-EN3232R/L-130	★	★	100	130	40	110	32	32	68	47	43	14.6

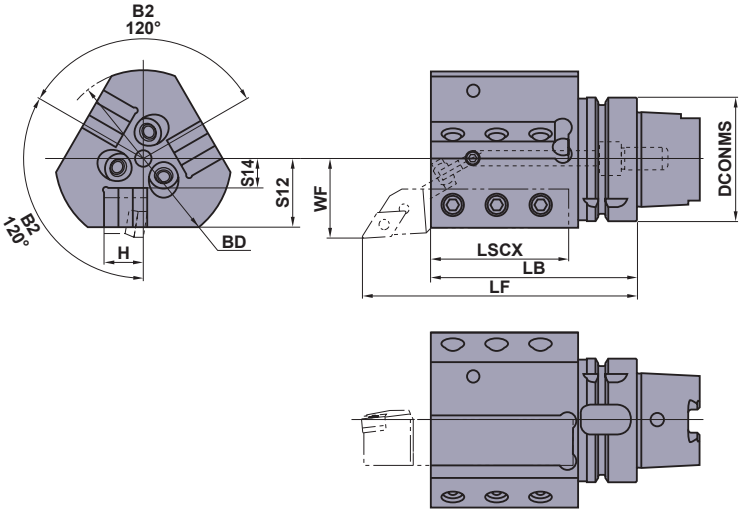
* WT : Mass

Note 1) Possible to fit a 25 x 25 tool by using a 7 mm plate.
Possible to fit a 1" x 1" tool by using a 6.6 mm plate.

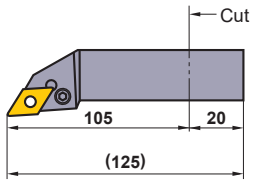
★ : Stocked in Japan

EXTERNAL TURNING TOOL HOLDERS

External turning • Facing



■This holder is for 20×20 size tools.
Please shorten the tool as shown below before use.



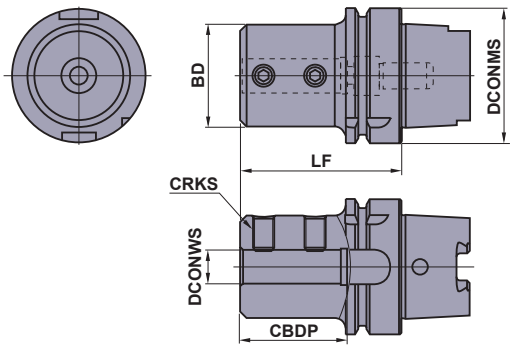
Right hand tool holder shown.

Order Number	Stock		Dimensions (mm)									WT* (lbs)
	R	L	DCONMS	LF	LB	LSCX	H	BD	WF	S14	S12	
H63TH-EV2020R/L-105-3	★	★	63	140	105	70	20	90	40	15	35	6.4

* WT : Mass

BORING BAR HOLDERS

Boring



Order Number	Stock	Dimensions (mm)						WT* (lbs)
		DCONMS	BD	DCONWS	LF	CBDP	CRKS	
H63TH-B08-65	★	63	28	8	65	40	M8	2.0
H63TH-B10-70	★	63	35	10	70	45	M8	2.2
H63TH-B12-70	★	63	42	12	70	45	M8	2.4
H63TH-B16-75	★	63	48	16	75	50	M10	2.9
H63TH-B20-75	★	63	52	20	75	50	M10	3.1
H63TH-B25-83	★	63	62	25	83	58	M12	3.7
H63TH-B32-87	★	63	62	32	87	62	M12	3.7
H63TH-B40-97	★	63	65	40	97	72	M16	4.0

* WT : Mass

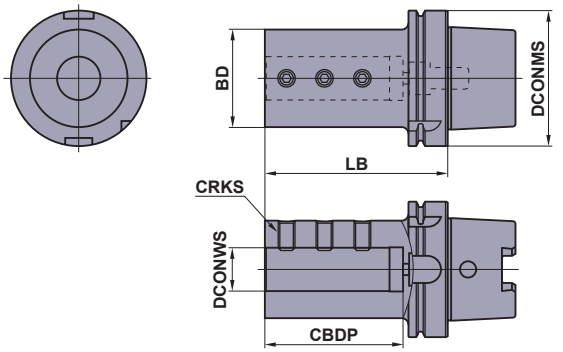
Note 1) Please shorten a boring bar to the required shank length. This holder is for boring bars and indexable type drills.

SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FOR MULTI-TASK MACHINES

BORING BAR HOLDERS

Boring

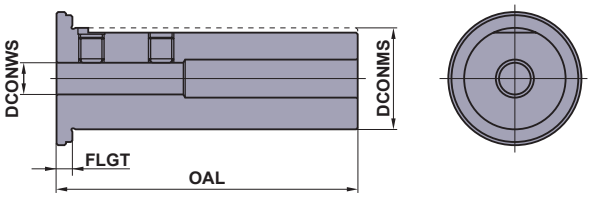


Order Number	Stock	Dimensions (mm)						WT* (lbs)
		DCONMS	BD	DCONWS	LB	CBDP	CRKS	
H100TH-B25-120	★	100	62	25	120	88	M12	8.6
H100TH-B32-135	★	100	72	32	135	102	M12	10.6
H100TH-B40-150	★	100	82	40	150	117	M16	13.0
H100TH-B50-180	★	100	92	50	180	147	M16	17.0

* WT : Mass

Note 1) Please shorten a boring bar to the required shank length. This holder is for boring bars and indexable type drills.

BORING BAR SLEEVES FOR H100TH-B32-135



Order Number	Stock	Dimensions (mm)				WT* (lbs)
		DCONWS	DCONMS	OAL	FLGT	
SL3208-90	★	8	32	95	5	1.3
SL3210-90	★	10	32	95	5	1.1
SL3212-90	★	12	32	95	5	1.1
SL3216-90	★	16	32	95	5	1.1
SL3220-90	★	20	32	95	5	0.9

* WT : Mass

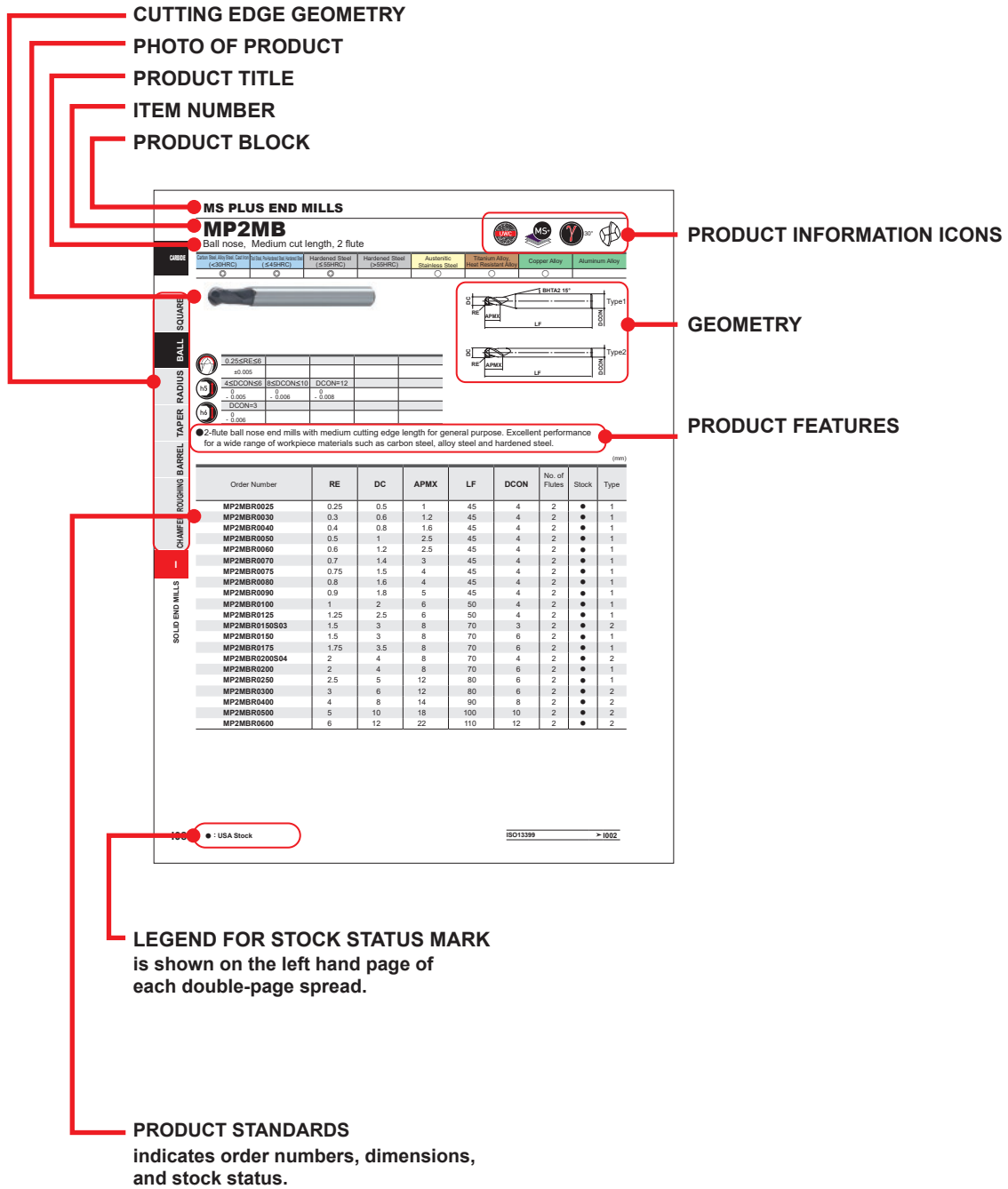
Note 1) These sleeves are only compatible with H100TH-B32-135 holder.

Memo

HOW TO READ THE STANDARD OF SOLID END MILLS

●How this section page is organized

①Organized according to cutting mode for milling. (Refer to END MILL LIST.)



●To Order: Please specify product title and order number.

MILLING

SOLID CARBIDE END MILLS

IDENTIFICATION I002
GUIDE FOR ISO13399 SYMBOLS I002
SYMBOL DESCRIPTIONS I003
COATING TECHNOLOGY I004
END MILLS SELECTION CHART I006

SOLID ENDMILL STANDARD
MSTAR END MILLS (MS Type) I014
MS PLUS END MILLS (MP Type) I068
MIRACLE END MILLS (VC Type) I106
SMART MIRACLE END MILLS (VQ Type) I112
IMPACT MIRACLE END MILLS (VF Type) I197
IMPACT MIRACLE REVOLUTION END MILLS (VFR Type) ... I260
ALIMASTER END MILLS I277
DIAMOND COATED END MILLS (DFC Type) I282
DIAMOND COATED END MILLS (DF Type) I284
DIAMOND COATED END MILLS (DC Type) I290
CERAMIC END MILLS (CE Type) I294
UNCOATED CARBIDE END MILLS I296
TAPER BALL NOSE END MILLS FOR MACHINING ALUMINUM ALLOY IMPELLERS I300

*Arranged by Alphabetical order

I277 **A3SA**
I278 **A3SARB**
I296 **C2MHA**
I298 **C4LATB**
I294 **CE4SRB**
I295 **CE6SRB**
I290 **DC2SB**
I292 **DC2XLB**
I284 **DF2XLB**
I286 **DF2XLBF**
I288 **DF4JC**
I282 **DFC4JC**
I283 **DFCJRT**
I279 **DLC3SA**
I280 **DLC3SARB**
I300 **DLC4LATB**
I097 **MP2ES**
I083 **MP2MB** (INCH)
I080 **MP2MB**
I079 **MP2SB**
I086 **MP2SDB**
I078 **MP2SSB**
I088 **MP2XLB**
I068 **MP3C**
I100 **MP3ES**
I070 **MP3MC**
I103 **MP4EC**
I074 **MP4JC**
I072 **MP4MC**
I076 **MP4MRB**
I054 **MS2ES**
I020 **MS2JS**
I022 **MS2LS**
I018 **MS2MD**
I062 **MS2MRB**
I015 **MS2MS**
I014 **MS2SS**
I032 **MS2XL** (INCH)
I024 **MS2XL**
I028 **MS2XL6**
I060 **MS2XLB**
I056 **MS3ES**
I058 **MS4EC**
I046 **MS4JC**
I044 **MS4MC**
I065 **MS4MRB**
I042 **MS4SC**
I052 **MS4XL** (INCH)
I048 **MS4XL**
I035 **MSMHD**
I040 **MSMHZD** (INCH)
I038 **MSMHZD**
I034 **MSSHD**
I110 **VC2C**
I108 **VC4JRB**
I106 **VCLD**
I199 **VF2MV**
I217 **VF2SB**
I216 **VF2WB**
I197 **VF2XL**
I226 **VF2XLB** (INCH)
I220 **VF2XLB**
I219 **VF2XLBS**
I228 **VF3XB**
I234 **VF4MB**
I201 **VF4MV**
I203 **VF6MHV**
I256 **VF6MHVRB**
I213 **VF6SVRCH**
I204 **VF8MHVCH**
I258 **VF8MHVRBCH**
I236 **VFFDRB**
I244 **VFHVRB** (INCH)
I238 **VFHVRB**
I246 **VFHVRB** (TAPER NECK)
I208 **VFMD** (INCH)
I206 **VFMD**
I252 **VFMDRB**
I214 **VFMFPR**
I254 **VFMHVRBCH**
I262 **VFR2SB**
I264 **VFR2SBF**
I260 **VFR2SSB**
I268 **VFR2XLB**
I266 **VFR4MB**
I272 **VFRPSRB**
I205 **VFSD**
I250 **VFSDRB**
I210 **VFSFPR**
I212 **VFSFPRCH**
I164 **VQ2XLB**
I166 **VQ4MRB-FB**
I170 **VQ4SVB** (INCH)
I168 **VQ4SVB**
I172 **VQ4WB**
I175 **VQ5MHV**
I176 **VQ5MHVRB**
I179 **VQ6MHVCH**
I180 **VQ6MHVRBCH**
I112 **VQFDRB**
I114 **VQHVRB**
I116 **VQJCS**
I146 **VQJHV** (INCH)
I144 **VQJHV**
I118 **VQLCS**
I141 **VQMHV** (INCH)
I137 **VQMHV**
I153 **VQMHVRB** (INCH)
I148 **VQMHVRB**
I158 **VQMHVRBF** (INCH)
I156 **VQMHVRBF**
I126 **VQMHZV** (INCH)
I120 **VQMHZV**
I134 **VQMHZVOH** (INCH)
I130 **VQMHZVOH**
I187 **VQN2MB**
I189 **VQN4MB**
I190 **VQN4MBF**
I192 **VQN4MVRB**
I192 **VQN6MVRB**
I161 **VQSVR**
I182 **VQT5MVRB**
I184 **VQT6UR**
I194 **VQXL**

IDENTIFICATION

ORDER NUMBER OF END MILLS

VQ 4 S VB R0100 *

End Mill Names

- **VQ** : SMART MIRACLE end mills
- **VQT** : SMART MIRACLE end mills focused on machining Ti-alloys
- **VQN** : SMART MIRACLE end mills focused on machining Ni-based alloys
- **VFR** : IMPACT MIRACLE REVOLUTION end mills
- **VF** : IMPACT MIRACLE end mills
- **MP** : MS plus end mills
- **MS** : Mstar end mills
- **VC** : Miracle end mills
- **DLC** : DLC coated end mills
- **A** : ALIMASTER end mills
- **DFC** : CVD diamond coated end mills
- **DF** : Diamond coated end mills
- **DC** : Diamond coated end mills
- **CE** : Ceramic end mills
- **C** : Carbide end mills

Number of Flutes

- **1** : 1flute
- **2** : 2flute
- **3** : 3flute
- **4** : 4flute
- **5** : 5flute
- **6** : 6flute
- **8** : 8flute
- • • •

Flute Length

- **ES** : Extra short
- **S** : Short
- **M** : Medium
- **J** : Semi long
- **L** : Long
- **XL** : Long neck
- **X** : Taper neck

Features

- **S** : General use
- **U** : For stainless steel
- **K** : For keyway
- **A** : For light alloy
- **C** : Center cut, chamfering
- **D** : For deep cut
- **V** : Irregular spiral helix angle
- **B** : Ball nose
- **VB** : Irregular spiral helix angle, Ball nose
- **R** : Roughing
- **FPR** : Fine roughing
- **H** : High helix
- **T** : Taper
- **TB** : Taper ball nose
- **WB** : Wide ball nose
- **RB** : Corner radius
- **FDRB** : Duplex corner radius
- **CH** : Coolant holes (side)
- **OH** : Coolant holes (end)
- **UR** : Multi step radius
- **Z** : Drilling

Dimensions

- **D✱✱✱✱** : Diameter

ex.

D0050 →ϕ0.5

D0500 →ϕ5

- **R✱✱✱✱** : Radius of ball nose

ex.

R0050 → R0.5

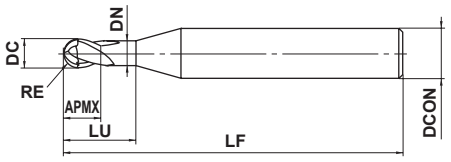
R0500 → R5

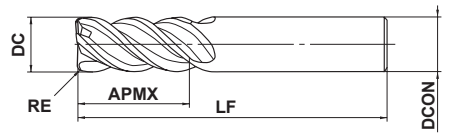
Others

- **S✱✱** : Shank diameter
- **N✱✱✱** : Neck length
- **T✱✱✱✱** : Taper angle one side
- **L✱✱** : Flute length
- **A✱✱✱** : Overall Length
- **C** : Coolant holes (center)

✱Other types are available by special order.

GUIDE FOR ISO13399 SYMBOLS





Symbol	Content
APMX	Depth of cut maximum
DC	Cutting diameter
DN	Neck diameter
LF	Functional length
LU	Usable length
RE	Corner radius

✱There are exceptions other than those listed above. For more details, please refer to the technical data (page N002).

SYMBOL DESCRIPTIONS

Tool Material

Ultra Micro Grain Carbide
Ultra micro grain carbide is used as the substrate material.

Cubic Boron Nitride
Mitsubishi's original CBN is used.

Ceramic
Ceramic is used as the substrate material.

Tolerances

Outside Diameter Tolerance
Indicates diameter tolerance of end mill.

R Tolerance
Indicates the radial tolerance of a ball nose end mill.

R Tolerance
Indicates the radial tolerance of an end mill with a corner radius.

Tolerance of Taper Angle
Indicates the tolerance of the taper angle.

Tolerance of Point Angle
Indicates the tolerance of the point angle.

Shank Diameter Tolerance
Indicates the shank diameter tolerance of end mill.

Angle, Coolant hole, Sharp corner edge and Gash land

Helix Angle
Indicates the helix angle of the end mill.

End Cutting Edge with Coolant Hole

Peripheral Cutting Edge with Coolant Hole

Sharp Corner Edge
Indicates the end mill has a sharp corner edge.

Gash Land
Indicates the end mill cutting edge has a gash land.

Series

SMART MIRACLE End Mills
(Al, Cr)N coaitng optimum for difficult-to-cut materials.

SMART MIRACLE End Mills
(Al, Cr)N coating optimum for Ti-alloys.

SMART MIRACLE End Mills
(Al, Ti, Si)N coating optimum for Ni-based alloys.

IMPACT MIRACLE REVOLUTION End Mills
A coating which adds the excellent high oxidation temperature of (AL, Cr, Si) N-based films to the nano crystal technology of VF.

IMPACT MIRACLE End Mills
Single phase nano crystal coating technology for higher film hardness and heat resistance.

MS PLUS End Mills
Offers higher versatility for carbon steel, alloy steel and hardened steel.

MS End Mills
PVD offers higher versatility.

MIRACLE End Mills
The original Miracle (Al, Ti)N coating also suitable for dry cutting of carbon steels and hardened steels.

DLC Coated End Mills
Hardness similar to that of CVD diamond coating achieved with high adhesion strength.
(Jointly developed with SHINMAYWA INDUSTRIES, LTD.)

CVD Diamond Coated End Mills
Suitable for CFRP

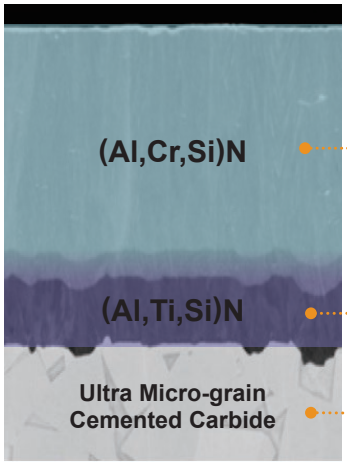
CVD Diamond Coated End Mills
High performance coating for hard brittle materials excelling in film adhesion to the substrate.

DF End Mills
Suitable for graphite machining.

COATING TECHNOLOGY

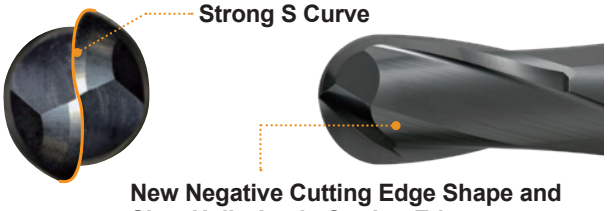
VFR

The combination of the (Al, Cr, Si) N coating (newly-developed), which has a high oxidation temperature and high lubricity, together with the (Al, Ti, Si) N coating, which has better wear resistance and high adhesion, allows hardened steel with even greater strength to be maintained.



★High Oxidation Temperature
★High Lubricity

★Better Wear Resistance
★High Adhesion



Strong S Curve

New Negative Cutting Edge Shape and Slow Helix Angle Cutting Edge

New ZERO-μ Surface
Newly-developed Surface Reforming Technology

New Ball Geometry for Mirror Finish Cutting

VF

For higher hardness, higher speed and longer tool life!

In comparison with the conventional coating single-phase nano crystal coating technology offers higher coating hardness and heat resistance. When machining hardened steels it can be seen that the IMPACT MIRACLE coating offers a lower friction of coefficient and as such prevents abnormal damage such as chipping.

Properties of IMPACT MIRACLE End Mills

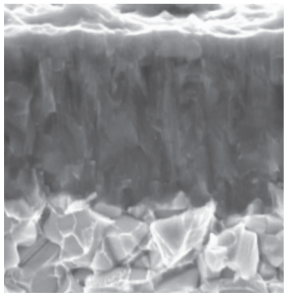
	ÍMPACT MIRACLE Single-phase nano coating (Al,Ti,Si)N	(Al,Ti,Si)N	(Al,Ti)N
Hardness (HV)	**3700**	3200	2800
Oxidation Temperature (°F)	**2370**	2010	1540
Adhesion (N)[1)]	**100**	80	80
Wear Coefficient[2)]	**0.48**	0.53	0.58

1) Adhesion : Measured by critical load scratch test.
2) Coefficient of friction : Measured by ball-on-disk method.
(Counter gear : AISI D2 60HRC)

MS+

Suitable coating for a broad range of workpiece materials such as carbon steel, alloy steel and hardened steel of approx. 50HRC.

Our original coating technology enables a multilayer of (Al,Ti)N and (Al,Cr)N. It allows machining of a wide range of workpiece materials.

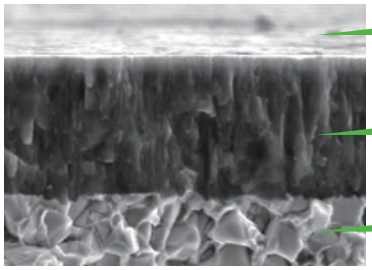


Properties of MS plus End Mills

	(Al,Ti,Cr)N multilayer	(Al,Ti)N	(Al,Cr)N
Hardness (HV)	**3200**	2800	3100
Oxidation Temperature (°F)	**2012**	1472	2012
Adhesion (N)	**100**	80	80

VQ VQT

Newly-developed (Al,Cr)N coating with improved wear resistance.
The smoothening treatment of the coating layer reduces the cutting resistance and improves chip discharge significantly. This next-generation coating offers longer tool life and higher efficiency in machining difficult-to-cut materials.



SMART MIRACLE Coating

ZERO- μ Surface

The original surface treatment technology offers smooth coating layer. A good balance of smooth surface and sharp edge allows smooth chip discharge and reduces the cutting resistance. Machining efficiency and tool life is improved.

VQN

The (Al, Ti, Si)N based coatings maintain their film hardness and heat resistant properties under the harshest of conditions, making it highly suitable for applying to end mills for machining heat resistant super alloys.

DLC

Newly developed DLC coating.
Hardness similar to that of CVD diamond coating achieved with high adhesion strength.

Mitsubishi Materials and SHINMAYWA INDUSTRIES, LTD. have jointly developed a unique DLC coating that has substantially increased "adhesion strength" compared to previous DLC coating.

DC

Proprietary CVD diamond coating produces excellent wear resistance and smooth surface finish.

The newly developed CVD diamond coated carbide material achieves outstanding abrasion resistance and smoothness due to a proprietary fine multilayer diamond crystal control technology.
Suitable for cutting hard brittle materials such as cemented carbide.

DF

Diamond coating for non-ferrous and new non-metal materials.

Owing to Mitsubishi's unique plasma chemical vapor deposition (CVD) coating technology, great combination of coating hardness similar to that of natural diamond has been combined with a good adhesion to carbide substrates.
DF end mill series suitable for graphite machining.

VC

MIRACLE coating for high speed milling.

Miracle coating is produced by adding Al to the existing TiN coating.
This coating layer consists of a compound solid solution of (Al,Ti)N.
This results in improving the heat resistance during cutting, and thus delivers high performance in high hardness material machining and high speed dry cutting. It also has the high adhesion strength for the cemented carbide substrate, and extends the tool life significantly compared to conventional products.

END MILLS SELECTION CHART

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-Hardened Steel, Hardened Steel	H – Hardened Steel(~55HRC)	H – Hardened Steel(55HRC~)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminum Alloy	Page
SQUARE															
	2	General Use	MS	MS2SS	End mill, Short cut length, 2 flute	METRIC DC 0.1–12	◎	◎	○		○	○	○		I014
			MS	MS2MS	End mill, Medium cut length, 2 flute	METRIC DC 0.2–20	◎	◎	○		○	○	○		I015
			MS	MS2MD	End mill, Medium cut length, 2 flute, Strong geometry type	METRIC DC 1–12	◎	◎	○		○	○			I018
			MS	MS2JS	End mill, Semi long cut length, 2 flute	METRIC DC 0.1–12	◎	◎	○		○	○	○		I020
			MS	MS2LS	End mill, Long cut length, 2 flute	METRIC DC 0.2–12	◎	◎	○		○	○	○		I022
		For Swiss-Type Lathes	MS+	NEW MP2ES	End mill, 2 flute, For Swiss-Type lathes	METRIC DC 3–10	◎	◎	○		○	○	○		I097
			MS	MS2ES	End mill, 2 flute, For Swiss-Type lathes	METRIC DC 3–12	◎	◎	○		○	○	○		I054
		For Hardened Steel	VF	VF2MV	End mill, Medium cut length, 2 flute, Irregular helix flutes	METRIC DC 0.5–6		○	◎	◎					I199
		For Aluminum Alloy	UWC	C2MHA	End mill, Medium cut length, 2 flute, For aluminum alloy	METRIC DC 3–25								◎	I296
	3	General Use	MS	MSMHZD	Slotting, Medium cut length, 3 flute	METRIC DC 1–20 INCH DC .0625–.7500	◎	◎	○		○	○	○		METRIC I038 INCH I040
			MS+	MP3MC	End Mill, Medium cut length, 3 flute	INCH DC .0312–.5000	◎	◎	○		○	○			I070
		For Swiss-Type Lathes	MS+	NEW MP3ES	End mill, 3 flute, For Swiss-Type lathes	METRIC DC 3–12	◎	◎	○		○	○	○		I100
			MS	MS3ES	End mill, 3 flute, For Swiss-Type lathes	METRIC DC 3–12	◎	◎	○		○	○	○		I056
		For Difficult-to-cut Materials	VQ	VQMHZV	End mill, Medium cut length, 3 flute for drilling and slotting	METRIC DC 1–20 INCH DC .0625–.5000	◎	◎			◎	◎	○		METRIC I120 INCH I126
			VQ	VQMHZVOH	End mill, Medium cut length, 3 flute for drilling and slotting with thru-coolant	METRIC DC 6–16 INCH DC .2500–.5000	◎	◎			◎	◎	○		METRIC I130 INCH I134

* DC : Cutting Diameter

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material									Page
							P		H		M	S	N			
							Carbon Steel, Alloy Steel, Cast Iron	Tool steel, Pre-Hardened Steel, Hardened Steel	Hardened Steel(-55HRC)	Hardened Steel(55HRC-)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy		
	3	For Aluminum Alloy	UWC	NEW A3SA	End mill, Short cut length, 3 flute, with multiple internal thru-coolant holes	METRIC DC 12–25								◎		I277
			DLC	NEW DLC3SA	End mill, Short cut length, 3 flute, with multiple internal thru-coolant holes	METRIC DC 12–25								◎		I279
	4	General Use	MS	MS4SC	End mill, Short cut length, 4 flute	METRIC DC 1–12	◎	◎	○		○	○	○			I042
			MS	MS4MC	End mill, Medium cut length, 4 flute	METRIC DC 1–20	◎	◎	○		○	○	○			I044
			MS	MS4JC	End mill, Semi long cut length, 4 flute	METRIC DC 1–12	◎	◎	○		○	○	○			I046
			MS+	MP4MC	End Mill, Medium cut length, 4 flute	INCH DC .0312–.5000	◎	◎	○		○	○				I072
			MS+	MP4JC	End Mill, Semi long cut length, 4 flute	INCH DC .0625–.5000	◎	◎	○		○	○				I074
			MS	MSSHD	High power, Short cut length, 4 flute	METRIC DC 3–20	◎	◎	○		○	○	○			I034
			MS	MSMHD	High power, Medium cut length, 4 flute	METRIC DC 2–25	◎	◎	○		○	○	○			I035
		For Swiss-Type Lathes	MS+	NEW MP4EC	End mill, 4 flute, For Swiss-Type lathes	METRIC DC 3–14	◎	◎	○		○	○	○			I103
			MS	MS4EC	End mill, 4 flute, For Swiss-Type lathes	METRIC DC 3–14	◎	◎	○		○	○	○			I058
		For Hardened Steel	VF	VF4MV	End mill, Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 6–20		○	◎	◎						I201
		For Difficult-to-cut Materials	VQ	VQMHV	End mill, Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 1–25 INCH DC .1250–.5000	◎	◎			◎	◎	○			METRIC I137 INCH I141
			VQ	VQJHV	End mill, Semi long cut length, 4 flute, Irregular helix flutes	METRIC DC 1–20 INCH DC .1250–.5000	◎	◎			◎	◎	○			METRIC I144 INCH I146
		For CFRP	DFC	DFC4JC	End mill, 4 flute, For CFRP	METRIC DC 6–12	CFRP : ◎									I282
		For Graphite	DF	DF4JC	End mill, Semi long cut length, 4 flute, For graphite	METRIC DC 3–12	Graphite : ◎ GFRP/CFRP : ○ Machineable Ceramics : ○						◎	○		I288

END MILLS SELECTION CHART

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-Hardened Steel, Hardened Steel	H – Hardened Steel(~55HRC)	H – Hardened Steel(55HRC~)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminum Alloy	Page
SQUARE															
	5	For Difficult-to-cut Materials	VQ	NEW VQJCS	End mill, Semi long cut length, 5 flute, Irregular pitch flutes, Chip breaker	METRIC DC 6–20	◎	◎			◎	◎	○		I116
	5	For Difficult-to-cut Materials	VQ	NEW VQLCS	End mill, Long cut length, 5 flute, Irregular pitch flutes, Chip breaker	METRIC DC 6–12	◎	◎			◎	◎	○		I118
	5	For Difficult-to-cut Materials	VQ	NEW VQ5MHV	End mill, Medium cut length, 5 flute, Irregular helix flutes	INCH DC .2500–.5000	◎	○			◎	◎			I175
	4 6	For Hardened Steel	VF	VFSD	End mill, Short cut length, For hardened materials	METRIC DC 1–12		○	◎	◎					I205
	4 6	For Hardened Steel	VF	VFMD	End mill, Medium cut length, For hardened materials	METRIC DC 1–25 INCH DC .0313–.5000		○	◎	◎					METRIC I206 INCH I208
	6	For Hardened Steel	VC	VCLD	End mill, Long cut length, 6 flute	METRIC DC 6–25		○	◎	◎					I106
	6	For Difficult-to-cut Materials	VF	VF6MHV	End mill, Medium cut length, 6 flute, Irregular helix flutes	METRIC DC 6–20	○	○			◎	◎			I203
	6	For Difficult-to-cut Materials	VQ	VQ6MHVCH	End mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant	METRIC DC 10–20	○	○			◎	◎	○		I179
	8	For Difficult-to-cut Materials	VF	VF8MHVCH	End mill, Medium cut length, Irregular helix flutes, with multiple thru-coolant	METRIC DC 16,20	○	○			◎	◎			I204
	10 12	For CFRP	DFC	DFCJRT	End mill with cross-nick, For CFRP	METRIC DC 6–12	CFRP : ◎								I283
LONG NECK SQUARE															
	3 4	For Difficult-to-cut Materials	VQ	VQXL	End mill, Short cut length, 3–4 flute, Long neck	METRIC DC 0.2–1	◎	◎			◎	◎	○		I194
	2	For Deep Slotting	MS	MS2XL	End mill, Short cut length, 2 flute, Long neck	METRIC DC 0.2–6 INCH DC .0156–.2500	◎	◎	○		○	○	○		METRIC I024 INCH I032
	2	For Deep Slotting	MS	MS2XL6	End mill, Short cut length, 2 flute, 6mm shank	METRIC DC 0.3–2.5	◎	◎	○		○	○	○		I028
	2	For Deep Slotting Hardened Steel	VF	VF2XL	End mill, 2 flute, Long neck	METRIC DC 0.2–3	○	◎	◎	◎					I197

* DC : Cutting Diameter
* RE : Ball Nose End Mill Radius

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material									Page
							P		H		M	S	N			
							Carbon Steel, Alloy Steel, Cast Iron	Tool steel, Pre-Hardened Steel, Hardened Steel	Hardened Steel(~55HRC)	Hardened Steel(55HRC~)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy		
	4	For Deep Slotting / General Use	MS	MS4XL	End mill, Short cut length, 4 flute, Long neck	METRIC DC 1–10 INCH DC .0625–.2500	◎	◎	○		○	○	○			METRIC I048 INCH I052
BALL																
	2	General Use	MS+	MP2SSB	Ball nose, Short cut length, 2 flute, Short shank	METRIC RE 0.1–6	◎	◎	◎		○	○	○			I078
			MS+	MP2SB	Ball nose, Short cut length, 2 flute	METRIC RE 0.1–6	◎	◎	◎		○	○	○			I079
			MS+	MP2MB	Ball nose, Medium cut length, 2 flute	METRIC RE 0.25–6 INCH RE .0156–.2500	◎	◎	◎		○	○	○			METRIC I080 INCH I083
			MS+	MP2SDB	Ball nose, Short cut length, 2 flute, High strength	METRIC RE 0.5–6	○	◎	◎							I086
		For Hardened Steel	VFR	VFR2SSB	Ball nose, Short cut length, 2 flute, Short shank	METRIC RE 0.5–6		○	◎	◎						I260
	2	For Hardened Steel	VFR	VFR2SB	Ball nose, Short cut length, 2 flute	METRIC RE 0.1–10		○	◎	◎						I262
			VFR	VFR2SBF	Ball nose, Short cut length, 2 flute, For Mirror finish cutting	METRIC RE 0.5–3		○	◎	◎						I264
			VF	VF2SB	Ball nose, Short cut length, 2 flute, For hardened materials	INCH RE .0156–.2500	○	◎	◎	◎	○	○				I217
		For Difficult-to-cut Materials	VQN	NEW VQN2MB	Ball nose, Medium cut length, 2 flute	METRIC RE 0.5–6						◎				I187
		For Hard Brittle Materials	DC	DC2SB	Ball nose, Short cut length, 2 flute, For hard brittle materials	METRIC RE 0.1–3	Cemented Carbide : ◎ Alumina / Zirconia : ○ Silicon Carbide / Nitride : ○ Quartz Glass : ○									I290
	4	For Hardened Steel	VFR	NEW VFR4MB	Ball nose, Medium cut length, 4 flute	METRIC RE 0.5–6		○	◎	◎						I266
			VF	VF4MB	Ball nose, Medium cut length, 4 flute	METRIC RE 0.5–6		○	◎	◎						I234
		For Difficult-to-cut Materials	VQN	NEW VQN4MB	Ball nose, Medium cut length, 4 flute	METRIC RE 1–6						◎				I189
			VQN	NEW VQN4MBF	Ball nose, Medium cut length, 4 flute	METRIC RE 1–6						◎				I190
			VQ	VQ4SVB	Ball nose, Medium cut length, 4 flute	METRIC RE 1–6 INCH RE .0625–.2500	◎	◎			◎	◎	○			METRIC I169 INCH I170

END MILLS SELECTION CHART

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-Hardened Steel, Hardened Steel	H – Hardened Steel(~55HRC)	H – Hardened Steel(55HRC~)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminum Alloy	Page
LONG NECK BALL															
	2	General Use	MS+	MP2XLB	Ball nose, Short cut length, 2 flute, Long neck	METRIC RE 0.05–3	◎	◎	◎		○	○	○		I088
		For Profiling of Special Geometry	VF	VF2WB	Wide ball nose, Medium cut length, 2 flute	METRIC RE 1–3	○	○	○		◎	◎			I216
		For Deep Slotting of Hardened Steel	VFR	NEW VFR2XLB	Ball nose, 2 flute, Long neck	METRIC RE 0.1–3		○	◎	◎					I268
			VF	VF2XLBS	Ball nose, 2 flute, Long neck, Short shank	METRIC RE 0.2–1	○	◎	◎	◎					I219
			VF	VF2XLB	Ball nose, 2 flute, Long neck	METRIC RE 0.1–3 INCH RE .0156–.1250	○	◎	◎	◎					METRIC I220 INCH I226
			VQ	NEW VQ2XLB	Ball nose, Short cut length, 2 flute, Long neck	METRIC RE 0.5–1.5						◎			I164
		For Hard Brittle Materials	DC	DC2XLB	Ball nose, Short cut length, 2 flute, For hard brittle materials	METRIC RE 0.1–3	Cemented Carbide : ◎ Alumina / Zirconia : ○ Silicon Carbide / Nitride : ○ Quartz Glass : ○								I292
		For Graphite	DF	DF2XLB	Ball nose, Medium cut length, 2 flute, Long neck, For graphite	METRIC RE 0.15–2	Graphite : ◎ GFRP/CFRP : ○ Machineable Ceramics : ○						◎	○	I284
			DF	DF2XLBF	Ball nose, Medium cut length, 2 flute, Long neck, For graphite	METRIC RE 0.3–1.5	Graphite : ◎ Zirconia : ◎ Rigid Composite Resin : ◎ Machineable Ceramics : ○						◎	○	I286
		For Deep Slotting	MS	MS2XLB	Ball nose, 2 flute, Long neck	INCH RE .0078–.1250	◎	◎	○		○	○			I060
	4	For Profiling of Special Geometry	VQ	NEW VQ4WB	Lollipop, Short cut length, 4 flute	METRIC RE 0.5–3	◎	◎			◎	◎	○		I172
TAPER NECK BALL															
	3	For Deep Slotting Hardened Steel	VF	VF3XB	Ball nose, Medium cut length, 3 flute, Taper neck	METRIC RE 0.4–2.5	○	◎	◎	◎					I228
RADIUS															
	2	General Use	MS	MS2MRB	Corner radius, Medium cut length, 2 flute	METRIC DC 1–12	◎	◎	○		○	○	○		I062

* DC : Cutting Diameter
* RE : Ball Nose End Mill Radius

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material								Page
							P		H		M	S	N		
							Carbon Steel, Alloy Steel, Cast Iron	Tool steel, Pre-Hardened Steel, Hardened Steel	Hardened Steel(~55HRC)	Hardened Steel(55HRC~)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy	
	3	For Aluminum Alloy	UWC	NEW A3SARB	Corner radius end mill, Short cut length, 3 flute, with multiple internal thru-coolant holes	METRIC DC 12–25								◎	I278
			DLC	NEW DLC3SARB	Corner radius end mill, Short cut length, 3 flute, with multiple internal thru-coolant holes	METRIC DC 12–25								◎	I280
	4	For High Efficiency Machining	VF	VFHVRB	4 flute, Corner radius, Short cut length,Irregular helix flutes	METRIC DC 1–16 INCH DC .1250–.5000	◎	◎	◎	○	○	○			METRIC I238 INCH I244
		General Use	MS+	MP4MRB	Corner radius, Medium cut length, 4 flute	INCH DC .1250–.5000	◎	◎	○		○	○			I076
			MS	MS4MRB	Corner radius, Medium cut length, 4 flute	METRIC DC 3–20	◎	◎	○		○	○	○		I065
			VC	VC4JRB	Corner radius, Semi long cut length, 4 flute	METRIC DC 3–20	○	◎	○		○	○			I108
		For Swiss Style Lathes	VQ	NEW VQ4MRB-FB	Corner radius end mill, Medium cut length, 4 flute, For Swiss-Type lathes	METRIC DC 4–10	◎	◎			◎	◎	○		I166
		For Hardened Steel	VFR	NEW VFRPSRB	Corner radius, Short cut length, 4 Flute	METRIC DC 0.5–12		○	◎	◎					I272
		For Difficult-to-cut Materials	VQ	NEW VQHVRB	Corner radius, Short cut length, 4 flute, Irregular helix flutes	METRIC DC 1–4						◎			I114
			VQ	NEW VQFDRB	Duplex corner radius end mill for high speed cutting	METRIC DC 3–6						◎			I112
			VQ	VQMHVRB	Corner radius, Medium cut length, 4 flute, Irregular helix flutes	METRIC DC 2–20 INCH DC .1250–.5000	◎	◎			◎	◎	○		METRIC I148 INCH I153
			VQ	VQMHVRBF	Corner radius, Medium cut length, 4 flute, Irregular helix flutes (for finishing)	METRIC DC 6–16 INCH DC .2500–.5000	◎	◎			◎	◎	○		METRIC I156 INCH I158
		For Hardened Steel	VF	VFMHVRBCH	Corner radius, Medium cut length, 4 flute, Irregular helix flutes, with multiple thru-coolant	METRIC DC 16.20	○	○			◎	◎			I254
	4 6	For Hardened Steel	VF	VFFDRB	Multi-task corner radius end mill for impact miracle high speed cutting	METRIC DC 3–12		○	◎	◎					I236
		For Difficult-to-cut Materials	VQN	NEW VQN4MVRB/ VQN6MVRB	Corner Radius, Medium cut length, 4/6 flute	METRIC DC 3–12						◎			I192
	5		VQ	NEW VQ5MHVRB	Corner radius, Medium cut length, 5 flute, Irregular helix flutes	INCH DC .2500–.5000	◎	○			◎	◎			I176

END MILLS SELECTION CHART

Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-Hardened Steel, Hardened Steel	H – Hardened Steel(-55HRC)	H – Hardened Steel(55HRC-)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminum Alloy	Page
RADIUS															
	6	For Hardened Steel	VF	VFSDRB	Corner radius, Short cut length, 6 flute	METRIC DC 3–12		○	◎	◎					I250
	6	For Hardened Steel	VF	VFMDRB	Corner radius, Medium cut length, 6 flute, For hardened materials	METRIC DC 3–20		○	◎	◎					I252
	6	For Difficult-to-cut Materials	VF	VF6MHVRB	Corner radius, Medium cut length, 6 flute, Irregular helix flutes	METRIC DC 6–20	○	○			◎	◎			I256
	6	For Difficult-to-cut Materials	VQ	VQ6MHVRBCH	Corner radius, Medium cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant	METRIC DC 10–20	○	○			◎	◎	○		I180
	5	For Difficult-to-cut Materials	VQT	VQT5MVRB	Corner radius, Medium cut length, 5 flute, Irregular helix flutes, with coolant hole	METRIC DC 16,20,25						◎			I182
	8	For Difficult-to-cut Materials	VF	VF8MHVRBCH	Corner radius, Medium cut length, 8 flute, Irregular helix flutes, with multiple thru-coolant	METRIC DC 16,20	○	○			◎	◎			I258
	4	For Heat Resistant Alloy	CERAMIC	CE4SRB	Corner radius, short cut length, 4 flute	METRIC DC 6–12						◎			I294
	6	For Heat Resistant Alloy	CERAMIC	CE6SRB	Corner radius, short cut length, 6 flute	METRIC DC 6–12						◎			I295
TAPER NECK RADIUS															
	4	For High Efficiency Machining	VF	VFHVRB	4 flute, Corner radius, Short cut length,Irregular helix flutes	METRIC DC 1–12	◎	◎	◎	○	○	○			I238
TAPER BALL															
	4	For Aluminum Alloy	DLC	NEW DLC4LATB	Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers	METRIC RE 0.5–2								◎	I300
	4	For Aluminum Alloy	UWC	C4LATB	Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers	METRIC RE 0.5–2								◎	I298
BARREL END MILL															
	6	For Difficult-to-cut Materials	VQT	VQT6UR	Barrel, Medium cut length, 6 flute	METRIC DC 8–12					○	◎		○	I184

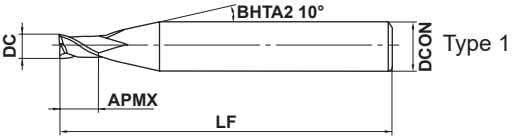
* DC : Cutting Diameter
* RE : Ball Nose End Mill Radius

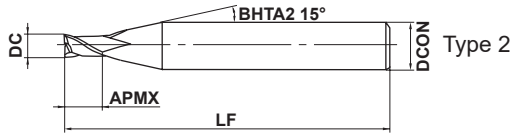
Type	No. of Flutes	Applications, Features	Coating or Substrate	Product Code	Shape	Size Range	Workpiece Material: P – Carbon Steel, Alloy Steel, Cast Iron	P – Tool steel, Pre-Hardened Steel, Hardened Steel	H – Hardened Steel(~55HRC)	H – Hardened Steel(55HRC~)	M – Austenitic Stainless Steel	S – Titanium Alloy, Heat Resistant Alloy	N – Copper Alloy	N – Aluminum Alloy	Page
ROUGHING															
	3 4	For Difficult-to-cut Materials	VQ	**VQSVR**	 Roughing end mill, Short cut length, 3–4 flute, Irregular helix flutes	**METRIC** DC 3–20	◎	◎			◎	◎	○		**I161**
			VF	**VFSFPR**	 Roughing end mill, Short cut length, 3–4 flute	**METRIC** DC 3–20	○	○			◎	◎			**I210**
	4		VF	**VFMFPR**	 Roughing end mill, Medium cut length, 4 flute	**METRIC** DC 5–20	○	○			◎	◎			**I214**
			VF	**VFSFPRCH**	 Roughing end mill, Short cut length, 4 flute, with multiple thru-coolant	**METRIC** DC 16,20	○	○			◎	◎			**I212**
	6		VF	**VF6SVRCH**	 Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant	**METRIC** DC 16,20	○	○			◎	◎			**I213**
CHAMFER CUTTER															
	3	For Chamfering	MS+	NEW **MP3C**	 Chamfer cutter, 3 flute	**METRIC** DC 2–12	◎	◎	○		◎	◎			**I068**
	2		VC	**VC2C**	 Chamfer cutter, 2 flute	**METRIC** DC 2–12	◎	◎	○		◎	◎	○	○	**I110**

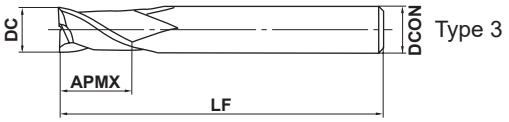
MS2SS

End mill, Short cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	







DC=0.1	DC>0.1			
0 - 0.010	0 - 0.020			
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●2 flute end mill for general use.

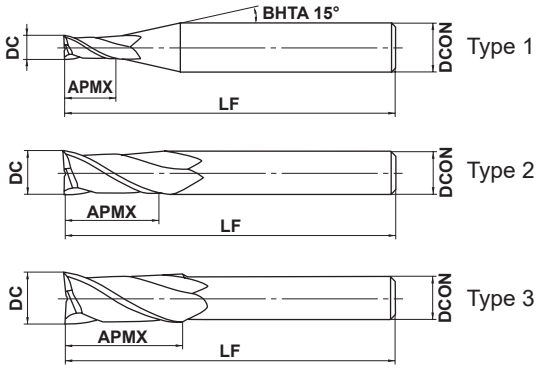
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2SSD0010	0.1	0.15	40	4	2	★	1
MS2SSD0020	0.2	0.3	40	4	2	★	2
MS2SSD0030	0.3	0.45	40	4	2	★	2
MS2SSD0040	0.4	0.6	40	4	2	★	2
MS2SSD0050	0.5	0.75	40	4	2	★	2
MS2SSD0060	0.6	0.9	40	4	2	★	2
MS2SSD0070	0.7	1.1	40	4	2	★	2
MS2SSD0080	0.8	1.2	40	4	2	★	2
MS2SSD0090	0.9	1.4	40	4	2	★	2
MS2SSD0100	1	1.5	40	4	2	★	2
MS2SSD0120	1.2	1.8	40	4	2	★	2
MS2SSD0150	1.5	2.3	40	4	2	★	2
MS2SSD0180	1.8	2.7	40	4	2	★	2
MS2SSD0200	2	3	40	4	2	★	2
MS2SSD0250	2.5	3.8	40	4	2	★	2
MS2SSD0300	3	4.5	45	6	2	★	2
MS2SSD0400	4	6	50	6	2	★	2
MS2SSD0500	5	7.5	50	6	2	★	2
MS2SSD0600	6	9	50	6	2	★	3
MS2SSD0700	7	10.5	60	8	2	★	2
MS2SSD0800	8	12	60	8	2	★	3
MS2SSD0900	9	13.5	70	10	2	★	2
MS2SSD1000	10	15	70	10	2	★	3
MS2SSD1100	11	16.5	75	12	2	★	2
MS2SSD1200	12	18	75	12	2	★	3

MS2MS

End mill, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



DC≤12	DC>12			
0 -0.020	0 -0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 -0.008	0 -0.009	0 -0.011	0 -0.013	

● 2 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MSD0020	0.2	0.4	40	4	2	●	1
MS2MSD0030	0.3	0.6	40	4	2	●	1
MS2MSD0040	0.4	0.8	40	4	2	●	1
MS2MSD0050	0.5	1	40	4	2	●	1
MS2MSD0060	0.6	1.2	40	4	2	●	1
MS2MSD0070	0.7	1.4	40	4	2	●	1
MS2MSD0080	0.8	1.6	40	4	2	●	1
MS2MSD0090	0.9	1.8	40	4	2	●	1
MS2MSD0100	1	2	40	4	2	●	1
MS2MSD0110	1.1	2.2	40	4	2	●	1
MS2MSD0120	1.2	2.4	40	4	2	●	1
MS2MSD0130	1.3	2.6	40	4	2	●	1
MS2MSD0140	1.4	2.8	40	4	2	●	1
MS2MSD0150	1.5	3	40	4	2	●	1
MS2MSD0160	1.6	3.2	40	4	2	●	1
MS2MSD0170	1.7	3.4	40	4	2	●	1
MS2MSD0180	1.8	3.6	40	4	2	●	1
MS2MSD0190	1.9	3.8	40	4	2	●	1
MS2MSD0200	2	4	40	4	2	●	1
MS2MSD0210	2.1	4.2	40	4	2	●	1
MS2MSD0220	2.2	4.4	40	4	2	●	1
MS2MSD0230	2.3	4.6	40	4	2	●	1
MS2MSD0240	2.4	4.8	40	4	2	●	1
MS2MSD0250	2.5	5	40	4	2	●	1
MS2MSD0260	2.6	5.2	40	4	2	●	1
MS2MSD0270	2.7	5.4	40	4	2	●	1
MS2MSD0280	2.8	5.6	40	4	2	●	1
MS2MSD0290	2.9	5.8	40	4	2	●	1
MS2MSD0300	3	6	45	6	2	●	1
MS2MSD0310	3.1	6.2	45	6	2	★	1
MS2MSD0320	3.2	6.4	45	6	2	★	1

MS2MS

End mill, Medium cut length, 2 flute

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MSD0330	3.3	6.6	45	6	2	★	1
MS2MSD0340	3.4	6.8	45	6	2	★	1
MS2MSD0350	3.5	7	45	6	2	★	1
MS2MSD0360	3.6	7.2	45	6	2	★	1
MS2MSD0370	3.7	7.4	45	6	2	★	1
MS2MSD0380	3.8	7.6	45	6	2	★	1
MS2MSD0390	3.9	7.8	45	6	2	★	1
MS2MSD0400	4	8	50	6	2	●	1
MS2MSD0410	4.1	8.2	50	6	2	★	1
MS2MSD0420	4.2	8.4	50	6	2	★	1
MS2MSD0430	4.3	8.6	50	6	2	★	1
MS2MSD0440	4.4	8.8	50	6	2	★	1
MS2MSD0450	4.5	9	50	6	2	★	1
MS2MSD0460	4.6	9.2	50	6	2	★	1
MS2MSD0470	4.7	9.4	50	6	2	★	1
MS2MSD0480	4.8	9.6	50	6	2	★	1
MS2MSD0490	4.9	9.8	50	6	2	★	1
MS2MSD0500	5	10	50	6	2	●	1
MS2MSD0510	5.1	10.2	50	6	2	★	1
MS2MSD0520	5.2	10.4	50	6	2	★	1
MS2MSD0530	5.3	10.6	50	6	2	★	1
MS2MSD0540	5.4	10.8	50	6	2	★	1
MS2MSD0550	5.5	11	50	6	2	★	1
MS2MSD0560	5.6	11.2	50	6	2	★	1
MS2MSD0570	5.7	11.4	50	6	2	★	1
MS2MSD0580	5.8	11.6	50	6	2	★	1
MS2MSD0590	5.9	11.8	50	6	2	★	1
MS2MSD0600	6	12	50	6	2	●	2
MS2MSD0650	6.5	13	60	8	2	★	1
MS2MSD0700	7	14	60	8	2	★	1
MS2MSD0750	7.5	15	60	8	2	★	1
MS2MSD0800	8	16	60	8	2	●	2
MS2MSD0850	8.5	17	70	10	2	★	1
MS2MSD0900	9	18	70	10	2	★	1
MS2MSD0950	9.5	19	70	10	2	★	1
MS2MSD1000	10	20	70	10	2	●	2
MS2MSD1100	11	22	75	12	2	★	1
MS2MSD1200	12	24	75	12	2	●	2
MS2MSD1600	16	32	90	16	2	★	2
MS2MSD1800	18	36	90	16	2	★	3
MS2MSD2000	20	40	100	20	2	★	2

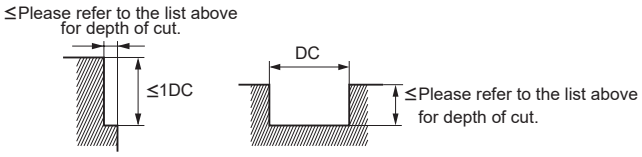
MS2SS
End mill, Short cut length, 2 flute

MS2MS
End mill, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
0.1	40000	40	1.6	0.001	40000	40	1.6	0.001
0.2	40000	100	3.9	0.002	40000	100	3.9	0.002
0.3	40000	200	7.9	0.005	40000	200	7.9	0.005
0.4	40000	600	23.6	0.01	40000	600	23.6	0.01
0.5	40000	1000	39.4	0.015	40000	960	37.8	0.015
0.6	40000	1200	47.2	0.02	40000	1200	47.2	0.02
0.7	40000	1400	55.1	0.02	40000	1400	55.1	0.02
0.8	40000	1600	63.0	0.03	40000	1600	63.0	0.03
0.9	40000	1800	70.9	0.04	40000	1600	63.0	0.04
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20
5	12000	1600	63.0	0.50	9000	900	35.4	0.25
6	10000	1400	55.1	0.60	7000	700	27.6	0.30
8	8000	1000	39.4	0.80	5600	550	21.7	0.40
10	6400	900	35.4	1.00	4500	500	19.7	0.50
12	5400	820	32.3	1.00	3800	450	17.7	0.50
16	2400	380	15.0	3.00	1200	100	3.9	0.80
20	1900	320	12.6	4.00	1000	80	3.1	1.00

Depth of cut



DC:Dia.

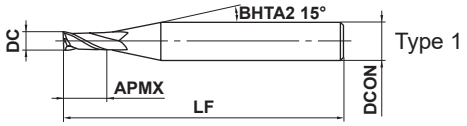
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
Note 3) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS2MD

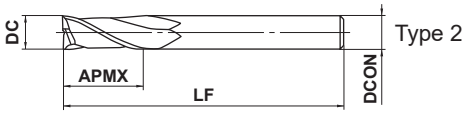
End mill, Medium cut length, 2 flute

UWC MS 30° DC<3 DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		



Type 1



Type 2

1≤DC≤12				
0 -0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

● Strong edge type, 2 flute end mill with high resistance to corner fracturing.

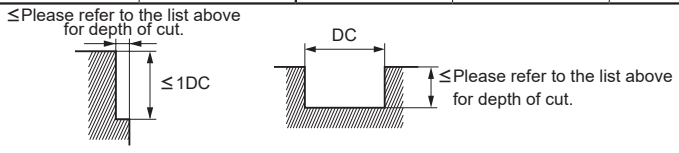
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MDD0100	1	2.5	40	4	2	★	1
MS2MDD0150	1.5	3.8	40	4	2	★	1
MS2MDD0200	2	5	40	4	2	★	1
MS2MDD0250	2.5	6.3	40	4	2	★	1
MS2MDD0300	3	7.5	50	6	2	★	1
MS2MDD0400	4	10	50	6	2	★	1
MS2MDD0500	5	12.5	50	6	2	★	1
MS2MDD0600	6	15	50	6	2	★	2
MS2MDD0800	8	20	60	8	2	★	2
MS2MDD1000	10	25	70	10	2	★	2
MS2MDD1200	12	30	90	12	2	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45-55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20
5	12000	1600	63.0	0.50	9000	900	35.4	0.25
6	10000	1400	55.1	0.60	7000	700	27.6	0.30
8	8000	1000	39.4	0.80	5600	550	21.7	0.40
10	6400	900	35.4	1.00	4500	500	19.7	0.50
12	5400	820	32.3	1.00	3800	450	17.7	0.50

Depth of cut



DC:Dia.

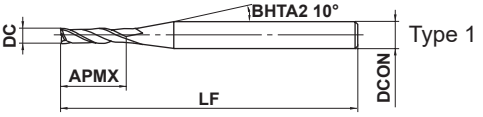
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS2JS

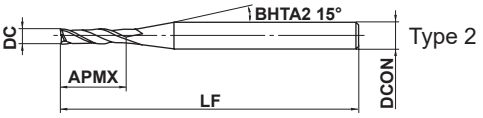
End mill, Semi long cut length, 2 flute

UWC MS 30° DC<3 DC≥3 DC<3 DC≥3

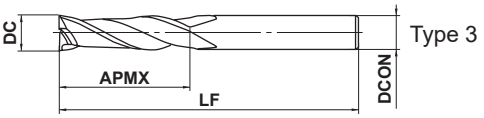
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2



Type 3

DC=0.1	DC>0.1			
0 - 0.010	0 - 0.020			
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 2 flute end mill for general use.

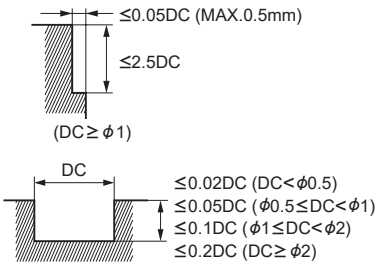
(mm)

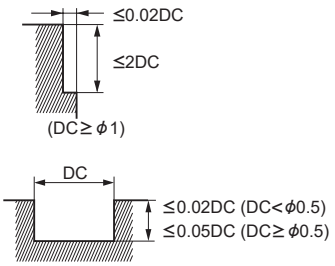
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2JSD0010	0.1	0.3	40	4	2	●	1
MS2JSD0020	0.2	0.6	40	4	2	●	2
MS2JSD0030	0.3	0.9	40	4	2	●	2
MS2JSD0040	0.4	1.2	40	4	2	●	2
MS2JSD0050	0.5	1.5	40	4	2	●	2
MS2JSD0060	0.6	1.8	40	4	2	●	2
MS2JSD0070	0.7	2.1	40	4	2	●	2
MS2JSD0080	0.8	2.4	40	4	2	●	2
MS2JSD0090	0.9	2.7	40	4	2	●	2
MS2JSD0100	1	3	40	4	2	●	2
MS2JSD0120	1.2	3.6	40	4	2	●	2
MS2JSD0150	1.5	4.5	40	4	2	●	2
MS2JSD0180	1.8	5.4	40	4	2	●	2
MS2JSD0200	2	6	40	4	2	●	2
MS2JSD0250	2.5	7.5	40	4	2	●	2
MS2JSD0300	3	9	45	6	2	●	2
MS2JSD0400	4	12	50	6	2	●	2
MS2JSD0500	5	15	50	6	2	●	2
MS2JSD0600	6	18	50	6	2	●	3
MS2JSD0800	8	24	70	8	2	●	3
MS2JSD1000	10	30	90	10	2	●	3
MS2JSD1200	12	36	90	12	2	●	3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
0.1	40000	— (40)	— (1.6)	40000	— (40)	— (1.6)	40000	— (35)	— (1.4)	40000	— (25)	— (1.0)
0.2	40000	— (45)	— (1.8)	40000	— (45)	— (1.8)	40000	— (35)	— (1.4)	32000	— (25)	— (1.0)
0.3	40000	— (55)	— (2.2)	32000	— (45)	— (1.8)	27000	— (35)	— (1.4)	21000	— (25)	— (1.0)
0.4	32000	— (60)	— (2.4)	24000	— (45)	— (1.8)	20000	— (35)	— (1.4)	16000	— (25)	— (1.0)
0.5	25000	— (60)	— (2.4)	19000	— (45)	— (1.8)	16000	— (35)	— (1.4)	13000	— (25)	— (1.0)
0.6	21000	— (60)	— (2.4)	16000	— (45)	— (1.8)	13000	— (35)	— (1.4)	11000	— (25)	— (1.0)
0.7	18000	— (60)	— (2.4)	14000	— (45)	— (1.8)	11000	— (35)	— (1.4)	9100	— (25)	— (1.0)
0.8	16000	— (60)	— (2.4)	12000	— (45)	— (1.8)	9900	— (35)	— (1.4)	8000	— (25)	— (1.0)
0.9	14000	— (60)	— (2.4)	11000	— (45)	— (1.8)	8800	— (35)	— (1.4)	7100	— (25)	— (1.0)
1	13000	60 (60)	2.4 (2.4)	9500	45 (45)	1.8 (1.8)	8000	35 (35)	1.4 (1.4)	6400	25 (25)	1.0 (1.0)
1.5	8500	60 (60)	2.4 (2.4)	6400	45 (45)	1.8 (1.8)	5300	35 (35)	1.4 (1.4)	4200	25 (25)	1.0 (1.0)
2	6400	60 (60)	2.4 (2.4)	4800	45 (45)	1.8 (1.8)	4000	35 (35)	1.4 (1.4)	3200	25 (25)	1.0 (1.0)
2.5	5100	60 (60)	2.4 (2.4)	3800	45 (45)	1.8 (1.8)	3200	40 (40)	1.6 (1.6)	2500	25 (25)	1.0 (1.0)
3	4200	65 (60)	2.6 (2.4)	3400	55 (45)	2.2 (1.8)	2600	40 (40)	1.6 (1.6)	2100	25 (25)	1.0 (1.0)
4	3400	80 (60)	3.1 (2.4)	2700	65 (45)	2.6 (1.8)	2100 (1600)	50 (30)	2.0 (1.2)	1700	35 (25)	1.4 (1.0)
5	2900	100 (60)	3.9 (2.4)	2300	80 (45)	3.1 (1.8)	1800 (1350)	60 (30)	2.4 (1.2)	1500	40 (25)	1.6 (1.0)
6	2500	120 (60)	4.7 (2.4)	2000	100 (50)	3.9 (2.0)	1500 (1100)	75 (30)	3.0 (1.2)	1300	50 (25)	2.0 (1.0)
8	1900	130 (60)	5.1 (2.4)	1500	100 (50)	3.9 (2.0)	1200 (900)	80 (30)	3.1 (1.2)	1000	50 (25)	2.0 (1.0)
10	1600	130 (60)	5.1 (2.4)	1300	100 (50)	3.9 (2.0)	950 (710)	75 (30)	3.0 (1.2)	800	50 (25)	2.0 (1.0)
12	1300	120 (60)	4.7 (2.4)	1100	100 (50)	3.9 (2.0)	800 (600)	75 (30)	3.0 (1.2)	670	50 (25)	2.0 (1.0)

Depth of cut





( ) : Indicates standard revolution and feed rate in slotting.

DC:Dia.

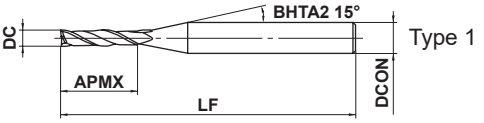
Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS2LS

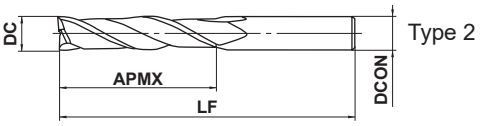
End mill, Long cut length, 2 flute

UWC MS γ 30° DC<3 DC≥3 DC<3 DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

0.2≤DC≤12				
0 -0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

h6

●2 flute end mill for general use.

(mm)

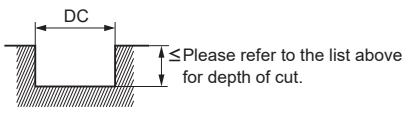
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2LSD0020	0.2	0.8	40	4	2	★	1
MS2LSD0030	0.3	1.2	40	4	2	★	1
MS2LSD0040	0.4	1.6	40	4	2	★	1
MS2LSD0050	0.5	2	40	4	2	★	1
MS2LSD0060	0.6	2.4	40	4	2	★	1
MS2LSD0070	0.7	2.8	40	4	2	★	1
MS2LSD0080	0.8	3.2	40	4	2	★	1
MS2LSD0090	0.9	3.6	40	4	2	★	1
MS2LSD0100	1	4	40	4	2	★	1
MS2LSD0150	1.5	6	40	4	2	★	1
MS2LSD0200	2	8	40	4	2	★	1
MS2LSD0250	2.5	10	50	4	2	★	1
MS2LSD0300	3	12	50	6	2	★	1
MS2LSD0400	4	16	50	6	2	★	1
MS2LSD0500	5	20	60	6	2	★	1
MS2LSD0600	6	24	60	6	2	★	2
MS2LSD0800	8	32	70	8	2	★	2
MS2LSD1000	10	40	90	10	2	★	2
MS2LSD1200	12	48	110	12	2	★	2

RECOMMENDED CUTTING CONDITIONS

Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
0.2	40000	400	15.7	0.001	30000	250	9.8	0.001
0.3	40000	600	23.6	0.005	35000	420	16.5	0.005
0.4	40000	700	27.6	0.007	30000	420	16.5	0.007
0.5	40000	800	31.5	0.01	24000	380	15.0	0.01
0.6	33000	800	31.5	0.015	21000	480	18.9	0.01
0.7	28000	800	31.5	0.015	18000	480	18.9	0.015
0.8	25000	800	31.5	0.02	16000	480	18.9	0.02
0.9	22000	800	31.5	0.03	15000	500	19.7	0.03
1	20000	800	31.5	0.04	13000	500	19.7	0.04
1.5	13000	800	31.5	0.10	9000	500	19.7	0.10
2	10000	800	31.5	0.15	6700	500	19.7	0.15
2.5	9000	800	31.5	0.20	6000	500	19.7	0.20
3	8000	800	31.5	0.20	5200	460	18.1	0.20
4	6000	600	23.6	0.20	4000	340	13.4	0.20
5	4800	480	18.9	0.30	3200	280	11.0	0.20
6	4000	400	15.7	0.30	2600	210	8.3	0.20
8	3000	300	11.8	0.30	2000	170	6.7	0.30
10	2400	240	9.4	0.30	1600	140	5.5	0.30
12	2000	200	7.9	0.30	1300	110	4.3	0.30

Depth of cut



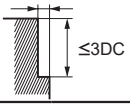
DC:Dia.

Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut (mm)
3	3500	370	14.6	0.05	2600	250	9.8	0.03
4	2800	370	14.6	0.06	2100	200	7.9	0.03
5	2200	330	13.0	0.06	1700	160	6.3	0.03
6	1800	300	11.8	0.06	1500	140	5.5	0.03
8	1600	270	10.6	0.08	1100	140	5.5	0.04
10	1400	240	9.4	0.10	900	140	5.5	0.05
12	1200	200	7.9	0.10	750	120	4.7	0.06

Depth of cut

≤Please refer to the list above for depth of cut.



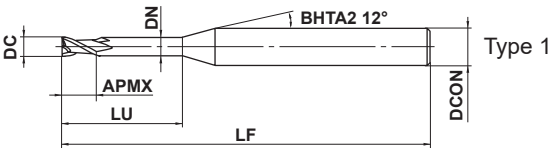
DC:Dia.

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

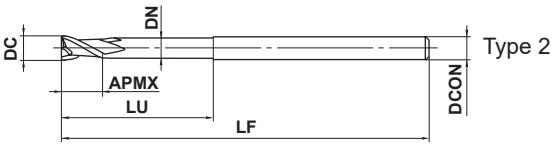
MS2XL

End mill, Short cut length, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

DC<0.5	DC≥0.5			
0 - 0.010	0 - 0.020			
4≤DCON≤6				
0 - 0.008				

●2 flute long neck end mill.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0020N005	0.2	0.3	0.5	0.17	45	4	2	★	1
MS2XLD0020N010	0.2	0.3	1	0.17	45	4	2	★	1
MS2XLD0020N015	0.2	0.3	1.5	0.17	45	4	2	★	1
MS2XLD0030N010	0.3	0.4	1	0.27	45	4	2	★	1
MS2XLD0030N020	0.3	0.4	2	0.27	45	4	2	★	1
MS2XLD0030N030	0.3	0.4	3	0.27	45	4	2	★	1
MS2XLD0030N060	0.3	0.4	6	0.27	45	4	2	★	1
MS2XLD0030N090	0.3	0.4	9	0.27	45	4	2	★	1
MS2XLD0040N020	0.4	0.6	2	0.36	45	4	2	★	1
MS2XLD0040N030	0.4	0.6	3	0.36	45	4	2	★	1
MS2XLD0040N040	0.4	0.6	4	0.36	45	4	2	★	1
MS2XLD0040N080	0.4	0.6	8	0.36	45	4	2	★	1
MS2XLD0040N120	0.4	0.6	12	0.36	45	4	2	★	1
MS2XLD0050N020	0.5	0.7	2	0.46	45	4	2	★	1
MS2XLD0050N040	0.5	0.7	4	0.46	45	4	2	●	1
MS2XLD0050N060	0.5	0.7	6	0.46	45	4	2	●	1
MS2XLD0050N080	0.5	0.7	8	0.46	50	4	2	●	1
MS2XLD0050N100	0.5	0.7	10	0.46	50	4	2	●	1
MS2XLD0050N150	0.5	0.7	15	0.46	50	4	2	●	1
MS2XLD0060N020	0.6	0.9	2	0.56	45	4	2	★	1
MS2XLD0060N040	0.6	0.9	4	0.56	45	4	2	★	1
MS2XLD0060N060	0.6	0.9	6	0.56	45	4	2	★	1
MS2XLD0060N080	0.6	0.9	8	0.56	50	4	2	★	1
MS2XLD0060N100	0.6	0.9	10	0.56	50	4	2	★	1
MS2XLD0060N120	0.6	0.9	12	0.56	50	4	2	★	1
MS2XLD0060N180	0.6	0.9	18	0.56	50	4	2	★	1
MS2XLD0070N020	0.7	1	2	0.66	45	4	2	★	1
MS2XLD0070N040	0.7	1	4	0.66	45	4	2	★	1
MS2XLD0070N060	0.7	1	6	0.66	45	4	2	★	1
MS2XLD0070N080	0.7	1	8	0.66	50	4	2	★	1
MS2XLD0070N100	0.7	1	10	0.66	50	4	2	★	1

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0080N040	0.8	1.2	4	0.76	45	4	2	★	1
MS2XLD0080N060	0.8	1.2	6	0.76	45	4	2	★	1
MS2XLD0080N080	0.8	1.2	8	0.76	50	4	2	★	1
MS2XLD0080N100	0.8	1.2	10	0.76	50	4	2	★	1
MS2XLD0080N120	0.8	1.2	12	0.76	50	4	2	★	1
MS2XLD0080N160	0.8	1.2	16	0.76	50	4	2	★	1
MS2XLD0080N240	0.8	1.2	24	0.76	60	4	2	★	1
MS2XLD0090N060	0.9	1.4	6	0.86	45	4	2	★	1
MS2XLD0090N080	0.9	1.4	8	0.86	50	4	2	★	1
MS2XLD0090N100	0.9	1.4	10	0.86	50	4	2	★	1
MS2XLD0090N150	0.9	1.4	15	0.86	60	4	2	★	1
MS2XLD0100N040	1	1.5	4	0.94	50	4	2	●	1
MS2XLD0100N060	1	1.5	6	0.94	50	4	2	●	1
MS2XLD0100N080	1	1.5	8	0.94	50	4	2	●	1
MS2XLD0100N100	1	1.5	10	0.94	50	4	2	●	1
MS2XLD0100N120	1	1.5	12	0.94	50	4	2	●	1
MS2XLD0100N160	1	1.5	16	0.94	60	4	2	●	1
MS2XLD0100N200	1	1.5	20	0.94	60	4	2	●	1
MS2XLD0100N250	1	1.5	25	0.94	70	4	2	★	1
MS2XLD0100N300	1	1.5	30	0.94	70	4	2	★	1
MS2XLD0120N060	1.2	1.8	6	1.14	50	4	2	★	1
MS2XLD0120N080	1.2	1.8	8	1.14	50	4	2	★	1
MS2XLD0120N100	1.2	1.8	10	1.14	50	4	2	★	1
MS2XLD0120N120	1.2	1.8	12	1.14	50	4	2	★	1
MS2XLD0120N160	1.2	1.8	16	1.14	60	4	2	★	1
MS2XLD0120N200	1.2	1.8	20	1.14	60	4	2	★	1
MS2XLD0150N060	1.5	2.3	6	1.44	50	4	2	★	1
MS2XLD0150N080	1.5	2.3	8	1.44	50	4	2	★	1
MS2XLD0150N100	1.5	2.3	10	1.44	50	4	2	★	1
MS2XLD0150N120	1.5	2.3	12	1.44	50	4	2	★	1
MS2XLD0150N140	1.5	2.3	14	1.44	60	4	2	★	1
MS2XLD0150N160	1.5	2.3	16	1.44	60	4	2	★	1
MS2XLD0150N180	1.5	2.3	18	1.44	60	4	2	★	1
MS2XLD0150N200	1.5	2.3	20	1.44	60	4	2	★	1
MS2XLD0150N250	1.5	2.3	25	1.44	70	4	2	★	1
MS2XLD0150N300	1.5	2.3	30	1.44	70	4	2	★	1
MS2XLD0150N380	1.5	2.3	38	1.44	80	4	2	★	1
MS2XLD0150N450	1.5	2.3	45	1.44	80	4	2	★	1
MS2XLD0200N060	2	3	6	1.9	50	4	2	★	1
MS2XLD0200N080	2	3	8	1.9	50	4	2	★	1
MS2XLD0200N100	2	3	10	1.9	50	4	2	●	1
MS2XLD0200N120	2	3	12	1.9	50	4	2	★	1
MS2XLD0200N140	2	3	14	1.9	60	4	2	●	1
MS2XLD0200N160	2	3	16	1.9	60	4	2	●	1
MS2XLD0200N180	2	3	18	1.9	60	4	2	★	1
MS2XLD0200N200	2	3	20	1.9	60	4	2	●	1
MS2XLD0200N250	2	3	25	1.9	70	4	2	●	1
MS2XLD0200N300	2	3	30	1.9	70	4	2	●	1
MS2XLD0200N350	2	3	35	1.9	80	4	2	★	1
MS2XLD0200N400	2	3	40	1.9	90	4	2	★	1
MS2XLD0200N500	2	3	50	1.9	100	4	2	★	1

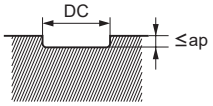
MS2XL

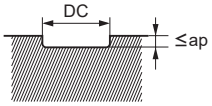
End mill, Short cut length, 2 flute, Long neck

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD0200N600	2	3	60	1.9	110	4	2	★	1
MS2XLD0250N080	2.5	3.7	8	2.4	50	4	2	★	1
MS2XLD0250N120	2.5	3.7	12	2.4	50	4	2	●	1
MS2XLD0250N160	2.5	3.7	16	2.4	60	4	2	●	1
MS2XLD0250N200	2.5	3.7	20	2.4	60	4	2	●	1
MS2XLD0250N250	2.5	3.7	25	2.4	70	4	2	●	1
MS2XLD0250N300	2.5	3.7	30	2.4	70	4	2	●	1
MS2XLD0250N400	2.5	3.7	40	2.4	90	4	2	★	1
MS2XLD0250N500	2.5	3.7	50	2.4	100	4	2	★	1
MS2XLD0300N080	3	4.5	8	2.8	50	6	2	★	1
MS2XLD0300N120	3	4.5	12	2.8	50	6	2	★	1
MS2XLD0300N160	3	4.5	16	2.8	60	6	2	●	1
MS2XLD0300N200	3	4.5	20	2.8	60	6	2	●	1
MS2XLD0300N250	3	4.5	25	2.8	70	6	2	●	1
MS2XLD0300N300	3	4.5	30	2.8	70	6	2	●	1
MS2XLD0300N400	3	4.5	40	2.8	90	6	2	●	1
MS2XLD0300N500	3	4.5	50	2.8	100	6	2	★	1
MS2XLD0400N120	4	6	12	3.8	50	6	2	★	1
MS2XLD0400N160	4	6	16	3.8	60	6	2	★	1
MS2XLD0400N200	4	6	20	3.8	60	6	2	★	1
MS2XLD0400N250	4	6	25	3.8	70	6	2	★	1
MS2XLD0400N300	4	6	30	3.8	70	6	2	★	1
MS2XLD0400N350	4	6	35	3.8	80	6	2	★	1
MS2XLD0400N400	4	6	40	3.8	90	6	2	★	1
MS2XLD0400N450	4	6	45	3.8	90	6	2	★	1
MS2XLD0400N500	4	6	50	3.8	100	6	2	★	1
MS2XLD0400N600	4	6	60	3.8	110	6	2	★	1
MS2XLD0500N160	5	7.5	16	4.8	60	6	2	●	1
MS2XLD0500N250	5	7.5	25	4.8	70	6	2	●	1
MS2XLD0500N350	5	7.5	35	4.8	80	6	2	●	1
MS2XLD0500N500	5	7.5	50	4.8	110	6	2	●	1
MS2XLD0500N600	5	7.5	60	4.8	120	6	2	★	1
MS2XLD0600N200	6	9	20	5.8	80	6	2	★	2
MS2XLD0600N300	6	9	30	5.8	90	6	2	★	2
MS2XLD0600N400	6	9	40	5.8	100	6	2	★	2
MS2XLD0600N500	6	9	50	5.8	110	6	2	★	2
MS2XLD0600N600	6	9	60	5.8	120	6	2	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
0.2	0.5	40000	600	23.6	0.004
	1	40000	400	15.7	0.001
0.3	1	40000	650	25.6	0.007
	3	40000	500	19.7	0.002
	9	22000	150	5.9	0.001
0.4	2	40000	800	31.5	0.007
	4	40000	800	31.5	0.003
	12	17000	150	5.9	0.001
0.5	2	40000	950	37.4	0.01
	6	40000	700	27.6	0.003
	10	25000	400	15.7	0.002
	15	14000	150	5.9	0.001
0.6	2	40000	950	37.4	0.01
	6	40000	800	31.5	0.005
	10	25000	450	17.7	0.003
	18	12000	150	5.9	0.001
0.7	2	40000	1000	39.4	0.02
	6	40000	900	35.4	0.01
	8	30000	700	27.6	0.005
	10	11000	300	11.8	0.005
0.8	4	40000	1200	47.2	0.02
	8	40000	1000	39.4	0.01
	12	25000	400	15.7	0.003
	24	10000	150	5.9	0.001
0.9	6	40000	1300	51.2	0.02
	10	35000	1000	39.4	0.01
	15	9000	400	15.7	0.003
1	6	40000	1600	63.0	0.04
	8	40000	1600	63.0	0.03
	12	30000	1000	39.4	0.02
	20	15000	400	15.7	0.005
	30	8000	150	5.9	0.001
1.2	6	40000	1900	74.8	0.06
	8	40000	1900	74.8	0.04
	12	25000	1000	39.4	0.03
	20	6500	150	5.9	0.01
Depth of cut		 DC:Dia.			

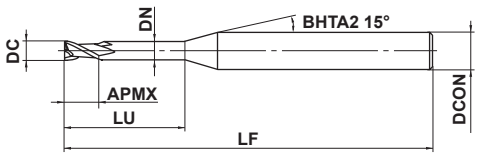
Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1.5	6	40000	2400	94.5	0.10
	10	30000	1800	70.9	0.05
	20	15000	600	23.6	0.02
	30	7500	300	11.8	0.005
	45	5000	150	5.9	0.001
1.6	6	40000	2400	94.5	0.12
	10	30000	1800	70.9	0.07
	16	20000	1000	39.4	0.04
2	6	40000	2400	94.5	0.18
	10	30000	1800	70.9	0.10
	16	20000	1000	39.4	0.06
	30	8000	500	19.7	0.04
	40	6000	250	9.8	0.01
	60	4200	150	5.9	0.003
2.5	8	25000	2500	98.4	0.20
	16	18000	1700	66.9	0.10
	20	12000	1000	39.4	0.08
	40	8000	400	15.7	0.03
	50	4000	150	5.9	0.015
3	8	20000	2000	78.7	0.30
	16	15000	1400	55.1	0.15
	20	10000	800	31.5	0.10
	40	5000	250	9.8	0.02
	50	3700	150	5.9	0.01
4	12	15000	3000	118.1	0.30
	20	11000	2200	86.6	0.22
	30	6400	1200	47.2	0.12
	40	4500	400	15.7	0.05
	50	2800	150	5.9	0.018
	60	1800	60	2.6	0.005
5	16	12000	2500	98.4	0.35
	35	5100	750	29.5	0.15
	60	2200	150	5.9	0.02
6	20	10000	2000	78.7	0.40
	40	4200	800	31.5	0.20
	60	1900	150	5.9	0.10
Depth of cut		 DC:Dia.			

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

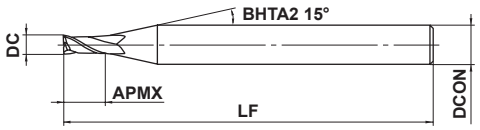
MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

0.3≤DC≤2.5				
0 - 0.020				
DCON=6				
0 - 0.008				

- 2 flute long neck end mill.
- ϕ6 shank type.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XL6D0030N008	0.3	0.8	—	—	50	6	2	●	2
MS2XL6D0030N015	0.3	0.5	1.5	0.27	50	6	2	●	1
MS2XL6D0040N010	0.4	0.6	1	0.36	50	6	2	●	1
MS2XL6D0040N020	0.4	0.6	2	0.36	50	6	2	●	1
MS2XL6D0050N013	0.5	0.8	1.3	0.46	50	6	2	●	1
MS2XL6D0050N025	0.5	0.8	2.5	0.46	50	6	2	●	1
MS2XL6D0060N015	0.6	0.9	1.5	0.56	50	6	2	●	1
MS2XL6D0060N030	0.6	0.9	3	0.56	50	6	2	●	1
MS2XL6D0070N018	0.7	1.1	1.8	0.66	50	6	2	●	1
MS2XL6D0070N035	0.7	1.1	3.5	0.66	50	6	2	●	1
MS2XL6D0080N020	0.8	1.2	2	0.76	50	6	2	●	1
MS2XL6D0080N040	0.8	1.2	4	0.76	50	6	2	●	1
MS2XL6D0090N023	0.9	1.4	2.3	0.86	50	6	2	●	1
MS2XL6D0090N045	0.9	1.4	4.5	0.86	50	6	2	●	1
MS2XL6D0100N025	1	1.5	2.5	0.94	50	6	2	●	1
MS2XL6D0100N050	1	1.5	5	0.94	50	6	2	●	1
MS2XL6D0110N028	1.1	1.7	2.8	1.04	50	6	2	●	1
MS2XL6D0110N055	1.1	1.7	5.5	1.04	50	6	2	●	1
MS2XL6D0120N030	1.2	1.8	3	1.14	50	6	2	●	1
MS2XL6D0120N060	1.2	1.8	6	1.14	50	6	2	●	1
MS2XL6D0130N033	1.3	2	3.3	1.24	50	6	2	●	1
MS2XL6D0130N065	1.3	2	6.5	1.24	50	6	2	●	1
MS2XL6D0140N035	1.4	2.1	3.5	1.34	50	6	2	●	1
MS2XL6D0140N070	1.4	2.1	7	1.34	50	6	2	●	1
MS2XL6D0150N038	1.5	2.3	3.8	1.44	50	6	2	●	1
MS2XL6D0150N075	1.5	2.3	7.5	1.44	50	6	2	●	1
MS2XL6D0160N040	1.6	2.4	4	1.54	50	6	2	●	1
MS2XL6D0160N080	1.6	2.4	8	1.54	50	6	2	●	1
MS2XL6D0170N043	1.7	2.6	4.3	1.64	50	6	2	●	1
MS2XL6D0170N085	1.7	2.6	8.5	1.64	50	6	2	●	1
MS2XL6D0180N045	1.8	2.7	4.5	1.74	50	6	2	●	1

● : USA Stock

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XL6D0180N090	1.8	2.7	9	1.74	50	6	2	●	1
MS2XL6D0190N048	1.9	2.9	4.8	1.84	50	6	2	●	1
MS2XL6D0190N095	1.9	2.9	9.5	1.84	50	6	2	●	1
MS2XL6D0200N050	2	3	5	1.90	50	6	2	●	1
MS2XL6D0200N100	2	3	10	1.90	50	6	2	●	1
MS2XL6D0210N053	2.1	3.2	5.3	2.00	50	6	2	●	1
MS2XL6D0210N105	2.1	3.2	10.5	2.00	60	6	2	●	1
MS2XL6D0220N055	2.2	3.3	5.5	2.10	50	6	2	●	1
MS2XL6D0220N110	2.2	3.3	11	2.10	60	6	2	●	1
MS2XL6D0230N058	2.3	3.5	5.8	2.20	50	6	2	●	1
MS2XL6D0230N115	2.3	3.5	11.5	2.20	60	6	2	●	1
MS2XL6D0240N060	2.4	3.6	6	2.30	50	6	2	●	1
MS2XL6D0240N120	2.4	3.6	12	2.30	60	6	2	●	1
MS2XL6D0250N063	2.5	3.8	6.3	2.40	50	6	2	●	1
MS2XL6D0250N125	2.5	3.8	12.5	2.40	60	6	2	●	1

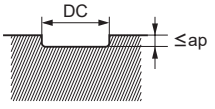
MS2XL6

End mill, Short cut length, 2 flute, 6mm shank

RECOMMENDED CUTTING CONDITIONS

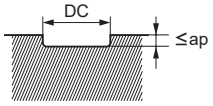
Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
0.3	**0.8**	40000	500−1000	19.7−39.4	0.01	30000	300−800	11.8−31.5	0.01
	1.5				0.007				0.007
0.4	**1**	40000	500−1000	19.7−39.4	0.015	30000	300−800	11.8−31.5	0.015
	2				0.01				0.01
0.5	**1.3**	40000	500−1000	19.7−39.4	0.02	30000	300−800	11.8−31.5	0.02
	2.5				0.013				0.013
0.6	**1.5**	33000	500−1000	19.7−39.4	0.03	25000	300−800	11.8−31.5	0.03
	3				0.018				0.018
0.7	**1.8**	29000	500−1000	19.7−39.4	0.04	22000	300−800	11.8−31.5	0.04
	3.5				0.025				0.025
0.8	**2**	25000	500−1000	19.7−39.4	0.06	20000	300−800	11.8−31.5	0.06
	4				0.03				0.03
0.9	**2.3**	22000	500−1000	19.7−39.4	0.08	18000	300−800	11.8−31.5	0.08
	4.5				0.05				0.05
1	**2.5**	20000	500−1000	19.7−39.4	0.1	16000	300−800	11.8−31.5	0.1
	5				0.07				0.07
1.1	**2.8**	18000	500−1000	19.7−39.4	0.12	14000	300−800	11.8−31.5	0.12
	5.5				0.08				0.08
1.2	**3**	16000	500−1000	19.7−39.4	0.12	13000	300−800	11.8−31.5	0.12
	6				0.08				0.08
1.3	**3.3**	15000	500−1000	19.7−39.4	0.12	12000	300−800	11.8−31.5	0.12
	6.5				0.08				0.08
1.4	**3.5**	14000	500−1000	19.7−39.4	0.12	11000	300−800	11.8−31.5	0.12
	7				0.08				0.08
1.5	**3.8**	13000	500−1000	19.7−39.4	0.15	10000	300−800	11.8−31.5	0.15
	7.5				0.1				0.1
1.6	**4**	12000	500−1000	19.7−39.4	0.15	10000	300−800	11.8−31.5	0.15
	8				0.1				0.1
1.7	**4.3**	12000	500−1000	19.7−39.4	0.17	9500	300−800	11.8−31.5	0.17
	8.5				0.12				0.12
1.8	**4.5**	11000	500−1000	19.7−39.4	0.17	9000	300−800	11.8−31.5	0.17
	9				0.12				0.12
1.9	**4.8**	10000	500−1000	19.7−39.4	0.17	9000	300−800	11.8−31.5	0.17
	9.5				0.12				0.12

Depth of cut



DC:Dia.

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

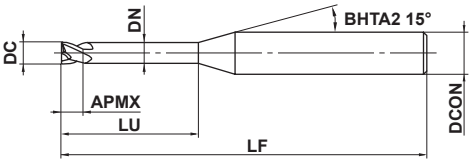
Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
2	**5**	10000	500−1000	19.7−39.4	0.2	9000	300−800	11.8−31.5	0.2
	10				0.15				0.15
2.1	**5.3**	9800	500−1000	19.7−39.4	0.2	9000	300−800	11.8−31.5	0.2
	10.5				0.15				0.15
2.2	**5.5**	9600	500−1000	19.7−39.4	0.2	9000	300−800	11.8−31.5	0.2
	11				0.15				0.15
2.3	**5.8**	9400	500−1000	19.7−39.4	0.2	8800	300−800	11.8−31.5	0.2
	11.5				0.15				0.15
2.4	**6**	9200	500−1000	19.7−39.4	0.25	8700	300−800	11.8−31.5	0.25
	12				0.2				0.2
2.5	**6.3**	9000	500−1000	19.7−39.4	0.25	8500	300−800	11.8−31.5	0.25
	12.5				0.2				0.2
Depth of cut		 DC:Dia.							

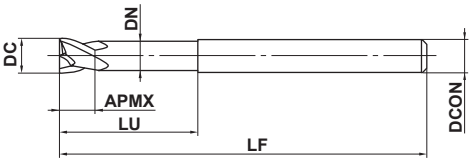
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS2XL – Inch sizes

End mill, Short cut length, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	





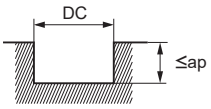
DC≤.2500"				
0 -.0008"				
DCON=.1250"	DCON=.1875"	DCON=.2500"		
0 -.00024"	0 -.00031"	0 -.00035"		

● 2 flute, long neck, square end mill for general purpose.

(inch)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLD1/64N0094	.0156	.0156	.0938	.0144	2.0	.1250	2	●	1
MS2XLD1/64N0125	.0156	.0156	.1250	.0144	2.0	.1250	2	●	1
MS2XLD1/64N0187	.0156	.0156	.1875	.0144	2.0	.1250	2	●	1
MS2XLD1/32N0187	.0313	.0313	.1875	.0301	2.0	.1250	2	●	1
MS2XLD1/32N0250	.0313	.0313	.2500	.0301	2.0	.1250	2	●	1
MS2XLD1/32N0375	.0313	.0313	.3750	.0301	2.0	.1250	2	●	1
MS2XLD1/16N0375	.0625	.0625	.3750	.0601	2.0	.1250	2	●	1
MS2XLD1/16N0500	.0625	.0625	.5000	.0601	2.0	.1250	2	●	1
MS2XLD1/16N0750	.0625	.0625	.7500	.0601	2.0	.1250	2	●	1
MS2XLD3/32N0562	.0938	.0938	.5625	.0898	2.0	.1250	2	●	1
MS2XLD3/32N0750	.0938	.0938	.7500	.0898	2.0	.1250	2	●	1
MS2XLD3/32N1125	.0938	.0938	1.1250	.0898	2.5	.1250	2	●	1
MS2XLD1/8N0750	.1250	.1250	.7500	.1211	2.0	.1250	2	●	2
MS2XLD3/16N1125	.1875	.1875	1.1250	.1836	2.5	.1875	2	●	2
MS2XLD1/4N1500	.2500	.2500	1.5000	.2441	3.0	.2500	2	●	2

RECOMMENDED CUTTING CONDITIONS

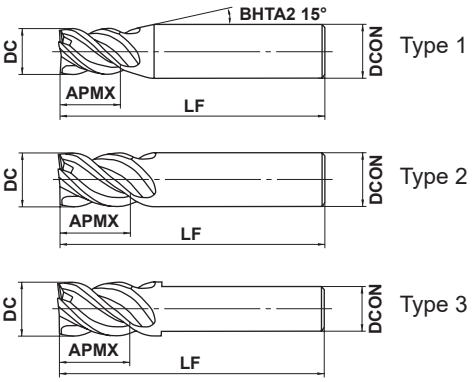
Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
DC (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0156	**.0938**	40000	17.0	.0002
	.1250	30000	10.6	.0002
	.1875	20000	5.6	.0001
.0313	**.1875**	40000	56.7	.0008
	.2500	25000	26.6	.0008
	.3750	15000	10.6	.0004
.0625	**.3750**	40000	90.7	.0028
	.5000	30000	51.0	.0016
	.7500	10000	10.6	.0008
.0938	**.5625**	33000	81.8	.003
	.7500	20000	42.5	.002
	1.1250	10000	14.1	.001
.1250	**.7500**	25000	72.4	.004
.1875	**1.1250**	17000	54.2	.006
.2500	**1.5000**	13000	55.3	.008
Depth of cut		 DC:Dia.		

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MSSHD

High power, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 4 flute high power end mill.

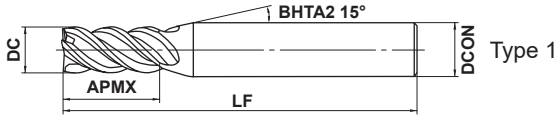
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSSHDD0300	3	4.5	45	6	4	★	1
MSSHDD0350	3.5	5.3	45	6	4	★	1
MSSHDD0400	4	6	45	6	4	★	1
MSSHDD0450	4.5	6.8	45	6	4	★	1
MSSHDD0500	5	7.5	50	6	4	★	1
MSSHDD0550	5.5	8.3	50	6	4	★	1
MSSHDD0600	6	9	50	6	4	★	2
MSSHDD0650	6.5	9.8	60	8	4	★	1
MSSHDD0700	7	10.5	60	8	4	★	1
MSSHDD0750	7.5	11.3	60	8	4	★	1
MSSHDD0800	8	12	60	8	4	★	2
MSSHDD0850	8.5	12.8	70	10	4	★	1
MSSHDD0900	9	13.5	70	10	4	★	1
MSSHDD0950	9.5	14.3	70	10	4	★	1
MSSHDD1000	10	15	70	10	4	★	2
MSSHDD1100	11	16.5	75	12	4	★	1
MSSHDD1200	12	18	75	12	4	★	2
MSSHDD1300	13	19.5	75	12	4	★	3
MSSHDD1400	14	21	90	16	4	★	1
MSSHDD1500	15	22.5	90	16	4	★	1
MSSHDD1600	16	24	90	16	4	★	2
MSSHDD1700	17	25.5	100	16	4	★	3
MSSHDD1800	18	27	100	16	4	★	3
MSSHDD1900	19	28.5	110	20	4	★	1
MSSHDD2000	20	30	110	20	4	★	2

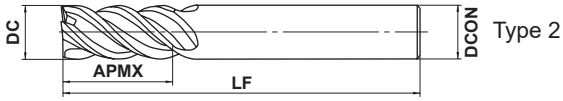
MSMHD

High power, Medium cut length, 4 flute

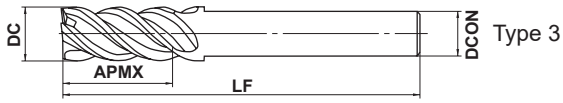
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	**8≤DCON≤10**	**12≤DCON≤16**	**20≤DCON≤25**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● 4 flute high power end mill.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDD0200	2	4	45	4	4	★	1
MSMHDD0210	2.1	5	45	4	4	★	1
MSMHDD0220	2.2	5	45	4	4	★	1
MSMHDD0230	2.3	5	45	4	4	★	1
MSMHDD0240	2.4	5	45	4	4	★	1
MSMHDD0250	2.5	5	45	4	4	★	1
MSMHDD0260	2.6	6	45	4	4	★	1
MSMHDD0270	2.7	6	45	4	4	★	1
MSMHDD0280	2.8	6	45	4	4	★	1
MSMHDD0290	2.9	6	45	4	4	★	1
MSMHDD0300	3	8	45	6	4	★	1
MSMHDD0310	3.1	8	45	6	4	★	1
MSMHDD0320	3.2	8	45	6	4	★	1
MSMHDD0330	3.3	8	45	6	4	★	1
MSMHDD0340	3.4	8	45	6	4	★	1
MSMHDD0350	3.5	8	45	6	4	★	1
MSMHDD0360	3.6	11	45	6	4	★	1
MSMHDD0370	3.7	11	45	6	4	★	1
MSMHDD0380	3.8	11	45	6	4	★	1
MSMHDD0390	3.9	11	45	6	4	★	1
MSMHDD0400	4	11	45	6	4	★	1
MSMHDD0410	4.1	12	45	6	4	★	1
MSMHDD0420	4.2	12	45	6	4	★	1
MSMHDD0430	4.3	12	45	6	4	★	1
MSMHDD0440	4.4	12	45	6	4	★	1
MSMHDD0450	4.5	12	45	6	4	★	1
MSMHDD0460	4.6	13	50	6	4	★	1
MSMHDD0470	4.7	13	50	6	4	★	1
MSMHDD0480	4.8	13	50	6	4	★	1
MSMHDD0490	4.9	13	50	6	4	★	1
MSMHDD0500	5	13	50	6	4	★	1

MSMHD

High power, Medium cut length, 4 flute

(mm)

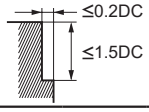
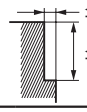
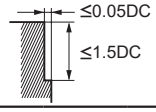
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHDD0510	5.1	13	50	6	4	★	1
MSMHDD0520	5.2	13	50	6	4	★	1
MSMHDD0530	5.3	13	50	6	4	★	1
MSMHDD0540	5.4	13	50	6	4	★	1
MSMHDD0550	5.5	13	50	6	4	★	1
MSMHDD0560	5.6	13	50	6	4	★	1
MSMHDD0570	5.7	13	50	6	4	★	1
MSMHDD0580	5.8	13	50	6	4	★	1
MSMHDD0590	5.9	13	50	6	4	★	1
MSMHDD0600	6	13	50	6	4	★	2
MSMHDD0650	6.5	16	60	8	4	★	1
MSMHDD0700	7	19	60	8	4	★	1
MSMHDD0750	7.5	19	60	8	4	★	1
MSMHDD0800	8	19	60	8	4	★	2
MSMHDD0850	8.5	19	70	10	4	★	1
MSMHDD0900	9	22	70	10	4	★	1
MSMHDD0950	9.5	22	70	10	4	★	1
MSMHDD1000	10	22	70	10	4	★	2
MSMHDD1100	11	26	75	12	4	★	1
MSMHDD1200S10	12	26	75	10	4	★	3
MSMHDD1200	12	26	75	12	4	★	2
MSMHDD1300	13	26	75	12	4	★	3
MSMHDD1400	14	30	90	16	4	★	1
MSMHDD1500	15	35	90	16	4	★	1
MSMHDD1600	16	35	90	16	4	★	2
MSMHDD1700	17	35	100	16	4	★	3
MSMHDD1800	18	40	100	16	4	★	3
MSMHDD1900	19	40	110	20	4	★	1
MSMHDD2000	20	45	110	20	4	★	2
MSMHDD2200	22	50	125	20	4	★	3
MSMHDD2500	25	55	125	25	4	★	2

MSSHD
High power, Short cut length, 4 flute

MSMHD
High power, Medium cut length, 4 flute

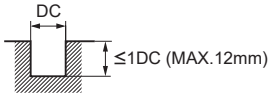
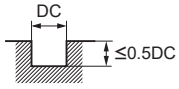
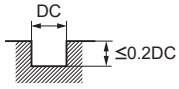
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	15000	550	21.7	10000	340	13.4	10000	320	12.6	6400	160	6.3	4800	100	3.9
3	11000	800	31.5	7400	500	19.7	7400	480	18.9	4800	250	9.8	4000	170	6.7
4	8000	900	35.4	5600	540	21.3	5600	520	20.5	3600	270	10.6	3200	240	9.4
5	6400	1000	39.4	4500	600	23.6	4500	580	22.8	2900	300	11.8	2600	240	9.4
6	5800	1100	43.3	3700	640	25.2	3700	600	23.6	2400	320	12.6	2100	230	9.1
8	4400	1100	43.3	2800	660	26.0	2800	600	23.6	1800	330	13.0	1600	220	8.7
10	3500	1000	39.4	2200	640	25.2	2200	560	22.0	1400	320	12.6	1300	200	7.9
12	2900	1000	39.4	1900	640	25.2	1900	530	20.9	1200	320	12.6	1100	170	6.7
16	2200	800	31.5	1400	500	19.7	1400	450	17.7	900	250	9.8	800	130	5.1
20	1800	750	29.5	1100	460	18.1	1100	440	17.3	720	230	9.1	640	100	3.9
25	1400	600	23.6	900	400	15.7	900	380	15.0	570	200	7.9	510	80	3.1
Depth of cut															

DC:Dia.

■Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	12000	400	15.7	7000	200	7.9	7000	100	3.9	4200	80	3.1	2300	40	1.6
3	9000	600	23.6	5300	300	11.8	5300	150	5.9	3200	130	5.1	1900	70	2.8
4	7200	720	28.3	4000	360	14.2	4000	180	7.1	2400	140	5.5	1400	95	3.7
5	5800	720	28.3	3200	360	14.2	3200	180	7.1	1900	150	5.9	1100	95	3.7
6	5000	800	31.5	2700	400	15.7	2700	200	7.9	1600	160	6.3	950	95	3.7
8	3700	800	31.5	2000	400	15.7	2000	200	7.9	1200	170	6.7	720	90	3.5
10	3000	720	28.3	1600	360	14.2	1600	180	7.1	960	160	6.3	570	80	3.1
12	2500	720	28.3	1300	360	14.2	1300	180	7.1	800	160	6.3	480	70	2.8
16	2000	600	23.6	1000	280	11.0	1000	150	5.9	600	130	5.1	360	50	2.0
20	1600	540	21.3	800	250	9.8	800	130	5.1	480	120	4.7	290	40	1.6
25	1300	480	18.9	640	220	8.7	640	120	4.7	380	100	3.9	230	35	1.4
Depth of cut															

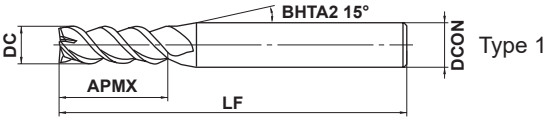
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

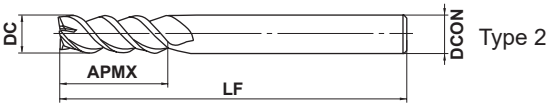
MSMHZD

Slotting, Medium cut length, 3 flute

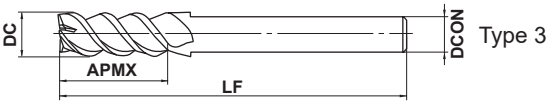
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2



Type 3

DC≤12	DC>12			
0 -0.020	0 -0.030			
4≤DCON≤6	**8≤DCON≤10**	**12≤DCON≤16**	**DCON=20**	
0 -0.008	0 -0.009	0 -0.011	0 -0.013	

●A single end mill for both plunging and slotting.

(mm)

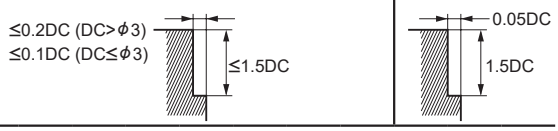
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHZDD0100	1	2	45	4	3	★	1
MSMHZDD0150	1.5	3	45	4	3	★	1
MSMHZDD0200	2	4	50	6	3	●	1
MSMHZDD0250	2.5	5	50	6	3	●	1
MSMHZDD0300	3	6	50	6	3	●	1
MSMHZDD0350	3.5	8	50	6	3	●	1
MSMHZDD0400	4	8	50	6	3	●	1
MSMHZDD0450	4.5	10	50	6	3	●	1
MSMHZDD0500	5	10	50	6	3	●	1
MSMHZDD0550	5.5	13	50	6	3	●	1
MSMHZDD0600	6	13	60	6	3	●	2
MSMHZDD0650	6.5	16	60	8	3	●	1
MSMHZDD0700	7	16	60	8	3	●	1
MSMHZDD0750	7.5	16	60	8	3	●	1
MSMHZDD0800	8	19	70	8	3	●	2
MSMHZDD0850	8.5	19	70	10	3	●	1
MSMHZDD0900	9	19	70	10	3	●	1
MSMHZDD0950	9.5	19	70	10	3	●	1
MSMHZDD1000	10	22	80	10	3	●	2
MSMHZDD1100	11	22	80	12	3	●	1
MSMHZDD1200	12	26	90	12	3	●	2
MSMHZDD1300	13	26	90	12	3	●	3
MSMHZDD1400	14	26	90	12	3	●	3
MSMHZDD1500	15	26	110	16	3	●	1
MSMHZDD1600	16	30	110	16	3	●	2
MSMHZDD2000	20	32	140	20	3	●	2

RECOMMENDED CUTTING CONDITIONS

Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	19000	600	23.6	13000	310	12.2	10000	200	7.9	9500	65	2.6
1.5	14000	600	23.6	9000	310	12.2	7500	210	8.3	6400	75	3.0
2	11000	600	23.6	7200	310	12.2	6000	210	8.3	4800	75	3.0
3	8500	770	30.3	5300	380	15.0	4400	220	8.7	3200	100	3.9
4	7200	850	33.5	4400	480	18.9	3700	250	9.8	2400	130	5.1
6	5300	940	37.0	3200	490	19.3	2700	270	10.6	1600	130	5.1
8	4000	1010	39.8	2400	560	22.0	2000	280	11.0	1200	120	4.7
10	3200	1000	39.4	1900	480	18.9	1600	300	11.8	950	110	4.3
12	2700	950	37.4	1600	440	17.3	1300	300	11.8	800	90	3.5
16	2000	720	28.3	1200	350	13.8	1000	260	10.2	600	70	2.8
20	1600	600	23.6	1000	290	11.4	800	240	9.4	480	60	2.4

Depth of cut

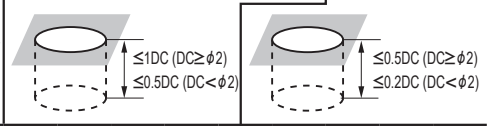


DC:Dia.

Plunging

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	13000	80	3.1	10000	50	2.0	6000	10	0.4
1.5	12000	120	4.7	8000	80	3.1	6000	20	0.8
2	11000	200	7.9	7200	140	5.5	6000	30	1.2
3	8500	250	9.8	5300	180	7.1	4200	50	2.0
4	7200	300	11.8	4400	210	8.3	3300	60	2.4
6	5300	300	11.8	3200	210	8.3	2200	70	2.8
8	4000	320	12.6	2400	220	8.7	1600	80	3.1
10	3200	340	13.4	1900	240	9.4	1300	70	2.8
12	2700	320	12.6	1600	220	8.7	1100	70	2.8
16	2000	250	9.8	1200	180	7.1	800	55	2.2
20	1600	200	7.9	1000	140	5.5	640	55	2.2

Depth of cut

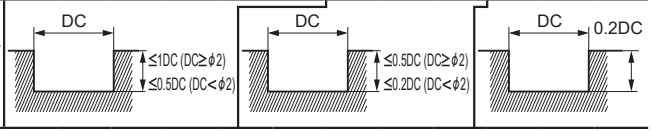


DC:Dia.

Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
1	13000	130	5.1	10000	80	3.1	6000	30	1.2	5700	25	1.0
1.5	12000	250	9.8	8000	150	5.9	6000	60	2.4	3800	30	1.2
2	11000	500	19.7	7200	260	10.2	6000	130	5.1	2800	35	1.4
3	8500	640	25.2	5300	320	12.6	4200	130	5.1	1900	50	2.0
4	7200	650	25.6	4400	370	14.6	3300	140	5.5	1400	70	2.8
6	5300	720	28.3	3200	380	15.0	2200	140	5.5	950	70	2.8
8	4000	780	30.7	2400	430	16.9	1600	140	5.5	720	60	2.4
10	3200	770	30.3	1900	370	14.6	1300	150	5.9	570	50	2.0
12	2700	730	28.7	1600	340	13.4	1100	150	5.9	480	40	1.6
16	2000	600	23.6	1200	290	11.4	800	130	5.1	360	30	1.2
20	1600	500	19.7	1000	240	9.4	640	120	4.7	290	25	1.0

Depth of cut



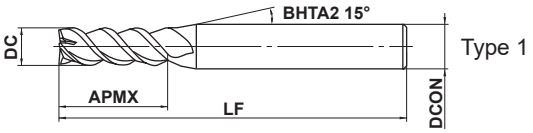
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

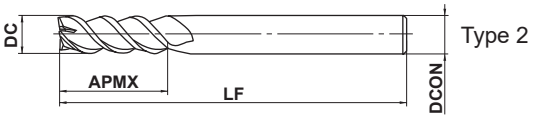
MSMHZD – Inch sizes

Slotting, Medium cut length, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

DC<.5000"	DC≥.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	.5000"≤DCON≤.6250"	DCON=.7500"		
0 - .00035"	0 - .00043"	0 - .00051"		

●A single end mill for both plunging and slotting.

(inch)

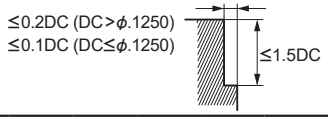
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MSMHZDD1/16	.0625	.125	2.000	.2500	3	●	1
MSMHZDD5/64	.0781	.156	2.000	.2500	3	●	1
MSMHZDD3/32	.0938	.188	2.000	.2500	3	●	1
MSMHZDD7/64	.1094	.250	2.000	.2500	3	●	1
MSMHZDD1/8	.1250	.313	2.000	.2500	3	●	2
MSMHZDD5/32	.1563	.313	2.000	.2500	3	●	1
MSMHZDD3/16	.1875	.406	2.000	.2500	3	●	1
MSMHZDD7/32	.2188	.406	2.000	.2500	3	●	1
MSMHZDD1/4	.2500	.625	2.500	.2500	3	●	2
MSMHZDD9/32	.2813	.625	2.500	.3750	3	●	1
MSMHZDD5/16	.3125	.750	2.750	.3750	3	●	1
MSMHZDD11/32	.3438	.750	2.750	.3750	3	●	2
MSMHZDD3/8	.3750	.750	3.000	.3750	3	●	2
MSMHZDD13/32	.4063	.875	3.000	.5000	3	●	1
MSMHZDD7/16	.4375	.875	3.000	.5000	3	●	1
MSMHZDD15/32	.4688	1.000	3.500	.5000	3	●	2
MSMHZDD1/2	.5000	1.000	3.500	.5000	3	●	2
MSMHZDD9/16	.5625	1.000	3.500	.6250	3	●	1
MSMHZDD5/8	.6250	1.125	4.250	.6250	3	●	2
MSMHZDD3/4	.7500	1.250	5.500	.7500	3	●	1

RECOMMENDED CUTTING CONDITIONS

Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
.0625	13000	550	21.7	8500	310	12.2	7100	200	7.9
.1250	8000	770	30.3	5100	380	15.0	4200	220	8.7
.1875	6300	880	34.6	3800	490	19.3	3200	250	9.8
.2500	5000	950	37.4	3000	500	19.7	2500	270	10.6
.3125	4000	1000	39.4	2400	560	22.0	2000	280	11.0
.3750	3300	1000	39.4	2000	490	19.3	1700	290	11.4
.4375	2900	970	38.2	1700	450	17.7	1400	300	11.8
.5000	2500	860	33.9	1500	420	16.5	1300	300	11.8
.5625	2200	790	31.1	1300	370	14.6	1100	280	11.0
.6250	2000	720	28.3	1200	350	13.8	1000	260	10.2
.7500	1700	610	24.0	1000	290	11.4	800	240	9.4

Depth of cut

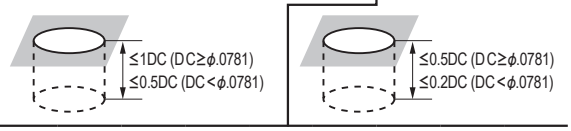


DC:Dia.

Plunging

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
.0625	11000	120	4.7	7600	80	3.1	6000	20	0.8
.1250	8000	260	10.2	5000	180	7.1	4000	50	2.0
.1875	6300	300	11.8	3800	210	8.3	2700	60	2.4
.2500	5000	310	12.2	3000	210	8.3	2000	70	2.8
.3125	4000	320	12.6	2400	220	8.7	1600	80	3.1
.3750	3300	330	13.0	2000	240	9.4	1300	70	2.8
.4375	2900	330	13.0	1700	220	8.7	1100	70	2.8
.5000	2500	310	12.2	1500	210	8.3	1000	70	2.8
.5625	2200	270	10.6	1300	180	7.1	900	60	2.4
.6250	2000	250	9.8	1200	180	7.1	800	55	2.2
.7500	1700	200	7.9	1000	140	5.5	700	55	2.2

Depth of cut

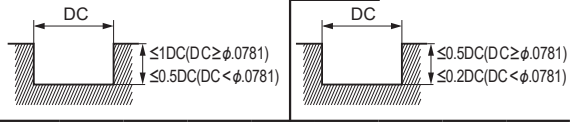


DC:Dia.

Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.		
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
.0625	11000	230	9.1	7600	150	5.9	6000	60	2.4
.1250	8000	600	23.6	5000	320	12.6	4000	130	5.1
.1875	6300	660	26.0	3800	360	14.2	2700	140	5.5
.2500	5000	720	28.3	3000	390	15.4	2000	140	5.5
.3125	4000	780	30.7	2400	430	16.9	1600	140	5.5
.3750	3300	740	29.1	2000	380	15.0	1300	150	5.9
.4375	2900	730	28.7	1700	340	13.4	1100	150	5.9
.5000	2500	700	27.6	1500	330	13.0	1000	140	5.5
.5625	2200	630	24.8	1300	300	11.8	900	140	5.5
.6250	2000	600	23.6	1200	290	11.4	800	130	5.1
.7500	1700	510	20.1	1000	240	9.4	700	120	4.7

Depth of cut



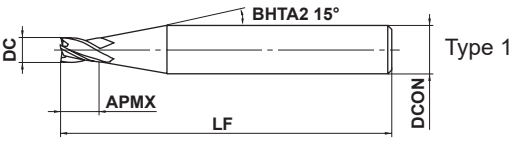
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

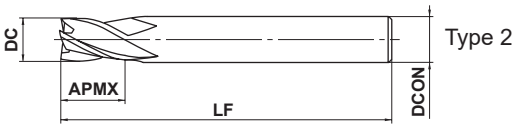
MS4SC

End mill, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

1≤DC≤12				
0 -0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

●4 flute end mill for general use.

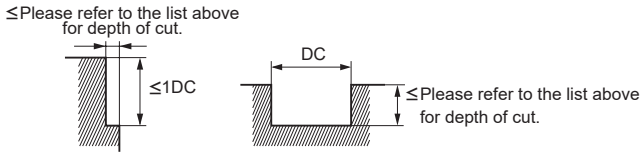
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4SCD0100	1	1.5	40	4	4	★	1
MS4SCD0150	1.5	2.3	40	4	4	★	1
MS4SCD0200	2	3	40	4	4	★	1
MS4SCD0250	2.5	3.8	40	4	4	★	1
MS4SCD0300	3	4.5	50	6	4	★	1
MS4SCD0400	4	6	50	6	4	★	1
MS4SCD0500	5	7.5	50	6	4	★	1
MS4SCD0600	6	9	50	6	4	★	2
MS4SCD0800	8	12	60	8	4	★	2
MS4SCD1000	10	15	70	10	4	★	2
MS4SCD1200	12	18	75	12	4	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
1	40000	3000	118.1	0.06	32000	2400	94.5	0.06
1.5	40000	4500	177.2	0.12	32000	3600	141.7	0.08
2	30000	4500	177.2	0.18	24000	3600	141.7	0.10
2.5	24000	3900	153.5	0.25	19000	3000	118.1	0.13
3	20000	3500	137.8	0.30	16000	2700	106.3	0.15
4	15000	3000	118.1	0.40	12000	2400	94.5	0.20
5	12000	2400	94.5	0.50	9000	1800	70.9	0.25
6	10000	2100	82.7	0.60	7000	1500	59.1	0.30
8	8000	1500	59.1	0.80	5600	1100	43.3	0.40
10	6400	1400	55.1	1.00	4500	950	37.4	0.50
12	5400	1200	47.2	1.00	3800	860	33.9	0.50

Depth of cut



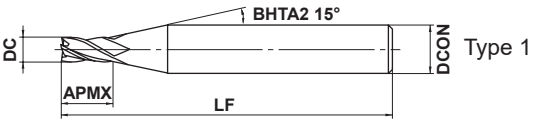
DC:Dia.

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

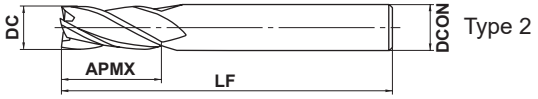
MS4MC

End mill, Medium cut length, 4 flute

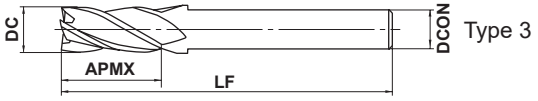
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute end mill for general use.

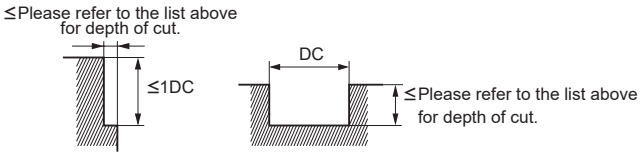
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MCD0100	1	2.5	40	4	4	●	1
MS4MCD0150	1.5	3.8	40	4	4	●	1
MS4MCD0200	2	5	40	4	4	●	1
MS4MCD0250	2.5	6.3	40	4	4	●	1
MS4MCD0300	3	7.5	50	6	4	●	1
MS4MCD0350	3.5	9	50	6	4	★	1
MS4MCD0400	4	10	50	6	4	●	1
MS4MCD0450	4.5	11.5	50	6	4	★	1
MS4MCD0500	5	12.5	50	6	4	●	1
MS4MCD0550	5.5	14	50	6	4	★	1
MS4MCD0600	6	15	50	6	4	●	2
MS4MCD0650	6.5	16.5	60	8	4	★	1
MS4MCD0700	7	17.5	60	8	4	★	1
MS4MCD0750	7.5	19	60	8	4	★	1
MS4MCD0800	8	20	60	8	4	●	2
MS4MCD0850	8.5	21.5	70	10	4	★	1
MS4MCD0900	9	22.5	70	10	4	★	1
MS4MCD0950	9.5	24	70	10	4	★	1
MS4MCD1000	10	25	70	10	4	●	2
MS4MCD1100	11	27.5	75	12	4	★	1
MS4MCD1200	12	30	90	12	4	●	2
MS4MCD1400	14	35	90	12	4	★	3
MS4MCD1600	16	40	100	16	4	★	2
MS4MCD1800	18	45	100	16	4	★	3
MS4MCD2000	20	50	110	20	4	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)	Revolution (min^{-1})	Table feed		Depth of cut (mm)
		(mm/min)	(IPM)			(mm/min)	(IPM)	
1	40000	3000	118.1	0.06	32000	2400	94.5	0.06
1.5	40000	4500	177.2	0.12	32000	3600	141.7	0.08
2	30000	4500	177.2	0.18	24000	3600	141.7	0.10
2.5	24000	3900	153.5	0.25	19000	3000	118.1	0.13
3	20000	3500	137.8	0.30	16000	2700	106.3	0.15
4	15000	3000	118.1	0.40	12000	2400	94.5	0.20
5	12000	2400	94.5	0.50	9000	1800	70.9	0.25
6	10000	2100	82.7	0.60	7000	1500	59.1	0.30
8	8000	1500	59.1	0.80	5600	1100	43.3	0.40
10	6400	1400	55.1	1.00	4500	950	37.4	0.50
12	5400	1200	47.2	1.00	3800	860	33.9	0.50
16	2400	550	21.7	3.00	1200	120	4.7	0.80
20	1900	480	18.9	4.00	1000	100	3.9	1.00

Depth of cut



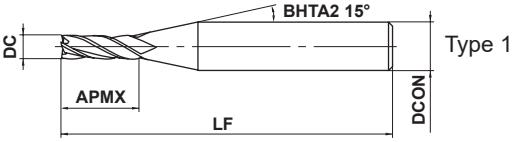
DC:Dia.

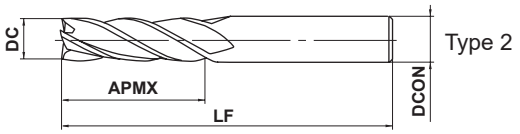
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS4JC

End mill, Semi long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	





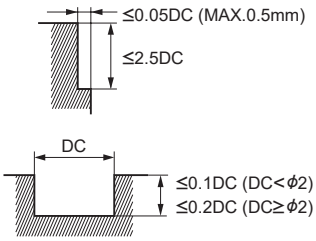
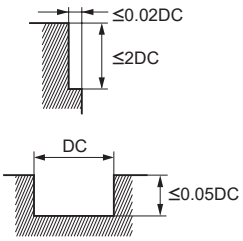
	1≤DC≤12				
	0 - 0.020				
h6	4≤DCON≤6	8≤DCON≤10	DCON=12		
	0 - 0.008	0 - 0.009	0 - 0.011		

●4 flute end mill for general use.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4JCD0100	1	4	40	4	4	●	1
MS4JCD0150	1.5	6	40	4	4	●	1
MS4JCD0200	2	8	40	4	4	●	1
MS4JCD0250	2.5	10	50	4	4	●	1
MS4JCD0300	3	12	50	6	4	●	1
MS4JCD0400	4	16	50	6	4	●	1
MS4JCD0500	5	20	60	6	4	●	1
MS4JCD0600	6	24	60	6	4	●	2
MS4JCD0800	8	32	70	8	4	●	2
MS4JCD1000	10	40	90	10	4	●	2
MS4JCD1200	12	48	110	12	4	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)		(mm/min)	(IPM)		(mm/min)	(IPM)		(mm/min)	(IPM)
1	11100	85	3.3	9500	65	2.6	8000	50	2.0	6400	35	1.4
1.5	7400	85	3.3	6400	90	3.5	5300	50	2.0	4200	35	1.4
2	5600	85	3.3	4800	90	3.5	4000	50	2.0	3200	35	1.4
2.5	4500	85	3.3	3800	90	3.5	3200	55	2.2	2500	35	1.4
3	3700	90	3.5	3400	90	3.5	2600	60	2.4	2100	35	1.4
4	3000	110	4.3	2700	90	3.5	2100	70	2.8	1700	50	2.0
5	2600	140	5.5	2300	110	4.3	1800	85	3.3	1500	55	2.2
6	2300	170	6.7	2000	140	5.5	1500	110	4.3	1300	70	2.8
8	1700	180	7.1	1500	140	5.5	1200	110	4.3	1000	70	2.8
10	1400	180	7.1	1300	140	5.5	950	110	4.3	800	70	2.8
12	1200	170	6.7	1100	140	5.5	800	110	4.3	670	70	2.8
Depth of cut												

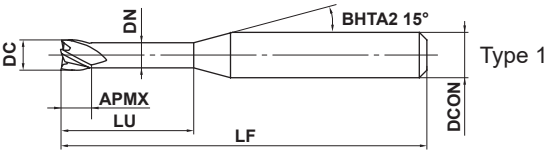
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

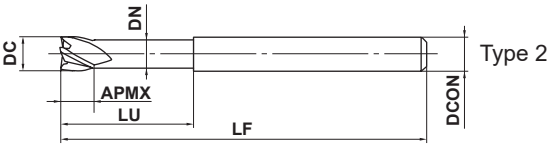
MS4XL

End mill, Short cut length, 4 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

1≤DC≤10				
0 - 0.020				
4≤DCON≤6	8≤DCON≤10			
0 - 0.008	0 - 0.009			

●4 flute long neck end mill.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0100N040	1	1	4	0.94	50	4	4	★	1
MS4XLD0100N060	1	1	6	0.94	50	4	4	★	1
MS4XLD0100N080	1	1	8	0.94	50	4	4	★	1
MS4XLD0100N100	1	1	10	0.94	50	4	4	★	1
MS4XLD0100N120	1	1	12	0.94	50	4	4	★	1
MS4XLD0100N160	1	1	16	0.94	60	4	4	★	1
MS4XLD0110N060	1.1	1.1	6	1.04	50	4	4	★	1
MS4XLD0110N100	1.1	1.1	10	1.04	50	4	4	★	1
MS4XLD0110N160	1.1	1.1	16	1.04	60	4	4	★	1
MS4XLD0120N060	1.2	1.2	6	1.14	50	4	4	★	1
MS4XLD0120N080	1.2	1.2	8	1.14	50	4	4	★	1
MS4XLD0120N100	1.2	1.2	10	1.14	50	4	4	★	1
MS4XLD0120N120	1.2	1.2	12	1.14	50	4	4	★	1
MS4XLD0120N160	1.2	1.2	16	1.14	60	4	4	★	1
MS4XLD0130N060	1.3	1.3	6	1.24	50	4	4	★	1
MS4XLD0130N120	1.3	1.3	12	1.24	50	4	4	★	1
MS4XLD0130N180	1.3	1.3	18	1.24	60	4	4	★	1
MS4XLD0140N060	1.4	1.4	6	1.34	50	4	4	★	1
MS4XLD0140N080	1.4	1.4	8	1.34	50	4	4	★	1
MS4XLD0140N100	1.4	1.4	10	1.34	50	4	4	★	1
MS4XLD0140N120	1.4	1.4	12	1.34	50	4	4	★	1
MS4XLD0140N140	1.4	1.4	14	1.34	60	4	4	★	1
MS4XLD0140N160	1.4	1.4	16	1.34	60	4	4	★	1
MS4XLD0140N220	1.4	1.4	22	1.34	60	4	4	★	1
MS4XLD0150N060	1.5	1.5	6	1.44	50	4	4	★	1
MS4XLD0150N080	1.5	1.5	8	1.44	50	4	4	★	1
MS4XLD0150N100	1.5	1.5	10	1.44	50	4	4	★	1
MS4XLD0150N120	1.5	1.5	12	1.44	50	4	4	★	1
MS4XLD0150N140	1.5	1.5	14	1.44	60	4	4	★	1
MS4XLD0150N160	1.5	1.5	16	1.44	60	4	4	★	1
MS4XLD0150N180	1.5	1.5	18	1.44	60	4	4	★	1

★ : Stocked in Japan

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0150N200	1.5	1.5	20	1.44	60	4	4	★	1
MS4XLD0160N060	1.6	1.6	6	1.54	50	4	4	★	1
MS4XLD0160N080	1.6	1.6	8	1.54	50	4	4	★	1
MS4XLD0160N100	1.6	1.6	10	1.54	50	4	4	★	1
MS4XLD0160N120	1.6	1.6	12	1.54	50	4	4	★	1
MS4XLD0160N140	1.6	1.6	14	1.54	60	4	4	★	1
MS4XLD0160N160	1.6	1.6	16	1.54	60	4	4	★	1
MS4XLD0160N180	1.6	1.6	18	1.54	60	4	4	★	1
MS4XLD0160N200	1.6	1.6	20	1.54	60	4	4	★	1
MS4XLD0160N260	1.6	1.6	26	1.54	70	4	4	★	1
MS4XLD0170N060	1.7	1.7	6	1.64	50	4	4	★	1
MS4XLD0170N140	1.7	1.7	14	1.64	60	4	4	★	1
MS4XLD0170N240	1.7	1.7	24	1.64	70	4	4	★	1
MS4XLD0180N060	1.8	1.8	6	1.74	50	4	4	★	1
MS4XLD0180N080	1.8	1.8	8	1.74	50	4	4	★	1
MS4XLD0180N100	1.8	1.8	10	1.74	50	4	4	★	1
MS4XLD0180N120	1.8	1.8	12	1.74	50	4	4	★	1
MS4XLD0180N140	1.8	1.8	14	1.74	60	4	4	★	1
MS4XLD0180N160	1.8	1.8	16	1.74	60	4	4	★	1
MS4XLD0180N180	1.8	1.8	18	1.74	60	4	4	★	1
MS4XLD0180N200	1.8	1.8	20	1.74	60	4	4	★	1
MS4XLD0180N250	1.8	1.8	25	1.74	70	4	4	★	1
MS4XLD0190N060	1.9	1.9	6	1.84	50	4	4	★	1
MS4XLD0190N160	1.9	1.9	16	1.84	60	4	4	★	1
MS4XLD0190N280	1.9	1.9	28	1.84	70	4	4	★	1
MS4XLD0200N060	2	2	6	1.9	50	4	4	★	1
MS4XLD0200N080	2	2	8	1.9	50	4	4	★	1
MS4XLD0200N100	2	2	10	1.9	50	4	4	★	1
MS4XLD0200N120	2	2	12	1.9	50	4	4	★	1
MS4XLD0200N140	2	2	14	1.9	60	4	4	★	1
MS4XLD0200N160	2	2	16	1.9	60	4	4	★	1
MS4XLD0200N180	2	2	18	1.9	60	4	4	★	1
MS4XLD0200N200	2	2	20	1.9	60	4	4	★	1
MS4XLD0200N250	2	2	25	1.9	70	4	4	★	1
MS4XLD0200N300	2	2	30	1.9	70	4	4	★	1
MS4XLD0250N080	2.5	2.5	8	2.4	50	4	4	★	1
MS4XLD0250N120	2.5	2.5	12	2.4	50	4	4	★	1
MS4XLD0250N160	2.5	2.5	16	2.4	60	4	4	★	1
MS4XLD0250N200	2.5	2.5	20	2.4	60	4	4	★	1
MS4XLD0250N250	2.5	2.5	25	2.4	70	4	4	★	1
MS4XLD0300N080	3	3	8	2.9	50	6	4	★	1
MS4XLD0300N120	3	3	12	2.9	50	6	4	★	1
MS4XLD0300N160	3	3	16	2.9	60	6	4	★	1
MS4XLD0300N200	3	3	20	2.9	60	6	4	★	1
MS4XLD0300N250	3	3	25	2.9	70	6	4	★	1
MS4XLD0300N300	3	3	30	2.9	70	6	4	★	1
MS4XLD0350N150	3.5	3.5	15	3.4	60	6	4	★	1
MS4XLD0350N250	3.5	3.5	25	3.4	70	6	4	★	1
MS4XLD0350N350	3.5	3.5	35	3.4	80	6	4	★	1
MS4XLD0400N120	4	4	12	3.9	50	6	4	★	1
MS4XLD0400N160	4	4	16	3.9	60	6	4	★	1

MS4XL

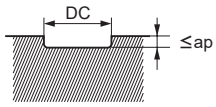
End mill, Short cut length, 4 flute, Long neck

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD0400N200	4	4	20	3.9	60	6	4	★	1
MS4XLD0400N250	4	4	25	3.9	70	6	4	★	1
MS4XLD0400N300	4	4	30	3.9	70	6	4	★	1
MS4XLD0400N350	4	4	35	3.9	80	6	4	★	1
MS4XLD0400N400	4	4	40	3.9	90	6	4	★	1
MS4XLD0400N450	4	4	45	3.9	90	6	4	★	1
MS4XLD0400N500	4	4	50	3.9	100	6	4	★	1
MS4XLD0500N160	5	5	16	4.9	60	6	4	★	1
MS4XLD0500N250	5	5	25	4.9	70	6	4	★	1
MS4XLD0500N350	5	5	35	4.9	80	6	4	★	1
MS4XLD0500N500	5	5	50	4.9	110	6	4	★	1
MS4XLD0600N200	6	6	20	5.85	80	6	4	★	2
MS4XLD0600N300	6	6	30	5.85	90	6	4	★	2
MS4XLD0600N400	6	6	40	5.85	100	6	4	★	2
MS4XLD0600N500	6	6	50	5.85	110	6	4	★	2
MS4XLD0800N300	8	8	30	7.85	90	8	4	★	2
MS4XLD0800N500	8	8	50	7.85	110	8	4	★	2
MS4XLD0800N700	8	8	70	7.85	130	8	4	★	2
MS4XLD1000N400	10	10	40	9.7	100	10	4	★	2
MS4XLD1000N600	10	10	60	9.7	120	10	4	★	2
MS4XLD1000N800	10	10	80	9.7	140	10	4	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1	4	40000	3000	118.1	0.04
	8	36000	2400	94.5	0.03
	12	20000	1000	39.4	0.02
	16	10000	500	19.7	0.005
1.2	6	40000	3000	118.1	0.05
	10	36000	2400	94.5	0.04
	12	20000	1200	47.2	0.03
	16	12000	600	23.6	0.01
1.5	6	40000	3200	126.0	0.06
	12	32000	2400	94.5	0.05
	16	16000	1100	43.3	0.03
	20	10000	600	23.6	0.01
1.8	6	40000	3600	141.7	0.08
	12	32000	2800	110.2	0.06
	20	12000	1000	39.4	0.02
	25	7000	600	23.6	0.01
2	6	40000	4000	157.5	0.1
	12	32000	3200	126.0	0.07
	16	24000	2400	94.5	0.05
	20	12000	1200	47.2	0.03
	30	5000	500	19.7	0.01
2.5	8	32000	4000	157.5	0.2
	25	9000	1100	43.3	0.04
	50	2500	300	11.8	0.005
3	8	25000	3600	141.7	0.4
	16	18000	2500	98.4	0.2
	25	12000	1700	66.9	0.1
	30	7000	800	31.5	0.05

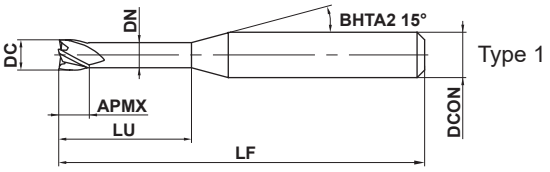
Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
3.5	15	20000	3000	118.1	0.6
	25	11000	1600	63.0	0.15
	35	5500	800	31.5	0.06
4	12	18000	3000	118.1	1
	20	12000	2000	78.7	0.5
	30	8000	1300	51.2	0.2
	40	4200	700	27.6	0.08
	50	2400	400	15.7	0.03
5	16	14000	2700	106.3	1
	25	9500	1800	70.9	0.5
	35	6400	1200	47.2	0.2
	50	3200	600	23.6	0.05
6	20	11000	2200	86.6	1.2
	30	8000	1600	63.0	0.6
	40	5400	1100	43.3	0.25
	50	3200	640	25.2	0.15
8	30	8000	1600	63.0	1.6
	50	4000	800	31.5	0.5
	70	2000	400	15.7	0.2
10	40	6400	1300	51.2	2
	60	3200	640	25.2	0.6
	80	1600	320	12.6	0.3
Depth of cut		 DC:Dia.			

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

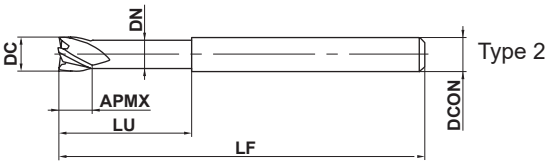
MS4XL – Inch sizes

End mill, Short cut length, 4 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

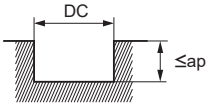
DC≤.2500"				
0 -.0008"				
DCON=.1250"	DCON=.1875"	DCON=.2500"		
0 -.00024"	0 -.00031"	0 -.00035"		

●4 flute long neck end mill.

(inch)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS4XLD1/16N0375	.0625	.0625	.3750	.0601	2.0	.1250	4	●	1
MS4XLD1/16N0500	.0625	.0625	.5000	.0601	2.0	.1250	4	●	1
MS4XLD1/16N0750	.0625	.0625	.7500	.0601	2.0	.1250	4	●	1
MS4XLD3/32N0562	.0938	.0938	.5625	.0898	2.0	.1250	4	●	1
MS4XLD3/32N0750	.0938	.0938	.7500	.0898	2.0	.1250	4	●	1
MS4XLD3/32N1125	.0938	.0938	1.1250	.0898	2.5	.1250	4	●	1
MS4XLD1/8N0750	.1250	.1250	.7500	.1211	2.0	.1250	4	●	2
MS4XLD3/16N1125	.1875	.1875	1.1250	.1836	2.5	.1875	4	●	2
MS4XLD1/4N1500	.2500	.2500	1.5000	.2441	3.0	.2500	4	●	2

RECOMMENDED CUTTING CONDITIONS

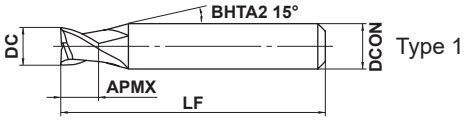
Workpiece Material		Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.		
DC (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0625	**.3750**	40000	121.0	.0028
	.5000	30000	68.0	.0016
	.7500	10000	14.2	.0008
.0938	**.5625**	33000	109.1	.003
	.7500	20000	56.6	.002
	1.1250	10000	18.8	.001
.1250	**.7500**	25000	96.5	.004
.1875	**1.1250**	17000	72.2	.006
.2500	**1.5000**	13000	73.7	.008
Depth of cut		 DC:Dia.		

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions.
Please use the above table as a start reference point.

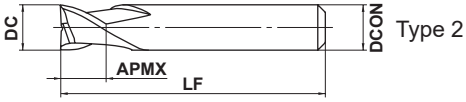
MS2ES

End mill, 2 flute, For Swiss-Type lathes

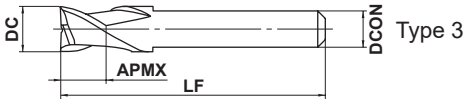
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2



Type 3

3≤DC≤12				
0 - 0.020				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

●2 flute end mill.

Overall length 35mm

(mm)

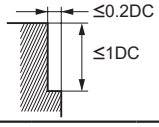
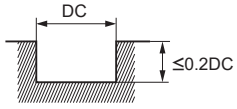
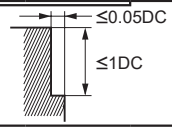
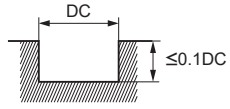
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2ESD0300L35S04	3	3	35	4	2	●	1
MS2ESD0350L35S04	3.5	3.5	35	4	2	●	1
MS2ESD0400L35S04	4	4	35	4	2	●	2
MS2ESD0500L35S05	5	5	35	5	2	●	2
MS2ESD0500L35S06	5	5	35	6	2	●	1
MS2ESD0600L35S05	6	6	35	5	2	●	3
MS2ESD0600L35S06	6	6	35	6	2	●	2
MS2ESD0700L35S07	7	6	35	7	2	●	2
MS2ESD0800L35S07	8	6	35	7	2	●	3
MS2ESD0800L35S08	8	6	35	8	2	●	2
MS2ESD1000L35S07	10	6	35	7	2	●	3
MS2ESD1000L35S10	10	6	35	10	2	●	2
MS2ESD1200L35S10	12	6	35	10	2	●	3

Overall length 45mm

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2ESD0300L45S04	3	3	45	4	2	●	1
MS2ESD0350L45S04	3.5	3.5	45	4	2	●	1
MS2ESD0400L45S04	4	4	45	4	2	●	2
MS2ESD0500L45S06	5	5	45	6	2	●	1
MS2ESD0600L45S06	6	6	45	6	2	●	2
MS2ESD0700L45S07	7	7	45	7	2	●	2
MS2ESD0800L45S07	8	8	45	7	2	●	3
MS2ESD0800L45S08	8	8	45	8	2	●	2
MS2ESD1000L45S07	10	10	45	7	2	●	3
MS2ESD1000L45S10	10	10	45	10	2	●	2
MS2ESD1200L45S10	12	12	45	10	2	●	3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	10000	600	23.6	7000	400	15.7	6000	300	11.8	5000	120	4.7
4	7500	600	23.6	5200	400	15.7	4500	300	11.8	4000	120	4.7
5	6000	600	23.6	4200	400	15.7	3600	300	11.8	3200	120	4.7
6	5000	600	23.6	3500	400	15.7	3000	300	11.8	2700	120	4.7
7	4500	560	22.0	3000	360	14.2	2700	280	11.0	2300	110	4.3
8	4000	520	20.5	2800	350	13.8	2400	260	10.2	2000	110	4.3
10	3200	450	17.7	2200	300	11.8	1900	230	9.1	1600	100	3.9
12	2700	410	16.1	1900	270	10.6	1600	210	8.3	1300	100	3.9
Depth of cut												

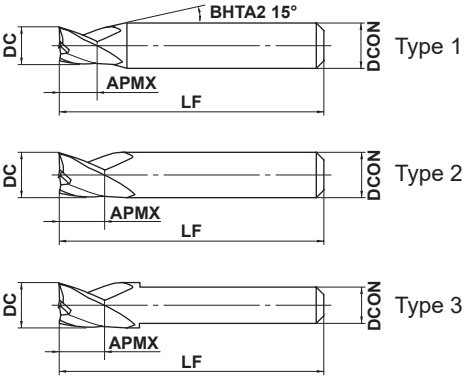
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

MS3ES

End mill, 3 flute, For Swiss-Type lathes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



3≤DC≤12				
0 - 0.020				
4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

● 3 flute end mill.

Overall length 35mm

(mm)

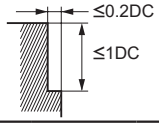
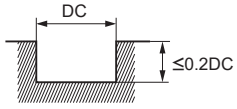
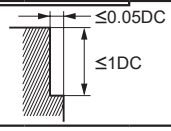
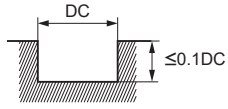
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS3ESD0300L35S04	3	3	35	4	3	●	1
MS3ESD0350L35S04	3.5	3.5	35	4	3	●	1
MS3ESD0400L35S04	4	4	35	4	3	●	2
MS3ESD0500L35S05	5	5	35	5	3	●	2
MS3ESD0500L35S06	5	5	35	6	3	●	1
MS3ESD0600L35S05	6	6	35	5	3	●	3
MS3ESD0600L35S06	6	6	35	6	3	●	2
MS3ESD0700L35S07	7	6	35	7	3	●	2
MS3ESD0800L35S07	8	6	35	7	3	●	3
MS3ESD0800L35S08	8	6	35	8	3	●	2
MS3ESD1000L35S07	10	6	35	7	3	●	3
MS3ESD1000L35S10	10	6	35	10	3	●	2
MS3ESD1200L35S10	12	6	35	10	3	●	3

Overall length 45mm

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS3ESD0300L45S04	3	3	45	4	3	●	1
MS3ESD0350L45S04	3.5	3.5	45	4	3	●	1
MS3ESD0400L45S04	4	4	45	4	3	●	2
MS3ESD0500L45S06	5	5	45	6	3	●	1
MS3ESD0600L45S06	6	6	45	6	3	●	2
MS3ESD0700L45S07	7	7	45	7	3	●	2
MS3ESD0800L45S07	8	8	45	7	3	●	3
MS3ESD0800L45S08	8	8	45	8	3	●	2
MS3ESD1000L45S07	10	10	45	7	3	●	3
MS3ESD1000L45S10	10	10	45	10	3	●	2
MS3ESD1200L45S10	12	12	45	10	3	●	3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	10000	600	23.6	7000	400	15.7	6000	300	11.8	5000	120	4.7
4	7500	600	23.6	5200	400	15.7	4500	300	11.8	4000	120	4.7
5	6000	600	23.6	4200	400	15.7	3600	300	11.8	3200	120	4.7
6	5000	600	23.6	3500	400	15.7	3000	300	11.8	2700	120	4.7
7	4500	560	22.0	3000	360	14.2	2700	280	11.0	2300	110	4.3
8	4000	520	20.5	2800	350	13.8	2400	260	10.2	2000	110	4.3
10	3200	450	17.7	2200	300	11.8	1900	230	9.1	1600	100	3.9
12	2700	410	16.1	1900	270	10.6	1600	210	8.3	1300	100	3.9
Depth of cut												

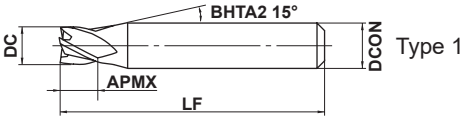
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

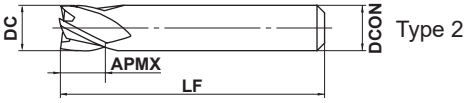
MS4EC

End mill, 4 flute, For Swiss-Type lathes

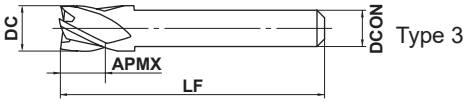
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

4≤DCON≤6	7≤DCON≤10			
0 - 0.008	0 - 0.009			

●4 flute end mill.

Overall length 35mm

(mm)

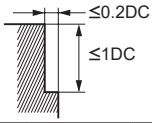
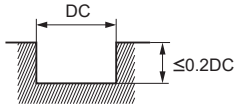
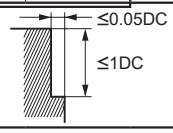
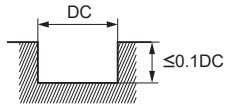
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4ECD0300L35S04	3	3	35	4	4	●	1
MS4ECD0350L35S04	3.5	3.5	35	4	4	●	1
MS4ECD0400L35S04	4	4	35	4	4	●	2
MS4ECD0500L35S05	5	5	35	5	4	●	2
MS4ECD0500L35S06	5	5	35	6	4	●	1
MS4ECD0600L35S05	6	6	35	5	4	●	3
MS4ECD0600L35S06	6	6	35	6	4	●	2
MS4ECD0700L35S07	7	6	35	7	4	●	2
MS4ECD0800L35S07	8	6	35	7	4	●	3
MS4ECD0800L35S08	8	6	35	8	4	●	2
MS4ECD1000L35S07	10	6	35	7	4	●	3
MS4ECD1000L35S10	10	6	35	10	4	●	2
MS4ECD1200L35S10	12	6	35	10	4	●	3

Overall length 45mm

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4ECD0300L45S04	3	3	45	4	4	●	1
MS4ECD0350L45S04	3.5	3.5	45	4	4	●	1
MS4ECD0400L45S04	4	4	45	4	4	●	2
MS4ECD0500L45S06	5	5	45	6	4	●	1
MS4ECD0600L45S06	6	6	45	6	4	●	2
MS4ECD0700L45S07	7	7	45	7	4	●	2
MS4ECD0800L45S07	8	8	45	7	4	●	3
MS4ECD0800L45S08	8	8	45	8	4	●	2
MS4ECD1000L45S07	10	10	45	7	4	●	3
MS4ECD1000L45S10	10	10	45	10	4	●	2
MS4ECD1200L45S10	12	12	45	10	4	●	3
MS4ECD1400L45S10	14	14	45	10	4	●	3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	10000	900	35.4	7000	600	23.6	6000	450	17.7	5000	180	7.1
4	7500	900	35.4	5200	600	23.6	4500	450	17.7	4000	180	7.1
5	6000	900	35.4	4200	600	23.6	3600	450	17.7	3200	180	7.1
6	5000	900	35.4	3500	600	23.6	3000	450	17.7	2700	180	7.1
7	4500	840	33.1	3000	540	21.3	2700	420	16.5	2300	160	6.3
8	4000	780	30.7	2800	520	20.5	2400	390	15.4	2000	160	6.3
10	3200	680	26.8	2200	450	17.7	1900	340	13.4	1600	140	5.5
12	2700	620	24.4	1900	410	16.1	1600	310	12.2	1300	120	4.7
14	2300	550	21.7	1600	350	13.8	1400	280	11.0	1200	120	4.7
Depth of cut												

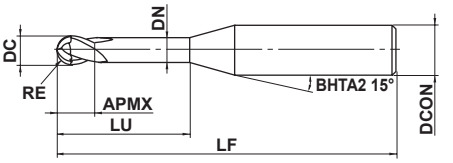
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

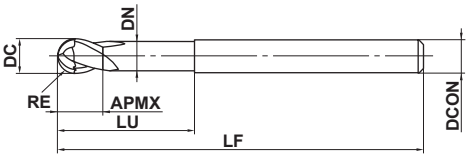
MS2XLB – Inch sizes

Ball nose, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened steel (≤55HRC)	Hardened steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		



Type 1



Type 2

.0078"≤RE≤.1250"				
±.0004"				
DCON=.1250"	DCON=.1875"	DCON=.2500"		
0 - .00024"	0 - .00031"	0 - .00035"		

●2 flute, long neck, ball nose end mill for general purpose.

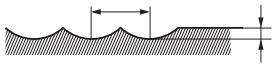
(inch)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MS2XLBD1/64N0094	.00781	.0156	.01563	.0938	.0144	2.0	.1250	2	▲	1
MS2XLBD1/64N0125	.00781	.0156	.01563	.1250	.0144	2.0	.1250	2	▲	1
MS2XLBD1/64N0187	.00781	.0156	.01563	.1875	.0144	2.0	.1250	2	▲	1
MS2XLBD1/32N0187	.01563	.0313	.03125	.1875	.0301	2.0	.1250	2	▲	1
MS2XLBD1/32N0250	.01563	.0313	.03125	.2500	.0301	2.0	.1250	2	▲	1
MS2XLBD1/32N0375	.01563	.0313	.03125	.3750	.0301	2.0	.1250	2	▲	1
MS2XLBD1/16N0375	.03125	.0625	.0625	.3750	.0601	2.0	.1250	2	▲	1
MS2XLBD1/16N0500	.03125	.0625	.0625	.5000	.0601	2.0	.1250	2	▲	1
MS2XLBD1/16N0750	.03125	.0625	.0625	.7500	.0601	2.0	.1250	2	▲	1
MS2XLBD3/32N0562	.04688	.0938	.09375	.5625	.0898	2.0	.1250	2	▲	1
MS2XLBD3/32N0750	.04688	.0938	.09375	.7500	.0898	2.0	.1250	2	▲	1
MS2XLBD3/32N1125	.04688	.0938	.09375	1.1250	.0898	2.5	.1250	2	▲	1
MS2XLBD1/8N0750	.06250	.1250	.1250	.7500	.1211	2.0	.1250	2	▲	2
MS2XLBD3/16N1125	.09375	.1875	.1875	1.1250	.1836	2.5	.1875	2	▲	2
MS2XLBD1/4N1500	.12500	.2500	.2500	1.5000	.2441	3.0	.2500	2	▲	2

▲ : This item to be discontinued with in two years.

ISO13399 ➤ I002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45—55HRC) AISI H13 etc.		
RE (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)
.0078	**.0938**	40000	21.2	.0002
	.1290	30000	17.7	.0002
	.1875	20000	10.6	.0001
.0156	**.1875**	40000	70.8	.0008
	.2500	25000	44.3	.0008
	.3750	15000	26.6	.0004
.0313	**.3750**	40000	113.4	.0028
	.5000	30000	85.1	.0016
	.7500	10000	28.4	.0008
.0469	**.5625**	40000	141.8	.003
	.7500	20000	70.8	.002
	1.1250	10000	35.5	.001
.0625	**.7500**	30000	124.0	.004
.0938	**1.1250**	20000	106.3	.006
.1250	**1.5000**	15000	106.3	.008
Depth of cut		≤0.1RE (RE≤3/64) ≤0.2RE (RE>3/64)  ≤ap RE : Radius		

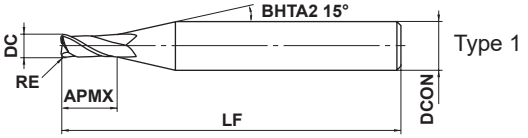
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

MS2MRB

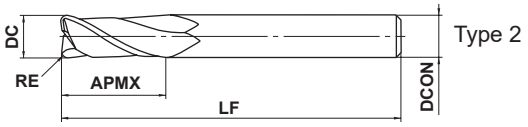
Corner radius, Medium cut length, 2 flute

UWC MS 30° DC<3 DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

1≤DC≤12				
0 -0.020				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 -0.008	0 -0.009	0 -0.011		

●2 flute corner radius end mill for general use.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MRBD0100R010	1	0.1	2	40	4	2	★	1
MS2MRBD0100R020	1	0.2	2	40	4	2	●	1
MS2MRBD0100R030	1	0.3	2	40	4	2	●	1
MS2MRBD0150R010	1.5	0.1	3	40	4	2	★	1
MS2MRBD0150R020	1.5	0.2	3	40	4	2	●	1
MS2MRBD0150R030	1.5	0.3	3	40	4	2	●	1
MS2MRBD0150R050	1.5	0.5	3	40	4	2	●	1
MS2MRBD0200R010	2	0.1	4	40	4	2	★	1
MS2MRBD0200R020	2	0.2	4	40	4	2	●	1
MS2MRBD0200R030	2	0.3	4	40	4	2	●	1
MS2MRBD0200R050	2	0.5	4	40	4	2	●	1
MS2MRBD0250R010	2.5	0.1	5	40	4	2	★	1
MS2MRBD0250R020	2.5	0.2	5	40	4	2	●	1
MS2MRBD0250R030	2.5	0.3	5	40	4	2	●	1
MS2MRBD0250R050	2.5	0.5	5	40	4	2	●	1
MS2MRBD0300R010	3	0.1	6	50	6	2	★	1
MS2MRBD0300R020	3	0.2	6	50	6	2	●	1
MS2MRBD0300R030	3	0.3	6	50	6	2	●	1
MS2MRBD0300R050	3	0.5	6	50	6	2	●	1
MS2MRBD0300R100	3	1	6	50	6	2	●	1
MS2MRBD0400R010	4	0.1	8	50	6	2	★	1
MS2MRBD0400R020	4	0.2	8	50	6	2	●	1
MS2MRBD0400R030	4	0.3	8	50	6	2	●	1
MS2MRBD0400R050	4	0.5	8	50	6	2	●	1
MS2MRBD0400R100	4	1	8	50	6	2	●	1
MS2MRBD0500R010	5	0.1	10	50	6	2	★	1
MS2MRBD0500R020	5	0.2	10	50	6	2	●	1
MS2MRBD0500R030	5	0.3	10	50	6	2	●	1
MS2MRBD0500R050	5	0.5	10	50	6	2	●	1
MS2MRBD0500R100	5	1	10	50	6	2	●	1
MS2MRBD0600R010	6	0.1	12	50	6	2	★	2

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS2MRBD0600R020	6	0.2	12	50	6	2	●	2
MS2MRBD0600R030	6	0.3	12	50	6	2	●	2
MS2MRBD0600R050	6	0.5	12	50	6	2	●	2
MS2MRBD0600R100	6	1	12	50	6	2	●	2
MS2MRBD0600R150	6	1.5	12	50	6	2	●	2
MS2MRBD0600R200	6	2	12	50	6	2	●	2
MS2MRBD0800R020	8	0.2	16	60	8	2	★	2
MS2MRBD0800R030	8	0.3	16	60	8	2	★	2
MS2MRBD0800R050	8	0.5	16	60	8	2	★	2
MS2MRBD0800R100	8	1	16	60	8	2	★	2
MS2MRBD0800R150	8	1.5	16	60	8	2	★	2
MS2MRBD0800R200	8	2	16	60	8	2	★	2
MS2MRBD0800R250	8	2.5	16	60	8	2	★	2
MS2MRBD0800R300	8	3	16	60	8	2	★	2
MS2MRBD1000R020	10	0.2	20	70	10	2	★	2
MS2MRBD1000R030	10	0.3	20	70	10	2	★	2
MS2MRBD1000R050	10	0.5	20	70	10	2	★	2
MS2MRBD1000R100	10	1	20	70	10	2	★	2
MS2MRBD1000R150	10	1.5	20	70	10	2	★	2
MS2MRBD1000R200	10	2	20	70	10	2	★	2
MS2MRBD1000R250	10	2.5	20	70	10	2	★	2
MS2MRBD1000R300	10	3	20	70	10	2	★	2
MS2MRBD1200R020	12	0.2	24	75	12	2	★	2
MS2MRBD1200R030	12	0.3	24	75	12	2	★	2
MS2MRBD1200R050	12	0.5	24	75	12	2	★	2
MS2MRBD1200R100	12	1	24	75	12	2	★	2
MS2MRBD1200R150	12	1.5	24	75	12	2	★	2
MS2MRBD1200R200	12	2	24	75	12	2	★	2
MS2MRBD1200R250	12	2.5	24	75	12	2	★	2
MS2MRBD1200R300	12	3	24	75	12	2	★	2

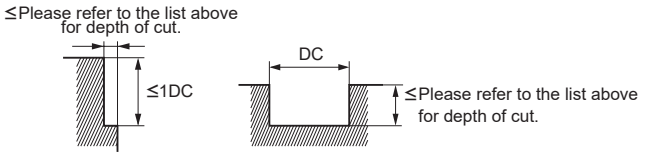
MS2MRB

Corner radius, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel, Pre-hardened steel AISI 1050, AISI No 35 B, AISI P20, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20
5	12000	1600	63.0	0.50	9000	900	35.4	0.25
6	10000	1400	55.1	0.60	7000	700	27.6	0.30
8	8000	1000	39.4	0.80	5600	550	21.7	0.40
10	6400	900	35.4	1.00	4500	500	19.7	0.50
12	5400	820	32.3	1.00	3800	450	17.7	0.50

Depth of cut



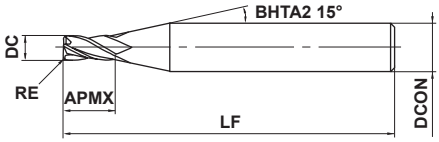
DC:Dia.

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) In case of slotting with over 3 mm endmill, please reduce revolution to 50—70% of above value, and reduce feed rate to 40—60% of above value.
Note 3) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

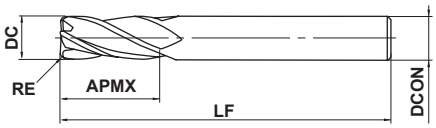
MS4MRB

Corner radius, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type 1



Type 2

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	**8≤DCON≤10**	**12≤DCON≤16**	**DCON=20**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

●4 flute corner radius end mill for general use.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MRBD0300R010	3	0.1	8	45	6	4	★	1
MS4MRBD0300R020	3	0.2	8	45	6	4	★	1
MS4MRBD0300R030	3	0.3	8	45	6	4	★	1
MS4MRBD0300R050	3	0.5	8	45	6	4	★	1
MS4MRBD0300R100	3	1	8	45	6	4	★	1
MS4MRBD0400R010	4	0.1	11	45	6	4	★	1
MS4MRBD0400R020	4	0.2	11	45	6	4	★	1
MS4MRBD0400R030	4	0.3	11	45	6	4	★	1
MS4MRBD0400R050	4	0.5	11	45	6	4	★	1
MS4MRBD0400R100	4	1	11	45	6	4	★	1
MS4MRBD0500R010	5	0.1	13	50	6	4	★	1
MS4MRBD0500R020	5	0.2	13	50	6	4	★	1
MS4MRBD0500R030	5	0.3	13	50	6	4	★	1
MS4MRBD0500R050	5	0.5	13	50	6	4	★	1
MS4MRBD0500R100	5	1	13	50	6	4	★	1
MS4MRBD0600R010	6	0.1	13	50	6	4	★	2
MS4MRBD0600R020	6	0.2	13	50	6	4	★	2
MS4MRBD0600R030	6	0.3	13	50	6	4	★	2
MS4MRBD0600R050	6	0.5	13	50	6	4	★	2
MS4MRBD0600R100	6	1	13	50	6	4	★	2
MS4MRBD0600R150	6	1.5	13	50	6	4	★	2
MS4MRBD0600R200	6	2	13	50	6	4	★	2
MS4MRBD0800R020	8	0.2	19	60	8	4	★	2
MS4MRBD0800R030	8	0.3	19	60	8	4	★	2
MS4MRBD0800R050	8	0.5	19	60	8	4	★	2
MS4MRBD0800R100	8	1	19	60	8	4	★	2
MS4MRBD0800R150	8	1.5	19	60	8	4	★	2
MS4MRBD0800R200	8	2	19	60	8	4	★	2
MS4MRBD0800R250	8	2.5	19	60	8	4	★	2
MS4MRBD0800R300	8	3	19	60	8	4	★	2
MS4MRBD1000R020	10	0.2	22	70	10	4	★	2

★ : Stocked in Japan

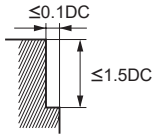
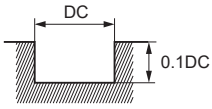
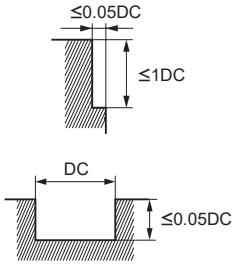
MS4MRB

Corner radius, Medium cut length, 4 flute

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MS4MRBD1000R030	10	0.3	22	70	10	4	★	2
MS4MRBD1000R050	10	0.5	22	70	10	4	★	2
MS4MRBD1000R100	10	1	22	70	10	4	★	2
MS4MRBD1000R150	10	1.5	22	70	10	4	★	2
MS4MRBD1000R200	10	2	22	70	10	4	★	2
MS4MRBD1000R250	10	2.5	22	70	10	4	★	2
MS4MRBD1000R300	10	3	22	70	10	4	★	2
MS4MRBD1200R020	12	0.2	26	75	12	4	★	2
MS4MRBD1200R030	12	0.3	26	75	12	4	★	2
MS4MRBD1200R050	12	0.5	26	75	12	4	★	2
MS4MRBD1200R100	12	1	26	75	12	4	★	2
MS4MRBD1200R150	12	1.5	26	75	12	4	★	2
MS4MRBD1200R200	12	2	26	75	12	4	★	2
MS4MRBD1200R250	12	2.5	26	75	12	4	★	2
MS4MRBD1200R300	12	3	26	75	12	4	★	2
MS4MRBD1600R050	16	0.5	32	90	16	4	★	2
MS4MRBD1600R100	16	1	32	90	16	4	★	2
MS4MRBD1600R150	16	1.5	32	90	16	4	★	2
MS4MRBD1600R200	16	2	32	90	16	4	★	2
MS4MRBD1600R250	16	2.5	32	90	16	4	★	2
MS4MRBD1600R300	16	3	32	90	16	4	★	2
MS4MRBD2000R050	20	0.5	38	100	20	4	★	2
MS4MRBD2000R100	20	1	38	100	20	4	★	2
MS4MRBD2000R150	20	1.5	38	100	20	4	★	2
MS4MRBD2000R200	20	2	38	100	20	4	★	2
MS4MRBD2000R250	20	2.5	38	100	20	4	★	2
MS4MRBD2000R300	20	3	38	100	20	4	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (—30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45—55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	16000	1500	59.1	10000	800	31.5	7400	480	18.9	8000	240	9.4
4	12000	1800	70.9	8000	1000	39.4	5600	600	23.6	6000	240	9.4
5	9600	1800	70.9	6400	1000	39.4	4400	600	23.6	4800	240	9.4
6	8000	1800	70.9	5300	1000	39.4	3700	600	23.6	4000	240	9.4
8	6000	1600	63.0	4000	900	35.4	2800	560	22.0	3000	240	9.4
10	4800	1400	55.1	3200	800	31.5	2200	500	19.7	2400	240	9.4
12	4000	1200	47.2	2700	700	27.6	1800	430	16.9	2000	230	9.1
16	3000	960	37.8	2000	560	22.0	1400	360	14.2	1500	190	7.5
20	2400	800	31.5	1600	480	18.9	1100	300	11.8	1200	170	6.7
Depth of cut	 											

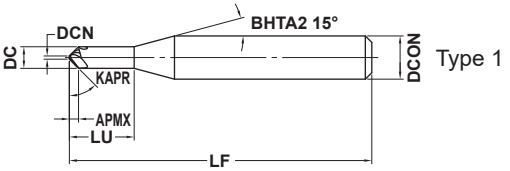
DC:Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

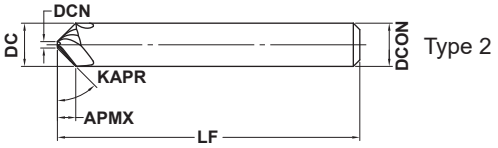
MP3C NEW

Chamfer cutter, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎		



Type 1



Type 2

DCN				
±0.03				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

●The optimum helix flutes provides great sharpness and suppresses the occurrence of burrs.

(mm)

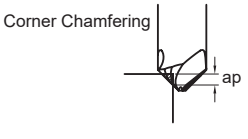
Order Number	DC	DCN	APMX	KAPR	LU	LF	DCON	No. of Flutes	Stock	Type
MP3CD0200	2	0.3	0.85	45°	6	50	6	3	●	1
MP3CD0400	4	0.3	1.85	45°	12	50	6	3	●	1
MP3CD0600	6	0.3	2.85	45°	—	50	6	3	●	2
MP3CD0800	8	0.4	3.8	45°	—	60	8	3	●	2
MP3CD1000	10	0.5	4.75	45°	—	70	10	3	★	2
MP3CD1200	12	0.5	5.75	45°	—	75	12	3	●	2

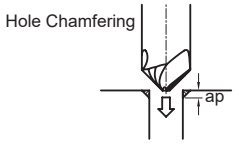
RECOMMENDED CUTTING CONDITIONS

■Corner and Hole Chamfering

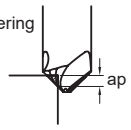
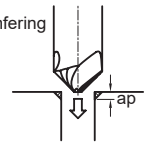
Workpiece Material		Carbon Steel, Ductile Cast Iron, Non-alloy Steel (C≥0.55%)				Alloy Steel (325HB) (38—45HRC)			
DC		Revolution **n**	Table Feed **vf**	Corner Chamfering **ap**	Hole Chamfering **ap**	Revolution **n**	Table Feed **vf**	Corner Chamfering **ap**	Hole Chamfering **ap**
(mm)	(inch)	(min^{-1})	(IPM)	(inch)	(inch)	(min^{-1})	(IPM)	(inch)	(inch)
2	**.079**	16000	55.1	≤.024	≤.016	11000	35.0	≤.024	≤.016
4	**.157**	8000	28.3	≤.047	≤.031	5600	17.7	≤.047	≤.031
6	**.236**	5300	18.9	≤.071	≤.047	3700	11.8	≤.071	≤.047
8	**.315**	4000	14.2	≤.094	≤.063	2800	9.1	≤.094	≤.063
10	**.394**	3200	11.4	≤.098	≤.079	2200	7.1	≤.098	≤.079
12	**.472**	2700	9.4	≤.098	≤.094	1900	5.9	≤.098	≤.094

Depth of Cut



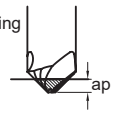


Note 1) For austenitic stainless steel the use of water-soluble coolant is effective.
Note 2) The revolution and feed rate can be increased with a smaller depth of cut.
Note 3) Vibration may occur if the rigidity of machine or workpiece material is low. In this case, please reduce the revolution and feed rate proportionately.

Workpiece Material		Austenitic stainless steel, Titanium alloy				Hardened Steel (45—55HRC)			
DC		Revolution **n**	Table Feed **vf**	Corner Chamfering **ap**	Hole Chamfering **ap**	Revolution **n**	Table Feed **vf**	Corner Chamfering **ap**	Hole Chamfering **ap**
(mm)	(inch)	(min^{-1})	(IPM)	(inch)	(inch)	(min^{-1})	(IPM)	(inch)	(inch)
2	**.079**	9500	26.8	≤.024	≤.016	8000	18.9	≤.024	≤.016
4	**.157**	4800	13.8	≤.047	≤.031	4000	9.4	≤.047	≤.031
6	**.236**	3200	9.1	≤.071	≤.047	2700	6.3	≤.071	≤.047
8	**.315**	2400	6.7	≤.094	≤.063	2000	4.7	≤.094	≤.063
10	**.394**	1900	5.5	≤.098	≤.079	1600	3.8	≤.098	≤.079
12	**.472**	1600	4.7	≤.098	≤.094	1300	3.1	≤.098	≤.094
Depth of Cut		Corner Chamfering 				Hole Chamfering 			

Note 1) For austenitic stainless steel the use of water-soluble coolant is effective.
Note 2) The revolution and feed rate can be increased with a smaller depth of cut.
Note 3) Vibration may occur if the rigidity of machine or workpiece material is low. In this case, please reduce the revolution and feed rate proportionately.

■V-Grooving

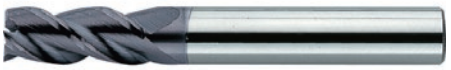
Workpiece Material		Carbon Steel, Ductile Cast Iron, Non-alloy Steel (C≥0.55%)			Alloy Steel (325HB) (38—45HRC)			Austenitic stainless steel, Titanium Alloys			Hardened Steel (45—55HRC)		
DC		Revolution **n**	Table Feed **vf**	Depth of Cut **ap**	Revolution **n**	Table Feed **vf**	Depth of Cut **ap**	Revolution **n**	Table Feed **vf**	Depth of Cut **ap**	Revolution **n**	Table Feed **vf**	Depth of Cut **ap**
(mm)	(inch)	(min^{-1})	(IPM)	(inch)	(min^{-1})	(IPM)	(inch)	(min^{-1})	(IPM)	(inch)	(min^{-1})	(IPM)	(inch)
2	**.079**	13000	37.0	≤.055	9500	24.4	≤.055	8000	18.1	≤.055	6400	12.2	≤.055
4	**.157**	6400	18.1	≤.110	4800	12.2	≤.110	4000	9.1	≤.110	3200	5.9	≤.110
6	**.236**	4200	11.8	≤.165	3200	8.3	≤.165	2700	6.3	≤.165	2100	3.9	≤.165
8	**.315**	3200	9.1	≤.220	2400	6.3	≤.220	2000	4.7	≤.220	1600	3.0	≤.220
10	**.394**	2500	7.1	≤.276	1900	4.7	≤.276	1600	3.6	≤.276	1300	2.4	≤.276
12	**.472**	2100	5.9	≤.331	1600	3.9	≤.331	1300	3.0	≤.331	1100	2.1	≤.331
Depth of Cut		V-Grooving Milling 											

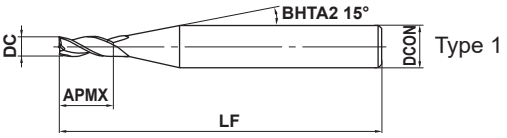
Note 1) For austenitic stainless steel the use of water-soluble coolant is effective.
Note 2) The revolution and feed rate can be increased with a smaller depth of cut.
Note 3) Vibration may occur if the rigidity of machine or workpiece material is low. In this case, please reduce the revolution and feed rate proportionately.

MP3MC - Inch sizes

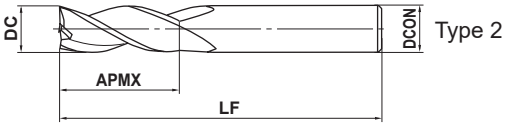
End mill, Medium cut length, 3 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		





Type 1



Type 2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
DCON=.1250"	.250"≤DCON≤.375"	DCON=.500"		
0 - .00024"	0 - .00035"	0 - .00043"		

(inch)

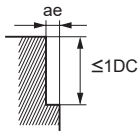
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP3MCD1/32	.0312	.0780	1.50	.1250	3	●	1
MP3MCD1/16	.0625	.1560	1.50	.1250	3	●	1
MP3MCD3/32	.0938	.2340	1.50	.1250	3	●	1
MP3MCD1/8	.1250	.3130	1.50	.1250	3	●	2
MP3MCD5/32	.1562	.3910	2.00	.2500	3	●	1
MP3MCD3/16	.1875	.4690	2.00	.2500	3	●	1
MP3MCD7/32	.2188	.5470	2.50	.2500	3	●	1
MP3MCD1/4	.2500	.6250	2.50	.2500	3	●	2
MP3MCD5/16	.3125	.7810	2.75	.3125	3	●	2
MP3MCD3/8	.3750	.9380	3.00	.3750	3	●	2
MP3MCD1/2	.5000	1.2500	3.50	.5000	3	●	2

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon Steel, Alloy Steel (≤280HB) Mild Steel			Carbon Steel, Alloy Steel (>280HB) Alloy Tool Steel Pre-hardened Steel			Austenitic Stainless Steel Titanium Alloy			Hardened Steel (40-55HRC)		
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)
1/32	30000	53.1	.006	30000	53.1	.006	28000	49.6	.006	20000	35.4	.002
1/16	30000	70.9	.012	15000	35.4	.012	14000	33.1	.012	10000	23.6	.003
3/32	13400	31.7	.019	10000	23.6	.019	9400	22.2	.019	6700	15.8	.006
1/8	10000	35.4	.025	7500	26.6	.025	7000	24.8	.025	5000	17.7	.006
5/32	8000	33.1	.031	6000	24.8	.031	5600	23.1	.031	4000	16.5	.008
3/16	6700	31.7	.037	5000	23.6	.037	4700	22.2	.037	3300	15.6	.009
7/32	5700	26.9	.044	4300	20.3	.044	4000	18.9	.044	2900	13.7	.011
1/4	5000	26.6	.050	3800	20.2	.050	3500	18.6	.050	2500	13.3	.013
5/16	4000	23.6	.062	3000	17.7	.062	2800	16.5	.062	2000	11.8	.016
3/8	3300	23.4	.075	2500	17.7	.075	2300	16.3	.075	1700	12.0	.019
1/2	2500	17.7	.100	1900	13.5	.100	1800	12.8	.100	1300	9.2	.025

Depth of Cut



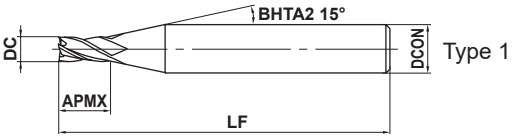
DC : Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

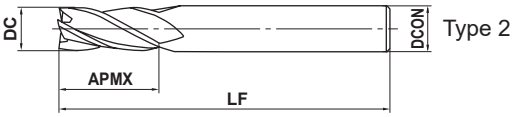
MP4MC - Inch sizes

End mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		



Type 1



Type 2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
DCON=.1250"	.250"≤DCON≤.375"	DCON=.500"		
0 - .00024"	0 - .00035"	0 - .00043"		

(inch)

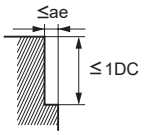
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP4MCD1/32	.0312	.0780	1.50	.1250	4	●	1
MP4MCD1/16	.0625	.1560	1.50	.1250	4	●	1
MP4MCD3/32	.0938	.2340	1.50	.1250	4	●	1
MP4MCD1/8	.1250	.3130	1.50	.1250	4	●	2
MP4MCD5/32	.1562	.3910	2.00	.2500	4	●	1
MP4MCD3/16	.1875	.4690	2.00	.2500	4	●	1
MP4MCD7/32	.2188	.5470	2.50	.2500	4	●	1
MP4MCD1/4	.2500	.6250	2.50	.2500	4	●	2
MP4MCD5/16	.3125	.7810	2.75	.3125	4	●	2
MP4MCD3/8	.3750	.9380	3.00	.3750	4	●	2
MP4MCD1/2	.5000	1.2500	3.50	.5000	4	●	2

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon Steel, Alloy Steel (≤280HB) Mild Steel			Carbon Steel,Alloy Steel (>280HB) Alloy Tool Steel Pre-hardened Steel			Austenitic Stainless Steel Titanium Alloy			Hardened Steel (40-55HRC)		
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)
1/32	30000	70.9	.006	30000	70.9	.006	28000	66.1	.006	20000	47.2	.002
1/16	20100	63.3	.012	15000	47.2	.012	14000	44.1	.012	10000	31.5	.003
3/32	13400	42.2	.019	10000	31.5	.019	9400	29.6	.019	6700	21.1	.005
1/8	10000	47.2	.025	7500	35.4	.025	7000	33.1	.025	5000	23.6	.006
5/32	8000	44.1	.031	6000	33.1	.031	5600	30.9	.031	4000	22.0	.008
3/16	6700	42.2	.037	5000	31.5	.037	4700	29.6	.037	3300	20.8	.009
7/32	5700	35.9	.044	4300	27.1	.044	4000	25.2	.044	2900	18.3	.011
1/4	5000	35.4	.050	3800	26.9	.050	3500	24.8	.050	2500	17.7	.013
5/16	4000	31.5	.062	3000	23.6	.062	2800	22.0	.062	2000	15.7	.016
3/8	3300	31.2	.075	2500	23.6	.075	2300	21.7	.075	1700	16.1	.019
1/2	2500	23.6	.100	1900	18.0	.100	1800	17.0	.100	1300	12.3	.025

Depth of Cut



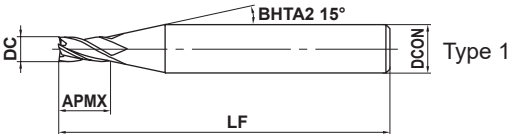
DC : Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

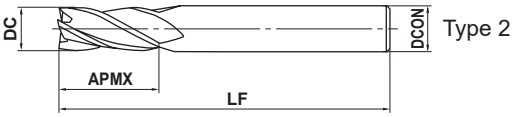
MP4JC - Inch sizes

End mill, Semi long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		



Type 1



Type 2

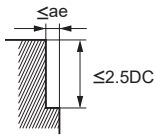
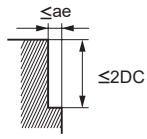
DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
DCON=.1250"	.250"≤DCON≤.375"	DCON=.500"		
0 - .00024"	0 - .00035"	0 - .00043"		

(inch)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP4JCD1/16	.0625	.2500	1.50	.1250	4	●	1
MP4JCD3/32	.0938	.3750	1.50	.1250	4	●	1
MP4JCD1/8	.1250	.5000	2.00	.1250	4	●	2
MP4JCD3/16	.1875	.7500	2.50	.2500	4	●	1
MP4JCD1/4	.2500	1.0000	2.50	.2500	4	●	2
MP4JCD5/16	.3125	1.2500	2.75	.3125	4	●	2
MP4JCD3/8	.3750	1.5000	3.50	.3750	4	●	2
MP4JCD1/2	.5000	2.0000	4.50	.5000	4	●	2

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon Steel, Alloy Steel (≤280HB) Mild Steel			Carbon Steel, Alloy Steel (>280HB) Alloy Tool Steel Pre-hardened Steel			Austenitic Stainless Steel Titanium Alloy			Hardened Steel (40-55HRC)		
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)
1/16	18100	39.9	.012	14000	30.9	.012	12000	26.5	.012	10000	22.0	.0010
3/32	12000	26.5	.019	9400	20.7	.019	8000	17.6	.019	6700	14.8	.0020
1/8	9000	29.8	.025	7000	23.1	.025	6000	19.8	.025	5000	16.5	.0030
3/16	6000	26.5	.037	4700	20.7	.037	4000	17.6	.037	3300	14.6	.0040
1/4	4500	22.7	.050	3500	17.6	.050	3000	15.1	.050	2500	12.6	.0050
5/16	3600	19.8	.062	2800	15.4	.062	2400	13.2	.062	2000	11.0	.0060
3/8	3000	19.8	.075	2300	15.2	.075	2000	13.2	.075	1700	11.3	.0080
1/2	2300	15.2	.100	1800	11.9	.100	1500	9.9	.100	1300	8.6	.0100
Depth of Cut												

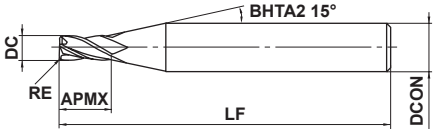
DC : Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

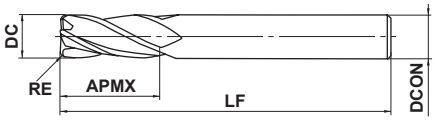
MP4MRB - Inch sizes

Corner radius, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○		



Type 1



Type 2

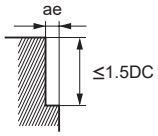
	RE<.0200"	.0200"≤RE≤.0450"		
DC<.3750"	±.0006"	±.0008"		
DC=.5000"	±.0008"	±.0008"		
DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
DCON=.1250"	.250"≤DCON≤.375"	DCON=.500"		
0 - .00024"	0 - .00035"	0 - .00043"		

(inch)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
MP4MRBD1/8R010	.1250	.0100	.3130	1.50	.1250	4	●	2
MP4MRBD1/8R015	.1250	.0150	.3130	1.50	.1250	4	●	2
MP4MRBD1/8R020	.1250	.0200	.3130	1.50	.1250	4	●	2
MP4MRBD3/16R010	.1875	.0100	.4690	2.00	.2500	4	●	1
MP4MRBD3/16R015	.1875	.0150	.4690	2.00	.2500	4	●	1
MP4MRBD3/16R020	.1875	.0200	.4690	2.00	.2500	4	●	1
MP4MRBD3/16R030	.1875	.0300	.4690	2.00	.2500	4	●	1
MP4MRBD1/4R010	.2500	.0100	.6250	2.50	.2500	4	●	2
MP4MRBD1/4R015	.2500	.0150	.6250	2.50	.2500	4	●	2
MP4MRBD1/4R020	.2500	.0200	.6250	2.50	.2500	4	●	2
MP4MRBD1/4R030	.2500	.0300	.6250	2.50	.2500	4	●	2
MP4MRBD1/4R045	.2500	.0450	.6250	2.50	.2500	4	●	2
MP4MRBD5/16R015	.3125	.0150	.7810	2.75	.3125	4	●	2
MP4MRBD5/16R020	.3125	.0200	.7810	2.75	.3125	4	●	2
MP4MRBD5/16R030	.3125	.0300	.7810	2.75	.3125	4	●	2
MP4MRBD5/16R045	.3125	.0450	.7810	2.75	.3125	4	●	2
MP4MRBD3/8R015	.3750	.0150	.9380	3.00	.3750	4	●	2
MP4MRBD3/8R020	.3750	.0200	.9380	3.00	.3750	4	●	2
MP4MRBD3/8R030	.3750	.0300	.9380	3.00	.3750	4	●	2
MP4MRBD3/8R045	.3750	.0450	.9380	3.00	.3750	4	●	2
MP4MRBD1/2R015	.5000	.0150	1.2500	3.50	.5000	4	●	2
MP4MRBD1/2R020	.5000	.0200	1.2500	3.50	.5000	4	●	2
MP4MRBD1/2R030	.5000	.0300	1.2500	3.50	.5000	4	●	2
MP4MRBD1/2R045	.5000	.0450	1.2500	3.50	.5000	4	●	2

RECOMMENDED CUTTING CONDITIONS

Side milling

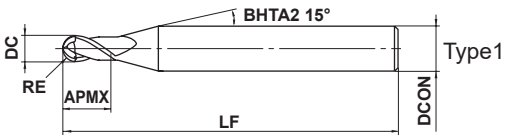
Workpiece Material	Carbon Steel, Alloy Steel (≤280HB) Mild Steel			Carbon Steel, Alloy Steel (>280HB) Alloy Tool Steel Pre-hardened Steel			Austenitic Stainless Steel Titanium Alloy			Hardened Steel (40-55HRC)		
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ae** (inch)
1/8	10000	47.2	.025	7500	8.9	.025	7000	8.3	.025	5000	5.9	.006
3/16	6700	42.2	.037	5000	7.9	.037	4700	7.4	.037	3300	5.2	.009
1/4	5000	35.4	.050	3800	6.7	.050	3500	6.2	.050	2500	4.4	.013
5/16	4000	31.5	.062	3000	5.9	.062	2800	5.5	.062	2000	3.9	.016
3/8	3300	31.2	.075	2500	5.9	.075	2300	5.4	.075	1700	4.0	.019
1/2	2500	23.6	.100	1900	4.5	.100	1800	4.3	.100	1300	3.1	.025
Depth of Cut	 DC : Dia.											

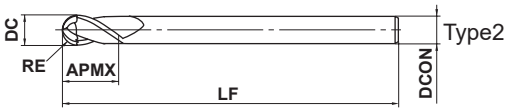
Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

MP2SSB

Ball nose, Short cut length, 2 flute, Short shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○	○	





0.1≤RE≤6				
±0.005				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

●2-flute ball nose end mills with short cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

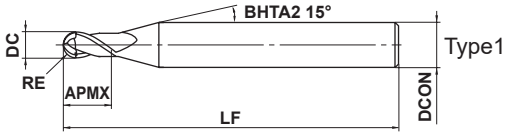
(mm)

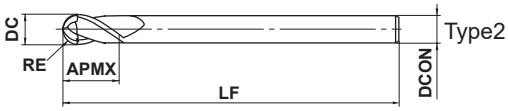
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2SSBR0010	0.1	0.2	0.2	40	4	2	●	1
MP2SSBR0020	0.2	0.4	0.4	40	4	2	●	1
MP2SSBR0030	0.3	0.6	0.6	40	4	2	●	1
MP2SSBR0040	0.4	0.8	0.8	40	4	2	●	1
MP2SSBR0050	0.5	1	1	40	4	2	●	1
MP2SSBR0050S06	0.5	1	1	40	6	2	●	1
MP2SSBR0075	0.75	1.5	1.5	40	4	2	●	1
MP2SSBR0075S06	0.75	1.5	1.5	40	6	2	●	1
MP2SSBR0100	1	2	2	45	6	2	●	1
MP2SSBR0150	1.5	3	3	45	6	2	●	1
MP2SSBR0200	2	4	4	45	6	2	●	1
MP2SSBR0250	2.5	5	5	50	6	2	●	1
MP2SSBR0300	3	6	6	50	6	2	●	2
MP2SSBR0400	4	8	8	60	8	2	●	2
MP2SSBR0500	5	10	10	70	10	2	●	2
MP2SSBR0600	6	12	12	75	12	2	●	2

MP2SB

Ball nose, Short cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○	○	





0.1≤RE≤6				
±0.005				
4≤DCON≤6	8≤DCON≤10	DCON=12		
0 - 0.005	0 - 0.006	0 - 0.008		

●2-flute ball nose end mills with short cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

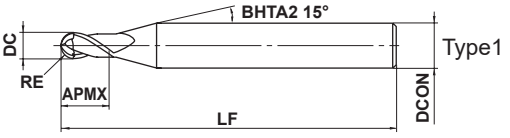
(mm)

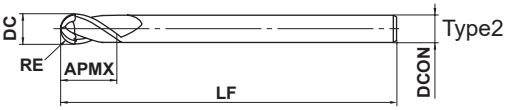
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2SBR0010	0.1	0.2	0.3	45	4	2	●	1
MP2SBR0015	0.15	0.3	0.5	45	4	2	●	1
MP2SBR0020	0.2	0.4	0.6	45	4	2	●	1
MP2SBR0020S06	0.2	0.4	0.6	50	6	2	●	1
MP2SBR0025	0.25	0.5	0.8	45	4	2	●	1
MP2SBR0030	0.3	0.6	0.9	45	4	2	●	1
MP2SBR0030S06	0.3	0.6	0.9	50	6	2	●	1
MP2SBR0035	0.35	0.7	1.1	45	4	2	●	1
MP2SBR0040	0.4	0.8	1.2	45	4	2	●	1
MP2SBR0040S06	0.4	0.8	1.2	50	6	2	●	1
MP2SBR0045	0.45	0.9	1.4	45	4	2	●	1
MP2SBR0050	0.5	1	1.5	45	4	2	●	1
MP2SBR0050S06	0.5	1	1.5	50	6	2	●	1
MP2SBR0060	0.6	1.2	1.8	45	4	2	●	1
MP2SBR0070	0.7	1.4	2.1	45	4	2	●	1
MP2SBR0075	0.75	1.5	2.3	45	4	2	●	1
MP2SBR0075S06	0.75	1.5	2.3	50	6	2	●	1
MP2SBR0080	0.8	1.6	2.4	45	4	2	●	1
MP2SBR0090	0.9	1.8	2.7	45	4	2	●	1
MP2SBR0100	1	2	3	50	4	2	●	1
MP2SBR0100S06	1	2	3	50	6	2	●	1
MP2SBR0125	1.25	2.5	3.8	50	4	2	●	1
MP2SBR0150	1.5	3	4.5	70	6	2	●	1
MP2SBR0200	2	4	6	70	6	2	●	1
MP2SBR0250	2.5	5	7.5	80	6	2	●	1
MP2SBR0300	3	6	9	80	6	2	●	2
MP2SBR0400	4	8	12	90	8	2	●	2
MP2SBR0500	5	10	15	100	10	2	●	2
MP2SBR0600	6	12	18	110	12	2	●	2

MP2MB

Ball nose, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○	○	





	0.25≤RE≤6				
	±0.005				
h5	4≤DCON≤6	8≤DCON≤10	DCON=12		
	0 - 0.005	0 - 0.006	0 - 0.008		
h6	DCON=3				
	0 - 0.006				

●2-flute ball nose end mills with medium cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

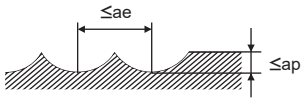
(mm)

Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2MBR0025	0.25	0.5	1	45	4	2	●	1
MP2MBR0030	0.3	0.6	1.2	45	4	2	●	1
MP2MBR0040	0.4	0.8	1.6	45	4	2	●	1
MP2MBR0050	0.5	1	2.5	45	4	2	●	1
MP2MBR0060	0.6	1.2	2.5	45	4	2	●	1
MP2MBR0070	0.7	1.4	3	45	4	2	●	1
MP2MBR0075	0.75	1.5	4	45	4	2	●	1
MP2MBR0080	0.8	1.6	4	45	4	2	●	1
MP2MBR0090	0.9	1.8	5	45	4	2	●	1
MP2MBR0100	1	2	6	50	4	2	●	1
MP2MBR0125	1.25	2.5	6	50	4	2	●	1
MP2MBR0150S03	1.5	3	8	70	3	2	●	2
MP2MBR0150	1.5	3	8	70	6	2	●	1
MP2MBR0175	1.75	3.5	8	70	6	2	●	1
MP2MBR0200S04	2	4	8	70	4	2	●	2
MP2MBR0200	2	4	8	70	6	2	●	1
MP2MBR0250	2.5	5	12	80	6	2	●	1
MP2MBR0300	3	6	12	80	6	2	●	2
MP2MBR0400	4	8	14	90	8	2	●	2
MP2MBR0500	5	10	18	100	10	2	●	2
MP2MBR0600	6	12	22	110	12	2	●	2

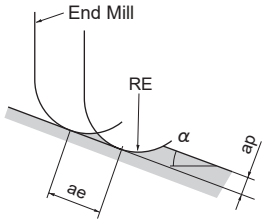
Ball nose, Short cut length, 2 flute, Short shank **MP2SSB**

Ball nose, Short cut length, 2 flute **MP2SB** Ball nose, Medium cut length, 2 flute **MP2MB**

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Mild Steel, Carbon Steel (180−280HB), Alloy Steel, Pre-hardened Steel, Hardened steel (−45HRC)						Austenitic Stainless Steel (≤200HB) Titanium Alloy					
RE (mm)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
R0.1	40000	11.8	40000	9.8	.0001	.0008	40000	11.8	40000	9.8	.0001	.0008
R0.15	40000	19.7	40000	13.8	.0003	.0012	40000	19.7	40000	13.8	.0003	.0012
R0.2	40000	63.0	40000	47.2	.0008	.0016	40000	59.1	40000	39.4	.0006	.0016
R0.25	40000	94.5	40000	55.1	.0010	.0020	40000	82.7	40000	47.2	.0008	.0020
R0.3	40000	126.0	40000	63.0	.0012	.0024	40000	110.2	40000	55.1	.0012	.0024
R0.4	40000	189.0	40000	94.5	.002	.003	40000	181.1	40000	82.7	.002	.003
R0.5	40000	220.5	40000	126.0	.002	.004	40000	220.5	40000	133.9	.002	.004
R0.75	40000	255.9	40000	157.5	.004	.006	40000	255.9	36000	141.7	.003	.006
R1	40000	255.9	39000	185.0	.004	.008	40000	255.9	35000	157.5	.004	.008
R1.25	40000	275.6	33000	177.2	.005	.010	40000	291.3	29000	157.5	.005	.010
R1.5	40000	295.3	27000	169.3	.005	.012	36000	271.7	24000	153.5	.005	.012
R2	32000	295.3	20000	141.7	.006	.016	28000	271.7	18000	122.0	.006	.016
R2.5	25000	236.2	16000	114.2	.008	.020	22000	244.1	14000	102.4	.008	.020
R3	21000	228.3	13000	102.4	.010	.024	18000	212.6	11000	90.6	.010	.024
R4	16000	177.2	10000	78.7	.012	.031	14000	161.4	9000	66.9	.012	.031
R5	13000	141.7	8000	66.9	.020	.039	11000	129.9	7200	51.2	.020	.039
R6	9000	98.4	6000	51.2	.020	.047	8100	90.6	5400	43.3	.020	.047
Depth of Cut												

Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.



MS PLUS END MILLS

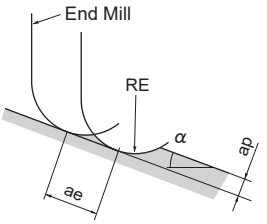
Ball nose, Short cut length, 2 flute, Short shank **MP2SSB**

Ball nose, Short cut length, 2 flute **MP2SB** Ball nose, Medium cut length, 2 flute **MP2MB**

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened Steel (45—55HRC)						Copper, Copper Alloy					
RE (mm)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
R0.1	40000	11.8	40000	9.8	.0001	.0008	40000	11.8	40000	9.8	.0001	.0008
R0.15	40000	19.7	40000	13.8	.0003	.0012	40000	19.7	40000	13.8	.0003	.0012
R0.2	40000	51.2	40000	37.4	.0006	.0016	40000	51.2	40000	37.4	.0006	.0016
R0.25	40000	74.8	40000	43.3	.0008	.0020	40000	74.8	40000	43.3	.0008	.0020
R0.3	40000	98.4	40000	51.2	.0010	.0024	40000	98.4	40000	51.2	.0010	.0024
R0.4	40000	157.5	40000	74.8	.002	.003	40000	157.5	40000	74.8	.002	.003
R0.5	40000	220.5	40000	118.1	.002	.004	40000	220.5	40000	118.1	.002	.004
R0.75	40000	255.9	32000	126.0	.003	.006	40000	255.9	32000	126.0	.003	.006
R1	40000	255.9	31000	137.8	.004	.008	40000	255.9	31000	137.8	.004	.008
R1.25	36000	255.9	26000	137.8	.005	.010	36000	255.9	26000	137.8	.005	.010
R1.5	32000	236.2	22000	133.9	.005	.012	32000	236.2	22000	133.9	.005	.012
R2	25000	236.2	16000	106.3	.006	.016	25000	236.2	16000	106.3	.006	.024
R2.5	20000	212.6	13000	90.6	.008	.020	20000	212.6	13000	90.6	.008	.031
R3	17000	185.0	10000	78.7	.010	.024	17000	185.0	10000	78.7	.010	.035
R4	13000	141.7	8000	59.1	.012	.031	13000	141.7	8000	59.1	.012	.063
R5	10000	114.2	6400	47.2	.020	.039	10000	114.2	6400	47.2	.020	.079
R6	7200	78.7	4800	39.4	.020	.047	8500	90.6	5300	43.3	.020	.094
Depth of Cut	≤ae, ≤ap											

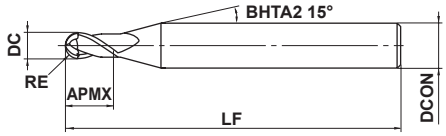
Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.



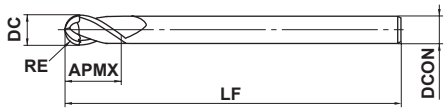
MP2MB - Inch sizes

Ball nose, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○	○	



Type 1



Type 2

.0312"≤DCON≤.5000"				
±.0002"				
DCON=.125"	.250"≤DCON≤.375"	DCON=.500"		
0 - .00020"	0 - .00024"	0 - .00031"		

● 2-flute ball nose end mills with medium cutting edge length for general purpose. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

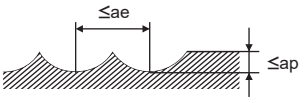
(inch)

Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2MBD1/32	.0156	.0312	.0630	1.50	.1250	2	●	1
MP2MBD1/16	.0312	.0625	.1250	1.50	.1250	2	●	1
MP2MBD1/8	.0625	.1250	.2500	1.50	.1250	2	●	2
MP2MBD3/16	.0938	.1875	.3750	2.00	.2500	2	●	1
MP2MBD1/4	.1250	.2500	.5000	2.50	.2500	2	●	2
MP2MBD5/16	.1562	.3125	.6250	3.25	.3125	2	●	2
MP2MBD3/8	.1875	.3750	.7500	3.50	.3750	2	●	2
MP2MBD1/2	.2500	.5000	1.0000	4.00	.5000	2	●	2

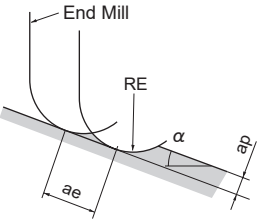
MP2MB - Inch sizes

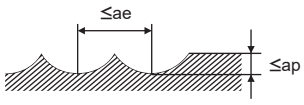
Ball nose, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

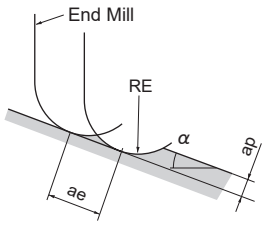
Workpiece Material		Mild Steel, Carbon Steel (180-280HB) Alloy Steel, Pre-hardened Steel, Hardened steel (— 45HRC)						Austenitic Stainless Steel (≤200HB) Titanium Alloy					
DC (inch)	**RE** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
		Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
1/32	**.0156**	40000	189.0	40000	189.0	.002	.003	40000	157.5	40000	74.8	.002	.003
1/16	**.0312**	40000	255.9	40000	255.9	.004	.006	40000	255.9	32000	126.0	.004	.006
1/8	**.0625**	40000	295.3	40000	295.3	.005	.012	32000	236.2	22000	133.9	.005	.012
3/16	**.0938**	25000	236.2	25000	236.2	.008	.020	20000	212.6	13000	90.6	.008	.020
1/4	**.1250**	21000	228.3	21000	228.3	.010	.024	17000	185.0	10000	78.7	.010	.024
5/16	**.1562**	16000	177.2	16000	177.2	.012	.032	13000	141.7	8000	59.1	.012	.032
3/8	**.1875**	13000	141.7	13000	141.7	.020	.039	10000	114.2	6400	47.2	.020	.039
1/2	**.2500**	9000	98.4	9000	98.4	.020	.047	8500	90.6	5300	43.3	.020	.047
Depth of Cut													

Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) If the rigidity of the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and the feed rate proportionately.



Workpiece Material		Hardened Steel (40-55HRC)						Copper, Copper Alloy					
DC (inch)	**RE** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
		Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
1/32	**.0156**	40000	126.0	40000	59.8	.002	.003	40000	189.0	40000	189.0	.002	.003
1/16	**.0312**	40000	204.7	32000	100.8	.004	.006	40000	255.9	40000	255.9	.004	.006
1/8	**.0625**	32000	189.0	22000	107.1	.005	.012	40000	295.3	40000	295.3	.005	.012
3/16	**.0938**	20000	170.1	13000	72.5	.008	.020	25000	236.2	25000	236.2	.008	.020
1/4	**.1250**	17000	148.0	10000	63.0	.010	.024	21000	228.3	21000	228.3	.010	.024
5/16	**.1562**	13000	113.4	8000	47.3	.012	.032	16000	177.2	16000	177.2	.012	.032
3/8	**.1875**	10000	91.4	6400	37.8	.020	.039	13000	141.7	13000	141.7	.020	.039
1/2	**.2500**	8500	72.5	5300	34.6	.020	.047	9000	98.4	9000	98.4	.020	.047
Depth of Cut													

Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) If the rigidity of the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and the feed rate proportionately.

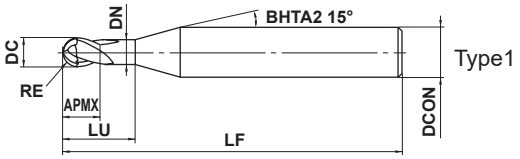


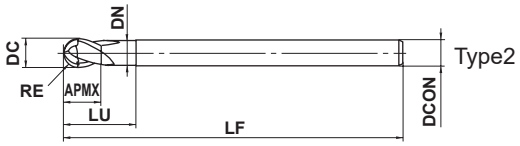
MS PLUS END MILLS

MP2SDB

Ball nose, Short cut length, 2 flute, High strength

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎					





	0.5≤RE≤6				
	±0.01				
h5	4≤DCON≤6	DCON=8			
	0 - 0.005	0 - 0.006			
h6	DCON=10	DCON=12			
	0 - 0.009	0 - 0.011			

●Excellent chipping resistance with a strong S curve cutting edge. Ideal for semi-finish machining of forging dies.

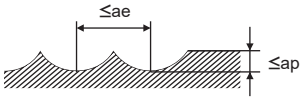
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
MP2SDBR0050	0.5	1	1	2	0.96	45	4	2	●	1
MP2SDBR0075S06	0.75	1.5	1.5	3	1.44	50	6	2	●	1
MP2SDBR0100	1	2	2	4	1.90	50	4	2	●	1
MP2SDBR0100S06	1	2	2	4	1.90	60	6	2	●	1
MP2SDBR0150	1.5	3	3	6	2.90	70	6	2	●	1
MP2SDBR0200	2	4	4	8	3.90	60	4	2	●	2
MP2SDBR0200S06	2	4	4	8	3.90	70	6	2	●	1
MP2SDBR0250	2.5	5	5	10	4.90	80	6	2	●	1
MP2SDBR0300	3	6	12	18	5.85	80	6	2	●	2
MP2SDBR0300A120	3	6	12	18	5.85	120	6	2	●	2
MP2SDBR0400	4	8	14	24	7.85	90	8	2	●	2
MP2SDBR0400A130	4	8	14	24	7.85	130	8	2	●	2
MP2SDBR0500	5	10	18	30	9.70	100	10	2	●	2
MP2SDBR0500A140	5	10	18	30	9.70	140	10	2	●	2
MP2SDBR0600	6	12	22	36	11.70	110	12	2	●	2
MP2SDBR0600A140	6	12	22	36	11.70	140	12	2	●	2

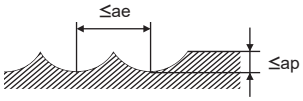
Note 1) MS plus end mills series MP2SB and MP2MB are recommended for finish surface processing.

RECOMMENDED CUTTING CONDITIONS

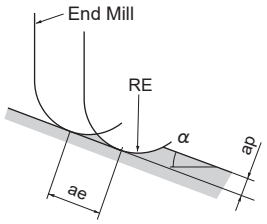
■ Overhang below DC x 5 (DC : Dia.)

Workpiece Material	Carbon Steel, Alloy Steel (180–280HB) Alloy Tool Steel, Tool Steel, Pre-hardened Steel						Hardened Steel (45–55HRC)					
RE (mm)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
R 0.5	40000	153.5	36000	82.7	.004	.010	40000	169.3	36000	86.6	.004	.010
R 0.75	40000	165.4	36000	102.4	.006	.014	40000	185.0	36000	106.3	.006	.014
R 1	40000	177.2	36000	122.0	.008	.020	40000	196.9	36000	129.9	.008	.020
R 1.5	37000	208.7	24000	106.3	.012	.030	37000	228.3	24000	110.2	.012	.030
R 2X4	24000	126.0	15000	78.7	.010	.028	19000	110.2	13000	63.0	.010	.028
R 2	30000	192.9	19000	98.4	.016	.039	28000	196.9	19000	94.5	.016	.039
R 2.5	25000	177.2	16000	90.6	.020	.051	22000	165.4	16000	86.6	.020	.049
R 3	22000	169.3	14000	86.6	.024	.071	18000	149.6	12000	70.9	.024	.059
R 4	19000	153.5	12000	78.7	.031	.094	15000	126.0	9500	63.0	.031	.079
R 5	15000	129.9	9500	70.9	.039	.118	11000	98.4	7000	55.1	.039	.098
R 6	12000	100.4	8000	63.0	.047	.142	9000	78.7	6000	51.2	.047	.118
Depth of Cut												

■ Overhang below DC x 7 (DC : Dia.)

Workpiece Material	Carbon Steel, Alloy Steel (180–280HB) Alloy Tool Steel, Tool Steel, Pre-hardened Steel						Hardened Steel (45–55HRC)					
RE (mm)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	α≤15°		α>15°		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
R 3	10000	59.1	6900	39.4	.008	.039	8000	55.1	5300	30.3	.008	.031
R 4	8000	55.1	5600	35.4	.012	.059	6400	51.2	4000	25.6	.012	.047
R 5	6000	47.2	4100	29.1	.016	.079	4800	43.3	3200	22.8	.016	.063
R 6	5000	39.4	3400	23.6	.018	.094	4000	35.4	2700	19.3	.018	.079
Depth of Cut												

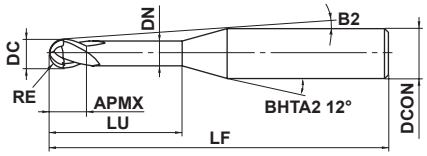
Note 1) α is the inclination angle of the machined surface.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.



MP2XLB

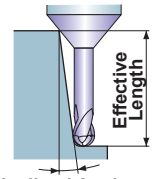
Ball nose, Short cut length, 2 flute, Long neck

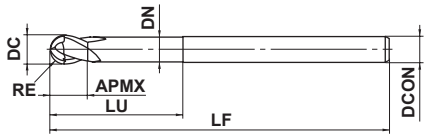
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		○	○	○	



Type1

Effective Length for Inclined Angle





Type2

0.05≤RE≤3			
±0.005			
4≤DCON≤6			
0 -0.005			

●2-flute long neck ball nose end mills. Excellent performance for a wide range of workpiece materials such as carbon steel, alloy steel and hardened steel.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective Length for Inclined Angle			
												0.5°	1°	2°	3°
MP2XLBR0005N003	0.05	0.1	0.08	0.3	0.085	11.6°	50	4	2	●	1	0.3	0.3	0.4	0.4
MP2XLBR0005N005	0.05	0.1	0.08	0.5	0.085	11.4°	50	4	2	●	1	0.5	0.5	0.6	0.7
MP2XLBR0010N005	0.1	0.2	0.15	0.5	0.18	11.5°	50	4	2	●	1	0.5	0.5	0.6	0.7
MP2XLBR0010N008	0.1	0.2	0.15	0.75	0.18	11.2°	50	4	2	●	1	0.8	0.8	0.9	1.0
MP2XLBR0010N010	0.1	0.2	0.15	1	0.18	10.9°	50	4	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0010N013	0.1	0.2	0.15	1.25	0.18	10.6°	50	4	2	●	1	1.3	1.4	1.5	1.7
MP2XLBR0010N015	0.1	0.2	0.15	1.5	0.18	10.4°	50	4	2	●	1	1.6	1.6	1.8	2.0
MP2XLBR0010N018	0.1	0.2	0.15	1.75	0.18	10.2°	50	4	2	●	1	1.8	1.9	2.1	2.3
MP2XLBR0010N020	0.1	0.2	0.15	2	0.18	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0010N025	0.1	0.2	0.15	2.5	0.18	9.5°	50	4	2	●	1	2.6	2.7	3.0	3.3
MP2XLBR0015N005	0.15	0.3	0.24	0.5	0.28	11.5°	50	4	2	●	1	0.5	0.5	0.6	0.6
MP2XLBR0015N008	0.15	0.3	0.24	0.75	0.28	11.2°	50	4	2	●	1	0.8	0.8	0.9	1.0
MP2XLBR0015N010	0.15	0.3	0.24	1	0.28	10.9°	50	4	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0015N010S06	0.15	0.3	0.24	1	0.28	11.3°	50	6	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0015N013	0.15	0.3	0.24	1.25	0.28	10.7°	50	4	2	●	1	1.3	1.4	1.5	1.6
MP2XLBR0015N013S06	0.15	0.3	0.24	1.25	0.28	11.1°	50	6	2	●	1	1.3	1.4	1.5	1.6
MP2XLBR0015N015	0.15	0.3	0.24	1.5	0.28	10.4°	50	4	2	●	1	1.6	1.6	1.8	2.0
MP2XLBR0015N015S06	0.15	0.3	0.24	1.5	0.28	10.9°	50	6	2	●	1	1.6	1.6	1.8	2.0
MP2XLBR0015N018	0.15	0.3	0.24	1.75	0.28	10.2°	50	4	2	●	1	1.8	1.9	2.1	2.3
MP2XLBR0015N020	0.15	0.3	0.24	2	0.28	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0015N025	0.15	0.3	0.24	2.5	0.28	9.5°	50	4	2	●	1	2.6	2.7	3.0	3.3
MP2XLBR0015N030	0.15	0.3	0.24	3	0.28	9.1°	50	4	2	●	1	3.1	3.3	3.6	4.0
MP2XLBR0015N035	0.15	0.3	0.24	3.5	0.28	8.7°	50	4	2	●	1	3.7	3.8	4.2	4.6
MP2XLBR0015N040	0.15	0.3	0.24	4	0.28	8.4°	50	4	2	●	1	4.2	4.4	4.8	5.3
MP2XLBR0020N005	0.2	0.4	0.3	0.5	0.37	11.6°	50	4	2	●	1	0.5	0.5	0.5	0.6
MP2XLBR0020N008	0.2	0.4	0.3	0.75	0.37	11.3°	50	4	2	●	1	0.7	0.8	0.9	0.9
MP2XLBR0020N010	0.2	0.4	0.3	1	0.37	11°	50	4	2	●	1	1.0	1.1	1.2	1.3
MP2XLBR0020N010S06	0.2	0.4	0.3	1	0.37	11.3°	50	6	2	●	1	1.0	1.1	1.2	1.3

● : USA Stock

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective Length for Inclined Angle			
												0.5°	1°	2°	3°
MP2XLBR0020N015	0.2	0.4	0.3	1.5	0.37	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
MP2XLBR0020N020	0.2	0.4	0.3	2	0.37	9.9°	50	4	2	●	1	2.1	2.2	2.3	2.6
MP2XLBR0020N020S06	0.2	0.4	0.3	2	0.37	10.6°	50	6	2	●	1	2.1	2.2	2.3	2.6
MP2XLBR0020N025	0.2	0.4	0.3	2.5	0.37	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.3
MP2XLBR0020N030	0.2	0.4	0.3	3	0.37	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
MP2XLBR0020N035	0.2	0.4	0.3	3.5	0.37	8.7°	50	4	2	●	1	3.6	3.8	4.1	4.6
MP2XLBR0020N040	0.2	0.4	0.3	4	0.37	8.4°	50	4	2	●	1	4.2	4.3	4.7	5.2
MP2XLBR0020N045	0.2	0.4	0.3	4.5	0.37	8°	50	4	2	●	1	4.7	4.9	5.3	5.9
MP2XLBR0020N050	0.2	0.4	0.3	5	0.37	7.7°	50	4	2	●	1	5.2	5.4	5.9	6.6
MP2XLBR0020N055	0.2	0.4	0.3	5.5	0.37	7.5°	50	4	2	●	1	5.7	6.0	6.5	7.2
MP2XLBR0020N060	0.2	0.4	0.3	6	0.37	7.2°	50	4	2	●	1	6.2	6.5	7.1	7.9
MP2XLBR0025N010	0.25	0.5	0.37	1	0.47	11°	50	4	2	●	1	1.0	1.0	1.1	1.2
MP2XLBR0025N015	0.25	0.5	0.37	1.5	0.47	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
MP2XLBR0025N015S06	0.25	0.5	0.37	1.5	0.47	11°	50	6	2	●	1	1.5	1.6	1.7	1.9
MP2XLBR0025N020	0.25	0.5	0.37	2	0.47	9.9°	50	4	2	●	1	2.1	2.1	2.3	2.6
MP2XLBR0025N020S06	0.25	0.5	0.37	2	0.47	10.6°	50	6	2	●	1	2.1	2.1	2.3	2.6
MP2XLBR0025N025	0.25	0.5	0.37	2.5	0.47	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
MP2XLBR0025N025S06	0.25	0.5	0.37	2.5	0.47	10.3°	50	6	2	●	1	2.6	2.7	2.9	3.2
MP2XLBR0025N030	0.25	0.5	0.37	3	0.47	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
MP2XLBR0025N030S06	0.25	0.5	0.37	3	0.47	10°	50	6	2	●	1	3.1	3.2	3.5	3.9
MP2XLBR0025N035	0.25	0.5	0.37	3.5	0.47	8.7°	50	4	2	●	1	3.6	3.8	4.1	4.6
MP2XLBR0025N040	0.25	0.5	0.37	4	0.47	8.3°	50	4	2	●	1	4.1	4.3	4.7	5.2
MP2XLBR0025N045	0.25	0.5	0.37	4.5	0.47	8°	50	4	2	●	1	4.7	4.9	5.3	5.9
MP2XLBR0025N050	0.25	0.5	0.37	5	0.47	7.7°	50	4	2	●	1	5.2	5.4	5.9	6.6
MP2XLBR0025N055	0.25	0.5	0.37	5.5	0.47	7.4°	50	4	2	●	1	5.7	6.0	6.5	7.2
MP2XLBR0025N060	0.25	0.5	0.37	6	0.47	7.2°	50	4	2	●	1	6.2	6.5	7.1	7.9
MP2XLBR0025N070	0.25	0.5	0.37	7	0.47	6.7°	50	4	2	●	1	7.3	7.6	8.3	9.2
MP2XLBR0025N080	0.25	0.5	0.37	8	0.47	6.3°	50	4	2	●	1	8.3	8.7	9.5	10.5
MP2XLBR0025N090	0.25	0.5	0.37	9	0.47	5.9°	50	4	2	●	1	9.4	9.8	10.7	11.9
MP2XLBR0025N100	0.25	0.5	0.37	10	0.47	5.6°	50	4	2	●	1	10.4	10.9	11.9	13.2
MP2XLBR0030N015	0.3	0.6	0.45	1.5	0.57	10.4°	50	4	2	●	1	1.5	1.6	1.8	2.0
MP2XLBR0030N015S06	0.3	0.6	0.45	1.5	0.57	11°	50	6	2	●	1	1.5	1.6	1.8	2.0
MP2XLBR0030N020	0.3	0.6	0.45	2	0.57	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0030N020S06	0.3	0.6	0.45	2	0.57	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0030N025	0.3	0.6	0.45	2.5	0.57	9.4°	50	4	2	●	1	2.6	2.7	3.0	3.3
MP2XLBR0030N030	0.3	0.6	0.45	3	0.57	9°	50	4	2	●	1	3.1	3.3	3.6	4.0
MP2XLBR0030N030S06	0.3	0.6	0.45	3	0.57	9.9°	50	6	2	●	1	3.1	3.3	3.6	4.0
MP2XLBR0030N035	0.3	0.6	0.45	3.5	0.57	8.6°	50	4	2	●	1	3.7	3.8	4.2	4.6
MP2XLBR0030N040	0.3	0.6	0.45	4	0.57	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.3
MP2XLBR0030N040S06	0.3	0.6	0.45	4	0.57	9.3°	50	6	2	●	1	4.2	4.4	4.8	5.3
MP2XLBR0030N045	0.3	0.6	0.45	4.5	0.57	7.9°	50	4	2	●	1	4.7	4.9	5.4	5.9
MP2XLBR0030N050	0.3	0.6	0.45	5	0.57	7.6°	50	4	2	●	1	5.2	5.5	6.0	6.6
MP2XLBR0030N050S06	0.3	0.6	0.45	5	0.57	8.8°	50	6	2	●	1	5.2	5.5	6.0	6.6
MP2XLBR0030N055	0.3	0.6	0.45	5.5	0.57	7.3°	50	4	2	●	1	5.8	6.0	6.6	7.3
MP2XLBR0030N060	0.3	0.6	0.45	6	0.57	7.1°	50	4	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0030N060S06	0.3	0.6	0.45	6	0.57	8.3°	50	6	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0030N065	0.3	0.6	0.45	6.5	0.57	6.8°	50	4	2	●	1	6.8	7.1	7.8	8.6
MP2XLBR0030N070	0.3	0.6	0.45	7	0.57	6.6°	50	4	2	●	1	7.3	7.6	8.4	9.3

MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective Length for Inclined Angle			
												0.5°	1°	2°	3°
MP2XLBR0030N080	0.3	0.6	0.45	8	0.57	6.2°	50	4	2	●	1	8.4	8.7	9.6	10.6
MP2XLBR0030N080S06	0.3	0.6	0.45	8	0.57	7.6°	50	6	2	●	1	8.4	8.7	9.6	10.6
MP2XLBR0030N085	0.3	0.6	0.45	8.5	0.57	6°	50	4	2	●	1	8.9	9.3	10.2	11.3
MP2XLBR0030N090	0.3	0.6	0.45	9	0.57	5.8°	50	4	2	●	1	9.4	9.8	10.8	11.9
MP2XLBR0030N095	0.3	0.6	0.45	9.5	0.57	5.7°	50	4	2	●	1	9.9	10.4	11.4	12.6
MP2XLBR0030N100	0.3	0.6	0.45	10	0.57	5.5°	50	4	2	●	1	10.5	10.9	12.0	13.2
MP2XLBR0030N110	0.3	0.6	0.45	11	0.57	5.2°	50	4	2	●	1	11.5	12.0	13.2	14.6
MP2XLBR0030N120	0.3	0.6	0.45	12	0.57	5°	50	4	2	●	1	12.5	13.1	14.4	15.9
MP2XLBR0040N020	0.4	0.8	0.6	2	0.77	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0040N020S06	0.4	0.8	0.6	2	0.77	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
MP2XLBR0040N024S06	0.4	0.8	0.6	2.4	0.77	10.3°	50	6	2	●	1	2.5	2.6	2.8	3.1
MP2XLBR0040N030	0.4	0.8	0.6	3	0.77	8.9°	50	4	2	●	1	3.1	3.3	3.6	3.9
MP2XLBR0040N030S06	0.4	0.8	0.6	3	0.77	9.9°	50	6	2	●	1	3.1	3.3	3.6	3.9
MP2XLBR0040N040	0.4	0.8	0.6	4	0.77	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.2
MP2XLBR0040N040S06	0.4	0.8	0.6	4	0.77	9.3°	50	6	2	●	1	4.2	4.4	4.8	5.2
MP2XLBR0040N050	0.4	0.8	0.6	5	0.77	7.5°	50	4	2	●	1	5.2	5.5	6.0	6.6
MP2XLBR0040N060	0.4	0.8	0.6	6	0.77	6.9°	50	4	2	●	1	6.3	6.5	7.2	7.9
MP2XLBR0040N070	0.4	0.8	0.6	7	0.77	6.5°	50	4	2	●	1	7.3	7.6	8.4	9.2
MP2XLBR0040N080	0.4	0.8	0.6	8	0.77	6°	50	4	2	●	1	8.4	8.7	9.5	10.6
MP2XLBR0040N090	0.4	0.8	0.6	9	0.77	5.7°	50	4	2	●	1	9.4	9.8	10.7	11.9
MP2XLBR0040N100	0.4	0.8	0.6	10	0.77	5.4°	50	4	2	●	1	10.5	10.9	11.9	13.2
MP2XLBR0040N120	0.4	0.8	0.6	12	0.77	4.8°	50	4	2	●	1	12.5	13.1	14.3	15.9
MP2XLBR0050N030	0.5	1	0.75	3	0.96	8.7°	50	4	2	●	1	3.2	3.4	3.7	4.1
MP2XLBR0050N030S06	0.5	1	0.75	3	0.96	9.8°	50	6	2	●	1	3.2	3.4	3.7	4.1
MP2XLBR0050N040	0.5	1	0.75	4	0.96	7.9°	50	4	2	●	1	4.3	4.5	4.9	5.4
MP2XLBR0050N040S06	0.5	1	0.75	4	0.96	9.2°	50	6	2	●	1	4.3	4.5	4.9	5.4
MP2XLBR0050N050	0.5	1	0.75	5	0.96	7.3°	50	4	2	●	1	5.3	5.6	6.1	6.7
MP2XLBR0050N050S06	0.5	1	0.75	5	0.96	8.6°	50	6	2	●	1	5.3	5.6	6.1	6.7
MP2XLBR0050N060	0.5	1	0.75	6	0.96	6.7°	50	4	2	●	1	6.4	6.7	7.3	8.1
MP2XLBR0050N060S06	0.5	1	0.75	6	0.96	8.2°	50	6	2	●	1	6.4	6.7	7.3	8.1
MP2XLBR0050N070	0.5	1	0.75	7	0.96	6.2°	50	4	2	●	1	7.4	7.8	8.5	9.4
MP2XLBR0050N080	0.5	1	0.75	8	0.96	5.8°	50	4	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0050N080S06	0.5	1	0.75	8	0.96	7.3°	50	6	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0050N090	0.5	1	0.75	9	0.96	5.5°	50	4	2	●	1	9.5	10.0	10.9	12.0
MP2XLBR0050N100	0.5	1	0.75	10	0.96	5.1°	50	4	2	●	1	10.6	11.1	12.1	13.4
MP2XLBR0050N100S06	0.5	1	0.75	10	0.96	6.7°	60	6	2	●	1	10.6	11.1	12.1	13.4
MP2XLBR0050N120	0.5	1	0.75	12	0.96	4.6°	50	4	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0050N120S06	0.5	1	0.75	12	0.96	6.1°	60	6	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0050N140	0.5	1	0.75	14	0.96	4.2°	55	4	2	●	1	14.8	15.4	16.9	18.7
MP2XLBR0050N160	0.5	1	0.75	16	0.96	3.8°	55	4	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0050N160S06	0.5	1	0.75	16	0.96	5.2°	65	6	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0050N180	0.5	1	0.75	18	0.96	3.5°	55	4	2	●	1	18.9	19.8	21.7	24.0
MP2XLBR0050N200	0.5	1	0.75	20	0.96	3.3°	55	4	2	●	1	21.0	22.0	24.1	26.6
MP2XLBR0050N200S06	0.5	1	0.75	20	0.96	4.6°	65	6	2	●	1	21.0	22.0	24.1	26.6
MP2XLBR0060N060	0.6	1.2	0.9	6	1.16	6.6°	50	4	2	●	1	6.4	6.7	7.3	8.0
MP2XLBR0060N060S06	0.6	1.2	0.9	6	1.16	8.1°	55	6	2	●	1	6.4	6.7	7.3	8.0
MP2XLBR0060N080	0.6	1.2	0.9	8	1.16	5.7°	50	4	2	●	1	8.5	8.9	9.7	10.7
MP2XLBR0060N080S06	0.6	1.2	0.9	8	1.16	7.3°	55	6	2	●	1	8.5	8.9	9.7	10.7

● : USA Stock

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective Length for Inclined Angle			
												0.5°	1°	2°	3°
MP2XLBR0060N100	0.6	1.2	0.9	10	1.16	5°	50	4	2	●	1	10.6	11.0	12.1	13.3
MP2XLBR0060N100S06	0.6	1.2	0.9	10	1.16	6.6°	55	6	2	●	1	10.6	11.0	12.1	13.3
MP2XLBR0060N120	0.6	1.2	0.9	12	1.16	4.4°	50	4	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0060N120S06	0.6	1.2	0.9	12	1.16	6°	65	6	2	●	1	12.7	13.2	14.5	16.0
MP2XLBR0060N140	0.6	1.2	0.9	14	1.16	4°	55	4	2	●	1	14.8	15.4	16.9	18.7
MP2XLBR0060N160	0.6	1.2	0.9	16	1.16	3.7°	55	4	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0060N160S06	0.6	1.2	0.9	16	1.16	5.1°	65	6	2	●	1	16.9	17.6	19.3	21.3
MP2XLBR0060N180	0.6	1.2	0.9	18	1.16	3.4°	60	4	2	●	1	18.9	19.8	21.7	24.0
MP2XLBR0060N200	0.6	1.2	0.9	20	1.16	3.1°	60	4	2	●	1	21.0	21.9	24.0	26.6
MP2XLBR0060N240	0.6	1.2	0.9	24	1.16	2.7°	60	4	2	●	1	25.2	26.3	28.8	*
MP2XLBR0070N080	0.7	1.4	1.05	8	1.34	5.5°	50	4	2	●	1	8.4	8.8	9.6	10.6
MP2XLBR0070N120	0.7	1.4	1.05	12	1.34	4.3°	50	4	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0070N160	0.7	1.4	1.05	16	1.34	3.5°	50	4	2	●	1	16.8	17.5	19.2	21.2
MP2XLBR0075N030	0.75	1.5	1.1	3	1.44	8.6°	50	4	2	●	1	3.1	3.3	3.6	3.9
MP2XLBR0075N040	0.75	1.5	1.1	4	1.44	7.7°	50	4	2	●	1	4.2	4.4	4.8	5.2
MP2XLBR0075N060	0.75	1.5	1.1	6	1.44	6.3°	50	4	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0075N060S06	0.75	1.5	1.1	6	1.44	8°	50	6	2	●	1	6.3	6.6	7.2	7.9
MP2XLBR0075N080	0.75	1.5	1.1	8	1.44	5.4°	50	4	2	●	1	8.4	8.8	9.6	10.6
MP2XLBR0075N080S06	0.75	1.5	1.1	8	1.44	7.2°	60	6	2	●	1	8.4	8.8	9.6	10.6
MP2XLBR0075N100	0.75	1.5	1.1	10	1.44	4.7°	50	4	2	●	1	10.5	11.0	12.0	13.2
MP2XLBR0075N100S06	0.75	1.5	1.1	10	1.44	6.5°	60	6	2	●	1	10.5	11.0	12.0	13.2
MP2XLBR0075N120	0.75	1.5	1.1	12	1.44	4.2°	50	4	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0075N120S06	0.75	1.5	1.1	12	1.44	5.9°	60	6	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0075N140	0.75	1.5	1.1	14	1.44	3.8°	55	4	2	●	1	14.7	15.3	16.8	18.5
MP2XLBR0075N160	0.75	1.5	1.1	16	1.44	3.4°	55	4	2	●	1	16.8	17.5	19.2	21.2
MP2XLBR0075N160S06	0.75	1.5	1.1	16	1.44	5°	60	6	2	●	1	16.8	17.5	19.2	21.2
MP2XLBR0075N180	0.75	1.5	1.1	18	1.44	3.1°	60	4	2	●	1	18.9	19.7	21.6	23.8
MP2XLBR0075N200	0.75	1.5	1.1	20	1.44	2.9°	60	4	2	●	1	21.0	21.9	23.9	*
MP2XLBR0075N220	0.75	1.5	1.1	22	1.44	2.7°	60	4	2	●	1	23.0	24.0	26.3	*
MP2XLBR0080N080	0.8	1.6	1.2	8	1.54	5.3°	55	4	2	●	1	8.4	8.8	9.6	10.5
MP2XLBR0080N120	0.8	1.6	1.2	12	1.54	4.1°	55	4	2	●	1	12.6	13.1	14.4	15.9
MP2XLBR0080N160	0.8	1.6	1.2	16	1.54	3.3°	55	4	2	●	1	16.8	17.5	19.1	21.2
MP2XLBR0080N200	0.8	1.6	1.2	20	1.54	2.8°	55	4	2	●	1	21.0	21.9	23.9	*
MP2XLBR0090N080	0.9	1.8	1.4	8	1.74	5.1°	55	4	2	●	1	8.4	8.8	9.6	10.5
MP2XLBR0090N120	0.9	1.8	1.4	12	1.74	3.9°	55	4	2	●	1	12.6	13.1	14.3	15.8
MP2XLBR0090N160	0.9	1.8	1.4	16	1.74	3.1°	55	4	2	●	1	16.8	17.5	19.1	21.1
MP2XLBR0090N200	0.9	1.8	1.4	20	1.74	2.6°	55	4	2	●	1	20.9	21.8	23.9	*
MP2XLBR0100N040	1	2	1.5	4	1.94	7.2°	50	4	2	●	1	4.2	4.4	4.7	5.2
MP2XLBR0100N040S06	1	2	1.5	4	1.94	9°	50	6	2	●	1	4.2	4.4	4.7	5.2
MP2XLBR0100N060	1	2	1.5	6	1.94	5.8°	50	4	2	●	1	6.3	6.6	7.1	7.8
MP2XLBR0100N060S06	1	2	1.5	6	1.94	7.8°	50	6	2	●	1	6.3	6.6	7.1	7.8
MP2XLBR0100N080	1	2	1.5	8	1.94	4.8°	50	4	2	●	1	8.4	8.8	9.5	10.5
MP2XLBR0100N080S06	1	2	1.5	8	1.94	6.9°	50	6	2	●	1	8.4	8.8	9.5	10.5
MP2XLBR0100N100	1	2	1.5	10	1.94	4.2°	50	4	2	●	1	10.5	10.9	11.9	13.1
MP2XLBR0100N100S06	1	2	1.5	10	1.94	6.2°	50	6	2	●	1	10.5	10.9	11.9	13.1
MP2XLBR0100N120	1	2	1.5	12	1.94	3.6°	50	4	2	●	1	12.6	13.1	14.3	15.8
MP2XLBR0100N120S06	1	2	1.5	12	1.94	5.6°	60	6	2	●	1	12.6	13.1	14.3	15.8
MP2XLBR0100N140	1	2	1.5	14	1.94	3.2°	55	4	2	●	1	14.7	15.3	16.7	18.4

* No interference

MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective Length for Inclined Angle			
												0.5°	1°	2°	3°
MP2XLBR0100N140S06	1	2	1.5	14	1.94	5.1°	60	6	2	●	1	14.7	15.3	16.7	18.4
MP2XLBR0100N160	1	2	1.5	16	1.94	2.9°	55	4	2	●	1	16.8	17.5	19.1	*
MP2XLBR0100N160S06	1	2	1.5	16	1.94	4.7°	65	6	2	●	1	16.8	17.5	19.1	21.1
MP2XLBR0100N180	1	2	1.5	18	1.94	2.7°	55	4	2	●	1	18.9	19.7	21.5	*
MP2XLBR0100N180S06	1	2	1.5	18	1.94	4.3°	65	6	2	●	1	18.9	19.7	21.5	23.8
MP2XLBR0100N200	1	2	1.5	20	1.94	2.4°	65	4	2	●	1	20.9	21.8	23.9	*
MP2XLBR0100N200S06	1	2	1.5	20	1.94	4°	65	6	2	●	1	20.9	21.8	23.9	26.4
MP2XLBR0100N220	1	2	1.5	22	1.94	2.3°	65	4	2	●	1	23.0	24.0	26.3	*
MP2XLBR0100N250	1	2	1.5	25	1.94	2°	65	4	2	●	1	26.2	27.3	*	*
MP2XLBR0100N250S06	1	2	1.5	25	1.94	3.5°	90	6	2	●	1	26.2	27.3	29.9	33
MP2XLBR0100N300	1	2	1.5	30	1.94	1.7°	80	4	2	●	1	31.4	32.7	*	*
MP2XLBR0100N300S06	1	2	1.5	30	1.94	3°	90	6	2	●	1	31.4	32.7	35.9	*
MP2XLBR0100N350	1	2	1.5	35	1.94	1.5°	80	4	2	●	1	36.6	38.2	*	*
MP2XLBR0100N350S06	1	2	1.5	35	1.94	2.7°	90	6	2	●	1	36.6	38.2	41.8	*
MP2XLBR0100N400	1	2	1.5	40	1.94	1.4°	80	4	2	●	1	41.8	43.6	*	*
MP2XLBR0100N400S06	1	2	1.5	40	1.94	2.4°	90	6	2	●	1	41.8	43.6	47.8	*
MP2XLBR0125N100	1.25	2.5	1.9	10	2.4	3.5°	55	4	2	●	1	10.4	10.8	11.8	12.9
MP2XLBR0125N150	1.25	2.5	1.9	15	2.4	2.5°	55	4	2	●	1	15.6	16.3	17.8	*
MP2XLBR0125N200	1.25	2.5	1.9	20	2.4	2°	55	4	2	●	1	20.8	21.7	*	*
MP2XLBR0125N250	1.25	2.5	1.9	25	2.4	1.6°	70	4	2	●	1	26.1	27.2	*	*
MP2XLBR0125N300	1.25	2.5	1.9	30	2.4	1.4°	70	4	2	●	1	31.3	32.6	*	*
MP2XLBR0125N350	1.25	2.5	1.9	35	2.4	1.2°	70	4	2	●	1	36.5	38.1	*	*
MP2XLBR0150N060S03	1.5	3	2.3	6	2.9	—	60	3	2	●	2	*	*	*	*
MP2XLBR0150N080	1.5	3	2.3	8	2.9	6.3°	60	6	2	●	1	8.3	8.6	9.3	10.2
MP2XLBR0150N100	1.5	3	2.3	10	2.9	5.5°	60	6	2	●	1	10.4	10.8	11.7	12.9
MP2XLBR0150N120	1.5	3	2.3	12	2.9	4.9°	60	6	2	●	1	12.5	13.0	14.1	15.5
MP2XLBR0150N140	1.5	3	2.3	14	2.9	4.4°	60	6	2	●	1	14.6	15.2	16.5	18.2
MP2XLBR0150N160	1.5	3	2.3	16	2.9	4°	70	6	2	●	1	16.7	17.3	18.9	20.8
MP2XLBR0150N200	1.5	3	2.3	20	2.9	3.4°	70	6	2	●	1	20.8	21.7	23.7	26.1
MP2XLBR0150N250	1.5	3	2.3	25	2.9	2.8°	70	6	2	●	1	26.1	27.2	29.7	*
MP2XLBR0150N300	1.5	3	2.3	30	2.9	2.5°	70	6	2	●	1	31.3	32.6	35.7	*
MP2XLBR0150N350	1.5	3	2.3	35	2.9	2.2°	90	6	2	●	1	36.5	38.0	41.7	*
MP2XLBR0150N400	1.5	3	2.3	40	2.9	1.9°	90	6	2	●	1	41.7	43.5	*	*
MP2XLBR0175N150	1.75	3.5	2.6	15	3.4	3.8°	65	6	2	●	1	15.6	16.2	17.7	19.4
MP2XLBR0175N250	1.75	3.5	2.6	25	3.4	2.5°	65	6	2	●	1	26.0	27.1	29.6	*
MP2XLBR0175N350	1.75	3.5	2.6	35	3.4	1.9°	90	6	2	●	1	36.5	38.0	*	*
MP2XLBR0175N450	1.75	3.5	2.6	45	3.4	1.5°	90	6	2	●	1	46.9	48.9	*	*
MP2XLBR0200N080S04	2	4	3	8	3.9	—	65	4	2	●	2	*	*	*	*
MP2XLBR0200N100	2	4	3	10	3.9	4.5°	65	6	2	●	1	10.4	10.8	11.6	12.7
MP2XLBR0200N120	2	4	3	12	3.9	3.9°	65	6	2	●	1	12.5	12.9	14.0	15.4
MP2XLBR0200N140	2	4	3	14	3.9	3.4°	65	6	2	●	1	14.6	15.1	16.4	18.0
MP2XLBR0200N160	2	4	3	16	3.9	3.1°	70	6	2	●	1	16.6	17.3	18.8	20.7
MP2XLBR0200N200	2	4	3	20	3.9	2.6°	70	6	2	●	1	20.8	21.7	23.6	*
MP2XLBR0200N250	2	4	3	25	3.9	2.1°	70	6	2	●	1	26.0	27.1	29.6	*
MP2XLBR0200N300	2	4	3	30	3.9	1.8°	80	6	2	●	1	31.2	32.6	*	*
MP2XLBR0200N350	2	4	3	35	3.9	1.6°	80	6	2	●	1	36.5	38.0	*	*
MP2XLBR0200N400	2	4	3	40	3.9	1.4°	90	6	2	●	1	41.7	43.5	*	*
MP2XLBR0200N450	2	4	3	45	3.9	1.2°	90	6	2	●	1	46.9	48.9	*	*

* No interference

● : USA Stock

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective Length for Inclined Angle			
												0.5°	1°	2°	3°
MP2XLBR0200N500	2	4	3	50	3.9	1.1°	100	6	2	●	1	52.1	54.3	*	*
MP2XLBR0250N150	2.5	5	3.8	15	4.9	2°	70	6	2	●	1	15.6	16.2	*	*
MP2XLBR0250N200	2.5	5	3.8	20	4.9	1.5°	70	6	2	●	1	20.8	21.6	*	*
MP2XLBR0250N250	2.5	5	3.8	25	4.9	1.2°	70	6	2	●	1	26.0	27.1	*	*
MP2XLBR0250N300	2.5	5	3.8	30	4.9	1°	80	6	2	●	1	31.2	*	*	*
MP2XLBR0250N350	2.5	5	3.8	35	4.9	0.9°	80	6	2	●	1	36.4	*	*	*
MP2XLBR0250N400	2.5	5	3.8	40	4.9	0.8°	90	6	2	●	1	41.7	*	*	*
MP2XLBR0300N200	3	6	6	20	5.85	—	70	6	2	●	2	*	*	*	*
MP2XLBR0300N250	3	6	6	25	5.85	—	70	6	2	●	2	*	*	*	*
MP2XLBR0300N300	3	6	6	30	5.85	—	80	6	2	●	2	*	*	*	*
MP2XLBR0300N400	3	6	6	40	5.85	—	90	6	2	●	2	*	*	*	*
MP2XLBR0300N500	3	6	6	50	5.85	—	100	6	2	●	2	*	*	*	*

* No interference

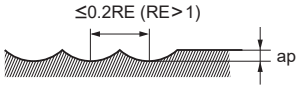
MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Alloy steel (180—280HB) Alloy tool steel, Pre-hardened steel, Precipitation hardening stainless steel			Hardened steel (45—55HRC)			Copper, Copper alloy		
RE (mm)	**LU** (mm)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
0.05	**0.3**	50000	7.9	.00008	50000	7.9	.00008	50000	7.9	.00016
	0.5	50000	7.9	.00004	50000	7.9	.00008	50000	7.9	.00008
0.1	**0.5**	50000	15.7	.00012	50000	12.6	.00012	50000	12.6	.00024
	1	50000	15.7	.00008	50000	12.6	.00008	50000	12.6	.00016
	1.5	40000	11.8	.00004	40000	9.4	.00004	40000	9.4	.00008
	2	40000	7.9	.00004	40000	6.3	.00004	40000	6.3	.00008
	2.5	40000	3.9	.00004	40000	3.1	.00004	40000	3.1	.00008
0.15	**1**	50000	23.6	.00028	50000	18.9	.00028	50000	18.9	.00055
	1.5	50000	23.6	.00020	50000	18.9	.00020	50000	18.9	.00039
	2	50000	23.6	.00012	50000	18.9	.00012	50000	18.9	.00024
	2.5	40000	15.7	.00012	40000	12.6	.00012	40000	12.6	.00024
	3	40000	11.8	.00008	40000	9.4	.00008	40000	9.4	.00016
	3.5	30000	9.8	.00008	30000	7.9	.00008	30000	7.9	.00016
	4	30000	7.9	.00008	30000	6.3	.00008	30000	6.3	.00016
0.2	**1**	50000	70.9	.00059	50000	55.1	.00059	50000	55.1	.00118
	2	50000	51.2	.00039	50000	39.4	.00039	50000	39.4	.00079
	3	50000	35.4	.00020	50000	27.6	.00020	50000	27.6	.00039
	4	40000	23.6	.00016	40000	18.9	.00016	40000	18.9	.00031
	5	40000	15.7	.00012	40000	12.6	.00012	40000	12.6	.00024
	6	30000	7.9	.00008	30000	6.3	.00008	30000	6.3	.00016
0.25	**2**	50000	98.4	.00079	50000	78.7	.00079	50000	78.7	.00157
	3	50000	59.1	.00059	50000	47.2	.00059	50000	47.2	.00118
	4	45000	47.2	.00039	45000	37.4	.00039	45000	37.4	.00079
	5	45000	35.4	.00028	45000	27.6	.00028	45000	27.6	.00055
	6	36000	23.6	.00024	36000	18.9	.00024	36000	18.9	.00047
	7	32000	15.7	.00020	32000	12.6	.00020	32000	12.6	.00039
	8	32000	11.8	.00012	32000	9.4	.00012	32000	9.4	.00024
	10	26000	7.9	.00008	26000	6.3	.00008	26000	6.3	.00016
0.3	**2**	50000	137.8	.00118	50000	110.2	.00118	50000	110.2	.00236
	3	50000	137.8	.00118	50000	110.2	.00118	50000	110.2	.00236
	4	44000	98.4	.00079	44000	78.7	.00079	44000	78.7	.00157
	5	37000	47.2	.00039	37000	37.4	.00039	37000	37.4	.00079
	6	37000	39.4	.00031	37000	31.5	.00031	37000	31.5	.00063
	7	35000	29.5	.00031	35000	23.6	.00031	35000	23.6	.00063
	8	35000	23.6	.00024	35000	18.9	.00024	35000	18.9	.00047
	9	30000	19.7	.00016	30000	15.7	.00016	30000	15.7	.00031
	10	30000	19.7	.00012	30000	15.7	.00012	30000	15.7	.00024
	11	22000	11.8	.00008	22000	9.4	.00008	22000	9.4	.00016
	12	22000	7.9	.00008	22000	6.3	.00008	22000	6.3	.00016
0.4	**2**	50000	173.2	.00157	50000	137.8	.00157	50000	137.8	.00315
	3	50000	157.5	.00157	50000	126.0	.00157	50000	126.0	.00315
	4	50000	157.5	.00079	50000	126.0	.00079	50000	126.0	.00157
	5	35000	94.5	.00079	35000	74.8	.00079	35000	74.8	.00157
	6	35000	94.5	.00079	35000	74.8	.00079	35000	74.8	.00157
	7	30000	59.1	.00059	30000	47.2	.00059	30000	47.2	.00118
	8	30000	59.1	.00039	30000	47.2	.00039	30000	47.2	.00079
	10	30000	27.6	.00031	30000	22.0	.00031	30000	22.0	.00063
	12	22000	19.7	.00024	22000	15.7	.00024	22000	15.7	.00047

Depth of Cut

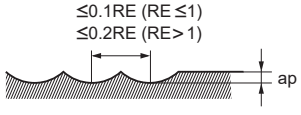


RE : Radius

Note 1) When the inclination angle of machined surface is high, or when machining at high loads; such as in corners, reduce the revolution and feed rate.
Note 2) The use of oil mist is recommended when machining with small diameter.
Note 3) The revolution and feed rate can be increased at small depths of cut (ap).

Workpiece Material		Carbon steel, Alloy steel (180—280HB) Alloy tool steel, Pre-hardened steel, Precipitation hardening stainless steel			Hardened steel (45—55HRC)			Copper, Copper alloy		
RE (mm)	**LU** (mm)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
0.5	**3**	40000	157.5	.00197	40000	126.0	.00197	40000	126.0	.00394
	4	40000	157.5	.00197	40000	126.0	.00197	40000	126.0	.00394
	6	35000	118.1	.00118	35000	94.5	.00118	35000	94.5	.00236
	8	30000	78.7	.00079	30000	63.0	.00079	30000	63.0	.00157
	10	20000	39.4	.00039	20000	31.5	.00039	20000	31.5	.00079
	12	20000	39.4	.00039	20000	31.5	.00039	20000	31.5	.00079
	14	18000	23.6	.00031	18000	18.9	.00031	18000	18.9	.00063
	16	18000	19.7	.00031	18000	15.7	.00031	18000	15.7	.00063
	18	13000	11.8	.00020	13000	9.4	.00020	13000	9.4	.00039
	20	13000	9.8	.00020	13000	7.9	.00020	13000	7.9	.00039
0.6	**6**	40000	173.2	.0016	40000	137.8	.0016	40000	137.8	.0031
	8	40000	157.5	.0016	40000	126.0	.0016	40000	126.0	.0031
	10	27000	74.8	.0008	27000	59.1	.0008	27000	59.1	.0016
	12	16000	55.1	.0008	16000	43.3	.0008	16000	43.3	.0016
	18	15000	27.6	.0003	15000	22.0	.0003	15000	22.0	.0006
	24	11000	11.8	.0002	11000	9.4	.0002	11000	9.4	.0005
0.7	**8**	40000	157.5	.0020	40000	126.0	.0020	40000	100.8	.0039
	12	26000	78.7	.0016	26000	63.0	.0016	26000	50.4	.0031
	16	17000	55.1	.0012	17000	44.1	.0012	17000	35.3	.0024
0.75	**6**	40000	236.2	.0028	36000	169.3	.0028	36000	169.3	.0055
	8	40000	236.2	.0028	36000	169.3	.0028	36000	169.3	.0055
	10	40000	196.9	.0024	36000	141.7	.0024	36000	141.7	.0047
	12	32000	133.9	.0016	29000	94.5	.0016	29000	94.5	.0031
	16	15000	55.1	.0012	15000	43.3	.0012	15000	43.3	.0024
	20	12000	35.4	.0008	12000	28.3	.0008	12000	28.3	.0016
	30	9000	15.7	.0004	9000	12.6	.0004	9000	12.6	.0008
0.8	**8**	40000	236.2	.0031	32000	149.6	.0031	32000	149.6	.0063
	12	36000	177.2	.0024	29000	110.2	.0024	29000	110.2	.0047
	16	14000	55.1	.0016	14000	43.3	.0016	14000	43.3	.0031
	20	12000	39.4	.0012	12000	31.5	.0012	12000	31.5	.0024
0.9	**8**	40000	259.8	.0035	32000	165.4	.0035	32000	165.4	.0071
	12	40000	196.9	.0028	32000	126.0	.0028	32000	126.0	.0055
	16	28000	110.2	.0016	22000	70.9	.0016	22000	70.9	.0031
	20	10000	31.5	.0012	10000	25.2	.0012	10000	25.2	.0024
1	**4**	40000	315.0	.0039	32000	196.9	.0039	32000	196.9	.0079
	6	40000	315.0	.0039	32000	196.9	.0039	32000	196.9	.0079
	8	40000	236.2	.0039	32000	149.6	.0039	32000	149.6	.0079
	10	40000	196.9	.0031	32000	126.0	.0031	32000	126.0	.0063
	12	40000	196.9	.0031	32000	126.0	.0031	32000	126.0	.0063
	16	32000	137.8	.0020	26000	86.6	.0020	26000	86.6	.0039
	20	10000	39.4	.0016	10000	31.5	.0016	10000	31.5	.0031
	25	10000	39.4	.0016	10000	31.5	.0016	10000	31.5	.0031
	30	10000	31.5	.0008	10000	25.2	.0008	10000	25.2	.0016
	35	10000	23.6	.0008	10000	18.9	.0008	10000	18.9	.0016
	40	8000	15.7	.0004	8000	12.6	.0004	8000	12.6	.0008

Depth of Cut



RE : Radius

Note 4) Cutting conditions may differ considerably due to the overhang, depth of cut and machine tool condition. Please use the table above as a reference starting point.
Note 5) For hardened steel over 55 HRC, use VF2XLB.
Note 6) For cutting conditions for austenitic stainless steel and titanium alloy, use the high hardness steel (45-55 HRC) table but reduce the spindle speed by 40% and the feed rate by 55%.

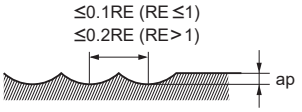
MP2XLB

Ball nose, Short cut length, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Alloy steel (180–280HB) Alloy tool steel, Pre-hardened steel, Precipitation hardening stainless steel			Hardened steel (45–55HRC)			Copper, Copper alloy		
RE (mm)	**LU** (mm)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
1.25	**10**	36000	236.2	.0047	29000	149.6	.0047	29000	149.6	.0094
	15	32000	177.2	.0039	26000	114.2	.0039	26000	114.2	.0079
	20	26000	126.0	.0028	21000	78.7	.0028	21000	78.7	.0055
	25	12000	55.1	.0024	8000	28.3	.0024	8000	28.3	.0047
	30	8000	35.4	.0016	8000	27.6	.0016	8000	27.6	.0031
	35	8000	31.5	.0008	8000	25.2	.0008	8000	20.1	.0016
1.5	**6**	32000	275.6	.0059	26000	177.2	.0059	22000	149.6	.0118
	10	32000	275.6	.0059	26000	177.2	.0059	22000	149.6	.0118
	16	32000	196.9	.0039	26000	126.0	.0039	22000	106.3	.0079
	20	27000	149.6	.0039	22000	94.5	.0039	22000	94.5	.0079
	25	21000	106.3	.0031	17000	66.9	.0031	17000	66.9	.0063
	30	10000	27.6	.0031	6000	22.0	.0031	6000	22.0	.0063
	35	6000	27.6	.0024	6000	22.0	.0024	6000	22.0	.0047
	40	6000	23.6	.0016	6000	18.9	.0016	6000	18.9	.0031
1.75	**15**	27500	173.2	.0051	22000	110.2	.0051	18000	90.6	.0102
	25	23000	141.7	.0039	18000	86.6	.0039	18000	86.6	.0079
	35	10000	55.1	.0031	10000	43.3	.0031	10000	43.3	.0063
	45	7500	35.4	.0016	7500	28.3	.0016	7500	28.3	.0031
2	**10**	24000	236.2	.0079	19000	149.6	.0079	16000	126.0	.0157
	20	24000	149.6	.0059	19000	94.5	.0059	16000	78.7	.0118
	30	20000	118.1	.0039	16000	74.8	.0039	16000	74.8	.0079
	40	12000	66.9	.0039	12000	55.1	.0039	12000	55.1	.0079
	50	8000	39.4	.0020	8000	31.5	.0020	8000	31.5	.0039
2.5	**20**	22000	236.2	.0079	18000	149.6	.0079	13000	110.2	.0157
	25	22000	173.2	.0079	18000	110.2	.0079	13000	78.7	.0157
	30	22000	149.6	.0059	18000	94.5	.0059	13000	66.9	.0118
	40	22000	141.7	.0039	18000	90.6	.0039	13000	63.0	.0079
3	**20**	20000	236.2	.0079	16000	149.6	.0079	11000	102.4	.0157
	30	20000	236.2	.0079	16000	149.6	.0079	11000	102.4	.0157
	40	20000	177.2	.0059	16000	110.2	.0059	11000	78.7	.0118
	50	20000	118.1	.0059	16000	74.8	.0059	11000	51.2	.0118

Depth of cut



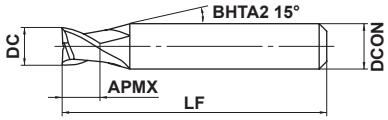
RE : Radius

Note 1) When the inclination angle of machined surface is high, or when machining at high loads; such as in corners, reduce the revolution and feed rate.
Note 2) The use of oil mist is recommended when machining with small diameter.
Note 3) The revolution and feed rate can be increased at small depths of cut (ap).
Note 4) Cutting conditions may differ considerably due to the overhang, depth of cut and machine tool condition. Please use the table above as a reference starting point.
Note 5) For hardened steel over 55 HRC, use VF2XLB.
Note 6) For cutting conditions for austenitic stainless steel and titanium alloy, use the high hardness steel (45-55 HRC) table but reduce the spindle speed by 40% and the feed rate by 55%.

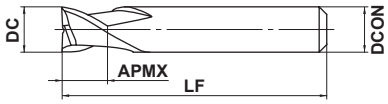
MP2ES NEW

End mill, 2 flute, For Swiss-Type lathe

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type1



Type2

3≤DC≤10					
- 0.010 - 0.030					
4≤DCON≤6	7≤DCON≤10				
0 - 0.008	0 - 0.009				

●2 flute end mill.

(mm)

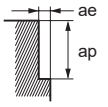
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP2ESD0300S04	3	4.5	50	4	2	●	1
MP2ESD0400S04	4	6	50	4	2	●	2
MP2ESD0500S06	5	7.5	50	6	2	●	1
MP2ESD0600S06	6	9	50	6	2	★	2
MP2ESD0700S07	7	10.5	50	7	2	★	2
MP2ESD0800S08	8	12	50	8	2	★	2
MP2ESD1000S10	10	15	50	10	2	●	2

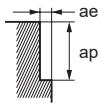
MP2ES

End mill, 2 flute, For Swiss-Type lathe

RECOMMENDED CUTTING CONDITIONS

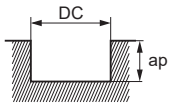
■ Side Milling

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)												
3	**.118**	10000	23.6	.118	.024	7000	15.7	.118	.024	6000	11.8	.118	.024
4	**.157**	7500	23.6	.157	.024	5200	15.7	.157	.024	4500	11.8	.157	.024
5	**.197**	6000	23.6	.197	.024	4200	15.7	.197	.024	3600	11.8	.197	.024
6	**.236**	5000	23.6	.236	.024	3500	15.7	.236	.024	3000	11.8	.236	.024
7	**.276**	4500	22.0	.276	.024	3200	14.2	.276	.024	2700	11.0	.276	.024
8	**.315**	4000	20.5	.315	.024	2800	13.8	.315	.024	2400	10.2	.315	.024
10	**.394**	3200	17.7	.394	.024	2200	11.8	.394	.024	1900	9.1	.394	.024
Depth of Cut													

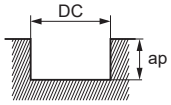
Workpiece Material		Hardened steel (45−55HRC) AISI H13				Copper, Copper Alloy			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)								
3	**.118**	5000	4.7	.118	.008	13000	30.7	.118	.024
4	**.157**	4000	4.7	.157	.008	9500	29.9	.157	.024
5	**.197**	3200	4.7	.197	.008	7600	29.9	.197	.024
6	**.236**	2700	4.7	.236	.008	6400	30.3	.236	.024
7	**.276**	2300	4.3	.276	.008	5500	26.8	.276	.024
8	**.315**	2000	4.3	.315	.008	4800	24.4	.315	.024
10	**.394**	1600	3.9	.394	.008	3800	20.9	.394	.024
Depth of Cut									

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

■ Slotting

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
(mm)	(inch)									
3	**.118**	10000	23.6	.024	7000	15.7	.024	6000	11.8	.024
4	**.157**	7500	23.6	.024	5200	15.7	.024	4500	11.8	.024
5	**.197**	6000	23.6	.024	4200	15.7	.024	3600	11.8	.024
6	**.236**	5000	23.6	.024	3500	15.7	.024	3000	11.8	.024
7	**.276**	4500	22.0	.024	3200	14.2	.024	2700	11.0	.024
8	**.315**	4000	20.5	.024	2800	13.8	.024	2400	10.2	.024
10	**.394**	3200	17.7	.024	2200	11.8	.024	1900	9.1	.024
Depth of Cut										

DC:Dia.

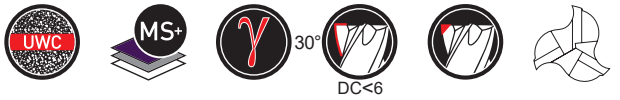
Workpiece Material		Hardened steel (45−55HRC) AISI H13			Copper, Copper Alloy		
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
(mm)	(inch)						
3	**.118**	5000	4.7	.008	13000	30.7	.024
4	**.157**	4000	4.7	.008	9500	29.9	.024
5	**.197**	3200	4.7	.008	7600	29.9	.024
6	**.236**	2700	4.7	.008	6400	30.3	.024
7	**.276**	2300	4.3	.008	5500	26.8	.024
8	**.315**	2000	4.3	.008	4800	24.4	.024
10	**.394**	1600	3.9	.008	3800	20.9	.024
Depth of Cut							

DC:Dia.

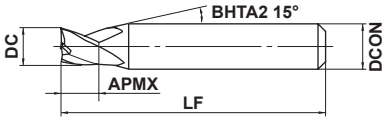
Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

MP3ES NEW

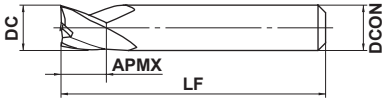
End mill, 3 flute, For Swiss-Type lathe



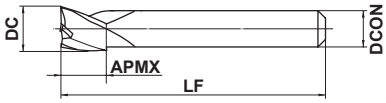
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



Type1



Type2



Type3

3≤DC≤12				
- 0.010 - 0.030				
4≤DCON≤6	7≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

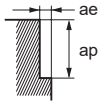
●3 flute end mill.

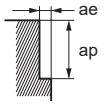
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP3ESD0300S04	3	4.5	50	4	3	●	1
MP3ESD0400S04	4	6	50	4	3	★	2
MP3ESD0500S06	5	7.5	50	6	3	●	1
MP3ESD0600S06	6	9	50	6	3	★	2
MP3ESD0700S07	7	10.5	50	7	3	●	2
MP3ESD0800S08	8	12	50	8	3	★	2
MP3ESD0900S10	9	13.5	50	10	3	★	1
MP3ESD1000S10	10	15	50	10	3	●	2
MP3ESD1200S10	12	15	50	10	3	●	3
MP3ESD1200S12	12	15	50	12	3	★	2

RECOMMENDED CUTTING CONDITIONS

■ Side Milling

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)												
3	**.118**	10000	28.3	.118	.024	7000	18.9	.118	.024	6000	14.2	.118	.024
4	**.157**	7500	28.3	.157	.024	5200	18.9	.157	.024	4500	14.2	.157	.024
5	**.197**	6000	28.3	.197	.024	4200	18.9	.197	.024	3600	14.2	.197	.024
6	**.236**	5000	28.3	.236	.024	3500	18.9	.236	.024	3000	14.2	.236	.024
7	**.276**	4500	26.4	.276	.024	3200	17.3	.276	.024	2700	13.4	.276	.024
8	**.315**	4000	24.4	.315	.024	2800	16.5	.315	.024	2400	12.2	.315	.024
9	**.354**	3500	22.8	.354	.024	2500	15.0	.354	.024	2100	11.4	.354	.024
10	**.394**	3200	21.3	.394	.024	2200	14.2	.394	.024	1900	11.0	.394	.024
12	**.472**	2700	19.3	.472	.024	1900	12.6	.472	.024	1600	9.8	.472	.024
Depth of Cut													

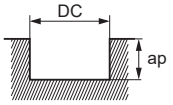
Workpiece Material		Hardened steel (45−55HRC) AISI H13				Copper, Copper Alloy			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)								
3	**.118**	5000	5.5	.118	.008	13000	37.0	.118	.024
4	**.157**	4000	5.5	.157	.008	9500	35.8	.157	.024
5	**.197**	3200	5.5	.197	.008	7600	35.8	.197	.024
6	**.236**	2700	5.5	.236	.008	6400	36.2	.236	.024
7	**.276**	2300	5.1	.276	.008	5500	32.3	.276	.024
8	**.315**	2000	5.1	.315	.008	4800	29.1	.315	.024
9	**.354**	1800	5.1	.354	.008	4200	27.6	.354	.024
10	**.394**	1600	4.7	.394	.008	3800	25.2	.394	.024
12	**.472**	1300	4.7	.472	.008	3200	22.8	.472	.024
Depth of Cut									

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

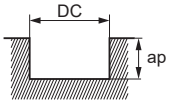
MP3ES

End mill, 3 flute, For Swiss-Type lathe

■Slotting

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC (mm)	DC (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
3	**.118**	10000	28.3	.024	7000	18.9	.024	6000	14.2	.024
4	**.157**	7500	28.3	.024	5200	18.9	.024	4500	14.2	.024
5	**.197**	6000	28.3	.024	4200	18.9	.024	3600	14.2	.024
6	**.236**	5000	28.3	.024	3500	18.9	.024	3000	14.2	.024
7	**.276**	4500	26.4	.024	3200	17.3	.024	2700	13.4	.024
8	**.315**	4000	24.4	.024	2800	16.5	.024	2400	12.2	.024
9	**.354**	3500	22.8	.024	2500	15.0	.024	2100	11.4	.024
10	**.394**	3200	21.3	.024	2200	14.2	.024	1900	11.0	.024
12	**.472**	2700	19.3	.024	1900	12.6	.024	1600	9.8	.024
Depth of Cut										

DC:Dia.

Workpiece Material		Hardened steel (45−55HRC) AISI H13			Copper, Copper Alloy		
DC (mm)	DC (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
3	**.118**	5000	5.5	.008	13000	37.0	.024
4	**.157**	4000	5.5	.008	9500	35.8	.024
5	**.197**	3200	5.5	.008	7600	35.8	.024
6	**.236**	2700	5.5	.008	6400	36.2	.024
7	**.276**	2300	5.1	.008	5500	32.3	.024
8	**.315**	2000	5.1	.008	4800	29.1	.024
9	**.354**	1800	5.1	.008	4200	27.6	.024
10	**.394**	1600	4.7	.008	3800	25.2	.024
12	**.472**	1300	4.7	.008	3200	22.8	.024
Depth of Cut							

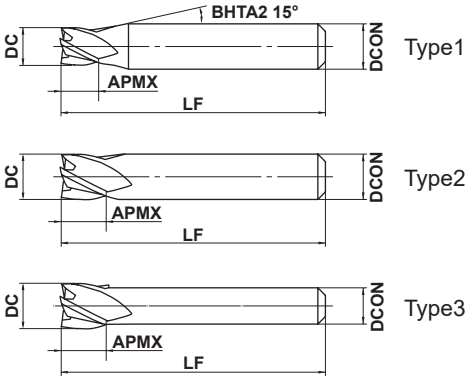
DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

MP4EC NEW

End mill, 4 flute, For Swiss-Type lathe

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		○	○	○	



3≤DC≤12	DC=14			
- 0.010 - 0.030	- 0.010 - 0.040			
4≤DCON≤6	**7≤DCON≤10**	**DCON=12**		
0 - 0.008	0 - 0.009	0 - 0.011		

●4 flute end mill.

(mm)

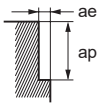
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
MP4ECD0300S04	3	4.5	50	4	4	●	1
MP4ECD0350S04	3.5	5	50	4	4	★	1
MP4ECD0400S04	4	6	50	4	4	●	2
MP4ECD0500S06	5	7.5	50	6	4	●	1
MP4ECD0600S06	6	9	50	6	4	●	2
MP4ECD0700S07	7	10.5	50	7	4	★	2
MP4ECD0800S07	8	12	50	7	4	★	3
MP4ECD0800S08	8	12	50	8	4	●	2
MP4ECD0900S10	9	13.5	50	10	4	●	1
MP4ECD1000S07	10	15	50	7	4	★	3
MP4ECD1000S10	10	15	50	10	4	●	2
MP4ECD1200S10	12	15	50	10	4	●	3
MP4ECD1200S12	12	15	50	12	4	★	2
MP4ECD1400S10	14	15	50	10	4	●	3

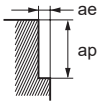
MP4EC

End mill, 4 flute, For Swiss-Type lathe

RECOMMENDED CUTTING CONDITIONS

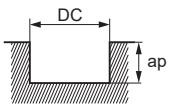
■ Side Milling

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)												
3	**.118**	10000	35.4	.118	.024	7000	23.6	.118	.024	6000	17.7	.118	.024
3.5	**.138**	8500	35.4	.138	.024	6000	23.6	.138	.024	5100	17.7	.138	.024
4	**.157**	7500	35.4	.157	.024	5200	23.6	.157	.024	4500	17.7	.157	.024
5	**.197**	6000	35.4	.197	.024	4200	23.6	.197	.024	3600	17.7	.197	.024
6	**.236**	5000	35.4	.236	.024	3500	23.6	.236	.024	3000	17.7	.236	.024
7	**.276**	4500	33.1	.276	.024	3200	21.3	.276	.024	2700	16.5	.276	.024
8	**.315**	4000	30.7	.315	.024	2800	20.5	.315	.024	2400	15.4	.315	.024
9	**.354**	3500	28.3	.354	.024	2500	18.9	.354	.024	2100	14.2	.354	.024
10	**.394**	3200	26.8	.394	.024	2200	17.7	.394	.024	1900	13.4	.394	.024
12	**.472**	2700	24.4	.472	.024	1900	16.1	.472	.024	1600	12.2	.472	.024
14	**.551**	2300	21.7	.551	.024	1600	13.8	.551	.024	1400	11.0	.551	.024
Depth of Cut													

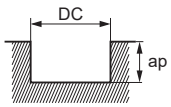
Workpiece Material		Hardened steel (45−55HRC) AISI H13				Copper, Copper Alloy			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)								
3	**.118**	5000	7.1	.118	.008	13000	47.2	.118	.024
3.5	**.138**	4500	7.1	.138	.008	11000	47.2	.138	.024
4	**.157**	4000	7.1	.157	.008	9500	43.3	.157	.024
5	**.197**	3200	7.1	.197	.008	7600	43.3	.197	.024
6	**.236**	2700	7.1	.236	.008	6400	43.3	.236	.024
7	**.276**	2300	6.3	.276	.008	5500	39.4	.276	.024
8	**.315**	2000	6.3	.315	.008	4800	37.0	.315	.024
9	**.354**	1800	5.9	.354	.008	4200	33.9	.354	.024
10	**.394**	1600	5.5	.394	.008	3800	31.9	.394	.024
12	**.472**	1300	4.7	.472	.008	3200	28.7	.472	.024
14	**.551**	1200	4.7	.551	.008	2700	25.6	.551	.024
Depth of Cut									

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

■ Slotting

Workpiece Material		Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
(mm)	(inch)									
3	**.118**	10000	35.4	.024	7000	23.6	.024	6000	17.7	.024
3.5	**.138**	8500	35.4	.024	6000	23.6	.024	5100	17.7	.024
4	**.157**	7500	35.4	.024	5200	23.6	.024	4500	17.7	.024
5	**.197**	6000	35.4	.024	4200	23.6	.024	3600	17.7	.024
6	**.236**	5000	35.4	.024	3500	23.6	.024	3000	17.7	.024
7	**.276**	4500	33.1	.024	3200	21.3	.024	2700	16.5	.024
8	**.315**	4000	30.7	.024	2800	20.5	.024	2400	15.4	.024
9	**.354**	3500	28.3	.024	2500	18.9	.024	2100	14.2	.024
10	**.394**	3200	26.8	.024	2200	17.7	.024	1900	13.4	.024
12	**.472**	2700	24.4	.024	1900	16.1	.024	1600	12.2	.024
14	**.551**	2300	21.7	.024	1600	13.8	.024	1400	11.0	.024
Depth of Cut										

DC:Dia.

Workpiece Material		Hardened steel (45−55HRC) AISI H13			Copper, Copper Alloy		
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)
(mm)	(inch)						
3	**.118**	5000	7.1	.008	13000	47.2	.024
3.5	**.138**	4500	7.1	.008	11000	47.2	.024
4	**.157**	4000	7.1	.008	9500	43.3	.024
5	**.197**	3200	7.1	.008	7600	43.3	.024
6	**.236**	2700	7.1	.008	6400	43.3	.024
7	**.276**	2300	6.3	.008	5500	39.4	.024
8	**.315**	2000	6.3	.008	4800	37.0	.024
9	**.354**	1800	5.9	.008	4200	33.9	.024
10	**.394**	1600	5.5	.008	3800	31.9	.024
12	**.472**	1300	4.7	.008	3200	28.7	.024
14	**.551**	1200	4.7	.008	2700	25.6	.024
Depth of Cut							

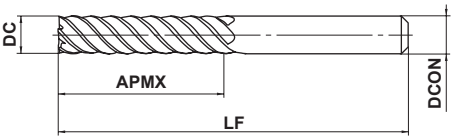
DC:Dia.

Note 1) When cutting austenitic stainless steels, the use of water-soluble cutting fluid is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) When drilling, please set the feed rate at 1/3 or below the values above.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

VCLD

End mill, Long cut length, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type 1

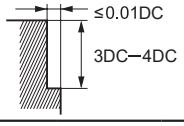
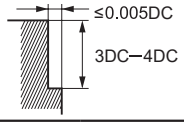
DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Ideal for tool steel and hardened materials machining

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VCLDD0600	6	26	70	6	6	★	1
VCLDD0800	8	36	90	8	6	★	1
VCLDD1000	10	46	100	10	6	★	1
VCLDD1200	12	56	110	12	6	★	1
VCLDD1600	16	66	130	16	6	★	1
VCLDD2000	20	76	140	20	6	★	1
VCLDD2500	25	92	180	25	6	★	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Hardened steel (45—55HRC) AISI H13 etc.			Hardened steel (55—62HRC) AISI D2 etc.			Hardened steel (62—70HRC) AISI W1, AISI M2 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	2100	450	17.7	1600	330	13.0	1300	240	9.4	1100	190	7.5
8	1600	430	16.9	1200	310	12.2	1000	230	9.1	800	170	6.7
10	1300	420	16.5	960	290	11.4	800	220	8.7	640	150	5.9
12	1100	380	15.0	800	260	10.2	660	200	7.9	530	140	5.5
16	800	310	12.2	600	220	8.7	500	160	6.3	400	120	4.7
20	640	270	10.6	480	190	7.5	400	140	5.5	320	110	4.3
25	510	230	9.1	380	160	6.3	320	120	4.7	260	90	3.5
Depth of cut												

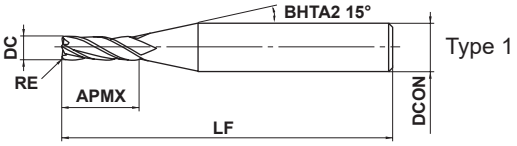
DC : Dia.

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

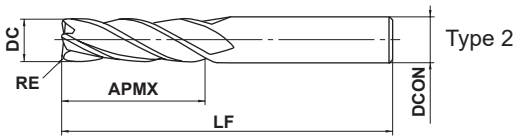
VC4JRB

Corner radius, Semi long cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	○		○	○		



Type 1



Type 2

DC≤12	DC>12			
0 -0.020	0 -0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 -0.008	0 -0.009	0 -0.011	0 -0.013	

- 4 flute corner radius end mill for general use.
- 4 flute corner radius end mill for longer reach applications.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VC4JRBD0300R0030	3	0.3	12	50	6	4	★	1
VC4JRBD0400R0030	4	0.3	15	50	6	4	★	1
VC4JRBD0400R0050	4	0.5	15	50	6	4	★	1
VC4JRBD0500R0030	5	0.3	20	60	6	4	★	1
VC4JRBD0500R0050	5	0.5	20	60	6	4	★	1
VC4JRBD0600R0030	6	0.3	20	60	6	4	★	2
VC4JRBD0600R0050	6	0.5	20	60	6	4	★	2
VC4JRBD0600R0100	6	1	20	60	6	4	★	2
VC4JRBD0800R0030	8	0.3	25	70	8	4	★	2
VC4JRBD0800R0050	8	0.5	25	70	8	4	★	2
VC4JRBD0800R0100	8	1	25	70	8	4	★	2
VC4JRBD0800R0150	8	1.5	25	70	8	4	★	2
VC4JRBD0800R0200	8	2	25	70	8	4	★	2
VC4JRBD1000R0030	10	0.3	30	90	10	4	★	2
VC4JRBD1000R0050	10	0.5	30	90	10	4	★	2
VC4JRBD1000R0100	10	1	30	90	10	4	★	2
VC4JRBD1000R0150	10	1.5	30	90	10	4	★	2
VC4JRBD1000R0200	10	2	30	90	10	4	★	2
VC4JRBD1200R0050	12	0.5	30	90	12	4	★	2
VC4JRBD1200R0100	12	1	30	90	12	4	★	2
VC4JRBD1200R0150	12	1.5	30	90	12	4	★	2
VC4JRBD1200R0200	12	2	30	90	12	4	★	2
VC4JRBD1600R0050	16	0.5	50	110	16	4	★	2
VC4JRBD1600R0100	16	1	50	110	16	4	★	2
VC4JRBD1600R0150	16	1.5	50	110	16	4	★	2
VC4JRBD1600R0200	16	2	50	110	16	4	★	2
VC4JRBD2000R0050	20	0.5	55	110	20	4	★	2
VC4JRBD2000R0100	20	1	55	110	20	4	★	2
VC4JRBD2000R0150	20	1.5	55	110	20	4	★	2
VC4JRBD2000R0200	20	2	55	110	20	4	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	4200	110	4.3	3400	95	3.7	2600	70	2.8	2100	50	2.0
4	3400	140	5.5	2700	110	4.3	2100	85	3.3	1700	60	2.4
5	2900	170	6.7	2300	140	5.5	1800	100	3.9	1500	70	2.8
6	2500	200	7.9	2000	170	6.7	1500	130	5.1	1300	85	3.3
8	1900	220	8.7	1500	170	6.7	1200	150	5.9	1000	85	3.3
10	1600	220	8.7	1300	170	6.7	950	130	5.1	800	85	3.3
12	1300	170	6.7	1100	150	5.9	800	100	3.9	670	70	2.8
16	1000	140	5.5	820	110	4.3	600	80	3.1	500	50	2.0
20	800	110	4.3	650	85	3.3	480	70	2.8	400	40	1.6
Depth of cut				≤0.05DC (MAX.0.5mm) ≤2.5DC DC ≤0.3DC (MAX.3mm)						≤0.02DC (MAX.0.3mm) ≤2DC DC ≤0.05DC (MAX.0.5mm)		

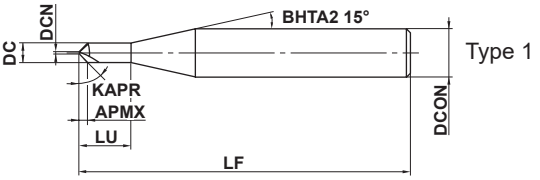
DC : Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) The above table shows cutting conditions for side milling. For slotting, please reduce the feed rate only to 50% of the table figure. Please set the revolution rate at 60% and the feed rate at 40% when slotting austenitic stainless steel.
Note 4) When drilling, please set the feed rate at 1/3 or below of the above value.
Note 5) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

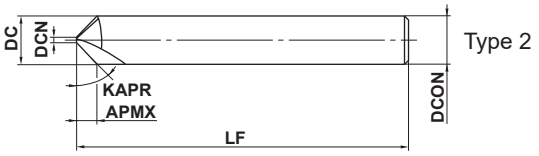
VC2C

Chamfer cutter, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	○		◎	◎	○	○



Type 1



Type 2

DCN				
±0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● Chamfering cutters for machining of hardened steel and difficult-to-cut materials.

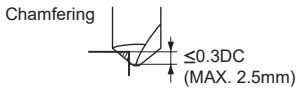
(mm)

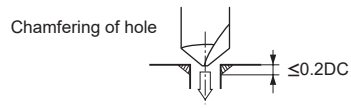
Order Number	DC	DCN	APMX	KAPR	LU	LF	DCON	No. of Flutes	Stock	Type
VC2CD0200	2	0.3	0.85	45°	6	50	6	2	★	1
VC2CD0400	4	0.3	1.85	45°	12	50	6	2	★	1
VC2CD0600	6	0.3	2.85	45°	—	50	6	2	★	2
VC2CD0800	8	0.4	3.8	45°	—	60	8	2	★	2
VC2CD1000	10	0.5	4.75	45°	—	70	10	2	★	2
VC2CD1200	12	0.5	5.75	45°	—	75	12	2	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Hardened steel (45−55HRC) AISI H13 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
2	16000	960	37.8	11000	590	23.2	9500	460	18.1	8000	320	12.6
4	8000	480	18.9	5600	300	11.8	4800	230	9.1	4000	160	6.3
6	5300	320	12.6	3700	200	7.9	3200	150	5.9	2700	110	4.3
8	4000	240	9.4	2800	150	5.9	2400	120	4.7	2000	80	3.1
10	3200	190	7.5	2200	120	4.7	1900	90	3.5	1600	60	2.4
12	2700	160	6.3	1900	100	3.9	1600	80	3.1	1300	50	2.0

Depth of cut





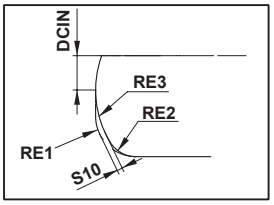
DC : Dia.

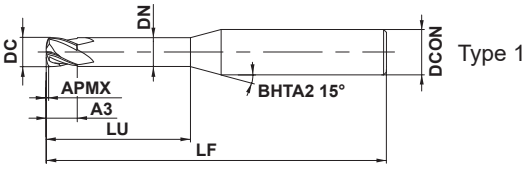
Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VQFDRB NEW

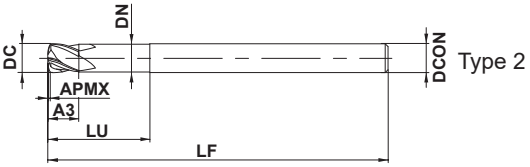
Duplex corner radius end mill for high speed cutting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Precipitation Hardening Stainless Steel	Austenitic Stainless Steel	Cobalt Chrome Alloy, Heat Resistant Alloy	Titanium Alloy	Aluminum Alloy
			○		◎	○	





Type 1



Type 2

1≤DC≤4					
0 - 0.020					
DCON=6					
0 - 0.005					

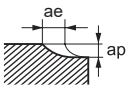
- Duplex corner radius type allows more efficient high feed.
- High feed cutting realized through use of multiple cuts.

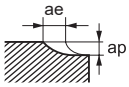
(mm)

Order Number	DC	*1 RE1	APMX	*3 A3	LU	DN	LF	DCON	No. of Flutes	Multi-task radius part				*2 RMPX	Stock	Type
										S10	DCIN	RE2	RE3			
VQFDRBD0300N080	3	0.64	0.18	3	8	2.8	50	6	4	0.08	0.75	0.5	2	2.1°	●	1
VQFDRBD0300N120	3	0.64	0.18	3	12	2.8	55	6	4	0.08	0.75	0.5	2	2.1°	●	1
VQFDRBD0400N120	4	0.71	0.25	4	12	3.8	55	6	4	0.13	1.0	0.5	3	1.9°	●	1
VQFDRBD0400N160	4	0.71	0.25	4	16	3.8	60	6	4	0.13	1.0	0.5	3	1.9°	●	1
VQFDRBD0600N180	6	0.92	0.36	6	18	5.6	60	6	4	0.21	1.5	0.6	5	1.7°	●	2

*1 RE1 : Approx. R
*2 RMPX : Max. Ramping Angle
*3 A3 : Cutting Edge Effective Length

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Titanium Alloys Ti-6Al-4V ELI, ASTM F136, etc.					Cobalt Chromium Alloys Precipitation Hardening Stainless Steels ASTM F75:Casting, F1537:Wrought Bar, F799:Forgings, etc.				
DC		Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)	Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)
(mm)	(inch)										
3	**.118**	8500	260	82.7	.008	.051	6400	195	118.1	.008	.051
4	**.157**	6400	260	86.6	.008	.067	4800	195	106.3	.008	.067
6	**.236**	4200	260	55.1	.012	.079	3200	195	82.7	.012	.102
Depth of Cut											

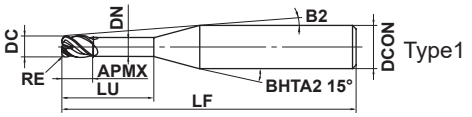
Workpiece Material		Heat Resistant Alloys Inconel 718 etc.				
DC		Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Feed Rate **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)
(mm)	(inch)					
3	**.118**	3200	100	30.3	.008	.024
4	**.157**	2400	100	30.3	.008	.031
6	**.236**	1600	100	20.5	.012	.051
Depth of Cut						

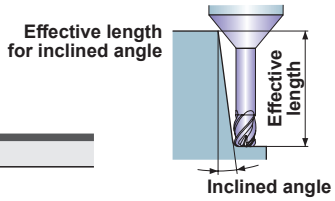
Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) If the depth of cut is smaller, the revolution and the feed rate can be increased.

VQHVRB NEW

Corner radius, Short cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Precipitation Hardening Stainless Steel	Austenitic Stainless Steel	Cobalt Chrome Alloy, Heat Resistant Alloy	Titanium Alloy	Aluminum Alloy
			○		◎	○	





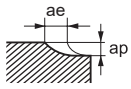
0.1≤RE≤1			
±0.01			
1≤DC≤4			
0 -0.02			
DCON=6			
0 -0.005			

● SMART MIRACLE corner radius end mill for high feed rates and efficient machining.

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type
VQHVRBD0100R01N080	1	0.1	1	8	0.94	8.2°	50	6	4	●	1
VQHVRBD0100R01N120	1	0.1	1	12	0.94	6.7°	55	6	4	●	1
VQHVRBD0200R02N120	2	0.2	2	12	1.9	5.9°	55	6	4	●	1
VQHVRBD0200R02N160	2	0.2	2	16	1.9	4.9°	60	6	4	●	1
VQHVRBD0300R05N100	3	0.5	3	10	2.9	5.6°	55	6	4	●	1
VQHVRBD0300R05N180	3	0.5	3	18	2.9	3.7°	60	6	4	●	1
VQHVRBD0400R10N120	4	1.0	4	12	3.9	3.9°	55	6	4	●	1
VQHVRBD0400R10N200	4	1.0	4	20	3.9	2.5°	60	6	4	●	1

RECOMMENDED CUTTING CONDITIONS

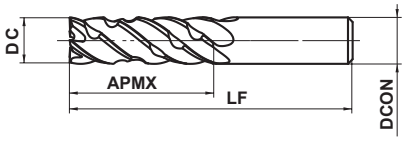
Workpiece Material				Titanium Alloys Ti-6Al-4V ELI, ASTM F136, etc.					Cobalt Chromium Alloys Precipitation Hardening Stainless Steels ASTM F75:Casting, F1537:Wrought Bar, F799:Forgings, etc.				
DC		**LU**		Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)	Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)										
1	**.039**	**8**	**.315**	2500	25	19.7	.001	.004	2500	25	19.7	.001	.004
1	**.039**	**12**	**.472**	2500	25	13.8	.001	.004	2500	25	13.8	.001	.004
2	**.079**	**12**	**.472**	4800	100	23.6	.003	.012	4800	100	23.6	.003	.012
2	**.079**	**16**	**.630**	4800	100	13.4	.003	.012	4800	100	13.8	.003	.012
3	**.118**	**10**	**.394**	8500	260	94.5	.007	.051	6400	195	86.6	.007	.051
3	**.118**	**18**	**.709**	8500	260	78.7	.007	.051	6400	195	63.0	.007	.051
4	**.157**	**12**	**.472**	6400	260	78.7	.010	.067	4800	195	70.9	.009	.067
4	**.157**	**20**	**.787**	6400	260	78.7	.010	.067	4800	195	70.9	.009	.067
Depth of Cut													

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.

VQJCS NEW

End mill, Semi long cut length, 5 flute, Irregular pitch flutes, Chip breaker

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

DC≤12	DC>12			
0 - 0.030	0 - 0.040			
DCON=6	**8≤DCON≤10**	**12≤DCON≤16**	**DCON=20**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- Chip breaker type end mill for efficient chip breaking capabilities that also provides good surface finishes.
- A high rigidity Smart Miracle vibration damping end mill for high efficiency trochoidal milling.

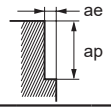
(mm)

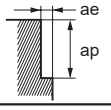
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQJCSD0600	6	18	70	6	5	●	1
VQJCSD0800	8	24	80	8	5	●	1
VQJCSD1000	10	30	90	10	5	●	1
VQJCSD1200	12	36	100	12	5	●	1
VQJCSD1600	16	48	110	16	5	●	1
VQJCSD2000	20	60	125	20	5	●	1

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an electrical contact type of tool setter may not work. When measuring the tool length, please use a mechanical contact type or a laser tool setter.

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic, Ferritic and Martensitic Stainless Steels, Titanium Alloys				Hardened Stainless Steels, Cobalt Chromium Alloys			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of cut ap (inch)	Width of Cut ae (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of cut ap (inch)	Width of Cut ae (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of cut ap (inch)	Width of Cut ae (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of cut ap (inch)	Width of Cut ae (inch)
(mm)	(inch)																
6	**.236**	10600	70.9	.709	.035	9500	59.1	.709	.035	6400	39.4	.709	.018	5300	31.5	.709	.018
8	**.315**	8000	70.9	.945	.047	7200	59.1	.945	.047	4800	39.4	.945	.024	4000	31.5	.945	.024
10	**.394**	6400	66.9	1.181	.059	5700	55.1	1.181	.059	3800	35.4	1.181	.030	3200	31.5	1.181	.030
12	**.472**	5300	66.9	1.417	.071	4800	55.1	1.417	.071	3200	31.5	1.417	.035	2700	27.6	1.417	.035
16	**.630**	4000	55.1	1.890	.094	3600	47.2	1.890	.094	2400	27.6	1.890	.047	2000	23.6	1.890	.047
20	**.787**	3200	47.2	2.362	.118	2900	39.4	2.362	.118	1900	23.6	2.362	.059	1600	19.7	2.362	.059
Depth of Cut																	

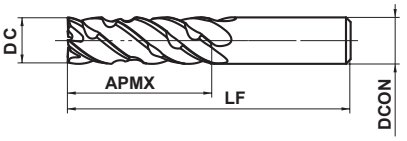
Workpiece Material		Copper, Copper Alloys				Heat Resistant Alloys			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of cut ap (inch)	Width of Cut ae (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of cut ap (inch)	Width of Cut ae (inch)
(mm)	(inch)								
6	**.236**	11700	82.7	.709	.035	2100	7.9	.709	.007
8	**.315**	8800	82.7	.945	.047	1600	7.9	.945	.009
10	**.394**	7000	70.9	1.181	.059	1300	7.9	1.181	.012
12	**.472**	5800	70.9	1.417	.071	1100	3.9	1.417	.014
16	**.630**	4400	59.1	1.890	.094	800	3.9	1.890	.019
20	**.787**	3500	55.1	2.362	.118	600	3.9	2.362	.024
Depth of Cut									

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an electrical contact type of tool setter may not work. When measuring the tool length, please use a mechanical contact type or a laser tool setter.
Note 2) The irregular pitch flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 3) The revolution and feed rate can be increased with a smaller depth of cut.
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

VQLCS NEW

End mill, Long cut length, 5 flute, Irregular pitch flutes, Chip breaker

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

DC				
0 - 0.030				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

- Chip breaker type end mill for efficient chip breaking capabilities that also provides good surface finishes.
- A high rigidity Smart Miracle vibration damping end mill for high efficiency trochoidal milling.

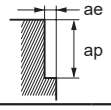
(mm)

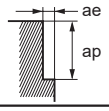
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQLCSD0600	6	24	70	6	5	●	1
VQLCSD0800	8	32	90	8	5	●	1
VQLCSD1000	10	40	100	10	5	●	1
VQLCSD1200	12	48	110	12	5	●	1

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an electrical contact type of tool setter may not work. When measuring the tool length, please use a mechanical contact type or a laser tool setter.

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic, Ferritic and Martensitic Stainless Steels, Titanium Alloys				Hardened Stainless Steels, Cobalt Chromium Alloys			
DC		Revolution (min-1)	Table Feed (IPM)	Depth of cut ap(inch)	Width of Cut ae(inch)	Revolution (min-1)	Table Feed (IPM)	Depth of cut ap(inch)	Width of Cut ae(inch)	Revolution (min-1)	Table Feed (IPM)	Depth of cut ap(inch)	Width of Cut ae(inch)	Revolution (min-1)	Table Feed (IPM)	Depth of cut ap(inch)	Width of Cut ae(inch)
(mm)	(inch)																
6	**.236**	9500	63.0	.945	.024	8500	47.2	.945	.024	5300	31.5	.945	.012	4800	27.6	.945	.012
8	**.315**	7200	63.0	1.260	.031	6400	51.2	1.260	.031	4000	31.5	1.260	.016	3600	27.6	1.260	.016
10	**.394**	5700	59.1	1.575	.039	5100	47.2	1.575	.039	3200	27.6	1.575	.020	2900	27.6	1.575	.020
12	**.472**	4800	59.1	1.890	.047	4200	47.2	1.890	.047	2700	27.6	1.890	.024	2400	23.6	1.890	.024
Depth of Cut																	

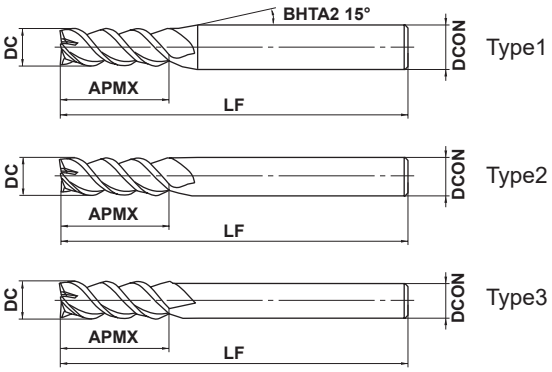
Workpiece Material		Copper, Copper Alloys				Heat Resistant Alloys			
DC		Revolution (min-1)	Table Feed (IPM)	Depth of cut ap(inch)	Width of Cut ae(inch)	Revolution (min-1)	Table Feed (IPM)	Depth of cut ap(inch)	Width of Cut ae(inch)
(mm)	(inch)								
6	**.236**	10600	70.9	.945	.024	1600	3.9	.945	.005
8	**.315**	8000	70.9	1.260	.031	1200	3.9	1.260	.006
10	**.394**	6400	63.0	1.575	.039	1000	3.9	1.575	.008
12	**.472**	5300	63.0	1.890	.047	800	3.9	1.890	.009
Depth of Cut									

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an electrical contact type of tool setter may not work. When measuring the tool length, please use a mechanical contact type or a laser tool setter.
Note 2) The irregular pitch flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sounds can occur. In that case, please adjust the revolution, feed rate and depth of cut.
Note 3) The revolution and feed rate can be increased with a smaller depth of cut.
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

VQMHZV

End mill, Medium cut length, 3 flute for drilling and slotting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	**8≤DCON≤10**	**12≤DCON≤16**	**DCON=20**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- A single end mill for both plunging and slotting.
- Irregular helical geometry controls the vibration.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD0100	1	2	45	4	3	●	1
VQMHZVD0110	1.1	2.2	45	4	3	●	1
VQMHZVD0120	1.2	2.4	45	4	3	●	1
VQMHZVD0130	1.3	2.6	45	4	3	●	1
VQMHZVD0140	1.4	2.8	45	4	3	●	1
VQMHZVD0150	1.5	3	45	4	3	●	1
VQMHZVD0160	1.6	3.2	45	4	3	●	1
VQMHZVD0170	1.7	3.4	45	4	3	●	1
VQMHZVD0180	1.8	3.6	45	4	3	●	1
VQMHZVD0190	1.9	3.8	45	4	3	●	1
VQMHZVD0200	2	4	50	6	3	●	1
VQMHZVD0210	2.1	4.2	50	6	3	●	1
VQMHZVD0220	2.2	4.4	50	6	3	●	1
VQMHZVD0230	2.3	4.6	50	6	3	●	1
VQMHZVD0240	2.4	4.8	50	6	3	●	1
VQMHZVD0250	2.5	5	50	6	3	●	1
VQMHZVD0260	2.6	5.2	50	6	3	●	1
VQMHZVD0270	2.7	5.4	50	6	3	●	1
VQMHZVD0280	2.8	5.6	50	6	3	●	1
VQMHZVD0290	2.9	5.8	50	6	3	●	1
VQMHZVD0300	3	6	50	6	3	●	1
VQMHZVD0310	3.1	7	50	6	3	●	1
VQMHZVD0320	3.2	7	50	6	3	●	1
VQMHZVD0330	3.3	7	50	6	3	●	1
VQMHZVD0340	3.4	7	50	6	3	●	1
VQMHZVD0350	3.5	8	50	6	3	●	1
VQMHZVD0360	3.6	8	50	6	3	●	1
VQMHZVD0370	3.7	8	50	6	3	●	1
VQMHZVD0380	3.8	8	50	6	3	●	1
VQMHZVD0390	3.9	8	50	6	3	●	1

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD0400	4	8	50	6	3	●	1
VQMHZVD0450	4.5	10	50	6	3	●	1
VQMHZVD0500	5	10	50	6	3	●	1
VQMHZVD0550	5.5	13	50	6	3	●	1
VQMHZVD0600	6	13	60	6	3	●	2
VQMHZVD0650	6.5	16	60	8	3	●	1
VQMHZVD0700	7	16	60	8	3	●	1
VQMHZVD0750	7.5	16	60	8	3	●	1
VQMHZVD0800	8	19	70	8	3	●	2
VQMHZVD0850	8.5	19	70	10	3	●	1
VQMHZVD0900	9	19	70	10	3	●	1
VQMHZVD0950	9.5	19	70	10	3	●	1
VQMHZVD1000	10	22	80	10	3	●	2
VQMHZVD1100	11	22	80	12	3	●	1
VQMHZVD1200	12	26	90	12	3	●	2
VQMHZVD1300	13	26	90	12	3	★	3
VQMHZVD1400	14	26	90	12	3	★	3
VQMHZVD1500	15	26	110	16	3	★	1
VQMHZVD1600	16	30	110	16	3	★	2
VQMHZVD2000	20	32	140	20	3	★	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

VQMHZV

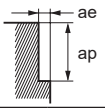
End mill, Medium cut length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

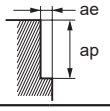
■ Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	100	32000	720	1.5	0.2	80	25000	530	1.5	0.2	60	19000	430	1.5	0.2	50	16000	340	1.5	0.1
1.5	130	28000	1300	2.25	0.3	100	21000	630	2.25	0.3	85	18000	540	2.25	0.3	65	14000	420	2.25	0.15
2	150	24000	1800	3	0.6	120	19000	860	3	0.6	100	16000	620	3	0.6	75	12000	540	3	0.4
3	150	16000	1900	4.5	0.9	120	13000	940	4.5	0.9	100	11000	660	4.5	0.9	75	8000	580	4.5	0.6
4	150	12000	2000	6	1.2	120	9500	940	6	1.2	100	8000	670	6	1.2	75	6000	590	6	0.8
5	150	9500	1900	7.5	1.5	120	7600	960	7.5	1.5	100	6400	670	7.5	1.5	75	4800	600	7.5	1
6	150	8000	1900	9	1.8	120	6400	960	9	1.8	100	5300	830	9	1.8	75	4000	600	9	1.2
8	150	6000	1900	12	2.4	120	4800	1000	12	2.4	100	4000	900	12	2.4	75	3000	630	12	1.6
10	150	4800	1700	15	3	120	3800	910	15	3	100	3200	960	15	3	75	2400	580	15	2
12	150	4000	1400	18	3.6	120	3200	860	18	3.6	100	2700	890	18	3.6	75	2000	540	18	2.4
16	150	3000	1200	24	4.8	120	2400	720	24	4.8	100	2000	720	24	4.8	75	1500	450	24	3.2
20	150	2400	970	30	6	120	1900	570	30	6	100	1600	580	30	6	75	1200	360	30	4
Depth of cut																				

General purpose cutting conditions

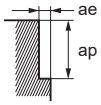
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	100	32000	480	1.5	0.2	80	25000	350	1.5	0.2	60	19000	280	1.5	0.2	50	16000	220	1.5	0.1
1.5	120	25000	740	2.25	0.3	100	21000	420	2.25	0.3	80	17000	340	2.25	0.3	65	14000	280	2.25	0.15
2	120	19000	940	3	0.6	100	16000	480	3	0.6	80	13000	340	3	0.6	70	11000	330	3	0.4
3	120	13000	1000	4.5	0.9	100	11000	520	4.5	0.9	80	8500	340	4.5	0.9	70	7400	350	4.5	0.6
4	120	9500	1000	6	1.2	100	8000	520	6	1.2	80	6400	350	6	1.2	70	5600	370	6	0.8
5	120	7600	980	7.5	1.5	100	6400	530	7.5	1.5	80	5100	350	7.5	1.5	70	4500	370	7.5	1
6	120	6400	1000	9	1.8	100	5300	540	9	1.8	80	4200	400	9	1.8	70	3700	370	9	1.2
8	120	4800	1000	12	2.4	100	4000	550	12	2.4	80	3200	430	12	2.4	70	2800	390	12	1.6
10	120	3800	900	15	3	100	3200	510	15	3	80	2500	450	15	3	70	2200	350	15	2
12	120	3200	760	18	3.6	100	2700	480	18	3.6	80	2100	420	18	3.6	70	1900	340	18	2.4
16	120	2400	640	24	4.8	100	2000	400	24	4.8	80	1600	340	24	4.8	70	1400	280	24	3.2
20	120	1900	510	30	6	100	1600	320	30	6	80	1300	270	30	6	70	1100	220	30	4
Depth of cut																				

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

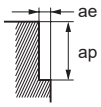
■Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min-1)	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min-1)	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	860	1.5	0.2	40	13000	160	1.5	0.05
1.5	150	32000	1400	2.25	0.3	40	8500	170	2.25	0.08
2	180	29000	2200	3	0.6	40	6400	170	3	0.2
3	180	19000	2300	4.5	0.9	40	4200	180	4.5	0.3
4	180	14000	2300	6	1.2	40	3200	180	6	0.4
5	180	11000	2300	7.5	1.5	40	2500	180	7.5	0.5
6	180	9500	2300	9	1.8	40	2100	190	9	0.6
8	180	7200	2300	12	2.4	40	1600	190	12	0.8
10	180	5700	2100	15	3	40	1300	220	15	1
12	180	4800	1700	18	3.6	40	1100	210	18	1.2
16	180	3600	1500	24	4.8	40	800	150	24	1.6
20	180	2900	1200	30	6	40	640	120	30	2
Depth of cut										

General purpose cutting conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min-1)	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min-1)	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	560	1.5	0.2	30	9500	75	1.5	0.05
1.5	140	30000	890	2.25	0.3	30	6400	82	2.25	0.07
2	140	22000	1100	3	0.6	30	4800	86	3	0.2
3	140	15000	1200	4.5	0.9	30	3200	89	4.5	0.3
4	140	11000	1200	6	1.2	30	2400	90	6	0.4
5	140	8900	1200	7.5	1.5	30	1900	90	7.5	0.5
6	140	7400	1200	9	1.8	30	1600	95	9	0.6
8	140	5600	1200	12	2.4	30	1200	95	12	0.8
10	140	4500	1100	15	3	30	950	110	15	1
12	140	3700	880	18	3.6	30	800	100	18	1.2
16	140	2800	750	24	4.8	30	600	76	24	1.6
20	140	2200	590	30	6	30	480	61	30	2
Depth of cut										

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHZV

End mill, Medium cut length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

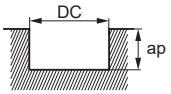
■Slotting

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
1	100	32000	380	0.5	80	25000	150	0.5	60	19000	100	0.5	45	14000	80	0.3	120	38000	460	0.5	30	9500	60	0.2
1.5	130	28000	590	0.75	100	21000	250	0.75	85	18000	220	0.75	60	12000	140	0.4	150	32000	670	0.75	30	6400	80	0.3
2	150	24000	940	2	120	19000	460	2	100	16000	480	2	60	9500	230	1	180	29000	1100	2	30	4800	100	0.6
3	150	16000	1100	3	120	13000	550	3	100	11000	500	3	60	6400	270	1.5	180	19000	1300	3	30	3200	120	0.9
4	150	12000	1400	4	120	9500	680	4	100	8000	530	4	60	4800	350	2	180	14000	1700	4	30	2400	130	1.2
5	150	9500	1400	5	120	7600	680	5	100	6400	540	5	60	3800	350	2.5	180	11000	1700	5	30	1900	130	1.5
6	150	8000	1400	6	120	6400	770	6	100	5300	560	6	60	3200	380	3	180	9500	1700	6	30	1600	130	1.8
8	150	6000	1300	8	120	4800	720	8	100	4000	600	8	60	2400	360	4	180	7200	1500	8	30	1200	140	2.4
10	150	4800	1200	10	120	3800	630	10	100	3200	670	10	60	1900	310	5	180	5700	1400	10	30	950	160	3
12	150	4000	960	12	120	3200	580	12	100	2700	650	12	60	1600	290	6	180	4800	1200	12	30	800	150	3.6
16	150	3000	810	12	120	2400	500	12	100	2000	480	12	60	1200	250	8	180	3600	970	12	30	600	120	4.8
20	150	2400	650	12	120	1900	400	12	100	1600	380	12	60	950	200	10	180	2900	780	12	30	480	90	6

Depth of cut

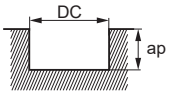


DC:Dia.

General purpose cutting conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
1	100	32000	250	0.5	80	25000	99	0.5	60	19000	80	0.5	45	14000	60	0.3	120	38000	300	0.5	25	8000	30	0.2
1.5	100	21000	290	0.75	80	17000	130	0.75	60	13000	100	0.75	50	11000	87	0.4	120	25000	350	0.75	25	5300	40	0.3
2	100	16000	410	2	80	13000	210	2	60	9500	190	2	50	8000	130	1	120	19000	490	2	25	4000	55	0.6
3	100	11000	500	3	80	8500	240	3	60	6400	190	3	50	5300	150	1.5	120	13000	590	3	25	2700	64	0.9
4	100	8000	630	4	80	6400	300	4	60	4800	210	4	50	4000	190	2	120	9500	750	4	25	2000	70	1.2
5	100	6400	630	5	80	5100	300	5	60	3800	210	5	50	3200	190	2.5	120	7600	750	5	25	1600	71	1.5
6	100	5300	630	6	80	4200	330	6	60	3200	220	6	50	2700	210	3	120	6400	760	6	25	1300	72	1.8
8	100	4000	550	8	80	3200	320	8	60	2400	240	8	50	2000	200	4	120	4800	670	8	25	990	78	2.4
10	100	3200	510	10	80	2500	270	10	60	1900	260	10	50	1600	170	5	120	3800	600	10	25	800	89	3
12	100	2700	430	12	80	2100	250	12	60	1600	250	12	50	1300	150	6	120	3200	510	12	25	660	84	3.6
16	100	2000	360	12	80	1600	220	12	60	1200	190	12	50	990	140	8	120	2400	430	12	25	500	63	4.8
20	100	1600	290	12	80	1300	180	12	60	950	150	12	50	800	110	10	120	1900	340	12	25	400	50	6

Depth of cut



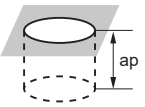
DC:Dia.

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

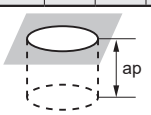
■ Plunging

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH					Copper, Copper alloy				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)
1	65	20000	160	0.5	0.1	50	16000	100	0.5	0.1	50	16000	50	0.5	0.05	30	9500	30	0.5	0.05	75	24000	190	0.5	0.1
1.5	85	18000	270	0.75	0.3	60	13000	120	0.75	0.3	60	13000	80	0.75	0.1	35	7400	40	0.75	0.1	100	21000	320	0.75	0.3
2	100	16000	480	2	0.5	70	11000	200	2	0.4	60	9500	90	1	0.15	40	6400	60	1	0.1	120	19000	570	2	0.5
3	100	11000	660	3	1	70	7400	270	3	0.6	60	6400	100	1.5	0.2	40	4200	60	1.5	0.2	120	13000	780	3	1.0
4	100	8000	800	4	2	70	5600	340	4	0.8	60	4800	100	2	0.4	40	3200	60	2	0.4	120	9500	950	4	2
5	100	6400	960	5	2.5	70	4500	410	5	1	60	3800	100	2.5	0.5	40	2500	60	2.5	0.5	120	7600	1100	5	2.5
6	100	5300	950	6	3	70	3700	440	6	1.2	60	3200	100	3	0.6	40	2100	60	3	0.6	120	6400	1200	6	3
8	100	4000	720	8	4	70	2800	340	8	1.6	60	2400	70	4	0.6	40	1600	50	4	0.6	120	4800	860	8	4
10	100	3200	580	10	5	70	2200	260	10	2.5	60	1900	60	5	0.6	40	1300	40	5	0.6	120	3800	680	10	5
12	100	2700	490	12	5	70	1900	230	12	3	60	1600	50	6	0.6	40	1100	30	6	0.6	120	3200	580	12	5
16	100	2000	360	16	5	70	1400	170	16	4	60	1200	40	8	0.6	40	800	20	8	0.6	120	2400	430	16	5
20	100	1600	290	20	5	70	1100	130	20	5	60	950	30	10	0.6	40	640	20	10	0.6	120	1900	340	20	5
Depth of cut																									

General purpose cutting conditions

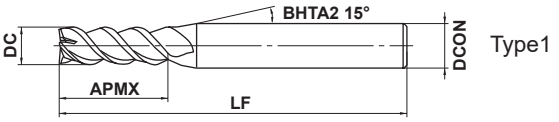
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH					Copper, Copper alloy				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Step (mm)
1	65	20000	160	0.5	0.05	50	16000	100	0.5	0.05	50	16000	50	0.5	0.05	30	9500	30	0.5	0.05	75	24000	190	0.5	0.05
1.5	85	18000	270	0.75	0.15	60	13000	120	0.75	0.1	60	13000	80	0.75	0.05	35	7400	40	0.75	0.05	100	21000	320	0.75	0.15
2	100	16000	480	2	0.25	70	11000	200	2	0.2	60	9500	90	1	0.05	40	6400	60	1	0.05	120	19000	570	2	0.25
3	100	11000	660	3	0.3	70	7400	270	3	0.3	60	6400	100	1.5	0.1	40	4200	60	1.5	0.1	120	13000	780	3	0.3
4	100	8000	800	4	0.4	70	5600	340	4	0.4	60	4800	100	2	0.2	40	3200	60	2	0.2	120	9500	950	4	0.4
5	100	6400	960	5	0.5	70	4500	410	5	0.5	60	3800	100	2.5	0.25	40	2500	60	2.5	0.25	120	7600	1100	5	0.5
6	100	5300	950	6	0.6	70	3700	440	6	0.6	60	3200	100	3	0.3	40	2100	60	3	0.3	120	6400	1200	6	0.6
8	100	4000	720	8	0.7	70	2800	340	8	0.7	60	2400	70	4	0.3	40	1600	50	4	0.3	120	4800	860	8	0.7
10	100	3200	580	10	0.75	70	2200	260	10	0.75	60	1900	60	5	0.3	40	1300	40	5	0.3	120	3800	680	10	0.75
12	100	2700	490	12	0.75	70	1900	230	12	0.75	60	1600	50	6	0.3	40	1100	30	6	0.3	120	3200	580	12	0.75
16	100	2000	360	16	0.75	70	1400	170	16	0.75	60	1200	40	8	0.3	40	800	20	8	0.3	120	2400	430	16	0.75
20	100	1600	290	20	0.75	70	1100	130	20	0.75	60	950	30	10	0.3	40	640	20	10	0.3	120	1900	340	20	0.75
Depth of cut																									

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.

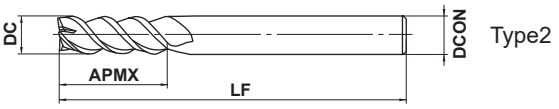
VQMHZV – Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

- A single end mill for both plunging and slotting.
- Irregular helical geometry controls the vibration.

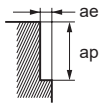
(inch)

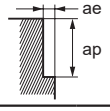
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVD1/16	.0625	.1250	2.0	.2500	3	●	1
VQMHZVD5/64	.0781	.1560	2.0	.2500	3	●	1
VQMHZVD3/32	.0938	.1880	2.0	.2500	3	●	1
VQMHZVD7/64	.1094	.2500	2.0	.2500	3	●	1
VQMHZVD1/8	.1250	.3130	2.0	.2500	3	●	1
VQMHZVD5/32	.1563	.3750	2.0	.2500	3	●	1
VQMHZVD3/16	.1875	.4375	2.0	.2500	3	●	1
VQMHZVD1/4	.2500	.6250	2.5	.2500	3	●	2
VQMHZVD5/16	.3125	.7500	2.75	.3125	3	●	2
VQMHZVD11/32	.3438	.7500	3.0	.3750	3	●	1
VQMHZVD3/8	.3750	.8750	3.0	.3750	3	●	2
VQMHZVD1/2	.5000	1.1250	3.5	.5000	3	●	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283						Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min-1)	Table feed (IPM)	Revolution (min-1)	Table feed (IPM)			Revolution (min-1)	Table feed (IPM)	Revolution (min-1)	Table feed (IPM)			Revolution (min-1)	Table feed (IPM)	Revolution (min-1)	Table feed (IPM)		
1/16	26000	55.3	24000	33.9	.094	.013	20000	26.0	20000	17.3	.094	.013	18000	23.4	16000	13.8	.094	.013
5/64	24000	70.9	19000	37.0	.12	.023	19000	33.7	16000	18.9	.12	.023	16000	24.6	13000	13.0	.12	.023
3/32	20000	70.9	16000	37.4	.14	.028	16000	34.0	13000	18.1	.14	.028	13000	24.6	11000	13.8	.14	.028
7/64	17000	72.3	14000	39.4	.16	.033	14000	34.7	11000	18.1	.16	.033	11000	24.7	9200	13.8	.16	.033
1/8	15000	76.2	12000	39.4	.19	.038	12000	36.9	10000	20.1	.19	.038	10000	26.0	8000	13.8	.19	.038
5/32	12000	78.0	9600	39.4	.23	.047	9600	37.4	8000	20.5	.23	.047	8000	26.5	6400	13.8	.23	.047
3/16	10000	74.4	8000	39.4	.28	.056	8000	37.8	6700	20.9	.28	.056	6700	26.5	5300	13.8	.28	.056
1/4	7500	74.4	6000	39.4	.38	.075	6000	39.0	5000	21.3	.38	.075	5000	35.4	4000	18.9	.38	.075
5/16	6000	74.4	4800	39.4	.47	.094	4800	39.7	4000	21.7	.47	.094	4000	35.4	3200	18.9	.47	.094
11/32	5500	71.5	4400	37.8	.52	.10	4400	37.9	3600	20.5	.52	.10	3600	36.1	2900	19.3	.52	.10
3/8	5000	67.9	4000	35.8	.56	.11	4000	36.9	3300	20.1	.56	.11	3300	37.0	2700	20.1	.56	.11
1/2	3800	56.1	3000	29.1	.75	.15	3000	32.6	2500	18.1	.75	.15	2500	32.5	2000	17.3	.75	.15
Depth of cut																		

Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.						Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min-1)	Table feed (IPM)	Revolution (min-1)	Table feed (IPM)			Revolution (min-1)	Table feed (IPM)	Revolution (min-1)	Table feed (IPM)			Revolution (min-1)	Table feed (IPM)	Revolution (min-1)	Table feed (IPM)		
1/16	13000	16.9	13000	11.0	.094	.0063	30000	63.8	28000	39.4	.094	.013	8000	3.3	6000	13.8	.094	.0031
5/64	12000	21.3	11000	13.0	.12	.016	29000	85.6	22000	43.3	.12	.023	6400	3.4	4800	13.0	.12	.0078
3/32	10000	21.3	9400	13.4	.14	.019	24000	85.0	19000	43.3	.14	.028	5300	3.4	4000	13.8	.14	.0094
7/64	8600	21.3	8000	13.0	.16	.022	21000	89.3	16000	43.3	.16	.033	4600	3.5	3400	13.8	.16	.011
1/8	7500	23.0	7000	14.2	.19	.025	18000	91.4	14000	47.2	.19	.038	4000	3.5	3000	13.8	.19	.013
5/32	6000	23.4	5600	14.6	.23	.031	14000	90.9	11000	47.2	.23	.047	3200	3.5	2400	13.8	.23	.016
3/16	5000	23.6	4700	14.6	.28	.038	12000	89.3	9400	47.2	.28	.056	2700	3.6	2000	13.8	.28	.019
1/4	3800	24.7	3500	15.0	.38	.050	9000	89.3	7000	47.2	.38	.075	2000	3.7	1500	18.9	.38	.025
5/16	3000	24.8	2800	15.4	.47	.063	7200	89.3	5600	47.2	.47	.094	1600	3.7	1200	18.9	.47	.031
11/32	2700	23.3	2600	15.0	.52	.069	6600	85.7	5100	43.3	.52	.10	1500	3.9	1100	19.3	.52	.034
3/8	2500	23.0	2300	14.2	.56	.075	6000	81.5	4700	43.3	.56	.11	1300	3.9	1000	20.1	.56	.038
1/2	1900	20.6	1800	13.0	.75	.10	4500	66.4	3500	34.3	.75	.15	1000	3.7	750	17.3	.75	.050
Depth of cut																		

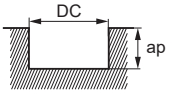
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, and titanium alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

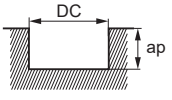
VQMHZV – Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting

RECOMMENDED CUTTING CONDITIONS

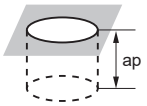
■Slotting

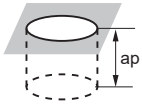
Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/16	26000	27.6	20000	14.2	.031	20000	11.8	16000	6.3	.031	18000	10.6	12000	4.7	.031
5/64	24000	36.9	16000	16.1	.078	19000	18.0	13000	8.3	.078	16000	18.9	9600	7.5	.078
3/32	20000	37.8	13000	16.1	.094	16000	18.9	11000	8.7	.094	13000	19.2	8000	7.9	.094
7/64	17000	40.2	11000	17.3	.11	14000	19.8	9200	8.7	.11	11000	19.5	6900	7.9	.11
1/8	15000	44.3	10000	19.7	.13	12000	22.7	8000	9.8	.13	10000	20.1	6000	7.9	.13
5/32	12000	56.7	8000	24.8	.16	9600	26.1	6400	11.4	.16	8000	20.8	4800	8.3	.16
3/16	10000	56.7	6700	25.2	.19	8000	26.9	5300	11.8	.19	6700	21.4	4000	8.3	.19
1/4	7500	55.8	5000	24.4	.25	6000	29.8	4000	13.0	.25	5000	21.9	3000	8.7	.25
5/16	6000	49.6	4000	21.7	.31	4800	28.3	3200	12.6	.31	4000	23.6	2400	9.4	.31
11/32	5500	48.7	3600	20.9	.34	4400	27.0	2900	11.8	.34	3600	24.2	2200	9.8	.34
3/8	5000	46.1	3300	20.1	.38	4000	25.5	2700	11.4	.38	3300	25.3	2000	10.2	.38
1/2	3800	35.9	2500	15.7	.50	3000	22.3	2000	9.8	.50	2500	23.6	1500	9.4	.50
Depth of cut	 DC : Dia.														

Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/16	11000	6.5	10000	3.9	.019	30000	31.9	24000	16.9	.031	6000	3.5	5000	2.0	.013
5/64	9600	9.1	8000	5.1	.039	29000	44.5	19000	19.3	.078	4800	4.0	4000	2.2	.023
3/32	8000	9.5	6700	5.1	.047	24000	45.4	16000	20.1	.094	4000	4.3	3300	2.3	.028
7/64	6900	9.8	5700	5.5	.055	21000	49.6	14000	21.7	.11	3400	4.4	2900	2.5	.033
1/8	6000	11.3	5000	6.3	.063	18000	53.1	12000	23.2	.13	3000	4.6	2500	2.5	.038
5/32	4800	13.0	4000	7.1	.078	14000	66.1	9600	29.9	.16	2400	5.0	2000	2.8	.047
3/16	4000	13.7	3300	7.5	.094	12000	68.0	8000	29.9	.19	2000	5.1	1700	2.9	.056
1/4	3000	14.9	2500	8.3	.13	9000	67.0	6000	29.5	.25	1500	5.3	1300	3.0	.075
5/16	2400	14.2	2000	7.9	.16	7200	59.5	4800	26.4	.31	1200	5.7	1000	3.1	.094
11/32	2200	13.5	1800	7.5	.17	6600	58.5	4400	25.6	.34	1100	5.9	910	3.2	.10
3/8	2000	12.8	1700	7.1	.19	6000	55.3	4000	24.4	.38	1000	6.1	840	3.4	.11
1/2	1500	11.2	1300	6.3	.25	4500	42.5	3000	18.9	.50	750	5.7	630	3.1	.15
Depth of cut	 DC : Dia.														

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy, and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

Drilling

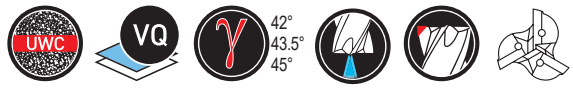
Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283							Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21							Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Step (inch)	Revolution (min^{-1})	Table feed (IPM)	Step (inch)		Revolution (min^{-1})	Table feed (IPM)	Step (inch)	Revolution (min^{-1})	Table feed (IPM)	Step (inch)		Revolution (min^{-1})	Table feed (IPM)	Step (inch)	Revolution (min^{-1})	Table feed (IPM)	Step (inch)	
1/16	18000	12.8	.013	18000	12.6	.006	.031	12000	5.2	.013	12000	5.2	.006	.031	12000	3.3	.004	12000	3.3	.002	.031
5/64	16000	18.9	.020	16000	18.9	.006	.078	11000	7.8	.016	11000	7.8	.006	.078	9600	3.5	.004	9600	3.5	.002	.039
3/32	13000	20.5	.023	13000	20.5	.010	.094	9400	8.8	.019	9400	8.8	.010	.094	8000	3.5	.006	8000	3.5	.002	.047
7/64	11000	21.7	.033	11000	21.7	.010	.11	8000	9.4	.022	8000	9.4	.010	.11	6900	3.5	.008	6900	3.5	.002	.055
1/8	10000	27.6	.044	10000	27.6	.012	.13	7000	11.0	.025	7000	11.0	.012	.13	6000	4.0	.008	6000	4.0	.004	.063
5/32	8000	31.5	.078	8000	31.5	.012	.16	5600	13.2	.031	5600	13.2	.012	.16	4800	3.8	.016	4800	3.8	.004	.078
3/16	6700	34.3	.094	6700	34.3	.016	.19	4700	15.0	.038	4700	15.0	.016	.19	4000	3.8	.020	4000	3.8	.008	.094
1/4	5000	35.4	.13	5000	35.4	.024	.25	3500	16.5	.050	3500	16.5	.024	.25	3000	3.5	.024	3000	3.5	.012	.13
5/16	4000	28.3	.16	4000	28.3	.028	.31	2800	13.2	.063	2800	13.2	.028	.31	2400	2.8	.024	2400	2.8	.012	.16
11/32	3600	25.5	.17	3600	25.5	.028	.34	2600	12.3	.069	2600	12.3	.028	.34	2200	2.6	.024	2200	2.6	.012	.17
3/8	3300	23.4	.19	3300	23.4	.030	.38	2300	11.0	.094	2300	11.0	.030	.38	2000	2.3	.024	2000	2.3	.012	.19
1/2	2500	17.7	.20	2500	17.7	.030	.50	1800	8.5	.13	1800	8.5	.030	.50	1500	2.0	.024	1500	2.0	.012	.25
Hole depth																					

Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.							Copper, Copper alloy						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Step (inch)	Revolution (min^{-1})	Table feed (IPM)	Step (inch)		Revolution (min^{-1})	Table feed (IPM)	Step (inch)	Revolution (min^{-1})	Table feed (IPM)	Step (inch)	
1/16	7000	2.0	.004	7000	2.0	.002	.031	22000	15.6	.013	22000	15.6	.006	.031
5/64	6400	2.4	.004	6400	2.4	.002	.039	19000	22.4	.020	19000	22.4	.006	.039
3/32	5300	2.4	.006	5300	2.4	.002	.047	16000	25.2	.023	16000	25.2	.010	.047
7/64	4600	2.4	.008	4600	2.4	.002	.055	14000	27.6	.033	14000	27.6	.010	.055
1/8	4000	2.8	.008	4000	2.8	.004	.063	12000	33.1	.044	12000	33.1	.012	.063
5/32	3200	2.4	.016	3200	2.4	.004	.078	9600	37.8	.078	9600	37.8	.012	.078
3/16	2700	2.4	.020	2700	2.4	.008	.094	8000	39.4	.094	8000	39.4	.016	.094
1/4	2000	2.4	.024	2000	2.4	.012	.13	6000	43.3	.130	6000	43.3	.024	.13
5/16	1600	2.0	.024	1600	2.0	.012	.16	4800	33.9	.160	4800	33.9	.028	.16
11/32	1500	1.8	.024	1500	1.8	.012	.17	4400	31.1	.17	4400	31.1	.028	.17
3/8	1300	1.5	.024	1300	1.5	.012	.19	4000	28.3	.19	4000	28.3	.030	.19
1/2	1000	1.2	.024	1000	1.2	.012	.25	3000	21.3	.20	3000	21.3	.030	.25
Hole depth														

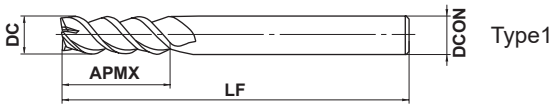
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, and titanium alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHZVOH

End mill, Medium cut length, 3 flute for drilling and slotting with thru-coolant



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

DC≤12	DC=16			
0 - 0.02	0 - 0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 - 0.008	0 - 0.009	0 - 0.011		

- A single end mill for both plunging and slotting.
- Excellent peformance in slotting and pocketing with oil supply from the end cutting edge.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVOHD0600	6	13	60	6	3	●	1
VQMHZVOHD0800	8	19	70	8	3	●	1
VQMHZVOHD1000	10	22	80	10	3	●	1
VQMHZVOHD1200	12	26	90	12	3	●	1
VQMHZVOHD1600	16	30	110	16	3	★	1

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

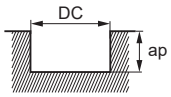
■ Slotting

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
6	150	8000	1400	6	120	6400	770	6	100	5300	560	6	60	3200	380	3	180	9500	1700	6	30	1600	130	1.8
8	150	6000	1300	8	120	4800	720	8	100	4000	600	8	60	2400	360	4	180	7200	1500	8	30	1200	140	2.4
10	150	4800	1200	10	120	3800	630	10	100	3200	670	10	60	1900	310	5	180	5700	1400	10	30	950	160	3
12	150	4000	960	12	120	3200	580	12	100	2700	650	12	60	1600	290	6	180	4800	1200	12	30	800	150	3.6
16	150	3000	810	12	120	2400	500	12	100	2000	480	12	60	1200	250	8	180	3600	970	12	30	600	120	4.8

Depth of cut

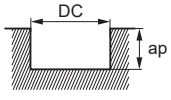


DC : Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
6	100	5300	630	6	80	4200	330	6	60	3200	220	6	50	2700	210	3	120	6400	760	6	25	1300	72	1.8
8	100	4000	550	8	80	3200	320	8	60	2400	240	8	50	2000	200	4	120	4800	670	8	25	990	78	2.4
10	100	3200	510	10	80	2500	270	10	60	1900	260	10	50	1600	170	5	120	3800	600	10	25	800	89	3
12	100	2700	430	12	80	2100	250	12	60	1600	250	12	50	1300	150	6	120	3200	510	12	25	660	84	3.6
16	100	2000	360	12	80	1600	220	12	60	1200	190	12	50	990	140	8	120	2400	430	12	25	500	63	4.8

Depth of cut



DC : Dia.

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

VQMHZVOH

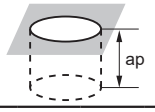
End mill, Medium cut length, 3 flute for drilling and slotting with thru-coolant

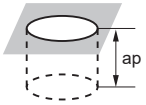
RECOMMENDED CUTTING CONDITIONS

■ Plunging

The rigidity of the machine or workpiece material and chip discharge are sufficient at high efficiency conditions.
The rigidity of the machine or workpiece material or chip discharge is insufficient at general-purpose conditions.

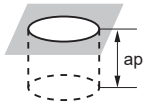
High efficiency conditions

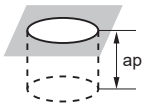
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)
6	100	5300	950	9	3	70	3700	440	9	1.2	60	3200	100	6	0.6	40	2100	60	6	0.6
8	100	4000	720	12	4	70	2800	340	12	1.6	60	2400	70	8	0.6	40	1600	50	8	0.6
10	100	3200	580	15	5	70	2200	260	15	2.5	60	1900	60	10	0.6	40	1300	40	10	0.6
12	100	2700	490	18	5	70	1900	230	18	3	60	1600	50	12	0.6	40	1100	30	12	0.6
16	100	2000	360	24	5	70	1400	170	24	4	60	1200	40	16	0.6	40	800	20	16	0.6
Depth of cut																				

Workpiece Material	Copper, Copper alloy				
Dia. DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)
6	120	6400	1200	9	3
8	120	4800	860	12	4
10	120	3800	680	15	5
12	120	3200	580	18	5
16	120	2400	430	24	5
Depth of cut					

Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.

General-purpose conditions

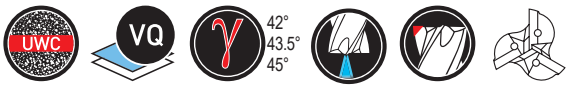
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)
6	100	5300	950	9	0.6	70	3700	440	9	0.6	60	3200	100	6	0.3	40	2100	60	6	0.3
8	100	4000	720	12	0.7	70	2800	340	12	0.7	60	2400	70	8	0.3	40	1600	50	8	0.3
10	100	3200	580	15	0.75	70	2200	260	15	0.75	60	1900	60	10	0.3	40	1300	40	10	0.3
12	100	2700	490	18	0.75	70	1900	230	18	0.75	60	1600	50	12	0.3	40	1100	30	12	0.3
16	100	2000	360	24	0.75	70	1400	170	24	0.75	60	1200	40	16	0.3	40	800	20	16	0.3
Depth of cut																				

Workpiece Material	Copper, Copper alloy				
Dia. **DC** (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table Feed (mm/min)	Hole Depth ap (mm)	Step (mm)
6	120	6400	1200	9	0.6
8	120	4800	860	12	0.7
10	120	3800	680	15	0.75
12	120	3200	580	18	0.75
16	120	2400	430	24	0.75
Depth of cut					

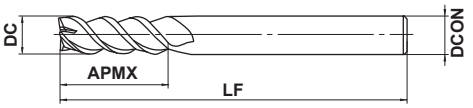
Note 1) SMART MIRACLE Coating is not energized because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.

VQMHZVOH – Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting with thru-coolant



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.250"≤DCON≤.375"	DCON=.500"			
0 - .00035"	0 - .00043"			

- A single end mill for both plunging and slotting.
- Excellent peformance in slotting and pocketing with oil supply from the end cutting edge.

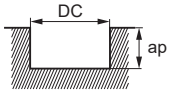
(inch)

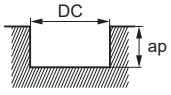
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHZVOHD1/4	.2500	.6252	2.5	.2500	3	●	1
VQMHZVOHD5/16	.3125	.7500	2.75	.3125	3	●	1
VQMHZVOHD3/8	.3750	.8752	3.0	.3750	3	●	1
VQMHZVOHD1/2	.5000	1.1252	3.5	.5000	3	●	1

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■Slotting

Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/4	7500	55.8	5000	24.4	.25	6000	29.8	5000	16.5	.25	5000	21.9	3000	8.7	.25
5/16	6000	49.6	4000	21.7	.31	4800	28.3	4000	15.7	.31	4000	23.6	2400	9.4	.31
3/8	5000	46.1	3300	20.1	.38	4000	25.5	3300	13.8	.38	3300	25.3	2000	10.2	.38
1/2	3800	35.9	2500	15.7	.50	3000	22.3	2500	12.2	.50	2500	23.6	1500	9.4	.50
Depth of cut	 DC : Dia.														

Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/4	3000	14.9	2500	8.3	.25	9000	67.0	6000	29.5	.25	1500	5.3	1300	3.0	.075
5/16	2400	14.2	2000	7.9	.31	7200	59.5	4800	26.4	.31	1200	5.7	1000	3.1	.094
3/8	2000	12.8	1700	7.1	.38	6000	55.3	4000	24.4	.38	1000	6.1	840	3.4	.11
1/2	1500	11.2	1300	6.3	.50	4500	42.5	3000	18.9	.50	750	5.7	630	3.1	.15
Depth of cut	 DC : Dia.														

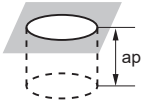
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy, and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

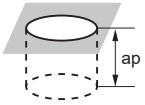
VQMHZVOH – Inch sizes

End mill, Medium cut length, 3 flute for drilling and slotting with thru-coolant

RECOMMENDED CUTTING CONDITIONS

■Plunging

Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283							Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21							Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min-1)	Table feed (IPM)	Step (inch)	Revolution (min-1)	Table feed (IPM)	Step (inch)		Revolution (min-1)	Table feed (IPM)	Step (inch)	Revolution (min-1)	Table feed (IPM)	Step (inch)		Revolution (min-1)	Table feed (IPM)	Step (inch)	Revolution (min-1)	Table feed (IPM)	Step (inch)	
1/4	5000	35.4	.13	5000	35.4	.024	.38	3500	16.5	.050	3500	16.5	.024	.38	3000	3.5	.024	3000	3.5	.012	.38
5/16	4000	28.3	.16	4000	28.3	.028	.47	2800	13.2	.063	2800	13.2	.028	.47	2400	2.8	.024	2400	2.8	.012	.47
3/8	3300	23.4	.19	3300	23.4	.030	.56	2300	11.0	.094	2300	11.0	.030	.56	2000	2.3	.024	2000	2.3	.012	.56
1/2	2500	17.7	.20	2500	17.7	.030	.75	1800	8.5	.13	1800	8.5	.030	.75	1500	2.0	.024	1500	2.0	.012	.75
Hole depth																					

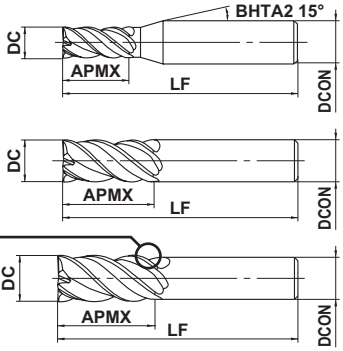
Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.							Copper, Copper alloy						
DC (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)	High speed cutting			General purpose cutting			Hole Depth ap (inch)
	Revolution (min-1)	Table feed (IPM)	Step (inch)	Revolution (min-1)	Table feed (IPM)	Step (inch)		Revolution (min-1)	Table feed (IPM)	Step (inch)	Revolution (min-1)	Table feed (IPM)	Step (inch)	
1/4	2000	2.3	.024	2000	2.3	.012	.38	6000	42.5	.13	6000	42.5	.0024	.38
5/16	1600	2.0	.024	1600	2.0	.012	.47	4800	34.0	.16	4800	34.0	.0028	.47
3/8	1300	1.5	.024	1300	1.5	.012	.56	4000	28.3	.19	4000	28.3	.003	.56
1/2	1000	1.2	.024	1000	1.2	.012	.75	3000	21.3	.20	3000	21.3	.003	.75
Hole depth														

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy, and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHV

End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



DC≤12	DC>12		
0 - 0.020	0 - 0.030		
4≤DCON≤6	**8≤DCON≤10**	**12≤DCON≤16**	**20≤DCON≤25**
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVD0100	1	2	45	4	4	●	1
VQMHVD0150	1.5	3	45	4	4	●	1
VQMHVD0200	2	4	45	4	4	●	1
VQMHVD0250	2.5	5	45	4	4	●	1
VQMHVD0300	3	8	45	6	4	●	1
VQMHVD0350	3.5	8	45	6	4	●	1
VQMHVD0400	4	11	45	6	4	●	1
VQMHVD0500	5	13	50	6	4	●	1
VQMHVD0600	6	13	50	6	4	●	2
VQMHVD0700	7	19	60	8	4	●	1
VQMHVD0800	8	19	60	8	4	●	2
VQMHVD0900	9	22	70	10	4	●	1
VQMHVD0900S08	9	22	75	8	4	●	3
VQMHVD1000	10	22	70	10	4	●	2
VQMHVD1000S08	10	22	100	8	4	●	3
VQMHVD1100	11	26	75	12	4	●	1
VQMHVD1100S10	11	26	100	10	4	●	3
VQMHVD1200	12	26	75	12	4	●	2
VQMHVD1200S10	12	26	110	10	4	●	3
VQMHVD1300	13	26	75	12	4	★	3
VQMHVD1300S12	13	26	110	12	4	★	3
VQMHVD1400	14	30	90	16	4	★	1
VQMHVD1400S12	14	32	130	12	4	★	3
VQMHVD1600	16	35	90	16	4	★	2
VQMHVD1800	18	40	100	16	4	★	3
VQMHVD1800S16	18	42	150	16	4	★	3
VQMHVD2000	20	45	110	20	4	★	2
VQMHVD2500	25	55	125	25	4	★	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

● : USA Stock ★ : Stocked in Japan

ISO13399 ➤ I002

VQMHV

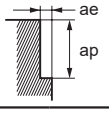
End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

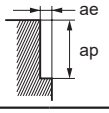
■ Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	1800	1.5	0.3	120	38000	910	1.5	0.3	80	25000	500	1.5	0.2	75	24000	580	1.5	0.2
2	150	24000	2400	3	0.6	120	19000	1100	3	0.6	100	16000	830	3	0.6	75	12000	720	3	0.4
3	150	16000	2600	4.5	0.9	120	13000	1200	4.5	0.9	100	11000	880	4.5	0.9	75	8000	770	4.5	0.6
4	150	12000	2600	6	1.2	120	9500	1300	6	1.2	100	8000	900	6	1.2	75	6000	790	6	0.8
5	150	9500	2600	7.5	1.5	120	7600	1300	7.5	1.5	100	6400	900	7.5	1.5	75	4800	810	7.5	1
6	150	8000	2600	9	1.8	120	6400	1300	9	1.8	100	5300	1100	9	1.8	75	4000	810	9	1.2
8	150	6000	2500	12	2.4	120	4800	1300	12	2.4	100	4000	1200	12	2.4	75	3000	840	12	1.6
10	150	4800	2300	15	3	120	3800	1200	15	3	100	3200	1300	15	3	75	2400	770	15	2
12	150	4000	1900	18	3.6	120	3200	1200	18	3.6	100	2700	1200	18	3.6	75	2000	720	18	2.4
16	150	3000	1600	24	4.8	120	2400	960	24	4.8	100	2000	960	24	4.8	75	1500	600	24	3.2
20	150	2400	1300	30	6	120	1900	760	30	6	100	1600	770	30	6	75	1200	480	30	4
25	150	1900	1100	37.5	7.5	120	1500	600	37.5	7.5	100	1300	620	37.5	7.5	75	950	380	37.5	5
Depth of cut																				

General-purpose conditions

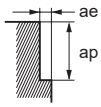
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	120	38000	1000	1.5	0.3	100	32000	560	1.5	0.3	80	25000	400	0.75	0.1	70	22000	390	1.5	0.2
2	120	19000	1300	3	0.6	100	16000	630	3	0.6	80	13000	450	1.5	0.2	70	11000	440	3	0.4
3	120	13000	1400	4.5	0.9	100	11000	700	4.5	0.9	80	8500	450	2.2	0.3	70	7400	470	4.5	0.6
4	120	9500	1400	6	1.2	100	8000	700	6	1.2	80	6400	470	3	0.6	70	5600	490	6	0.8
5	120	7600	1400	7.5	1.5	100	6400	710	7.5	1.5	80	5100	470	4.5	0.9	70	4500	500	7.5	1
6	120	6400	1400	9	1.8	100	5300	710	9	1.8	80	4200	580	6	1.2	70	3700	500	9	1.2
8	120	4800	1300	12	2.4	100	4000	740	12	2.4	80	3200	630	7.5	1.5	70	2800	520	12	1.6
10	120	3800	1200	15	3	100	3200	680	15	3	80	2500	660	9	1.8	70	2200	460	15	2
12	120	3200	1000	18	3.6	100	2700	640	18	3.6	80	2100	610	12	2.4	70	1900	450	18	2.4
16	120	2400	860	24	4.8	100	2000	530	24	4.8	80	1600	510	15	3	70	1400	370	24	3.2
20	120	1900	680	30	6	100	1600	420	30	6	80	1300	410	18	3.6	70	1100	290	30	4
25	120	1500	390	37.5	7.5	100	1300	340	37.5	7.5	80	1000	210	24	4.8	70	890	230	37.5	5
Depth of cut																				

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

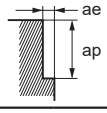
■ Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	1800	1.5	0.3	40	13000	210	1.5	0.1
2	180	29000	2900	3	0.6	40	6400	230	3	0.2
3	180	19000	3000	4.5	0.9	40	4200	240	4.5	0.3
4	180	14000	3000	6	1.2	40	3200	240	6	0.4
5	180	11000	3000	7.5	1.5	40	2500	240	7.5	0.5
6	180	9500	3000	9	1.8	40	2100	250	9	0.6
8	180	7200	3000	12	2.4	40	1600	260	12	0.8
10	180	5700	2700	15	3	40	1300	290	15	1
12	180	4800	2300	18	3.6	40	1100	280	18	1.2
16	180	3600	1900	24	4.8	40	800	200	24	1.6
20	180	2900	1600	30	6	40	640	160	30	2
25	180	2300	1300	37.5	7.5	40	510	130	37.5	2.5
Depth of cut										

General-purpose conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	1300	1.5	0.3	30	9600	92	1.5	0.1
2	140	22000	1500	3	0.6	30	4800	110	3	0.2
3	140	15000	1600	4.5	0.9	30	3200	120	4.5	0.3
4	140	11000	1600	6	1.2	30	2400	120	6	0.4
5	140	8900	1600	7.5	1.5	30	1900	120	7.5	0.5
6	140	7400	1600	9	1.8	30	1600	130	9	0.6
8	140	5600	1600	12	2.4	30	1200	130	12	0.8
10	140	4500	1400	15	3	30	950	140	15	1
12	140	3700	1200	18	3.6	30	800	140	18	1.2
16	140	2800	1000	24	4.8	30	600	100	24	1.6
20	140	2200	780	30	6	30	480	81	30	2
25	140	1800	670	37.5	7.5	30	380	64	37.5	2.5
Depth of cut										

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHV

End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

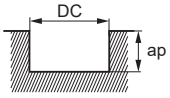
■Slotting

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
2	150	24000	1200	2	120	19000	610	2	100	16000	640	2	60	9500	300	1	180	29000	1500	2	30	4800	130	0.6
3	150	16000	1500	3	120	13000	730	3	100	11000	660	3	60	6400	360	1.5	180	19000	1700	3	30	3200	150	0.9
4	150	12000	1900	4	120	9500	910	4	100	8000	700	4	60	4800	460	2	180	14000	2200	4	30	2400	170	1.2
5	150	9500	1900	5	120	7600	910	5	100	6400	720	5	60	3800	460	2.5	180	11000	2200	5	30	1900	170	1.5
6	150	8000	1900	6	120	6400	1000	6	100	5300	740	6	60	3200	510	3	180	9500	2300	6	30	1600	180	1.8
8	150	6000	1700	8	120	4800	960	8	100	4000	800	8	60	2400	480	4	180	7200	2000	8	30	1200	190	2.4
10	150	4800	1500	10	120	3800	840	10	100	3200	900	10	60	1900	420	5	180	5700	1800	10	30	950	210	3
12	150	4000	1300	12	120	3200	770	12	100	2700	860	12	60	1600	380	6	180	4800	1500	12	30	800	200	3.6
16	150	3000	1100	12	120	2400	670	12	100	2000	640	12	60	1200	340	8	180	3600	1300	12	30	600	150	4.8
20	150	2400	860	12	120	1900	530	12	100	1600	510	12	60	950	270	10	180	2900	1000	12	30	480	120	6
25	150	1900	760	12	120	1500	420	12	100	1300	420	12	60	760	210	12	180	2300	920	12	30	380	100	7.5

Depth of cut

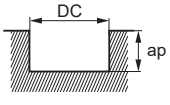


DC : Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
1	100	32000	500	1	80	25000	250	1	80	25000	300	1	50	16000	150	0.5	120	38000	590	1	25	8000	67	0.3
2	100	16000	550	2	80	13000	270	2	60	9500	250	2	50	8000	170	1	120	19000	650	2	25	4000	74	0.6
3	100	11000	670	3	80	8500	310	3	60	6400	250	3	50	5300	200	1.5	120	13000	790	3	25	2700	86	0.9
4	100	8000	840	4	80	6400	410	4	60	4800	280	4	50	4000	250	2	120	9500	1000	4	25	2000	93	1.2
5	100	6400	840	5	80	5100	410	5	60	3800	280	5	50	3200	250	2.5	120	7600	1000	5	25	1600	95	1.5
6	100	5300	840	6	80	4200	440	6	60	3200	300	6	50	2700	290	3	120	6400	1000	6	25	1300	96	1.8
8	100	4000	740	8	80	3200	420	8	60	2400	320	8	50	2000	260	4	120	4800	890	8	25	990	100	2.4
10	100	3200	680	10	80	2500	360	10	60	1900	350	10	50	1600	230	5	120	3800	800	10	25	800	120	3
12	100	2700	570	12	80	2100	330	12	60	1600	340	12	50	1300	210	6	120	3200	680	12	25	660	110	3.6
16	100	2000	480	12	80	1600	300	12	60	1200	250	12	50	990	180	8	120	2400	570	12	25	500	84	4.8
20	100	1600	380	12	80	1300	240	12	60	950	200	12	50	800	150	10	120	1900	450	12	25	400	68	6
25	100	1300	340	12	80	1000	180	12	60	760	160	12	50	640	120	12	120	1500	400	12	25	320	50	7.5

Depth of cut



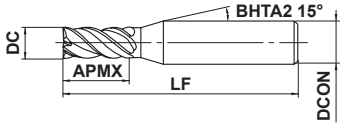
DC : Dia.

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

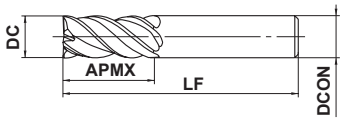
VQMHV – Inch sizes

End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(inch)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVD1/8	.1250	.3130	2.0	.2500	4	●	1
VQMHVD3/16	.1875	.4375	2.0	.2500	4	●	1
VQMHVD1/4	.2500	.6250	2.5	.2500	4	●	2
VQMHVD5/16	.3125	.7500	2.75	.3125	4	●	2
VQMHVD3/8	.3750	.8750	3.0	.3750	4	●	2
VQMHVD1/2	.5000	1.1250	3.5	.5000	4	●	2

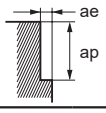
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

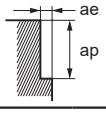
VQMHV – Inch sizes

End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

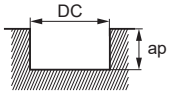
Side milling

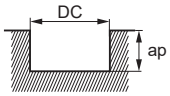
Workpiece Material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283						Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		
1/8	15000	102.0	12000	55.1	.19	.038	12000	49.1	10000	27.2	.19	.038	10000	34.6	8000	18.1	.19	.038
3/16	10000	99.2	8000	51.2	.28	.056	8000	50.4	6700	28.0	.28	.056	6700	35.3	5300	18.5	.28	.056
1/4	7500	99.2	6000	51.2	.38	.075	6000	52.0	5000	28.7	.38	.075	5000	47.2	4000	24.8	.38	.075
5/16	6000	99.2	4800	51.2	.47	.094	4800	52.9	4000	29.1	.47	.094	4000	47.2	3200	24.8	.47	.094
3/8	5000	90.6	4000	47.2	.56	.11	4000	49.1	3300	26.8	.56	.11	3300	49.4	2700	26.8	.56	.11
1/2	3800	74.8	3000	39.0	.75	.15	3000	43.5	2500	24.0	.75	.15	2500	43.3	2000	22.8	.75	.15
Depth of cut																		

Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.						Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		
1/8	7500	30.7	7000	18.9	.19	.025	18000	122.0	14000	63.0	.19	.038	4000	9.5	3000	4.7	.19	.013
3/16	5000	31.5	4700	19.7	.28	.038	12000	119.0	9400	63.0	.28	.056	2700	9.8	2000	4.7	.28	.019
1/4	3800	32.9	3500	20.1	.38	.050	9000	119.0	7000	63.0	.38	.075	2000	10.1	1500	5.1	.38	.025
5/16	3000	33.1	2800	20.5	.47	.063	7200	119.0	5600	63.0	.47	.094	1600	10.1	1200	5.1	.47	.031
3/8	2500	30.7	2300	18.5	.56	.075	6000	109.0	4700	55.1	.56	.11	1300	10.6	1000	5.5	.56	.038
1/2	1900	27.5	1800	17.3	.75	.10	4500	88.6	3500	47.2	.75	.15	1000	10.1	750	5.1	.75	.050
Depth of cut																		

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

Slotting

Workpiece Material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/8	15000	59.1	10000	26.0	.13	12000	30.2	8000	13.4	.13	10000	26.8	6000	10.6	.13
3/16	10000	75.6	6700	33.5	.19	8000	35.9	5300	15.7	.19	6700	28.5	4000	11.4	.19
1/4	7500	74.4	5000	32.7	.25	6000	39.7	4000	17.3	.25	5000	29.1	3000	11.4	.25
5/16	6000	66.1	4000	29.1	.31	4800	37.8	3200	16.5	.31	4000	31.5	2400	12.6	.31
3/8	5000	61.4	3300	26.8	.38	4000	34.0	2700	15.0	.38	3300	33.8	2000	13.4	.38
1/2	3800	47.9	2500	20.9	.50	3000	29.8	2000	13.0	.50	2500	31.5	1500	12.6	.50
Depth of cut	 DC : Dia.														

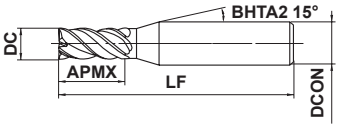
Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/8	6000	15.1	5000	8.3	.063	18000	70.9	12000	31.1	.13	3000	6.14	2500	3.4	.038
3/16	4000	18.3	3300	9.8	.094	12000	90.7	8000	39.4	.19	2000	6.80	1700	3.8	.056
1/4	3000	19.8	2500	11.0	.13	9000	89.3	6000	39.4	.25	1500	7.09	1300	3.9	.075
5/16	2400	18.9	2000	10.2	.16	7200	79.4	4800	35.0	.31	1200	7.56	1000	4.3	.094
3/8	2000	17.0	1700	9.4	.19	6000	73.7	4000	32.3	.38	1000	8.19	840	4.7	.11
1/2	1500	14.9	1300	8.7	.25	4500	56.7	3000	24.8	.50	750	7.56	630	4.3	.15
Depth of cut	 DC : Dia.														

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

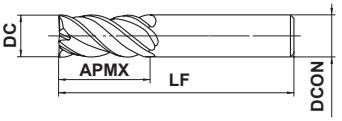
VQJHV

End mill, Semi long cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

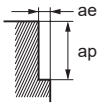
(mm)

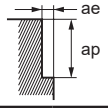
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQJHVD0100	1	4	45	4	4	●	1
VQJHVD0150	1.5	6	45	4	4	●	1
VQJHVD0200	2	8	60	6	4	●	1
VQJHVD0250	2.5	10	60	6	4	●	1
VQJHVD0300	3	12	60	6	4	●	1
VQJHVD0350	3.5	14	60	6	4	●	1
VQJHVD0400	4	16	60	6	4	●	1
VQJHVD0450	4.5	18	60	6	4	●	1
VQJHVD0500	5	20	60	6	4	●	1
VQJHVD0600	6	24	60	6	4	●	2
VQJHVD0700	7	25	80	8	4	●	1
VQJHVD0800	8	28	80	8	4	●	2
VQJHVD0900	9	32	90	10	4	●	1
VQJHVD1000	10	35	90	10	4	●	2
VQJHVD1200	12	40	100	12	4	●	2
VQJHVD1600	16	55	125	16	4	★	2
VQJHVD2000	20	70	140	20	4	★	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy SUS630, SUS631, 15-5PH, 17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	530	2.5	0.1	100	32000	410	2.5	0.1	80	25000	300	2.5	0.05	75	24000	290	2.5	0.05
2	130	21000	700	5	0.2	100	16000	510	5	0.2	80	13000	390	5	0.1	75	12000	360	5	0.1
3	130	14000	960	7.5	0.3	100	11000	680	7.5	0.3	80	8500	490	7.5	0.15	75	8000	460	7.5	0.15
4	130	10000	1000	10	0.4	100	8000	690	10	0.4	80	6400	540	10	0.2	75	6000	510	10	0.2
5	130	8300	1100	12.5	0.5	100	6400	730	12.5	0.5	80	5100	570	12.5	0.25	75	4800	540	12.5	0.25
6	130	6900	1200	15	0.6	100	5300	810	15	0.6	80	4200	630	15	0.3	75	4000	600	15	0.3
8	130	5200	1200	20	0.8	100	4000	840	20	0.8	80	3200	640	20	0.4	75	3000	600	20	0.4
10	130	4100	1100	25	1	100	3200	810	25	1	80	2500	590	25	0.5	75	2400	570	25	0.5
12	130	3400	1100	30	1.2	100	2700	780	30	1.2	80	2100	550	30	0.6	75	2000	520	30	0.6
16	130	2600	920	40	1.6	100	2000	640	40	1.6	80	1600	450	40	0.8	75	1500	420	40	0.8
20	130	2100	820	50	2	100	1600	570	50	2	80	1300	420	50	1	75	1200	390	50	1
Depth of cut																				

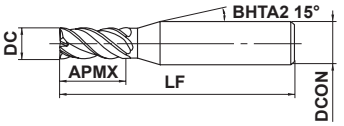
Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
1	130	40000	530	2.5	0.1	40	13000	73	2.5	0.02
2	160	25000	830	5	0.2	40	6400	90	5	0.04
3	160	17000	1200	7.5	0.3	40	4200	130	7.5	0.06
4	160	13000	1300	10	0.4	40	3200	190	10	0.08
5	160	10000	1300	12.5	0.5	40	2500	180	12.5	0.1
6	160	8500	1500	15	0.6	40	2100	180	15	0.12
8	160	6400	1500	20	0.8	40	1600	170	20	0.16
10	160	5100	1300	25	1	40	1300	170	25	0.2
12	160	4200	1300	30	1.2	40	1100	140	30	0.24
16	160	3200	1100	40	1.6	40	800	110	40	0.32
20	160	2500	970	50	2	40	640	80	50	0.4
Depth of cut										

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

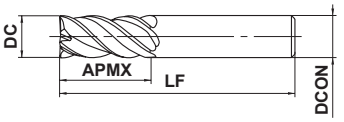
VQJHV – Inch sizes

End mill, Semi long cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

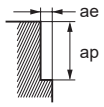
(inch)

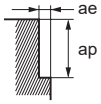
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQJHVD1/8	.1250	.5000	2.5	.2500	4	●	1
VQJHVD3/16	.1875	.7500	2.5	.2500	4	●	1
VQJHVD1/4	.2500	1.0000	2.5	.2500	4	●	2
VQJHVD5/16	.3125	1.0900	3.25	.3125	4	●	2
VQJHVD3/8	.3750	1.3100	3.5	.3750	4	●	2
VQJHVD1/2	.5000	1.6500	4.0	.5000	4	●	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1035, AISI 1050, ASTM 283				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI H13, AISI 4140, AISI P21				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				Hardened stainless steel, Cobalt chromium alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
1/8	13000	39	.313	.013	10000	26.8	.313	.013	8000	20.1	.313	.006	7500	18.9	.313	.006
3/16	8700	39.4	.469	.019	6700	27.6	.469	.019	5300	21.7	.469	.009	5000	20.5	.469	.009
1/4	6500	47.2	.625	.025	5000	32.3	.625	.025	4000	25.2	.625	.013	3800	24	.625	.013
5/16	5200	47.2	.781	.031	4000	33.5	.781	.031	3200	25.2	.781	.016	3000	23.6	.781	.016
3/8	4300	43.3	.938	.038	3300	31.9	.938	.038	2700	23.2	.938	.019	2500	22.4	.938	.019
1/2	3300	43.3	1.25	.05	2500	29.1	1.25	.05	2000	20.9	1.25	.025	1900	20.1	1.25	.025
Depth of cut																

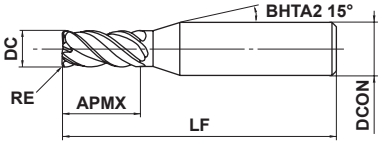
Workpiece Material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Depth of cut ae (inch)
1/8	16000	48	.013	.013	4000	5.1	.313	.003
3/16	11000	51.9	.019	.019	2700	7.1	.469	.004
1/4	8000	57.9	.025	.025	2000	6.7	.625	.005
5/16	6400	59.4	.031	.031	1600	6.7	.781	.006
3/8	5300	51.7	.038	.038	1300	6.7	.938	.008
1/2	4000	50.4	.05	.05	1000	5.1	1.25	.01
Depth of cut								

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

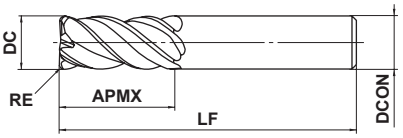
VQMHVRB

Corner radius, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

0.2≤RE≤6.35				
±0.015				
DC≤12	DC>12			
0 - 0.02	0 - 0.03			
4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

- Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD0200R020	2	0.2	4	45	4	4	●	1
VQMHVRBD0200R030	2	0.3	4	45	4	4	●	1
VQMHVRBD0300R020	3	0.2	8	45	6	4	●	1
VQMHVRBD0300R030	3	0.3	8	45	6	4	●	1
VQMHVRBD0300R050	3	0.5	8	45	6	4	●	1
VQMHVRBD0400R020	4	0.2	11	45	6	4	●	1
VQMHVRBD0400R030	4	0.3	11	45	6	4	●	1
VQMHVRBD0400R050	4	0.5	11	45	6	4	●	1
VQMHVRBD0500R020	5	0.2	13	50	6	4	●	1
VQMHVRBD0500R030	5	0.3	13	50	6	4	●	1
VQMHVRBD0500R050	5	0.5	13	50	6	4	●	1
VQMHVRBD0500R100	5	1	13	50	6	4	●	1
VQMHVRBD0600R030	6	0.3	13	50	6	4	●	2
VQMHVRBD0600R050	6	0.5	13	50	6	4	●	2
VQMHVRBD0600R100	6	1	13	50	6	4	●	2
VQMHVRBD0800R030	8	0.3	19	60	8	4	●	2
VQMHVRBD0800R050	8	0.5	19	60	8	4	●	2
VQMHVRBD0800R100	8	1	19	60	8	4	●	2
VQMHVRBD0800R150	8	1.5	19	60	8	4	●	2
VQMHVRBD1000R030	10	0.3	22	70	10	4	●	2
VQMHVRBD1000R050	10	0.5	22	70	10	4	●	2
VQMHVRBD1000R100	10	1	22	70	10	4	●	2
VQMHVRBD1000R150	10	1.5	22	70	10	4	●	2
VQMHVRBD1000R200	10	2	22	70	10	4	●	2
VQMHVRBD1200R050	12	0.5	26	75	12	4	●	2
VQMHVRBD1200R100	12	1	26	75	12	4	●	2
VQMHVRBD1200R150	12	1.5	26	75	12	4	●	2
VQMHVRBD1200R200	12	2	26	75	12	4	●	2
VQMHVRBD1200R250	12	2.5	26	75	12	4	●	2
VQMHVRBD1200R300	12	3	26	75	12	4	●	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD1600R100	16	1	35	90	16	4	★	2
VQMHVRBD1600R150	16	1.5	35	90	16	4	★	2
VQMHVRBD1600R200	16	2	35	90	16	4	★	2
VQMHVRBD1600R250	16	2.5	35	90	16	4	★	2
VQMHVRBD1600R300	16	3	35	90	16	4	★	2
VQMHVRBD1600R400	16	4	35	90	16	4	★	2
VQMHVRBD1600R500	16	5	35	90	16	4	★	2
VQMHVRBD2000R100	20	1	45	110	20	4	★	2
VQMHVRBD2000R150	20	1.5	45	110	20	4	★	2
VQMHVRBD2000R200	20	2	45	110	20	4	★	2
VQMHVRBD2000R250	20	2.5	45	110	20	4	★	2
VQMHVRBD2000R300	20	3	45	110	20	4	★	2
VQMHVRBD2000R400	20	4	45	110	20	4	★	2
VQMHVRBD2000R500	20	5	45	110	20	4	★	2
VQMHVRBD2000R635	20	6.35	45	110	20	4	★	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

VQMHVRB

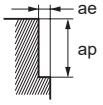
Corner radius, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

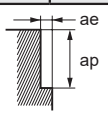
■ Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency cutting conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
2	150	24000	2400	3	0.6	120	19000	1100	3	0.6	100	16000	830	3	0.6	75	12000	720	3	0.4
3	150	16000	2600	4.5	0.9	120	13000	1200	4.5	0.9	100	11000	880	4.5	0.9	75	8000	770	4.5	0.6
4	150	12000	2600	6	1.2	120	9500	1300	6	1.2	100	8000	900	6	1.2	75	6000	790	6	0.8
5	150	9500	2600	7.5	1.5	120	7600	1300	7.5	1.5	100	6400	900	7.5	1.5	75	4800	810	7.5	1
6	150	8000	2600	9	1.8	120	6400	1300	9	1.8	100	5300	1100	9	1.8	75	4000	810	9	1.2
8	150	6000	2500	12	2.4	120	4800	1300	12	2.4	100	4000	1200	12	2.4	75	3000	840	12	1.6
10	150	4800	2300	15	3	120	3800	1200	15	3	100	3200	1300	15	3	75	2400	770	15	2
12	150	4000	1900	18	3.6	120	3200	1200	18	3.6	100	2700	1200	18	3.6	75	2000	720	18	2.4
16	150	3000	1600	24	4.8	120	2400	960	24	4.8	100	2000	960	24	4.8	75	1500	600	24	3.2
20	150	2400	1300	30	6	120	1900	760	30	6	100	1600	770	30	6	75	1200	480	30	4
Depth of cut																				

General purpose cutting conditions

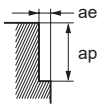
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH,17-4PH				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
2	120	19000	1300	3	0.6	100	16000	630	3	0.6	80	13000	450	1.5	0.2	70	11000	440	3	0.4
3	120	13000	1400	4.5	0.9	100	11000	700	4.5	0.9	80	8500	450	2.2	0.3	70	7400	470	4.5	0.6
4	120	9500	1400	6	1.2	100	8000	700	6	1.2	80	6400	470	3	0.6	70	5600	490	6	0.8
5	120	7600	1400	7.5	1.5	100	6400	710	7.5	1.5	80	5100	470	4.5	0.9	70	4500	500	7.5	1
6	120	6400	1400	9	1.8	100	5300	710	9	1.8	80	4200	580	6	1.2	70	3700	500	9	1.2
8	120	4800	1300	12	2.4	100	4000	740	12	2.4	80	3200	630	7.5	1.5	70	2800	520	12	1.6
10	120	3800	1200	15	3	100	3200	680	15	3	80	2500	660	9	1.8	70	2200	460	15	2
12	120	3200	1000	18	3.6	100	2700	640	18	3.6	80	2100	610	12	2.4	70	1900	450	18	2.4
16	120	2400	860	24	4.8	100	2000	530	24	4.8	80	1600	510	15	3	70	1400	370	24	3.2
20	120	1900	680	30	6	100	1600	420	30	6	80	1300	410	18	3.6	70	1100	290	30	4
Depth of cut																				

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

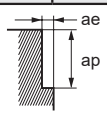
■ Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
2	180	29000	2900	3	0.6	40	6400	230	3	0.2
3	180	19000	3000	4.5	0.9	40	4200	240	4.5	0.3
4	180	14000	3000	6	1.2	40	3200	240	6	0.4
5	180	11000	3000	7.5	1.5	40	2500	240	7.5	0.5
6	180	9500	3000	9	1.8	40	2100	250	9	0.6
8	180	7200	3000	12	2.4	40	1600	260	12	0.8
10	180	5700	2700	15	3	40	1300	290	15	1
12	180	4800	2300	18	3.6	40	1100	280	18	1.2
16	180	3600	1900	24	4.8	40	800	200	24	1.6
20	180	2900	1600	30	6	40	640	160	30	2
Depth of cut										

General-purpose conditions

Workpiece Material	Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
2	140	22000	1500	3	0.6	30	4800	110	3	0.2
3	140	15000	1600	4.5	0.9	30	3200	120	4.5	0.3
4	140	11000	1600	6	1.2	30	2400	120	6	0.4
5	140	8900	1600	7.5	1.5	30	1900	120	7.5	0.5
6	140	7400	1600	9	1.8	30	1600	130	9	0.6
8	140	5600	1600	12	2.4	30	1200	130	12	0.8
10	140	4500	1400	15	3	30	950	140	15	1
12	140	3700	1200	18	3.6	30	800	140	18	1.2
16	140	2800	1000	24	4.8	30	600	100	24	1.6
20	140	2200	780	30	6	30	480	81	30	2
Depth of cut										

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHVRB

Corner radius, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

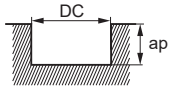
■Slotting

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
2	150	24000	1200	2	120	19000	610	2	100	16000	640	2	60	9500	300	1	180	29000	1500	2	30	4800	130	0.6
3	150	16000	1500	3	120	13000	730	3	100	11000	660	3	60	6400	360	1.5	180	19000	1700	3	30	3200	150	0.9
4	150	12000	1900	4	120	9500	910	4	100	8000	700	4	60	4800	460	2	180	14000	2200	4	30	2400	170	1.2
5	150	9500	1900	5	120	7600	910	5	100	6400	720	5	60	3800	460	2.5	180	11000	2200	5	30	1900	170	1.5
6	150	8000	1900	6	120	6400	1000	6	100	5300	740	6	60	3200	510	3	180	9500	2300	6	30	1600	180	1.8
8	150	6000	1700	8	120	4800	960	8	100	4000	800	8	60	2400	480	4	180	7200	2000	8	30	1200	190	2.4
10	150	4800	1500	10	120	3800	840	10	100	3200	900	10	60	1900	420	5	180	5700	1800	10	30	950	210	3
12	150	4000	1300	12	120	3200	770	12	100	2700	860	12	60	1600	380	6	180	4800	1500	12	30	800	200	3.6
16	150	3000	1100	12	120	2400	670	12	100	2000	640	12	60	1200	340	8	180	3600	1300	12	30	600	150	4.8
20	150	2400	860	12	120	1900	530	12	100	1600	510	12	60	950	270	10	180	2900	1000	12	30	480	120	6

Depth of cut

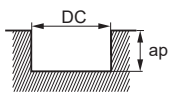


DC : Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631 15-5PH, 17-4PH				Copper, Copper alloy				Heat resistant alloy Inconel718			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
2	100	16000	550	2	80	13000	270	2	60	9500	250	2	50	8000	170	1	120	19000	650	2	25	4000	74	0.6
3	100	11000	670	3	80	8500	310	3	60	6400	250	3	50	5300	200	1.5	120	13000	790	3	25	2700	86	0.9
4	100	8000	840	4	80	6400	410	4	60	4800	280	4	50	4000	250	2	120	9500	1000	4	25	2000	93	1.2
5	100	6400	840	5	80	5100	410	5	60	3800	280	5	50	3200	250	2.5	120	7600	1000	5	25	1600	95	1.5
6	100	5300	840	6	80	4200	440	6	60	3200	300	6	50	2700	290	3	120	6400	1000	6	25	1300	96	1.8
8	100	4000	740	8	80	3200	420	8	60	2400	320	8	50	2000	260	4	120	4800	890	8	25	990	100	2.4
10	100	3200	680	10	80	2500	360	10	60	1900	350	10	50	1600	230	5	120	3800	800	10	25	800	120	3
12	100	2700	570	12	80	2100	330	12	60	1600	340	12	50	1300	210	6	120	3200	680	12	25	660	110	3.6
16	100	2000	480	12	80	1600	300	12	60	1200	250	12	50	990	180	8	120	2400	570	12	25	500	84	4.8
20	100	1600	380	12	80	1300	240	12	60	950	200	12	50	800	150	10	120	1900	450	12	25	400	68	6

Depth of cut



DC : Dia.

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
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Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
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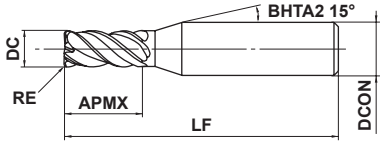
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

VQMHVRB – Inch sizes

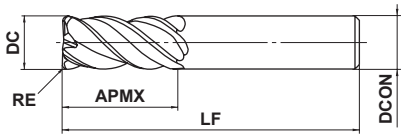
Corner radius, Medium cut length, 4 flute, Irregular helix flutes

UWC | VQ | γ 37° 40°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

.0080"≤RE≤.1200"				
±.0006"				
DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .00035"	0 - .00043"			

● Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials and for long overhang applications.

(inch)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBD1/8R008	.1250	.0080	.3130	2.0	.2500	4	●	1
VQMHVRBD1/8R010	.1250	.0100	.3130	2.0	.2500	4	●	1
VQMHVRBD3/16R010	.1875	.0100	.4375	2.0	.2500	4	●	1
VQMHVRBD3/16R015	.1875	.0150	.4375	2.0	.2500	4	●	1
VQMHVRBD3/16R020	.1875	.0200	.4375	2.0	.2500	4	●	1
VQMHVRBD3/16R030	.1875	.0300	.4375	2.0	.2500	4	●	1
VQMHVRBD1/4R008	.2500	.0080	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R010	.2500	.0100	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R015	.2500	.0150	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R020	.2500	.0200	.6250	2.5	.2500	4	●	2
VQMHVRBD1/4R030	.2500	.0300	.6250	2.5	.2500	4	●	2
VQMHVRBD5/16R010	.3125	.0100	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R015	.3125	.0150	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R020	.3125	.0200	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R030	.3125	.0300	.7500	2.75	.3125	4	●	2
VQMHVRBD5/16R060	.3125	.0600	.7500	2.75	.3125	4	●	2
VQMHVRBD3/8R010	.3750	.0100	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R015	.3750	.0150	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R020	.3750	.0200	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R030	.3750	.0300	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R040	.3750	.0400	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R060	.3750	.0600	.8750	3.0	.3750	4	●	2
VQMHVRBD3/8R090	.3750	.0900	.8750	3.0	.3750	4	●	2
VQMHVRBD1/2R010	.5000	.0100	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R015	.5000	.0150	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R020	.5000	.0200	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R030	.5000	.0300	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R060	.5000	.0600	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R090	.5000	.0900	1.1250	3.5	.5000	4	●	2
VQMHVRBD1/2R120	.5000	.1200	1.1250	3.5	.5000	4	●	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

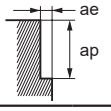
● : USA Stock

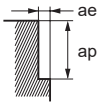
VQMHVRB – Inch sizes

Corner radius, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

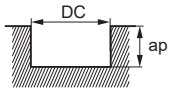
■Side milling

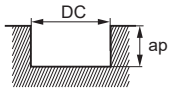
Workpiece Material	Carbon steel (—30HRC) AISI 1035, AISI 1050, ASTM 283						Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21						Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		
1/8	15000	102.0	12000	55.1	.19	.038	12000	49.1	10000	27.2	.19	.038	10000	34.6	8000	18.1	.19	.038
3/16	10000	99.2	8000	51.2	.28	.056	8000	50.4	6700	28.0	.28	.056	6700	35.3	5300	18.5	.28	.056
1/4	7500	99.2	6000	51.2	.38	.075	6000	52.0	5000	28.7	.38	.075	5000	47.2	4000	24.8	.38	.075
5/16	6000	99.2	4800	51.2	.47	.094	4800	52.9	4000	29.1	.47	.094	4000	47.2	3200	24.8	.47	.094
3/8	5000	90.6	4000	47.2	.56	.11	4000	49.1	3300	26.8	.56	.11	3300	49.4	2700	26.8	.56	.11
1/2	3800	74.8	3000	39.0	.75	.15	3000	43.5	2500	24.0	.75	.15	2500	43.3	2000	22.8	.75	.15
Depth of cut																		

Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.						Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	Width of cut ae (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		
1/8	7500	30.7	7000	18.9	.19	.025	18000	122.0	14000	63.0	.19	.038	4000	9.5	3000	4.7	.19	.013
3/16	5000	31.5	4700	19.7	.28	.038	12000	119.0	9400	63.0	.28	.056	2700	9.8	2000	4.7	.28	.019
1/4	3800	32.9	3500	20.1	.38	.050	9000	119.0	7000	63.0	.38	.075	2000	10.1	1500	5.1	.38	.025
5/16	3000	33.1	2800	20.5	.47	.063	7200	119.0	5600	63.0	.47	.094	1600	10.1	1200	5.1	.47	.031
3/8	2500	30.7	2300	18.5	.56	.075	6000	109.0	4700	55.1	.56	.11	1300	10.6	1000	5.5	.56	.038
1/2	1900	27.5	1800	17.3	.75	.10	4500	88.6	3500	47.2	.75	.15	1000	10.1	750	5.1	.75	.050
Depth of cut																		

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

■Slotting

Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283					Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21					Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, AISI 316L, Ti-6Al-4V etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/8	15000	59.1	10000	26.0	.13	12000	30.2	8000	13.4	.13	10000	26.8	6000	10.6	.13
3/16	10000	75.6	6700	33.5	.19	8000	35.9	5300	15.7	.19	6700	28.5	4000	11.4	.19
1/4	7500	74.4	5000	32.7	.25	6000	39.7	4000	17.3	.25	5000	29.1	3000	11.4	.25
5/16	6000	66.1	4000	29.1	.31	4800	37.8	3200	16.5	.31	4000	31.5	2400	12.6	.31
3/8	5000	61.4	3300	26.8	.38	4000	34.0	2700	15.0	.38	3300	33.8	2000	13.4	.38
1/2	3800	47.9	2500	20.9	.50	3000	29.8	2000	13.0	.50	2500	31.5	1500	12.6	.50
Depth of cut	 DC : Dia.														

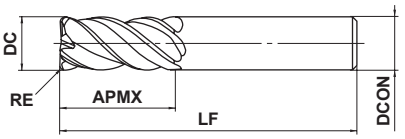
Workpiece Material	Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.					Copper, Copper alloy					Heat resistant alloy Inconel718 etc.				
DC (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)	High speed cutting		General purpose cutting		Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	
1/8	6000	15.1	5000	8.3	.063	18000	70.9	12000	31.1	.13	3000	6.14	2500	3.4	.038
3/16	4000	18.3	3300	9.8	.094	12000	90.7	8000	39.4	.19	2000	6.80	1700	3.8	.056
1/4	3000	19.8	2500	11.0	.13	9000	89.3	6000	39.4	.25	1500	7.09	1300	3.9	.075
5/16	2400	18.9	2000	10.2	.16	7200	79.4	4800	35.0	.31	1200	7.56	1000	4.3	.094
3/8	2000	17.0	1700	9.4	.19	6000	73.7	4000	32.3	.38	1000	8.19	840	4.7	.11
1/2	1500	14.9	1300	8.7	.25	4500	56.7	3000	24.8	.50	750	7.56	630	4.3	.15
Depth of cut	 DC : Dia.														

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) Vibration can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.

VQMHVRBF

Corner radius, Medium cut length, 4 flute, Irregular helix flutes (for finishing)

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

0.3≤RE≤3				
±0.015				
DC≤12	DC>12			
0 -0.02	0 -0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16		
0 -0.008	0 -0.009	0 -0.011		

- Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials.
- With the special substrate, suitable for finishing of heat resistance alloy, etc.

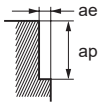
(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBFD0600R030	6	0.3	13	50	6	4	●	1
VQMHVRBFD0600R050	6	0.5	13	50	6	4	●	1
VQMHVRBFD0600R100	6	1	13	50	6	4	●	1
VQMHVRBFD0800R050	8	0.5	19	60	8	4	●	1
VQMHVRBFD0800R100	8	1	19	60	8	4	●	1
VQMHVRBFD1000R030	10	0.3	22	70	10	4	●	1
VQMHVRBFD1000R050	10	0.5	22	70	10	4	●	1
VQMHVRBFD1000R100	10	1	22	70	10	4	●	1
VQMHVRBFD1000R200	10	2	22	70	10	4	●	1
VQMHVRBFD1200R100	12	1	26	75	12	4	●	1
VQMHVRBFD1200R200	12	2	26	75	12	4	●	1
VQMHVRBFD1200R300	12	3	26	75	12	4	●	1
VQMHVRBFD1600R100	16	1	35	90	16	4	★	1
VQMHVRBFD1600R200	16	2	35	90	16	4	★	1

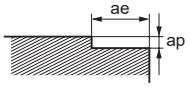
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
6	150	8000	2600	9	0.3	120	6400	1300	9	0.3	75	4000	800	9	0.3	180	9500	3000	9	0.3	40	2100	250	9	0.18
8	150	6000	2500	12	0.4	120	4800	1300	12	0.4	75	3000	840	12	0.4	180	7200	3000	12	0.4	40	1600	260	12	0.24
10	150	4800	2300	15	0.5	120	3800	1200	15	0.5	75	2400	770	15	0.5	180	5700	2700	15	0.5	41	1300	290	15	0.3
12	150	4000	1900	18	0.6	120	3200	1200	18	0.6	75	2000	720	18	0.6	180	4800	2300	18	0.6	41	1100	280	18	0.36
16	150	3000	1600	24	0.8	120	2400	960	24	0.8	75	1500	600	24	0.8	180	3600	1900	24	0.8	40	800	200	24	0.48
Depth of cut																									

■ Bottom face milling

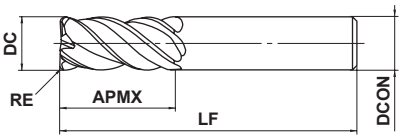
Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340, SKD, SKT					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy					Heat resistant alloy Inconel718				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Width of cut ae (mm)
6	110	5800	1400	0.3	4.8	90	4800	770	0.3	4.8	55	2900	460	0.3	4.8	130	6900	1700	0.3	4.8	30	1600	180	0.18	4.8
8	110	4400	1200	0.4	6.4	90	3600	720	0.4	6.4	55	2200	440	0.4	6.4	130	5200	1500	0.4	6.4	30	1200	190	0.24	6.4
10	110	3500	1100	0.5	8	90	2900	640	0.5	8	55	1800	400	0.5	8	130	4100	1300	0.5	8	30	950	210	0.3	8
12	110	2900	930	0.6	9.6	90	2400	580	0.6	9.6	55	1500	360	0.6	9.6	130	3400	1100	0.6	9.6	30	800	200	0.36	9.6
16	110	2200	790	0.8	12.8	90	1800	500	0.8	12.8	55	1100	310	0.8	12.8	130	2600	940	0.8	12.8	30	600	150	0.48	12.8
Depth of cut																									

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQMHVRBF – Inch sizes

Corner radius, Medium cut length, 4 flute, Irregular helix flutes (for finishing)

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

.2500"≤RE≤.5000"				
±.0006"				
DC<.5000"	DC=.5000"			
0 - .0008"	0 - .0012"			
.250"≤DCON≤.375"	DCON=.500"			
0 - .00035"	0 - .00043"			

- Smart Miracle vibration control end mill achieving stable machining of difficult-to-cut materials.
- With the special substrate, suitable for finishing of heat resistance alloy, etc.

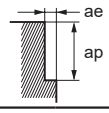
(inch)

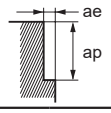
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQMHVRBFD1/4R015	.2500	.0150	.6250	2.5	.2500	4	●	1
VQMHVRBFD1/4R030	.2500	.0300	.6250	2.5	.2500	4	●	1
VQMHVRBFD5/16R015	.3125	.0150	.7500	2.75	.3125	4	●	1
VQMHVRBFD5/16R030	.3125	.0300	.7500	2.75	.3125	4	●	1
VQMHVRBFD5/16R060	.3125	.0600	.7500	2.75	.3125	4	●	1
VQMHVRBFD3/8R015	.3750	.0150	.8750	3.0	.3750	4	●	1
VQMHVRBFD3/8R030	.3750	.0300	.8750	3.0	.3750	4	●	1
VQMHVRBFD3/8R060	.3750	.0600	.8750	3.0	.3750	4	●	1
VQMHVRBFD3/8R090	.3750	.0900	.8750	3.0	.3750	4	●	1
VQMHVRBFD1/2R030	.5000	.0300	1.1250	3.5	.5000	4	●	1
VQMHVRBFD1/2R060	.5000	.0600	1.1250	3.5	.5000	4	●	1
VQMHVRBFD1/2R090	.5000	.0900	1.1250	3.5	.5000	4	●	1
VQMHVRBFD1/2R120	.5000	.1200	1.1250	3.5	.5000	4	●	1

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	7500	94.5	.38	.013	6000	47.2	.38	.013	3800	29.9	.38	.013
5/16	6000	99.2	.47	.016	4800	52.9	.47	.016	3000	33.1	.47	.016
3/8	5000	94.5	.56	.019	4000	50.4	.56	.019	2500	31.5	.56	.019
1/2	3800	71.8	.75	.025	3000	42.5	.75	.025	1900	26.9	.75	.025
Depth of cut												

Workpiece Material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	9000	113	.38	.013	2000	9.5	.38	.008
5/16	7200	119	.47	.016	1600	10.1	.47	.009
3/8	6000	113	.56	.019	1300	11.5	.56	.011
1/2	4500	85.0	.75	.025	1000	10.1	.75	.015
Depth of cut								

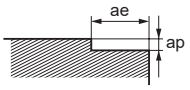
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy, and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) If the depth of cut is smaller than this table, feed rate can be increased.
Note 4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

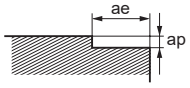
VQMHVRBF – Inch sizes

Corner radius, Medium cut length, 4 flute, Irregular helix flutes (for finishing)

RECOMMENDED CUTTING CONDITIONS

■Bottom face milling

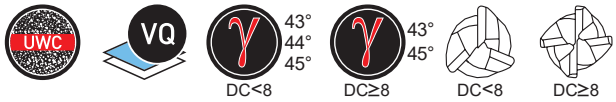
Workpiece Material	Carbon steel (−30HRC) AISI 1035, AISI 1050, ASTM 283				Alloy steel, Pre-hardened steel AISI H13, AISI 4140, AISI P21				Precipitation hardening martensitic stainless steel, Co-Cr-Mo alloy ASTM S 17400, ASTM S 17700, 17-4PH, 15-5PH etc.			
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	5500	52.0	.013	.2	4500	28.3	.013	.2	2800	17.6	.013	.2
5/16	4400	48.5	.016	.25	3600	28.3	.016	.25	2200	17.3	.016	.25
3/8	3700	46.6	.019	.3	3000	26.0	.019	.3	1800	15.6	.019	.3
1/2	2800	35.3	.025	.4	2300	21.7	.025	.4	1400	13.2	.025	.4
Depth of cut												

Workpiece Material	Copper, Copper alloy				Heat resistant alloy Inconel718 etc.			
DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
1/4	6500	61.4	.013	.2	1500	6.6	.008	.2
5/16	5200	57.3	.016	.25	1200	7.6	.009	.25
3/8	4300	54.2	.019	.3	1000	8.8	.011	.3
1/2	3300	41.6	.025	.4	750	7.6	.015	.4
Depth of cut								

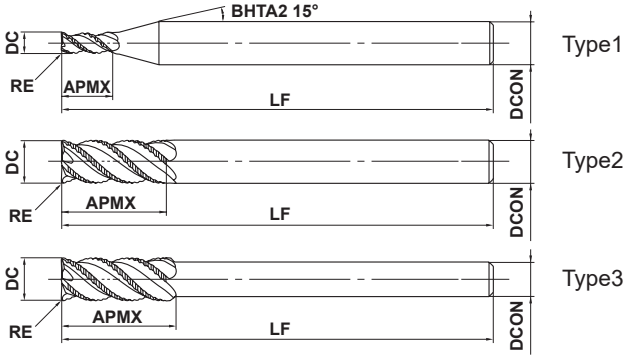
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy, and heat resistant alloy can be achieved with the use of water-soluble cutting fluid.
Note 3) Higher feeds and speeds can be used for smaller depth of cut.
Note 4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VQSVR

Roughing end mill, Short cut length, 3–4 flute, Irregular helix flutes



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

- Achieving an excellent vibration resistance due to the adoption of irregular helix.
- Use of an asymmetric chip breaker improves fracture resistance substantially. (Compared to a conventional roughing end mill)

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQSVRD0300	3	0.2	6	60	6	3	●	1
VQSVRD0400	4	0.2	8	60	6	3	●	1
VQSVRD0500	5	0.3	10	60	6	3	●	1
VQSVRD0600	6	0.3	12	70	6	3	●	2
VQSVRD0700	7	0.3	17	80	8	3	●	1
VQSVRD0800	8	0.5	17	80	8	4	●	2
VQSVRD0900	9	0.5	22	90	10	4	●	1
VQSVRD1000S08	10	0.5	22	90	8	4	●	3
VQSVRD1000	10	0.5	22	90	10	4	●	2
VQSVRD1200S10	12	0.5	27	100	10	4	●	3
VQSVRD1200	12	0.5	27	100	12	4	●	2
VQSVRD1400	14	0.5	27	130	12	4	★	3
VQSVRD1600	16	0.5	33	125	16	4	★	2
VQSVRD1800	18	0.5	33	150	16	4	★	3
VQSVRD2000	20	0.5	38	140	20	4	★	2

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

VQSVR

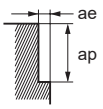
Roughing end mill, Short cut length, 3—4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

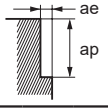
■ Side milling

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)
3	150	16000	960	4.5	1.5	120	13000	640	4.5	1.5	100	11000	450	4.5	1.5	75	8000	330	4.5	0.9	180	19000	1100	4.5	1.5
4	150	12000	960	6	2	120	9500	640	6	2	100	8000	430	6	2	75	6000	330	6	1.2	180	14000	1100	6	2
5	150	9500	960	7.5	2.5	120	7600	640	7.5	2.5	100	6400	440	7.5	2.5	75	4800	330	7.5	1.5	180	11000	1100	7.5	2.5
6	150	8000	960	9	3	120	6400	680	9	3	100	5300	480	9	3	75	4000	360	9	1.8	180	9500	1100	9	3
7	150	6800	950	10.5	3.5	120	5500	700	10.5	3.5	100	4500	500	10.5	3.5	75	3400	380	10.5	2.1	180	8200	1100	10.5	3.5
8	150	6000	1100	12	4	120	4800	800	12	4	100	4000	570	12	4	75	3000	430	12	2.4	180	7200	1300	12	4
9	150	5300	1100	13.5	4.5	120	4200	760	13.5	4.5	100	3500	570	13.5	4.5	75	2700	430	13.5	2.7	180	6400	1300	13.5	4.5
10	150	4800	1100	15	5	120	3800	760	15	5	100	3200	570	15	5	75	2400	430	15	3	180	5700	1200	15	5
12	150	4000	960	18	6	120	3200	700	18	6	100	2700	540	18	6	75	2000	400	18	3.6	180	4800	1200	18	6
14	150	3400	880	21	7	120	2700	650	21	7	100	2300	510	21	7	75	1700	380	21	4.2	180	4100	1100	21	7
16	150	3000	840	24	8	120	2400	620	24	8	100	2000	500	24	8	75	1500	380	24	4.8	180	3600	1000	24	8
18	150	2700	810	27	9	120	2100	590	27	9	100	1800	500	27	9	75	1300	360	27	5.4	180	3200	960	27	9
20	150	2400	760	30	10	120	1900	560	30	10	100	1600	500	30	10	75	1200	360	30	6	180	2900	920	30	10
Depth of cut																									

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010					Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340					Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 316, Ti-6Al-4V					Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH					Copper, Copper alloy				
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Hole Depth ap (mm)	Hole Depth ae (mm)
3	120	13000	610	4.5	1.5	100	11000	430	4.5	1.5	80	8500	280	4.5	1.5	70	7400	240	4.5	0.9	140	15000	700	4.5	1.5
4	120	9500	610	6	2	100	8000	430	6	2	80	6400	280	6	2	70	5600	240	6	1.2	140	11000	700	6	2
5	120	7600	610	7.5	2.5	100	6400	430	7.5	2.5	80	5100	280	7.5	2.5	70	4500	250	7.5	1.5	140	8900	720	7.5	2.5
6	120	6400	610	9	3	100	5300	450	9	3	80	4200	300	9	3	70	3700	270	9	1.8	140	7400	720	9	3
7	120	5500	620	10.5	3.5	100	4500	480	10.5	3.5	80	3600	320	10.5	3.5	70	3200	290	10.5	2.1	140	6400	720	10.5	3.5
8	120	4800	720	12	4	100	4000	570	12	4	80	3200	380	12	4	70	2800	340	12	2.4	140	5600	840	12	4
9	120	4200	670	13.5	4.5	100	3500	510	13.5	4.5	80	2800	360	13.5	4.5	70	2500	320	13.5	2.7	140	5000	800	13.5	4.5
10	120	3800	670	15	5	100	3200	510	15	5	80	2500	360	15	5	70	2200	310	15	3	140	4500	790	15	5
12	120	3200	610	18	6	100	2700	470	18	6	80	2100	340	18	6	70	1900	300	18	3.6	140	3700	710	18	6
14	120	2700	560	21	7	100	2300	440	21	7	80	1800	320	21	7	70	1600	280	21	4.2	140	3200	670	21	7
16	120	2400	540	24	8	100	2000	410	24	8	80	1600	320	24	8	70	1400	280	24	4.8	140	2800	630	24	8
18	120	2100	500	27	9	100	1800	400	27	9	80	1400	310	27	9	70	1200	270	27	5.4	140	2500	600	27	9
20	120	1900	480	30	10	100	1600	380	30	10	80	1300	310	30	10	70	1100	270	30	6	140	2200	560	30	10
Depth of cut																									

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

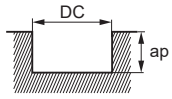
■Slotting

When machine rigidity, workpiece material rigidity and chip discharge are enough, please select the high efficiency cutting conditions.
When either machine rigidity, workpiece material rigidity or chip discharge are not enough, please select the general-purpose cutting conditions.

High efficiency conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH				Copper, Copper alloy			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
3	120	13000	720	3	100	11000	440	3	80	8500	340	3	60	6400	250	1.5	150	16000	890	3
4	120	9500	720	4	100	8000	450	4	80	6400	340	4	60	4800	250	2	150	12000	900	4
5	120	7600	720	5	100	6400	460	5	80	5100	300	5	60	3800	230	2.5	150	9500	900	5
6	120	6400	720	6	100	5300	460	6	80	4200	310	6	60	3200	240	3	150	8000	900	6
7	120	5500	730	7	100	4500	470	7	80	3600	330	7	60	2700	250	3.5	150	6800	950	7
8	120	4800	840	8	100	4000	560	8	80	3200	400	8	60	2400	300	4	150	6000	1100	8
9	120	4200	810	9	100	3500	540	9	80	2800	350	9	60	2100	260	4.5	150	5300	1000	9
10	120	3800	800	10	100	3200	520	10	80	2500	340	10	60	1900	260	5	150	4800	1000	10
12	120	3200	750	12	100	2700	480	12	80	2100	340	12	60	1600	260	6	150	4000	940	12
14	120	2700	670	14	100	2300	420	14	80	1800	300	14	60	1400	240	7	150	3400	840	14
16	120	2400	620	16	100	2000	380	16	80	1600	290	16	60	1200	220	8	150	3000	780	16
18	120	2100	570	18	100	1800	380	18	80	1400	260	18	60	1100	210	9	150	2700	730	18
20	120	1900	540	20	100	1600	350	20	80	1300	260	20	60	950	190	10	150	2400	680	20

Depth of cut

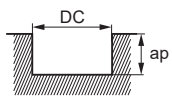


DC : Dia.

General-purpose conditions

Workpiece Material	Carbon steel, Alloy steel, Mild steel AISI 1045, AISI 4140, ASTM A36, AISI 1010				Pre-hardened steel, Carbon steel, Alloy steel, Alloy tool steel AISI P21, AISI P20, AISI 4340				Austenitic, Ferritic and Martensitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V				Hardened stainless steel, Cobalt chromium alloy AISI 630, AISI 631, 15-5PH, 17-4PH				Copper, Copper alloy			
DC (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
3	100	11000	490	3	80	8500	300	3	60	6400	200	3	50	5300	170	1.5	120	13000	580	3
4	100	8000	490	4	80	6400	310	4	60	4800	200	4	50	4000	170	2	120	9500	580	4
5	100	6400	490	5	80	5100	310	5	60	3800	200	5	50	3200	170	2.5	120	7600	580	5
6	100	5300	490	6	80	4200	310	6	60	3200	200	6	50	2700	170	3	120	6400	580	6
7	100	4500	500	7	80	3600	320	7	60	2700	200	7	50	2300	170	3.5	120	5500	620	7
8	100	4000	600	8	80	3200	380	8	60	2400	240	8	50	2000	200	4	120	4800	720	8
9	100	3500	540	9	80	2800	330	9	60	2100	210	9	50	1800	180	4.5	120	4200	650	9
10	100	3200	540	10	80	2500	330	10	60	1900	210	10	50	1600	180	5	120	3800	640	10
12	100	2700	510	12	80	2100	320	12	60	1600	210	12	50	1300	170	6	120	3200	600	12
14	100	2300	460	14	80	1800	300	14	60	1400	190	14	50	1100	150	7	120	2700	540	14
16	100	2000	410	16	80	1600	290	16	60	1200	170	16	50	990	140	8	120	2400	500	16
18	100	1800	390	18	80	1400	260	18	60	1100	170	18	50	880	130	9	120	2100	460	18
20	100	1600	360	20	80	1300	260	20	60	950	150	20	50	800	130	10	120	1900	430	20

Depth of cut



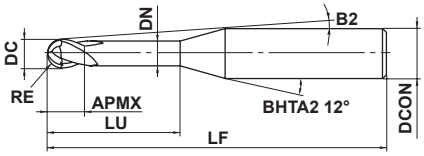
DC : Dia.

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the feed rate can be increased.

VQ2XLB NEW

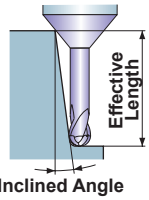
Ball nose, Short cut length, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Precipitation Hardening Stainless Steel	Austenitic Stainless Steel	Cobalt Chrome Alloy, Heat Resistant Alloy	Titanium Alloy	Aluminum Alloy
			○		◎	◎	



Type1

Effective Length for Inclined Angle



0.05≤RE≤1.5			
±0.005			
4≤DCON≤6			
0 / - 0.005			

- Fracture resistance is improved by adopting a new S-shape, reinforced cutting edge geometry.
- SMART MIRACLE coating provides better wear resistance when machining difficult-to-cut materials.

(mm)

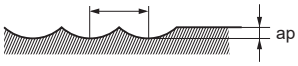
Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type
VQ2XLBR0050N080	0.5	1	0.75	8	0.94	6.4°	50	4	2	●	1
VQ2XLBR0050N100	0.5	1	0.75	10	0.94	5.6°	50	4	2	●	1
VQ2XLBR0050N080S06	0.5	1	0.75	8	0.94	8.3°	50	6	2	●	1
VQ2XLBR0050N100S06	0.5	1	0.75	10	0.94	7.5°	55	6	2	●	1
VQ2XLBR0050N120S06	0.5	1	0.75	12	0.94	6.8°	55	6	2	●	1
VQ2XLBR0075N100S06	0.75	1.5	1.1	10	1.44	7.2°	55	6	2	●	1
VQ2XLBR0075N120S06	0.75	1.5	1.1	12	1.44	6.5°	55	6	2	●	1
VQ2XLBR0100N100	1.0	2	1.5	10	1.9	4.5°	50	4	2	●	1
VQ2XLBR0100N100S06	1.0	2	1.5	10	1.9	6.9°	55	6	2	●	1
VQ2XLBR0100N120	1.0	2	1.5	12	1.9	3.9°	50	4	2	●	1
VQ2XLBR0100N120S06	1.0	2	1.5	12	1.9	6.1°	55	6	2	●	1
VQ2XLBR0150N120	1.5	3	2.3	12	2.9	5.3°	55	6	2	●	1
VQ2XLBR0150N140	1.5	3	2.3	14	2.9	4.7°	60	6	2	●	1
VQ2XLBR0150N160	1.5	3	2.3	16	2.9	4.3°	60	6	2	●	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material				Titanium Alloys Ti-6Al-4V ELI, ASTM F136, etc.					Cobalt Chromium Alloys Precipitation Hardening Stainless Steels ASTM F75:Casting, F1537:Wrought Bar, F799:Forgings, etc.				
RE		LU		Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)	Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)										
0.5	**.020**	**8**	**.315**	32000	330	98.4	.002	.004	27000	260	78.7	.002	.004
0.5	**.020**	**10**	**.394**	24000	245	59.1	.002	.004	19000	195	59.1	.002	.004
0.5	**.020**	**12**	**.472**	24000	245	59.1	.001	.004	19000	195	59.1	.001	.004
0.75	**.030**	**10**	**.394**	21000	330	82.7	.005	.012	17000	260	66.9	.003	.004
0.75	**.030**	**12**	**.472**	16000	245	59.1	.005	.012	13000	195	47.2	.003	.004
1	**.039**	**10**	**.394**	16000	330	70.9	.008	.020	13000	260	59.1	.008	.020
1	**.039**	**12**	**.472**	16000	330	70.9	.008	.020	13000	260	59.1	.008	.020
1.5	**.059**	**12**	**.472**	10000	330	63.0	.012	.031	8500	260	51.2	.012	.031
1.5	**.059**	**14**	**.551**	10000	330	63.0	.012	.031	8500	260	51.2	.012	.031
1.5	**.059**	**16**	**.630**	10000	330	63.0	.012	.031	8500	260	51.2	.012	.031

Depth of Cut

≤.004" RE (RE≤.039")
≤.008" RE (RE>.039")

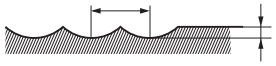


RE : Radius

Workpiece Material				Pure Titanium ASTM F67, etc.				
RE		LU		Revolution **n** (min^{-1})	Cutting Speed **vc** (SFM)	Table Feed **vf** (IPM)	Depth of cut **ap** (inch)	Width of cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)					
0.5	**.020**	**8**	**.315**	27000	260	63.0	.003	.004
0.5	**.020**	**10**	**.394**	19000	195	47.2	.003	.004
0.5	**.020**	**12**	**.472**	19000	195	47.2	.002	.004
0.75	**.030**	**10**	**.394**	25000	395	78.7	.005	.008
0.75	**.030**	**12**	**.472**	21000	330	63.0	.005	.008
1	**.039**	**10**	**.394**	32000	655	98.4	.013	.031
1	**.039**	**12**	**.472**	29000	590	66.9	.013	.031
1.5	**.059**	**12**	**.472**	21000	655	63.0	.019	.047
1.5	**.059**	**14**	**.551**	21000	655	63.0	.019	.047
1.5	**.059**	**16**	**.630**	21000	655	63.0	.019	.047

Depth of Cut

≤.004" RE (RE≤.039")
≤.008" RE (RE>.039")



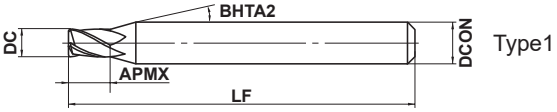
RE : Radius

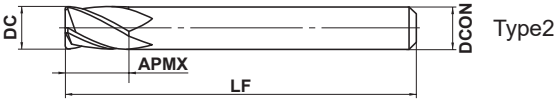
Note 1) The SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electrically transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electrical type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) If the depth of cut is shallow, the revolution and the feed rate can be increased.

VQ4MRB-FB NEW

Corner radius end mill, Medium cut length, 4 flute, For Swiss-Type lathe

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	





DC				
0 -0.020				
DCON=6	8≤DCON≤10			
0 -0.008	0 -0.009			

- A corner radius end mill with high fracture resistance.
- A turn milling machine tool for Swiss-type automatic lathes for machining lobe surfaces.

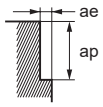
(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQ4MRBD0400R030-FB	4	0.3	6	50	6	4	●	1
VQ4MRBD0600R030-FB	6	0.3	9	50	6	4	●	2
VQ4MRBD0800R030-FB	8	0.3	12	60	8	4	●	2
VQ4MRBD1000R050-FB	10	0.5	15	70	10	4	●	2

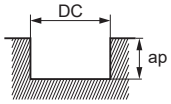
Note 1) SMART MIRACLE Coating is not conductive because of its nature. Therefore, an external contact (voltaic type) tool setter cannot be used. An internal contact (non-voltaic) type or laser type tool setter is recommended to measure the length of the tool.

RECOMMENDED CUTTING CONDITIONS

Side Milling

Workpiece Material		Carbon Steels, Cast Irons, Alloy Steels (−30HRC) AISI 1050, AISI No 35 B, AISI P20				Alloy Steels, Tool Steels, Pre-hardened Steels AISI H13, AISI W1-10, AISI P21				Austenitic Stainless Steels, Titanium Alloys AISI 304, AISI 306, Ti-6Al-4V				Copper, Copper Alloys			
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)																
4	**.157**	7500	35.4	.157	.024	5200	23.6	.157	.024	4500	17.7	.157	.024	9500	43.3	.157	.024
6	**.236**	5000	35.4	.236	.024	3500	23.6	.236	.024	3000	17.7	.236	.024	6400	43.3	.236	.024
8	**.315**	4000	30.7	.315	.024	2800	20.5	.315	.024	2400	15.4	.315	.024	4800	37.0	.315	.024
10	**.394**	3200	26.8	.394	.024	2200	17.7	.394	.024	1900	13.4	.394	.024	3800	31.9	.394	.024
Depth of Cut																	

Slotting

Workpiece Material		Carbon Steels, Cast Irons, Alloy Steels (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy Steels, Tool Steels, Pre-hardened Steels AISI H13, AISI W1-10, AISI P21			Austenitic Stainless Steels, Titanium Alloys AISI 304, AISI 306, Ti-6Al-4V			Copper, Copper Alloys		
DC		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap**	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap**	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap**	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap**
(mm)	(inch)												
4	**.157**	7500	35.4	.024	5200	23.6	.024	4500	17.7	.024	9500	43.3	.024
6	**.236**	5000	35.4	.024	3500	23.6	.024	3000	17.7	.024	6400	43.3	.024
8	**.315**	4000	30.7	.024	2800	20.5	.024	2400	15.4	.024	4800	37.0	.024
10	**.394**	3200	26.8	.024	2200	17.7	.024	1900	13.4	.024	3800	31.9	.024
Depth of Cut													

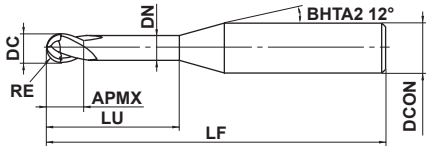
DC:Dia.

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
Note 2) When cutting austenitic stainless steels and titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 4) When drilling, please set the feed rate at 1/3 or below the values above.
Note 5) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

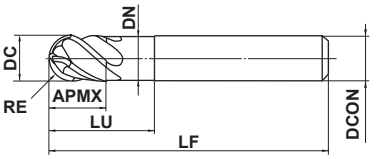
VQ4SVB

Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

1≤RE≤6				
±0.01				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

- 4 flute ball nose end mill
- With the special substrate, suitable for finishing of heat resistance alloy, etc.

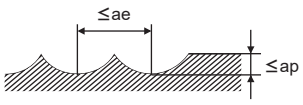
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQ4SVBR0100	1	2	3	5	1.9	50	6	4	●	1
VQ4SVBR0150	1.5	3	4.5	7.5	2.9	50	6	4	●	1
VQ4SVBR0200	2	4	6	10	3.9	50	6	4	●	1
VQ4SVBR0250	2.5	5	7.5	12.5	4.9	50	6	4	●	1
VQ4SVBR0300	3	6	9	15	5.85	50	6	4	●	2
VQ4SVBR0400	4	8	12	20	7.85	60	8	4	●	2
VQ4SVBR0500	5	10	15	25	9.7	70	10	4	●	2
VQ4SVBR0600	6	12	18	30	11.7	75	12	4	●	2

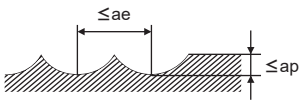
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (slotting)

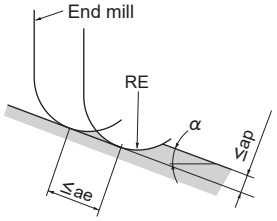
Workpiece Material	Carbon steel, Alloy steel, Mild steel, Pre-hardened steel AISI 1045, AISI 4140, ASTM A36, AISI 1010, AISI P21, AISI P20, AISI 4340								Austenitic stainless steel, Titanium alloy, Precipitation Hardening Stainless Steel, Cobalt chromium alloy, Ferritic and Martensitic stainless steel AISI 304, AISI 316, Ti-6Al-4V, AISI 630, AISI 631, 15-5PH, 17-4PH, AISI 431, AISI 420							
RE (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)
	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)			Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)		
R 1	250	40000	8000	200	32000	3800	0.17	0.5	230	36000	6500	150	24000	2900	0.17	0.5
R 1.5	300	32000	7700	200	21000	3200	0.25	0.75	230	24000	4800	150	16000	1900	0.25	0.75
R 2	300	24000	5800	200	16000	2800	0.33	1	230	18000	4000	150	12000	1700	0.33	1
R 2.5	300	19000	5300	200	12700	2600	0.42	1.25	230	14400	3500	150	9600	1500	0.42	1.25
R 3	300	16000	4800	200	10600	2100	0.5	1.5	230	12000	3200	150	8000	1400	0.5	1.5
R 4	300	12000	4300	200	8000	1900	0.8	2	230	9000	3200	150	6000	1400	0.8	2
R 5	300	9600	4100	200	6400	1800	1	2.5	230	7200	3000	150	4800	1300	1	2.5
R 6	300	8000	4000	200	5300	1800	1.2	3	230	6000	3000	150	4000	1300	1.2	3
Depth of cut																

RE : Radius

Workpiece Material	Copper, Copper alloy								Heat resistant alloy Inconel etc.							
RE (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)	α≤15°			α>15°			Depth of cut ap (mm)	Depth of cut ae (mm)
	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)			Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)		
R 1	250	40000	8000	240	38000	4500	0.17	0.5	60	9600	960	40	6400	510	0.08	0.2
R 1.5	360	38000	9100	240	25000	3800	0.25	0.7	60	6400	640	40	4200	340	0.13	0.3
R 2	360	29000	7000	240	19000	3300	0.33	1	60	4800	580	40	3200	260	0.17	0.4
R 2.5	360	23000	6400	240	15000	3100	0.42	1.2	60	3800	530	39	2500	250	0.21	0.5
R 3	360	19000	5700	240	13000	2600	0.5	1.5	60	3200	500	40	2100	210	0.25	0.6
R 4	360	14000	5000	240	9600	2300	0.8	2	60	2400	430	40	1600	190	0.4	0.8
R 5	360	12000	5100	240	7700	2200	1	2.5	63	2000	420	41	1300	180	0.5	1
R 6	360	9600	4800	240	6400	2200	1.2	3	64	1700	350	41	1100	150	0.6	1.2
Depth of cut																

RE : Radius

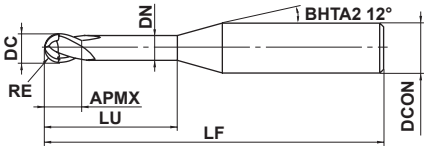
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) Chattering can still occur if the machine rigidity and clamping method are insufficient. In these cases the feed and speed should be reduced proportionately.
Note 4) When the depth of cut is smaller than shown the revolution and feed rate can be increased.
Note 5) α is the inclination angle of the machined surface.



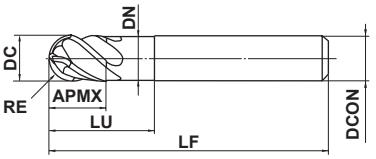
VQ4SVB –Inch sizes

Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1



Type2

.0625"≤RE≤.2500"				
±.0004"				
.250"≤DCON≤.375"	DCON=.500"			
0 - .00035"	0 - .00043"			

- 4 flute ball nose end mill
- With the special substrate, suitable for finishing of heat resistance alloy, etc.

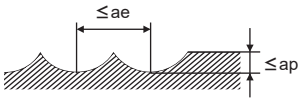
(inch)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQ4SVBD1/8	.0625	.1250	.188	.3126	.1213	2.0	.2500	4	●	1
VQ4SVBD3/16	.0938	.1875	.281	.4689	.1835	2.0	.2500	4	●	1
VQ4SVBD1/4	.1250	.2500	.375	.6252	.2441	2.0	.2500	4	●	2
VQ4SVBD5/16	.1563	.3125	.469	.7811	.3067	2.5	.3125	4	●	2
VQ4SVBD3/8	.1875	.3750	.563	.9374	.3693	2.75	.3750	4	●	2
VQ4SVBD1/2	.2500	.5000	.750	1.2500	.4882	3.0	.5000	4	●	2

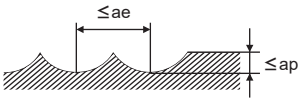
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

RECOMMENDED CUTTING CONDITIONS

■Shoulder milling (Slotting)

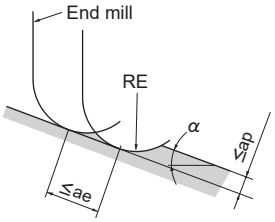
Workpiece Material	Carbon steel, Alloy steel, Mild Steel, Pre-hardened steel AISI 1010, AISI 1035, AISI 1050, ASTM 283, AISI H13, AISI 4140, AISI P21						Austenitic steinless steel, Titanium alloy, Precipitation Hardening Stainless Steel, Cobalt chomium alloy, Ferritic and Martensitic stainless steel AISI 304, AISI 316, AISI S17400, AISI S17700, AISI 430, AISI 420					
RE (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		
.0625	30000	283.5	20000	118.1	.0098	.0313	22500	189.0	15000	74.8	.0098	.0313
.0938	20000	220.5	13400	102.4	.0165	.0469	15000	137.8	10000	59.1	.0165	.0469
.1250	15000	177.2	10000	82.7	.0197	.0626	11200	126.0	7500	55.1	.0197	.0626
.1563	12000	169.3	8000	74.8	.0315	.0781	9000	126.0	6000	55.1	.0315	.0781
.1875	10000	161.4	6700	70.9	.0394	.0937	7500	118.1	5000	51.2	.0394	.0937
.2500	7600	149.6	5000	70.9	.0472	.125	5600	118.1	3800	51.2	.0472	.125
Depth of cut												

RE : Radius

Workpiece Material	Copper, Copper alloy						Heat resistant alloy Inconel718 etc.					
RE (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)
	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)			Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)		
.0625	36000	338.6	24000	141.7	.0098	.0313	6000	25.2	4000	13.4	.0051	.0313
.0938	24000	263.8	16000	122.0	.0165	.0469	4000	20.9	2700	9.8	.0083	.0469
.1250	18000	212.6	12000	98.4	.0197	.0626	3000	19.7	2000	8.3	.0098	.0626
.1563	14000	196.9	9600	90.6	.0315	.0781	2400	16.9	1600	7.5	.0157	.0781
.1875	12000	192.9	8000	82.7	.0394	.0937	2000	16.5	1300	7.1	.0197	.0937
.2500	9100	181.1	6000	86.6	.0472	.125	1500	13.8	1000	5.9	.0236	.0125
Depth of cut												

RE : Radius

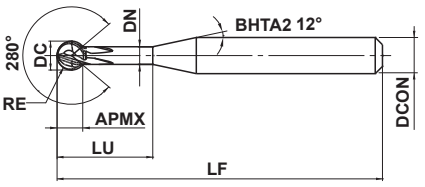
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 3) If the depth of cut is smaller than this table, feed rate can be increased.
Note 4) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.
Note 5) α is the inclination of the machined surface.



VQ4WB NEW

Lollipop, Short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



0.5≤RE≤3					
±0.01					
4≤DCON≤6					
0 / - 0.008					

- Multi-function ball end mill with a lollipop shape for 5-axis machining.
- Optimal for back deburring, undercutting, and inner curved surface machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
VQ4WBR0050N06E280	0.5	1.0	0.88	6	0.61	50	4	4	●
VQ4WBR0065N08E280	0.65	1.3	1.14	8	0.80	50	4	4	●
VQ4WBR0090N06E280	0.9	1.8	1.58	6	1.11	50	4	4	●
VQ4WBR0100N06E280	1.0	2.0	1.76	6	1.24	60	6	4	●
VQ4WBR0140N16E280	1.4	2.8	2.47	16	1.74	60	6	4	●
VQ4WBR0150N08E280	1.5	3.0	2.64	8	1.87	60	6	4	●
VQ4WBR0190N12E280	1.9	3.8	3.35	12	2.37	60	6	4	●
VQ4WBR0200N12E280	2.0	4.0	3.53	12	2.50	60	6	4	●
VQ4WBR0240N16E280	2.4	4.8	4.23	16	3.00	70	6	4	●
VQ4WBR0250N12E280	2.5	5.0	4.41	12	3.13	80	6	4	●
VQ4WBR0300N12E280	3.0	6.0	5.29	12	3.76	80	6	4	●

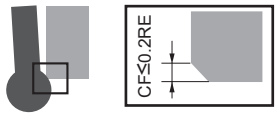
Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.

<Order for Special Product>

For special products other than the above tool specifications, please contact our sales department.

RECOMMENDED CUTTING CONDITIONS

■ Chamfering (Debarring)

Workpiece Material				Milld Steels, Carbon Steels, Copper Alloys, Pre-hardened Steels AISI 1045, 4140, 1010, P20, P21, 4340, ASTM A36 etc.			Austentic, Ferritic and Martensitic Stainless Steels, Precipitation Hardening Stainless Steels, Cobalt Chrome Alloys, Titanium Alloys AISI 304, 316, 630, 631, 431, 420, Ti-6Al-4V, 15-5PH, 17-4PH etc.		
DC		RE		Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **Max.CF** (inch)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **Max.CF** (inch)
(mm)	(inch)	(mm)	(inch)						
1.0	**.039**	**0.5**	**.020**	19000	11.8	.004	14000	8.7	.004
1.3	**.051**	**0.65**	**.026**	15000	16.5	.005	11000	12.2	.005
1.8	**.071**	**0.9**	**.035**	11000	22.4	.007	8000	16.5	.007
2.0	**.079**	**1.0**	**.039**	9500	24.0	.008	7200	18.1	.008
2.8	**.110**	**1.4**	**.055**	6800	29.9	.011	5100	22.4	.011
3.0	**.118**	**1.5**	**.059**	6400	30.3	.012	4800	22.8	.012
3.8	**.150**	**1.9**	**.075**	5000	33.1	.015	3800	25.2	.015
4.0	**.157**	**2.0**	**.079**	4800	34.6	.016	3600	26.0	.016
4.8	**.189**	**2.4**	**.094**	4000	37.8	.019	3000	28.3	.019
5.0	**.197**	**2.5**	**.098**	3800	38.2	.020	2900	29.1	.020
6.0	**.236**	**3.0**	**.118**	3200	39.4	.024	2400	30.3	.024
Depth of Cut				 RE : Radius					

■ Internal Profile / Undercut

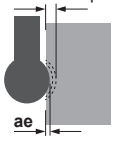
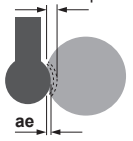
Workpiece Material				Milld Steels, Carbon Steels, Copper Alloys, Pre-hardened Steels AISI 1045, 4140, 1010, P20, P21, 4340, ASTM A36 etc.			Austentic, Ferritic and Martensitic Stainless Steels, Precipitation Hardening Stainless Steels, Cobalt Chrome Alloys, Titanium Alloys AISI 304, 316, 630, 631, 431, 420, Ti-6Al-4V, 15-5PH, 17-4PH etc.		
DC		RE		Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **ae** (inch)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)						
2.0	**.079**	**1.0**	**.039**	9500	18.1	.001	7200	11.4	.001
3.0	**.118**	**1.5**	**.059**	6400	22.0	.004	4800	13.8	.004
4.0	**.157**	**2.0**	**.079**	4800	25.6	.006	3600	15.4	.006
5.0	**.197**	**2.5**	**.098**	3800	28.7	.007	2900	17.3	.007
6.0	**.236**	**3.0**	**.118**	3200	30.3	.009	2400	18.1	.009
Depth of Cut				RE : Radius					

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work. When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
Note 4) For sizes RE 0.5, 0.65, 0.9, 1.4, 1.9 and RE 2.4 which have long neck lengths, internal profile milling and round shape slotting are not recommended.

VQ4WB

Lollipop, Short cut length, 4 flute

■ Radiused Shape Slotting

Workpiece Material				Milld Steels, Carbon Steels, Copper Alloys, Pre-hardened Steels AISI 1045, 4140, 1010, P20, P21, 4340, ASTM A36 etc.				Austentic, Ferritic and Martensitic Stainless Steels, Precipitation Hardening Stainless Steels, Cobalt Chrome Alloys, Titanium Alloys AISI 304, 316, 630, 631, 431, 420, Ti-6Al-4V, 15-5PH, 17-4PH etc.			
DC		**RE**		Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut	
(mm)	(inch)	(mm)	(inch)			**ae** (inch)	**Max. ae** (inch)			**ae** (inch)	**Max. ae** (inch)
2.0	**.079**	**1.0**	**.039**	9500	11.8	.001	.002	7200	5.5	.001	.002
3.0	**.118**	**1.5**	**.059**	6400	15.0	.004	.008	4800	7.5	.004	.008
4.0	**.157**	**2.0**	**.079**	4800	17.3	.006	.011	3600	9.1	.006	.011
5.0	**.197**	**2.5**	**.098**	3800	19.3	.007	.021	2900	10.2	.007	.021
6.0	**.236**	**3.0**	**.118**	3200	20.1	.009	.035	2400	10.6	.009	.035
Depth of Cut				Max Cut of Depth  ae				Max Cut of Depth  ae			

RE : Radius

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work. When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.

Note 2) If the depth of cut is smaller than this table, feed rate can be increased.

Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

Note 4) For sizes RE 0.5, 0.65, 0.9, 1.4, 1.9 and RE 2.4 which have long neck lengths, internal profile milling and round shape slotting are not recommended.

Note 5) Though max ae means stably machinable cutting condition, maximum depth of calculated by effective cutting edge angle is 0.3 times RE. (In that case please reduce the revolution and feed rate than this table.)

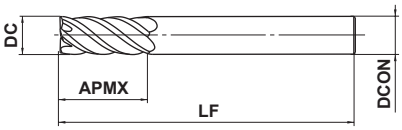
VQ5MHV – Inch sizes

NEW

End mill, Medium cut length, 5 flute, Irregular helix flutes

39°
40°
41°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		



.2500"≤DC≤.5000"				
0 - .0012"				
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .0002"	0 - .0003"			

● SMART MIRACLE irregular helix end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials and long overhang applications.

(inch)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock
VQ5MHVD1/4	.2500	.625	2.500	.2500	5	●
VQ5MHVD5/16	.3125	.750	2.750	.3125	5	●
VQ5MHVD3/8	.3750	.875	3.250	.3750	5	●
VQ5MHVD1/2	.5000	1.125	4.000	.5000	5	●

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

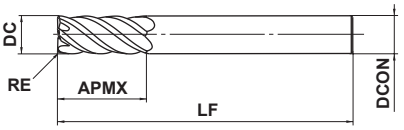
VQ5MHVRB – Inch sizes

NEW

Corner radius, Medium cut length, 5 flute, Irregular helix flutes

39°
40°
41°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		



.0010"≤RE≤.0030"				
±.0006"				
.2500"≤DC≤.5000"				
0 - .0012"				
.2500"≤DCON≤.3750"	DCON=.5000"			
0 - .0002"	0 - .0003"			

● SMART MIRACLE corner radius, irregular helix end mills for reducing vibration and for delivering stable performance on difficult-to-cut materials and long overhang applications.

(inch)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock
VQ5MHVRBD1/4R010	.2500	.010	.625	2.500	.2500	5	●
VQ5MHVRBD5/16R015	.3125	.015	.750	2.750	.3125	5	●
VQ5MHVRBD3/8R030	.3750	.030	.875	3.250	.3750	5	●
VQ5MHVRBD1/2R030	.5000	.030	1.125	4.000	.5000	5	●

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

VQ5MHV – Inch sizes NEW

End mill, Medium cut length, 5 flute, Irregular helix flutes

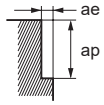
VQ5MHVRB – Inch sizes NEW

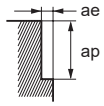
Corner radius, Medium cut length, 5 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Side milling

(inch)

Workpiece Material		Carbon Steels(–30HRC)						Alloy Steels, Pre-hardened Steels					
DC		High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
(mm)	(inch)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)			Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)		
6.350	**.2500**	7500	90.6	6000	63.0	.375	.075	6000	47.2	5000	31.5	.375	.075
7.938	**.3125**	6000	90.6	4800	63.0	.469	.094	4800	51.2	4000	35.4	.469	.094
9.525	**.3750**	5000	90.6	4000	59.1	.563	.113	4000	51.2	3300	33.5	.563	.113
12.700	**.5000**	3800	66.9	3000	43.3	.750	.150	3000	43.3	2500	29.5	.750	.150
Depth of Cut													

Workpiece Material		Austenitic Stainless Steels, Titanium Alloys						Precipitation Hardening Steinless Steels, Cobalt Chrome Alloys					
DC		High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)	High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)	Depth of Cut **ae** (inch)
(mm)	(inch)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)			Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)		
6.350	**.2500**	5000	39.4	4000	25.6	.375	.050	3800	37.4	3500	21.7	.375	.050
7.938	**.3125**	4000	43.3	3200	29.5	.469	.063	3000	43.3	2800	25.6	.469	.063
9.525	**.3750**	3300	51.2	2700	33.5	.563	.075	2500	39.4	2300	23.6	.563	.075
12.700	**.5000**	2500	39.4	2000	27.6	.750	.100	1900	30.3	1800	19.7	.750	.100
Depth of Cut													

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills.
However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnomal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 4) If the depth of cut is smaller, the revolution and the feed rate can be increased.

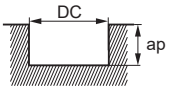
VQ5MHV – Inch sizes NEW

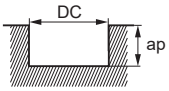
End mill, Medium cut length, 5 flute, Irregular helix flutes

VQ5MHVRB – Inch sizes NEW

Corner radius, Medium cut length, 5 flute, Irregular helix flutes

Slot Milling

Workpiece Material		Carbon Steels(–30HRC)					Alloy Steels, Pre-hardened Steels				
DC		High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)	High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)
(mm)	(inch)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)		Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	
6.350	**.2500**	7500	55.1	5000	37.4	.250	6000	31.5	4000	19.7	.250
7.938	**.3125**	6000	55.1	4000	35.4	.312	4800	31.5	3200	19.7	.312
9.525	**.3750**	5000	51.2	3300	33.5	.375	4000	28.3	2700	17.7	.375
12.700	**.5000**	3800	39.4	2500	25.6	.500	3000	23.2	2000	13.8	.500
Depth of Cut											

Workpiece Material		Austenitic Stainless Steels, Titanium Alloys					Precipitation Hardening Steinless Steels				
DC		High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)	High Speed Cutting		General Purpose Cutting		Depth of Cut **ap** (inch)
(mm)	(inch)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)		Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	
6.350	**.2500**	5000	34.3	3000	13.8	.250	3000	23.6	2500	11.8	.250
7.938	**.3125**	4000	39.4	2400	15.7	.312	2400	23.6	2000	11.8	.312
9.525	**.3750**	3300	37.8	2000	17.7	.375	2000	21.7	1700	9.8	.375
12.700	**.5000**	2500	31.5	1500	13.8	.500	1500	17.7	1300	7.9	.500
Depth of Cut											

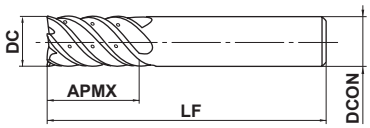
Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) When cutting titanium alloys, the use of water-soluble cutting fluid is effective.
Note 3) The irregular helix flute end mill has a larger effect on controlling vibration when compred to standard end mills.
However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnomal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 4) If the depth of cut is smaller, the revolution and the feed rate can be increased.

VQ6MHVCH

End mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎	○	

CoolStar



Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

DCON=10	DCON=12	DCON=16	DCON=20	
0 - 0.009	0 - 0.011	0 - 0.011	0 - 0.013	

●Vibration control end mill with multiple thru-coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

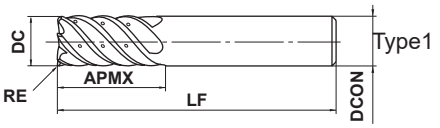
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VQ6MHVCHD1000	10	22	70	10	6	●	1
VQ6MHVCHD1200	12	26	75	12	6	●	1
VQ6MHVCHD1600	16	32	90	16	6	●	1
VQ6MHVCHD2000	20	38	100	20	6	●	1

VQ6MHVRBCH

Corner radius, Medium cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎	○	

CoolStar



0.5≤RE≤4				
±0.015				
DC≤12	DC>12			
0 -0.020	0 -0.030			
DCON=10	DCON=12	DCON=16	DCON=20	
0 -0.009	0 -0.011	0 -0.011	0 -0.013	

● Vibration control corner radius end mill with multiple thru-coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

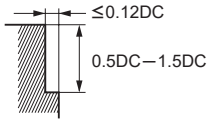
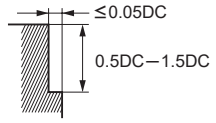
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQ6MHVRBCHD1000R050	10	0.5	22	70	10	6	●	1
VQ6MHVRBCHD1000R100	10	1	22	70	10	6	●	1
VQ6MHVRBCHD1200R050	12	0.5	26	75	12	6	●	1
VQ6MHVRBCHD1200R100	12	1	26	75	12	6	●	1
VQ6MHVRBCHD1600R100	16	1	32	90	16	6	●	1
VQ6MHVRBCHD1600R300	16	3	32	90	16	6	●	1
VQ6MHVRBCHD1600R400	16	4	32	90	16	6	●	1
VQ6MHVRBCHD2000R100	20	1	38	100	20	6	●	1
VQ6MHVRBCHD2000R300	20	3	38	100	20	6	●	1
VQ6MHVRBCHD2000R400	20	4	38	100	20	6	●	1

VQ6MHVCH
End mill, Medium cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant

VQ6MHVRBCH
Corner radius, Medium cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant

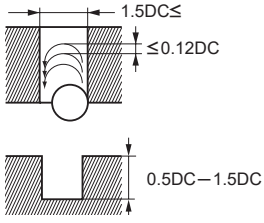
RECOMMENDED CUTTING CONDITIONS

Shoulder milling

Workpiece Material		Alloy Steel, Tool Steel, Pre-hardened Steel AISI H13, AISI W1-10, AISI P21		Austenitic Stainless Steel(≤200HB) Titanium Alloy AISI 304, AISI 316, Ti-6AL-4V		Copper, Copper Alloy		Heat Resistant Alloy Inconel 718	
DC (mm)	DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)
10	**.394**	—	—	4800	78.7	—	—	1300	10.2
12	**.472**	—	—	4000	78.7	—	—	1100	9.1
16	**.630**	4000	86.6	3000	63.0	2400	55.1	800	7.1
20	**.787**	3200	74.8	2400	55.1	1900	43.3	640	5.9
Depth of Cut									

DC : Dia.

Trochoid milling

Workpiece Material		Alloy Steel, Tool Steel, Pre-hardened Steel AISI H13, AISI W1-10, AISI P21		Austenitic Stainless Steel(≤200HB) Titanium Alloy AISI 304, AISI 316, Ti-6AL-4V	
DC (mm)	DC (inch)	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)
10	**.394**	—	—	4800	55.1
12	**.472**	—	—	4000	47.2
16	**.630**	4000	63.0	3000	43.3
20	**.787**	3200	55.1	2400	35.4
Depth of Cut					

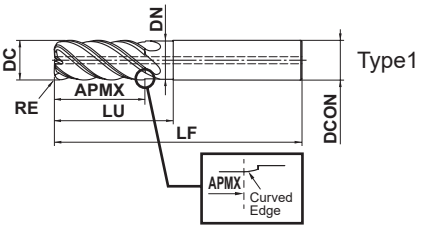
DC : Dia.

Note 1) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 2) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.

VQT5MVRB

Corner radius, Medium cut length, 5 flute, Irregular helix flutes, with coolant hole

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



RE				
±0.02				
DC≤16	20≤DC≤25			
0 - 0.03	0 - 0.04			
DCON = 16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

- Flute geometry suitable for slot milling.
- The sharp corner R edges provide long tool life in machining of titanium alloys.

(mm)

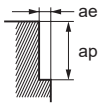
Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
NEW VQT5MVRB160R100N48C	16	1	34	48	15.5	120	16	5	●	1
NEW VQT5MVRB160R300N48C	16	3	34	48	15.5	120	16	5	●	1
NEW VQT5MVRB160R400N48C	16	4	34	48	15.5	120	16	5	●	1
NEW VQT5MVRB200R100N60C	20	1	44	60	19.5	135	20	5	●	1
NEW VQT5MVRB200R300N60C	20	3	44	60	19.5	135	20	5	●	1
NEW VQT5MVRB200R400N60C	20	4	44	60	19.5	135	20	5	●	1
NEW VQT5MVRB200R600N60C	20	6	44	60	19.5	135	20	5	●	1
NEW VQT5MVRB250R100N75C	25	1	54	75	24.5	155	25	5	●	1
NEW VQT5MVRB250R300N75C	25	3	54	75	24.5	155	25	5	●	1
NEW VQT5MVRB250R400N75C	25	4	54	75	24.5	155	25	5	●	1
NEW VQT5MVRB250R600N75C	25	6	54	75	24.5	155	25	5	●	1

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.

RECOMMENDED CUTTING CONDITIONS

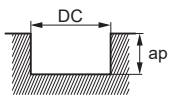
■ Shoulder milling

Overhang Length DC×3 (DC=Dia.)

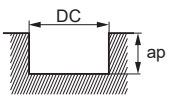
Workpiece Material		Titanium Alloys Ti-6Al-4V etc.						
DC		RE		Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)					
16	**.630**	**1**	**.039**	260	1600	31.5	1.260	.097
		3	**.118**	260	1600	31.5	1.260	.094
		4	**.157**	260	1600	31.5	1.260	.094
20	**.787**	**1**	**.039**	260	1300	25.6	1.575	.118
		3	**.118**	260	1300	25.6	1.575	.118
		4	**.157**	260	1300	25.6	1.575	.118
		6	**.236**	260	1300	25.6	1.575	.118
25	**.984**	**1**	**.039**	260	1000	19.7	1.969	.150
		3	**.118**	260	1000	19.7	1.969	.150
		4	**.157**	260	1000	19.7	1.969	.150
		6	**.236**	260	1000	19.7	1.969	.150
Depth of Cut								

■ Slot milling

Depth of Cut DC×1

Workpiece Material		Titanium Alloys Ti-6Al-4V etc.					
DC		RE		Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **ap** (inch)
(mm)	(inch)	(mm)	(inch)				
16	**.630**	**1**	**.039**	195	1200	16.5	.630
		3	**.118**	195	1200	16.5	.630
		4	**.157**	195	1200	11.8	.630
20	**.787**	**1**	**.039**	195	950	13.0	.787
		3	**.118**	195	950	13.0	.787
		4	**.157**	195	950	13.0	.787
		6	**.236**	195	950	9.4	.787
25	**.984**	**1**	**.039**	165	640	8.7	.984
		3	**.118**	165	640	8.7	.984
		4	**.157**	165	640	8.7	.984
		6	**.236**	165	640	6.3	.984
Depth of Cut		 DC=Dia.					

Depth of Cut DC×2

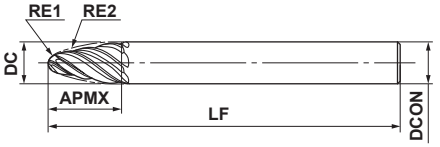
Workpiece Material		Titanium Alloys Ti-6Al-4V etc.					
DC		RE		Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Table Feed **vf** (IPM)	Depth of Cut **ap** (inch)
(mm)	(inch)	(mm)	(inch)				
16	**.630**	**1**	**.039**	195	1200	9.4	1.260
		3	**.118**	195	1200	9.4	1.260
		4	**.157**	195	1200	7.1	1.260
20	**.787**	**1**	**.039**	195	950	7.5	1.575
		3	**.118**	195	950	7.5	1.575
		4	**.157**	195	950	7.5	1.575
		6	**.236**	195	950	5.6	1.575
25	**.984**	**1**	**.039**	165	640	5.1	1.969
		3	**.118**	165	640	5.1	1.969
		4	**.157**	165	640	5.1	1.969
		6	**.236**	165	640	3.8	1.969
Depth of Cut		 DC=Dia.					

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, please use an internal contact type (non-electricity type) or a laser tool setter.
Note 2) When cutting titanium alloy, the use of water-soluble cutting fluid is effective.
Note 3) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 4) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 5) When machining a deep slot exceeding 1D, use a holder with a high gripping strength or an anti slippage mechanism.
Also, make sure that the clamping force and rigidity are sufficient before use.

VQT6UR

Barrel, Medium cut length, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				○	◎		○



Type1

RE1≤4	RE2≤100			
±0.01	±0.01			
DCON≤10	DCON=12			
0 - 0.009	0 - 0.011			

● Nose and tangential form part has two distinct radii.
● Irregular pitch design prevents chattering.

(mm)

Order Number	DC	RE1	RE2	APMX	LF	DCON	No. of Flutes	Stock	Type
VQT6URR020R075S08	8	2	75	21	90	8	6	●	1
VQT6URR020R085S10	10	2	85	26	100	10	6	●	1
VQT6URR030R075S10	10	3	75	22	100	10	6	●	1
VQT6URR040R100S12	12	4	100	25	110	12	6	●	1

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, an internal contact / non-electric type or laser tool setter is recommended.

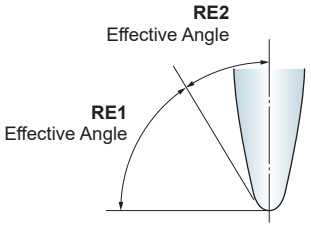
RECOMMENDED CUTTING CONDITIONS

■ Effective Angle

Please refer to the table below for the use of the nose radius (RE1) and tangential form radius (RE2).

(inch)

Order Number	Nose Radius		Tangential Form Radius	
	RE1	Effective Angle	**RE2**	Effective Angle
VQT6URR020R075S08	.079 (2mm)	76.6°	2.953 (75mm)	13.4°
VQT6URR020R085S10	.079 (2mm)	74.5°	3.346 (85mm)	15.5°
VQT6URR030R075S10	.118 (3mm)	76.4°	2.953 (75mm)	13.6°
VQT6URR040R100S12	.157 (4mm)	78.3°	3.937 (100mm)	11.7°



■ Side Milling with the Use of the Tangential Form Radius (RE2)

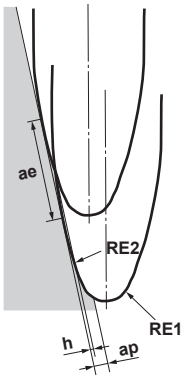
Workpiece Material				Mild steel (≤180HB) Carbon steel, Alloy steel (180—280HB)			Austenitic stainless steel (≤200HB) Titanium alloy			Aluminum alloy (Si<5%)		
DC		**RE2**		Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ap** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ap** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ap** (inch)
mm	inch	mm	inch									
8	**.315**	**75**	**2.953**	8000	94.5	.002–.012	3200	30.3	.002–.012	16000	189.0	.002–.012
10	**.394**	**85**	**3.346**	6400	74.8	.002–.012	2500	23.6	.002–.012	13000	153.5	.002–.012
10	**.394**	**75**	**2.953**	6400	74.8	.002–.012	2500	23.6	.002–.012	13000	153.5	.002–.012
12	**.472**	**100**	**3.937**	5300	63.0	.002–.012	2100	19.7	.002–.012	11000	129.9	.002–.012

■ Depth of Cut Calculation Table Based on Tangential Form Radius (RE2) and Cusp Height (h)

(inch)

Order Number	**RE2**	Cusp Height **h**	.000004	.000012	.000020	.000031	.000039	.000118	.000197	.000315
VQT6URR020R075S08	2.953 (75mm)	Depth of Cut **ap**	.0096	.0167	.0216	.0273	.0305	.0528	.0682	.0863
VQT6URR030R075S10	2.953 (75mm)		.0096	.0167	.0216	.0273	.0305	.0528	.0682	.0863
VQT6URR020R085S10	3.346 (85mm)		.0103	.0178	.0230	.0291	.0325	.0562	.0726	.0918
VQT6URR040R100S12	3.937 (100mm)		.0111	.0193	.0249	.0315	.0352	.0610	.0787	.0996

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, an internal contact/non-electric type or laser tool setter is recommended.
Note 2) Recommended for finish cutting only.
Note 3) The tool contact part differs between the nose radius and tangential form radius depending on machining geometries and tilt angles. Select suitable cutting conditions according to tool contact parts.



VQT6UR

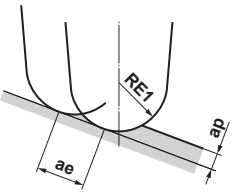
Barrel, Medium cut length, 6 flute

RECOMMENDED CUTTING CONDITIONS

■ Fillet Milling with the Use of the Nose Radius (RE1)

Workpiece Material				Mild Steel (≤180HB) Carbon Steel, Alloy Steel (180−280HB)				Austenitic Stainless Steel (≤200HB) Titanium Alloy				Aluminum Alloy (Si<5%)			
DC		RE1		Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ap** (inch)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ap** (inch)	Depth of cut **ae** (inch)	Revolution (min^{-1})	Table feed (IPM)	Depth of cut **ap** (inch)	Depth of cut **ae** (inch)
mm	inch	mm	inch												
8	**.315**	**2**	**.079**	16000	94.5	.016	.039	6400	22.8	.016	.039	32000	189.0	.016	.039
10	**.394**	**2**	**.079**	16000	94.5	.016	.039	6400	22.8	.016	.039	32000	189.0	.016	.039
10	**.394**	**3**	**.118**	11000	66.9	.024	.059	4200	15.0	.024	.059	21000	126.0	.024	.059
12	**.472**	**4**	**.157**	8000	47.2	.031	.079	3200	11.4	.031	.079	16000	94.5	.031	.079

Note 1) SMART MIRACLE coating has very low electrical conductivity; therefore, an external contact type of tool setter (electric transmitted) may not work.
When measuring the tool length, an internal contact/non-electric type or laser tool setter is recommended.
Note 2) Recommended for finish cutting only.
Note 3) The tool contact part differs between the nose radius and tangential form radius depending on machining geometries and tilt angles. Select suitable cutting conditions according to tool contact parts.



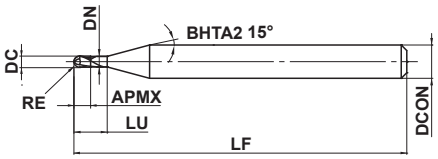
ae:Pick Feed

VQN2MB NEW

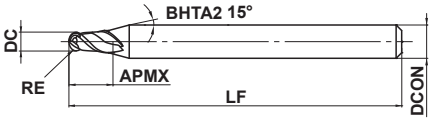
Ball nose, Medium cut length, 2 flute

UWC | VQN | RE≤1.5 | 30° | RE>1.5 | 45°

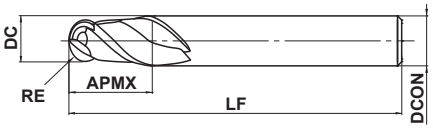
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



Type1



Type2



Type3

RE≤6		
±0.010		
DCON=6	8≤DCON≤10	DCON=12
0 - 0.005	0 - 0.006	0 - 0.008

h5

- (Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
- The R cutting edge rake angle and ball nose geometry have been optimised to improve strength.

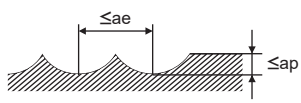
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQN2MBR0050	0.5	1	1	4	0.94	60	6	2	●	1
VQN2MBR0100	1.0	2	2	6	1.9	60	6	2	●	1
VQN2MBR0150	1.5	3	3	8	2.9	60	6	2	●	1
VQN2MBR0200	2.0	4	8	–	–	60	6	2	●	2
VQN2MBR0250	2.5	5	12	–	–	60	6	2	●	2
VQN2MBR0300	3.0	6	12	–	–	60	6	2	●	3
VQN2MBR0400	4.0	8	14	–	–	70	8	2	●	3
VQN2MBR0500	5.0	10	18	–	–	80	10	2	●	3
VQN2MBR0600	6.0	12	22	–	–	80	12	2	●	3

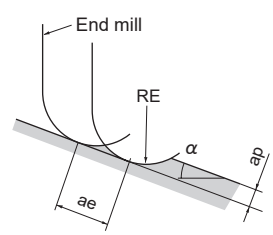
VQN2MB

Ball nose, Medium cut length, 2 flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Nickel-based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.					
RE		$\alpha \leq 15°$		$\alpha > 15°$		Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)	Revolution (SFM)	Table Feed (IPM)	Revolution (SFM)	Table Feed (IPM)		
0.5	**.020**	65	25.2	65	29.9	.004	.010
1.0	**.039**	65	12.6	65	15.0	.008	.020
1.5	**.059**	65	9.8	65	9.8	.012	.030
2.0	**.079**	65	7.5	65	8.7	.016	.039
2.5	**.098**	65	7.1	65	7.9	.020	.049
3.0	**.118**	65	6.7	65	8.3	.024	.059
4.0	**.157**	60	5.1	60	6.3	.031	.079
5.0	**.197**	60	5.1	60	5.5	.039	.098
6.0	**.236**	60	4.3	60	4.7	.047	.118
Depth of cut							

Note 1) For heat resistant super alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if the rigidity of machine or workpiece is low. In this case, please reduce the revolution and feed rate proportionately.
Note 4) α is the inclination angle of the machined surface.

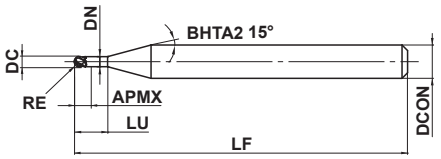


ae:Pick Feed

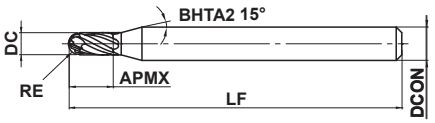
VQN4MB NEW

Ball nose, Medium cut length, 4 flute

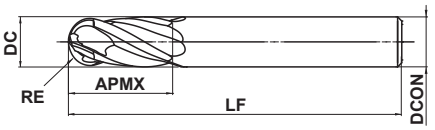
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



Type1



Type2



Type3

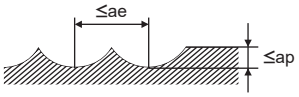
RE≤6		
±0.010		
DCON=6	8≤DCON≤10	DCON=12
0 - 0.005	0 - 0.006	0 - 0.008

- (Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
- The 2-flute end cutting edge provides excellent chip evacuation and is ideal for rough machining.

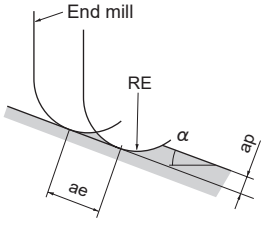
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQN4MBR0100	1.0	2	2	6	1.9	60	6	4	●	1
VQN4MBR0150	1.5	3	3	8	2.9	60	6	4	●	1
VQN4MBR0200	2.0	4	8	–	–	60	6	4	●	2
VQN4MBR0250	2.5	5	12	–	–	60	6	4	●	2
VQN4MBR0300	3.0	6	12	–	–	60	6	4	●	3
VQN4MBR0400	4.0	8	14	–	–	70	8	4	●	3
VQN4MBR0500	5.0	10	18	–	–	80	10	4	●	3
VQN4MBR0600	6.0	12	22	–	–	80	12	4	●	3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Nickel-based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.						
RE		α≤15°		α>15°		Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)	Revolution (SFM)	Table Feed (IPM)	Revolution (SFM)	Table Feed (IPM)		
1.0	**.039**	65	15.0	65	20.1	.008	.020
1.5	**.059**	65	13.4	65	16.5	.012	.030
2.0	**.079**	65	12.6	65	15.0	.016	.039
2.5	**.098**	65	9.8	65	12.2	.020	.049
3.0	**.118**	65	8.3	65	9.8	.024	.059
4.0	**.157**	60	6.3	60	7.5	.031	.079
5.0	**.197**	60	5.9	60	7.9	.039	.098
6.0	**.236**	60	5.9	60	6.7	.047	.118
Depth of cut							

Note 1) For heat resistant super alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if the rigidity of machine or workpiece is low. In this case, please reduce the revolution and feed rate proportionately.
Note 4) α is the inclination angle of the machined surface.

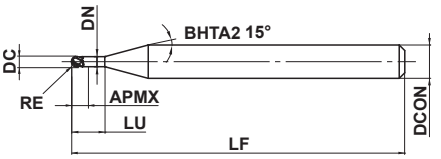


ae:Pick Feed

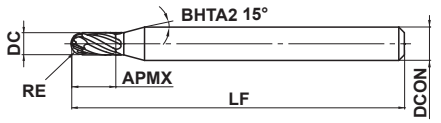
VQN4MBF NEW

Ball nose, Medium cut length, 4 flute

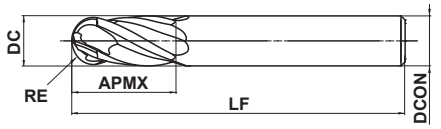
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



Type1



Type2



Type3

RE≤6		
±0.010		
DCON=6	8≤DCON≤10	DCON=12
0 - 0.005	0 - 0.006	0 - 0.008

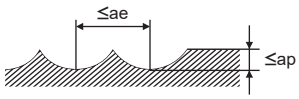
h5

- (Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
- The 4-flute end cutting edge is also ideal for 5-axis machining.

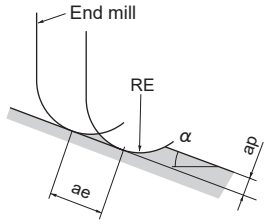
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQN4MBFR0100	1.0	2	2	6	1.9	60	6	4	●	1
VQN4MBFR0150	1.5	3	3	8	2.9	60	6	4	●	1
VQN4MBFR0200	2.0	4	8	–	–	60	6	4	●	2
VQN4MBFR0250	2.5	5	12	–	–	60	6	4	●	2
VQN4MBFR0300	3.0	6	12	–	–	60	6	4	●	3
VQN4MBFR0400	4.0	8	14	–	–	70	8	4	●	3
VQN4MBFR0500	5.0	10	18	–	–	80	10	4	●	3
VQN4MBFR0600	6.0	12	22	–	–	80	12	4	●	3

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Nickel-based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.						
RE		α≤15°			α>15°			Depth of Cut ap (inch)
(mm)	(inch)	Revolution (SFM)	Table Feed (IPM)	Depth of Cut ae (inch)	Revolution (SFM)	Table Feed (IPM)	Depth of Cut ae (inch)	
1.0	**.039**	65	7.1	.016	65	12.2	.020	.008
1.5	**.059**	65	6.7	.024	65	13.4	.030	.012
2.0	**.079**	65	7.5	.031	65	12.6	.039	.016
2.5	**.098**	65	5.9	.039	65	9.8	.049	.020
3.0	**.118**	65	6.7	.047	65	9.8	.059	.024
4.0	**.157**	60	5.1	.063	60	7.5	.079	.031
5.0	**.197**	60	3.9	.079	60	7.9	.098	.039
6.0	**.236**	60	5.1	.094	60	6.7	.118	.047
Depth of cut								

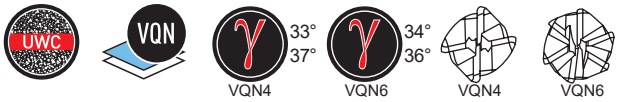
Note 1) For heat resistant super alloy, the use of water-soluble coolant is effective.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Vibration may occur if the rigidity of machine or workpiece is low. In this case, please reduce the revolution and feed rate proportionately.
Note 4) α is the inclination angle of the machined surface.



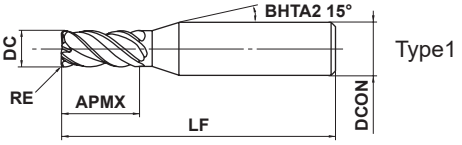
ae:Pick Feed

VQN4/6MVRB NEW

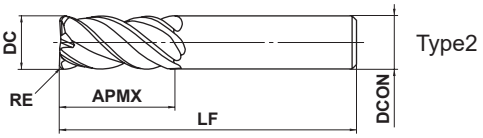
Corner Radius, Medium cut length, 4/6 flute



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



Type1



Type2

VQN4	VQN6			
±0.015	±0.02			
DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

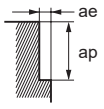
- (Al, Ti, Si) N-based coating exhibits excellent wear and chipping resistance when machining heat resistant super alloys.
- Optimized number of flutes for efficient and stable machining.

(mm)

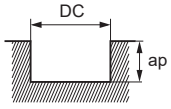
Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VQN4MVRBD0300R030	3	0.3	7	45	6	4	●	1
VQN4MVRBD0300R050	3	0.5	7	45	6	4	●	1
VQN4MVRBD0400R030	4	0.3	10	45	6	4	●	1
VQN4MVRBD0400R050	4	0.5	10	45	6	4	●	1
VQN4MVRBD0500R050	5	0.5	12	50	6	4	●	1
VQN4MVRBD0600R050	6	0.5	13	50	6	4	●	2
VQN4MVRBD0600R100	6	1	13	50	6	4	●	2
VQN6MVRBD0800R050	8	0.5	19	60	8	6	●	2
VQN6MVRBD0800R100	8	1	19	60	8	6	●	2
VQN6MVRBD1000R050	10	0.5	22	70	10	6	●	2
VQN6MVRBD1000R100	10	1	22	70	10	6	●	2
VQN6MVRBD1200R050	12	0.5	26	75	12	6	●	2
VQN6MVRBD1200R100	12	1	26	75	12	6	●	2

RECOMMENDED CUTTING CONDITIONS

Side milling

Workpiece Material			Nickel-based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.			
DC		Number of Flutes	Revolution (SFM)	Table Feed (IPM)	Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)					
3	**.118**	**4**	4200	13.4	.177	.012
4	**.157**	**4**	3200	10.2	.236	.016
5	**.197**	**4**	2500	11.8	.295	.020
6	**.236**	**4**	2100	9.8	.354	.024
8	**.315**	**6**	1600	11.4	.472	.031
10	**.394**	**6**	1300	12.2	.591	.039
12	**.472**	**6**	1100	10.2	.709	.047
Depth of cut						

Slot milling

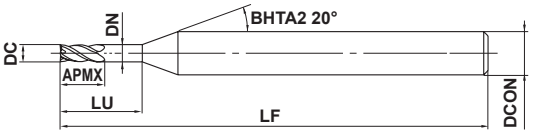
Workpiece Material			Nickel-based Heat Resistant Super Alloy Inconel718, Inconel713C, WASPALOY etc.		
DC		Number of Flutes	Revolution (SFM)	Table Feed (IPM)	Depth of Cut ap (inch)
(mm)	(inch)				
3	**.118**	**4**	3200	10.2	.059
4	**.157**	**4**	2400	7.5	.079
5	**.197**	**4**	1900	9.1	.098
6	**.236**	**4**	1600	7.5	.118
8	**.315**	**6**	1200	5.5	.157
10	**.394**	**6**	1000	4.7	.197
12	**.472**	**6**	800	5.5	.236
Depth of cut					

Note 1) For heat resistant super alloy, the use of water-soluble coolant is effective.
Note 2) Chattering can still occur if the machine rigidity and clamping method are insufficient.
In these cases the feed and speed should be reduced proportionately.
Note 3) If the depth of cut is shallow, the revolution and feed rate can be increased.

VQXL

End mill, Short cut length, 3—4 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎			◎	◎	○	



Type1

DC≤1				
0 - 0.010				
DCON=4				
0 - 0.005				

- The use of SMART MIRACLE Coating improves chip discharge dramatically.
- Multi-cutters at a small diameter of ϕ1 is realized.

(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VQXLD0020N006	0.2	0.3	0.6	0.18	40	4	3	●	1
VQXLD0030N009	0.3	0.5	0.9	0.28	40	4	3	●	1
VQXLD0030N015	0.3	0.5	1.5	0.28	40	4	3	●	1
VQXLD0040N010	0.4	0.6	1	0.37	40	4	4	●	1
VQXLD0040N018	0.4	0.6	1.8	0.37	40	4	4	●	1
VQXLD0050N015	0.5	0.7	1.5	0.46	40	4	4	●	1
VQXLD0050N025	0.5	0.7	2.5	0.46	40	4	4	●	1
VQXLD0050N030	0.5	0.7	3	0.46	40	4	4	●	1
VQXLD0060N030	0.6	0.9	3	0.57	40	4	4	●	1
VQXLD0070N035	0.7	1	3.5	0.67	40	4	4	●	1
VQXLD0080N024	0.8	1.2	2.4	0.77	40	4	4	●	1
VQXLD0080N030	0.8	1.2	3	0.77	40	4	4	●	1
VQXLD0080N040	0.8	1.2	4	0.77	40	4	4	●	1
VQXLD0100N050	1	1.5	5	0.96	40	4	4	●	1

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.

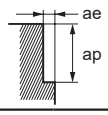
TORX Chart

Order Number	ISO 10664 TORX Type
VQXLD0020N006	T4
VQXLD0030N009	T6
VQXLD0030N015	
VQXLD0040N010	T8
VQXLD0040N018	
VQXLD0050N015	T15
VQXLD0050N025	
VQXLD0050N030	
VQXLD0080N024	T25
VQXLD0080N040	
VQXLD0100N050	T40

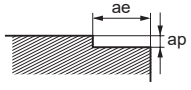
● : USA Stock

RECOMMENDED CUTTING CONDITIONS

■ Side milling

Workpiece Material		Carbon steel, Alloy steel, Austenitic stainless steel, Titanium alloy Cobalt chromium alloy, Copper, Copper alloy AISI 1045, AISI 4140, AISI 4340, AISI 304, AISI 316, AISI 304LN, AISI 316LN, Ti-6Al-4V					Heat resistant alloy, Pre-hardened steel, Hardened steel Inconel718, AISI P21, AISI P20, AISI H13, AISI L6, AISI 431, AISI 420				
DC (mm)	LU (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.6**	25	40000	360	0.03	0.01	20	32000	290	0.03	0.01
0.3	**0.9**	40	40000	480	0.045	0.015	20	21000	250	0.045	0.015
0.3	**1.5**	40	40000	360	0.045	0.015	20	21000	190	0.045	0.015
0.4	**1**	50	40000	800	0.06	0.02	20	16000	320	0.06	0.02
0.4	**1.8**	50	40000	560	0.06	0.02	20	16000	220	0.06	0.025
0.5	**1.5**	60	38000	910	0.075	0.025	20	13000	310	0.075	0.025
0.5	**2.5**	60	38000	610	0.075	0.025	20	13000	210	0.075	0.025
0.5	**3**	60	38000	550	0.075	0.025	20	13000	180	0.075	0.025
0.6	**3**	60	32000	640	0.09	0.03	20	10500	210	0.09	0.03
0.7	**3.5**	60	27000	650	0.11	0.035	20	9100	200	0.11	0.035
0.8	**2.4**	60	24000	960	0.12	0.04	20	8000	260	0.12	0.04
0.8	**3**	60	24000	860	0.12	0.04	20	8000	230	0.12	0.04
0.8	**4**	60	24000	670	0.12	0.04	20	8000	190	0.12	0.04
1	**5**	60	20000	800	0.15	0.05	20	6500	210	0.15	0.05
Depth of cut											

■ Bottom face milling

Workpiece Material		Carbon steel, Alloy steel, Austenitic stainless steel, Titanium alloy Cobalt chromium alloy, Copper, Copper alloy AISI 1045, AISI 4140, AISI 4340, AISI 304, AISI 316, AISI 304LN, AISI 316LN, Ti-6Al-4V					Heat resistant alloy, Pre-hardened steel, Hardened steel Inconel718, AISI P21, AISI P20, AISI H13, AISI L6, AISI 431, AISI 420				
DC (mm)	LU (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.2	**0.6**	25	40000	360	0.015	≤0.2	20	32000	290	0.015	≤0.1
0.3	**0.9**	40	40000	480	0.025	≤0.3	20	21000	250	0.025	≤0.15
0.3	**1.5**	40	40000	360	0.02	≤0.3	20	21000	190	0.02	≤0.15
0.4	**1**	50	40000	800	0.03	≤0.4	20	16000	320	0.03	≤0.2
0.4	**1.8**	50	40000	560	0.02	≤0.4	20	16000	220	0.02	≤0.2
0.5	**1.5**	60	38000	910	0.04	≤0.5	20	13000	310	0.04	≤0.25
0.5	**2.5**	60	38000	610	0.03	≤0.5	20	13000	210	0.03	≤0.25
0.5	**3**	60	38000	550	0.03	≤0.5	20	13000	180	0.03	≤0.25
0.6	**3**	60	32000	640	0.035	≤0.6	20	10500	210	0.035	≤0.3
0.7	**3.5**	60	27000	640	0.035	≤0.7	20	9100	190	0.035	≤0.35
0.8	**2.4**	60	24000	960	0.06	≤0.8	20	8000	260	0.06	≤0.4
0.8	**3**	60	24000	840	0.05	≤0.8	20	8000	230	0.05	≤0.4
0.8	**4**	60	24000	670	0.04	≤0.8	20	8000	190	0.04	≤0.4
1	**5**	60	20000	800	0.05	≤1	20	6500	210	0.05	≤0.5
Depth of cut											

Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) When the depth of cut is smaller than shown the revolution and feed rate can be increased.

VQXL

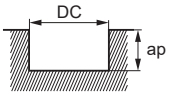
End mill, Short cut length, 3—4 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

■Slotting

Workpiece Material		Carbon steel, Alloy steel, Austenitic stainless steel, Titanium alloy Cobalt chromium alloy, Copper, Copper alloy AISI 1045, AISI 4140, AISI 4340, AISI 304, AISI 306, AISI 304LN, AISI 316LN, Ti-6Al-4V				Heat resistant alloy, Pre-hardened steel, Hardened steel Inconel718, AISI P21, AISI P20, AISI H13, AISI L6, AISI 431, AISI 420			
DC (mm)	LU (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)	Cutting speed (m/min)	Revolution (min^{-1})	Table feed (mm/min)	Depth of cut ap (mm)
0.2	**0.6**	20	30000	270	0.03	15	24000	220	0.03
0.3	**0.9**	30	30000	360	0.045	14	15000	180	0.045
0.3	**1.5**	30	30000	270	0.045	14	15000	140	0.045
0.4	**1**	40	30000	600	0.06	15	12000	240	0.06
0.4	**1.8**	40	30000	420	0.06	15	12000	170	0.06
0.5	**1.5**	45	28000	670	0.075	15	9500	230	0.075
0.5	**2.5**	45	28000	450	0.075	15	9500	150	0.075
0.5	**3**	45	28000	390	0.075	15	9500	130	0.075
0.6	**3**	45	24000	480	0.09	15	7800	160	0.09
0.7	**3.5**	45	20000	480	0.11	15	6800	140	0.11
0.8	**2.4**	45	18000	720	0.12	15	6000	190	0.12
0.8	**3**	45	18000	650	0.12	15	6000	170	0.12
0.8	**4**	45	18000	500	0.12	15	6000	140	0.12
1	**5**	45	15000	600	0.15	15	4800	150	0.15

Depth of cut

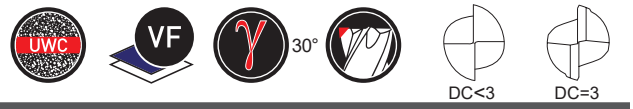


DC : Dia.

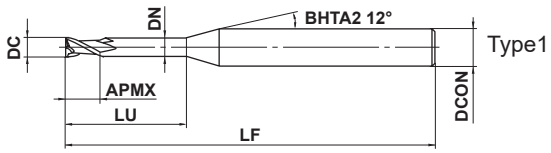
Note 1) SMART MIRACLE coating has reduced electric conductivity; therefore an external contact type (electric transmitted) tool setter may not work. When measuring the tool length, please use an internal contact type (non-electricity type) tool setter or a laser type tool setter.
Note 2) Effective cutting of stainless steel, titanium alloy and heat resistant alloy etc. can be achieved with the use of emulsion.
Note 3) When the depth of cut is smaller than shown the feed rate can be increased.

VF2XL

End mill, 2 flute, Long neck



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				



0.2≤DC≤3					
0 - 0.020					
4≤DCON≤6					
0 - 0.008					

● 2 flute long neck end mill for high-speed machining of hardened steels.

(mm)

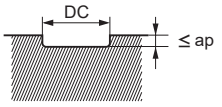
Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2XLD0020N006	0.2	0.3	0.6	0.17	45	4	2	★	1
VF2XLD0030N010	0.3	0.5	1	0.27	45	4	2	★	1
VF2XLD0040N010	0.4	0.6	1	0.36	45	4	2	★	1
VF2XLD0040N020	0.4	0.6	2	0.36	45	4	2	★	1
VF2XLD0050N020	0.5	0.8	2	0.46	45	4	2	★	1
VF2XLD0050N040	0.5	0.8	4	0.46	45	4	2	★	1
VF2XLD0060N020	0.6	0.9	2	0.56	45	4	2	★	1
VF2XLD0060N040	0.6	0.9	4	0.56	45	4	2	★	1
VF2XLD0080N040	0.8	1.2	4	0.76	45	4	2	★	1
VF2XLD0080N060	0.8	1.2	6	0.76	45	4	2	★	1
VF2XLD0100N040	1	1.5	4	0.94	50	4	2	★	1
VF2XLD0100N060	1	1.5	6	0.94	50	4	2	★	1
VF2XLD0100N080	1	1.5	8	0.94	50	4	2	★	1
VF2XLD0100N120	1	1.5	12	0.94	50	4	2	★	1
VF2XLD0150N060	1.5	2.3	6	1.44	50	4	2	★	1
VF2XLD0150N080	1.5	2.3	8	1.44	50	4	2	★	1
VF2XLD0150N100	1.5	2.3	10	1.44	50	4	2	★	1
VF2XLD0150N120	1.5	2.3	12	1.44	50	4	2	★	1
VF2XLD0150N160	1.5	2.3	16	1.44	60	4	2	★	1
VF2XLD0200N060	2	3	6	1.9	50	4	2	★	1
VF2XLD0200N100	2	3	10	1.9	50	4	2	★	1
VF2XLD0200N120	2	3	12	1.9	50	4	2	★	1
VF2XLD0200N160	2	3	16	1.9	60	4	2	★	1
VF2XLD0200N200	2	3	20	1.9	60	4	2	★	1
VF2XLD0300N120	3	4.5	12	2.9	50	6	2	★	1
VF2XLD0300N200	3	4.5	20	2.9	60	6	2	★	1

★ : Stocked in Japan

VF2XL

End mill, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

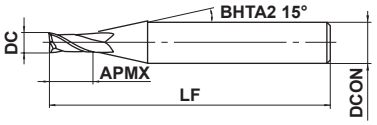
Workpiece Material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut per pass ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut per pass ap (mm)
0.2	**0.6**	40000	400	15.7	0.004	40000	360	14.2	0.004
0.3	**1**	40000	500	19.7	0.006	40000	450	17.7	0.004
0.4	**1**	40000	800	31.5	0.008	36000	500	19.7	0.006
	2	40000	500	19.7	0.007	30000	350	13.8	0.005
0.5	**2**	40000	800	31.5	0.01	30000	600	23.6	0.009
	4	36000	600	23.6	0.008	27000	450	17.7	0.007
0.6	**2**	40000	1000	39.4	0.015	30000	700	27.6	0.012
	4	36000	800	31.5	0.01	27000	500	19.7	0.01
0.8	**4**	36000	1200	47.2	0.03	27000	900	35.4	0.02
	6	30000	900	35.4	0.02	22000	650	25.6	0.015
1	**4**	32000	1600	63.0	0.05	24000	1100	43.3	0.04
	6	32000	1400	55.1	0.04	24000	1000	39.4	0.03
	8	28000	1000	39.4	0.03	21000	750	29.5	0.02
	12	24000	500	19.7	0.02	18000	370	14.6	0.01
1.5	**6**	22000	1200	47.2	0.08	16000	900	35.4	0.06
	8	22000	1100	43.3	0.07	16000	800	31.5	0.05
	10	22000	1000	39.4	0.06	16000	750	29.5	0.04
	12	20000	800	31.5	0.05	15000	600	23.6	0.03
	16	18000	500	19.7	0.03	13000	350	13.8	0.02
2	**6**	16000	1000	39.4	0.15	12000	750	29.5	0.15
	10	16000	800	31.5	0.1	12000	600	23.6	0.08
	12	16000	800	31.5	0.08	12000	600	23.6	0.06
	16	15000	600	23.6	0.06	11000	450	17.7	0.05
	20	14000	500	19.7	0.05	10000	350	13.8	0.04
3	**12**	11000	800	31.5	0.2	8200	600	23.6	0.15
	20	11000	500	19.7	0.1	8200	350	13.8	0.1
Depth of cut		 DC : Dia.							

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

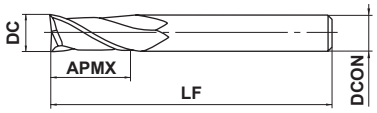
VF2MV

End mill, Medium cut length, 2 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type1



Type2

0.5≤DC≤6				
0 - 0.020				
4≤DCON≤6				
0 - 0.008				

● An irregular helix 2 flute square end mill suitable for high-speed machining of hardened steel.

(mm)

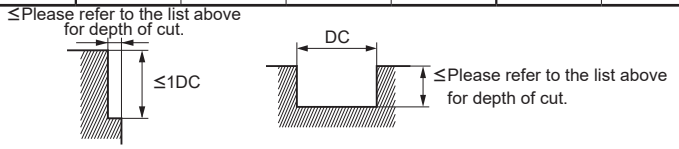
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF2MVD0050	0.5	1.3	40	4	2	●	1
VF2MVD0100	1	2.5	40	4	2	●	1
VF2MVD0150	1.5	3.8	40	4	2	●	1
VF2MVD0200	2	5	40	4	2	●	1
VF2MVD0250	2.5	6.3	40	4	2	●	1
VF2MVD0300	3	7.5	50	6	2	●	1
VF2MVD0400	4	10	50	6	2	●	1
VF2MVD0500	5	12.5	50	6	2	●	1
VF2MVD0600	6	15	50	6	2	●	2

VF2MV

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
0.5	40000	1000	39.4	0.015	40000	960	37.8	0.015	30000	600	23.6	0.01
1	40000	2000	78.7	0.06	32000	1600	63.0	0.06	16000	550	21.7	0.05
1.5	40000	3000	118.1	0.12	32000	1900	74.8	0.08	10600	500	19.7	0.08
2	30000	3000	118.1	0.18	24000	1900	74.8	0.10	8100	400	15.7	0.1
2.5	24000	2600	102.4	0.25	19000	1600	63.0	0.13	6400	350	13.8	0.13
3	20000	2300	90.6	0.30	16000	1400	55.1	0.15	5400	300	11.8	0.15
4	15000	2000	78.7	0.40	12000	1200	47.2	0.20	4000	240	9.4	0.2
5	12000	1600	63.0	0.50	9000	900	35.4	0.25	3200	190	7.5	0.2
6	10000	1400	55.1	0.60	7000	700	27.6	0.30	2700	160	6.3	0.2

Depth of cut



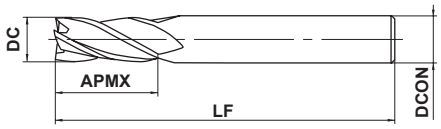
DC : Dia.

Note 1) When slotting, reduce the revolutions by 50 - 70% and the feed rate by 40 - 60%.
Note 2) For austenitic stainless steel, titanium and heat resistant alloys, VFMHV is recommended.
Note 3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF4MV

End mill, Medium cut length, 4 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	**8≤DCON≤10**	**12≤DCON≤16**	**DCON=20**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● An irregular helix 4 flute square end mill suitable for high-speed machining of hardened steel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MVD0600	6	15	50	6	4	●	1
VF4MVD0800	8	20	60	8	4	●	1
VF4MVD1000	10	25	70	10	4	●	1
VF4MVD1200	12	30	90	12	4	●	1
VF4MVD1600	16	40	100	16	4	★	1
VF4MVD2000	20	50	110	20	4	★	1

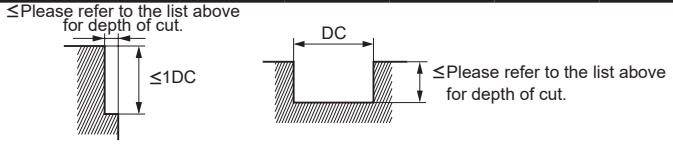
VF4MV

End mill, Medium cut length, 4 flute, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1—10, AISI P21 etc.				Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
6	10000	2100	82.7	0.60	7000	1400	55.1	0.30	2700	320	12.6	0.20
8	8000	1500	59.1	0.80	5600	1100	43.3	0.40	2000	240	9.4	0.20
10	6400	1400	55.1	1.00	4500	950	37.4	0.50	1600	210	8.3	0.30
12	5400	1200	47.2	1.00	3800	860	33.9	0.50	1300	160	6.3	0.30
16	2400	550	21.7	3.00	1200	280	11.0	0.80	1000	130	5.1	0.30
20	1900	480	18.9	4.00	1000	240	9.4	1.00	800	100	3.9	0.30

Depth of cut



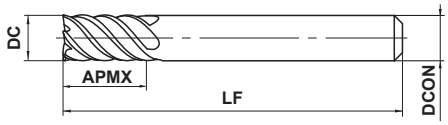
DC : Dia.

Note 1) When slotting, reduce the revolutions by 50 - 70% and the feed rate by 40 - 60%.
Note 2) For austenitic stainless steel, titanium and heat resistant alloys, VFMHV is recommended.
Note 3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF6MHV

End mill, Medium cut length, 6 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		



Type1

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	**8≤DCON≤10**	**12≤DCON≤16**	**DCON=20**	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

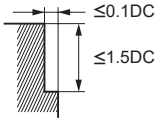
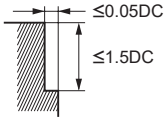
● Newly developed irregular helix 6 flute geometry reduces vibrations and achieves high efficiency machining. Suitable for machining of difficult-to-cut materials such as stainless steel, titanium alloy and inconel.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVD0600	6	13	50	6	6	★	1
VF6MHVD0800	8	19	60	8	6	★	1
VF6MHVD1000	10	22	70	10	6	★	1
VF6MHVD1200	12	26	75	12	6	★	1
VF6MHVD1600	16	32	90	16	6	★	1
VF6MHVD2000	20	38	100	20	6	★	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	10600	2900	114.2	8000	2000	78.7	2100	320	12.6
8	8000	2900	114.2	6000	2000	78.7	1600	300	11.8
10	6400	2700	106.3	4800	2000	78.7	1300	260	10.2
12	5300	2700	106.3	4000	2000	78.7	1100	230	9.1
16	4000	2200	86.6	3000	1600	63.0	800	180	7.1
20	3200	1900	74.8	2400	1400	55.1	640	150	5.9
Depth of cut									

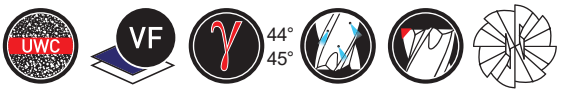
DC : Dia.

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

★ : **Stocked in Japan**

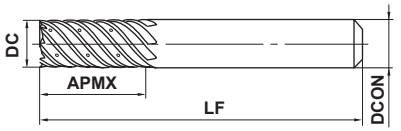
VF8MHVCH

End mill, Medium cut length, Irregular helix flutes, with multiple thru-coolant



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		

CoolStar



Type1

16≤DC≤20				
0 -0.03				
DCON=16	DCON=20			
0 -0.011	0 -0.013			

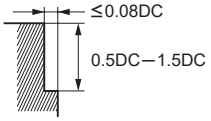
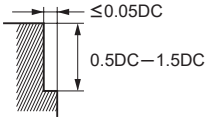
● Vibration control end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF8MHVCHD1600	16	32	90	16	8	★	1
VF8MHVCHD2000	20	38	100	20	8	★	1

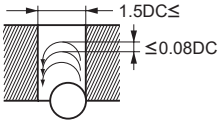
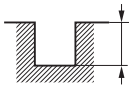
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Heat resistant alloy Inconel718		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	4000	2400	94.5	3000	2100	82.7	800	240	9.4
20	3200	1900	74.8	2400	1900	74.8	640	200	7.9
Depth of cut									

DC:Dia.

■Trochoidal milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	4000	1900	74.8	3000	1400	55.1
20	3200	1500	59.0	2400	1200	47.2
Depth of cut						

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.

Note 2) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abonrmal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

● : USA Stock ★ : Stocked in Japan

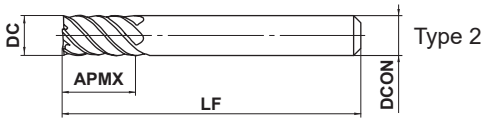
VFSD

End mill, Short cut length, For hardened materials

UWC | VF | 30° | 45° | DC<3 | DC≥3 | DC<3 | DC≥3

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				

Type 1



Type 2

1≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● End mills with Impact Miracle coating for high hardness materials.

(mm)

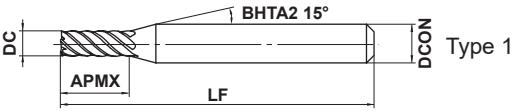
Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSDD0100	1	2	45	6	4	●	1
VFSDD0150	1.5	3	45	6	4	●	1
VFSDD0200	2	4	45	6	4	●	1
VFSDD0250	2.5	5	45	6	4	●	1
VFSDD0300	3	6	45	6	6	●	1
VFSDD0350	3.5	7	45	6	6	●	1
VFSDD0400	4	8	45	6	6	●	1
VFSDD0500	5	10	50	6	6	●	1
VFSDD0600	6	12	50	6	6	●	2
VFSDD0800	8	16	60	8	6	●	2
VFSDD1000	10	20	70	10	6	●	2
VFSDD1200	12	24	75	12	6	●	2

VFMD

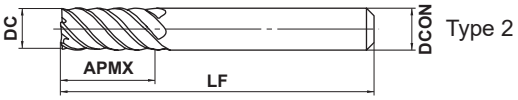
End mill, Medium cut length, For hardened materials

UWC VF γ 30° DC<3 γ 45° DC≥3 DC<3 DC≥3

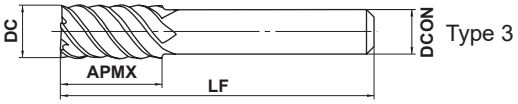
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type 1



Type 2



Type 3

DC≤12	DC>12			
0 -0.02	0 -0.03			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 -0.008	0 -0.009	0 -0.011	0 -0.013	

h6

● End mills with Impact Miracle coating for high hardness materials.

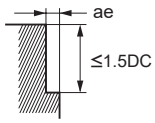
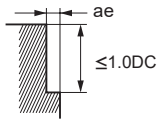
(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDD0100	1	3.5	60	6	4	●	1
VFMDD0150	1.5	5	60	6	4	●	1
VFMDD0200	2	7	60	6	4	●	1
VFMDD0250	2.5	8	60	6	4	●	1
VFMDD0300	3	10	60	6	6	●	1
VFMDD0400	4	12	60	6	6	●	1
VFMDD0500	5	15	60	6	6	●	1
VFMDD0600	6	15	60	6	6	●	2
VFMDD0800	8	20	75	8	6	●	2
VFMDD1000	10	25	80	10	6	●	2
VFMDD1200	12	30	100	12	6	●	2
VFMDD1400	14	35	105	12	6	★	3
VFMDD1500	15	40	110	16	6	★	1
VFMDD1600	16	40	110	16	6	★	2
VFMDD1800	18	40	120	16	6	★	3
VFMDD2000	20	45	125	20	6	★	2
VFMDD2200	22	45	135	20	6	★	3
VFMDD2500	25	60	160	25	6	★	2

VFSD
End mill, Short cut length, For hardened materials

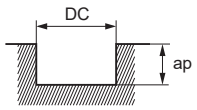
VFMD
End mill, Medium cut length, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.				Hardened steel (62—70HRC) AISI W1, AISI M2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (mm)
1	40000	1200	47.2	0.05	40000	800	31.5	0.03	32000	500	19.7	0.02
2	40000	2000	78.7	0.1	24000	1000	39.4	0.05	16000	600	23.6	0.05
3	32000	3800	149.6	0.2	16000	1900	74.8	0.1	11000	1200	47.2	0.05
4	24000	4400	173.2	0.2	12000	2200	86.6	0.1	8000	1300	51.2	0.05
6	16000	5800	228.3	0.3	8000	2900	114.2	0.2	5300	1800	70.9	0.1
8	12000	5800	228.3	0.4	6000	2900	114.2	0.2	4000	1800	70.9	0.1
10	9600	5800	228.3	0.5	4800	2900	114.2	0.3	3200	1800	70.9	0.2
12	8000	4800	189.0	0.6	4000	2400	94.5	0.3	2700	1500	59.1	0.2
16	6000	3600	141.7	0.8	3000	1800	70.9	0.5	2000	1100	43.3	0.3
20	4800	2900	114.2	1.0	2400	1400	55.1	0.5	1600	880	34.6	0.3
25	3800	2300	90.6	1.0	1900	1100	43.3	0.5	1300	720	28.3	0.3
Depth of cut												

DC : Dia.

■Slot milling with small diameter tools

Workpiece Material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
1	15000	300	11.8	0.1	9500	110	4.3	0.05
2	8000	320	12.6	0.2	4800	190	7.5	0.1
Depth of cut								

DC : Dia.

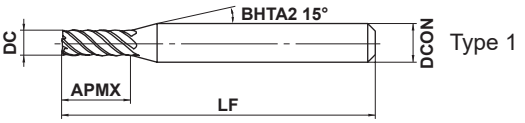
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFMD – Inch sizes

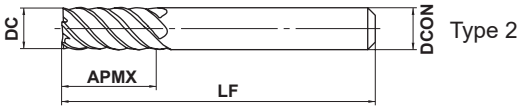
End mill, Medium cut length, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				

DC<1/8 DC≥1/8 DC<1/8 DC≥1/8



Type 1



Type 2

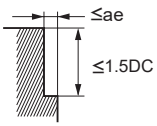
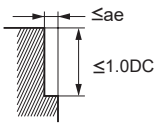
DC<.5000"	DC=.5000"			
0 -.0008"	0 -.0012"			
.2500"≤DCON≤.3750"	DCON=.5000"			
0 -.00035"	0 -.00043"			

● End mills with Impact Miracle coating for high hardness materials.

(inch)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDD1/32	.0313	.0938	2.5	.2500	4	●	1
VFMDD1/16	.0625	.1875	2.5	.2500	4	●	1
VFMDD3/32	.0938	.2813	2.5	.2500	4	●	1
VFMDD1/8	.1250	.3750	2.5	.2500	6	●	1
VFMDD5/32	.1563	.5000	2.5	.2500	6	●	1
VFMDD3/16	.1875	.5630	2.5	.2500	6	●	1
VFMDD1/4	.2500	.5630	3.5	.2500	6	●	2
VFMDD5/16	.3125	.6875	4.0	.3125	6	●	2
VFMDD3/8	.3750	.8125	4.0	.3750	6	●	2
VFMDD1/2	.5000	1.0938	4.5	.5000	6	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.				Hardened steel (62—70HRC) AISI W1, AISI M2 etc.			
DC (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Width of cut ae (inch)
.0313	40000	1100	43.3	.0016	40000	800	31.5	.00094	36000	500	19.6	.00063
.0625	40000	1800	70.8	.0031	30000	960	37.8	.0019	20000	560	22	.0013
.0938	40000	2600	102	.0047	20000	1100	43	.0028	13000	680	26.6	.0019
.1250	30000	4100	161	.0063	15000	2100	82	.0038	10000	1300	49.6	.0025
.1563	24000	4300	170	.0078	12000	2200	86	.0047	8000	1300	51	.0031
.1875	20000	4800	189	.0094	10000	2400	94.5	.0056	6700	1400	55	.0038
.2500	15000	5800	228	.013	7500	2900	114	.0075	5000	1800	70.8	.005
.3125	12000	5800	228	.016	6000	2900	114	.0094	4000	1800	70.8	.0063
.3750	10000	5800	228	.019	5000	2900	114	.011	3300	1800	70.8	.0075
.5000	7500	4500	177	.025	3800	2300	90.5	.015	2500	1400	55	.01
Depth of cut												

DC : Dia.

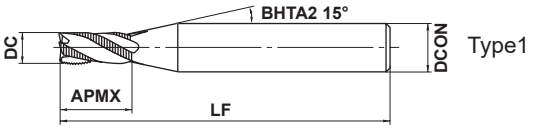
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFSFPR

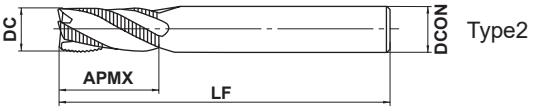
Roughing end mill, Short cut length, 3—4 flute

UWC VF γ 30° DC<8 DC≥8

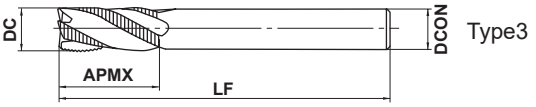
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		



Type1



Type2



Type3

h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

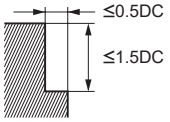
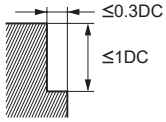
● Impact Miracle roughing end mills for a wide range of workpiece materials from carbon and alloy steel through to difficult-to-cut materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSFPRD0300	3	6	50	6	3	★	1
VFSFPRD0400	4	8	50	6	3	★	1
VFSFPRD0500	5	10	50	6	3	★	1
VFSFPRD0600	6	12	50	6	3	★	2
VFSFPRD0700	7	17	60	8	3	★	1
VFSFPRD0800	8	17	60	8	4	★	2
VFSFPRD0900	9	22	70	10	4	★	1
VFSFPRD1000S08	10	22	90	8	4	★	3
VFSFPRD1000	10	22	70	10	4	★	2
VFSFPRD1200S10	12	27	100	10	4	★	3
VFSFPRD1200	12	27	75	12	4	★	2
VFSFPRD1400	14	27	75	12	4	★	3
VFSFPRD1600	16	33	90	16	4	★	2
VFSFPRD1800	18	33	90	16	4	★	3
VFSFPRD2000	20	38	100	20	4	★	2

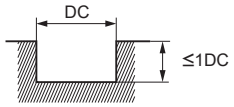
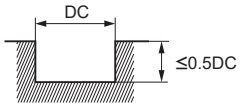
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti−6Al−4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	16000	960	37.8	13000	640	25.2	6400	260	10.2	5300	320	12.6	4200	70	2.8
4	12000	960	37.8	9500	640	25.2	4800	260	10.2	4000	320	12.6	3200	70	2.8
5	9500	960	37.8	7600	640	25.2	3800	260	10.2	3200	320	12.6	2500	70	2.8
6	8000	960	37.8	6400	680	26.8	3200	290	11.4	2700	340	13.4	2100	75	3.0
8	6000	1050	41.3	4800	760	29.9	2400	340	13.4	2000	400	15.7	1600	95	3.7
10	4800	1050	41.3	3800	760	29.9	1900	340	13.4	1600	400	15.7	1300	105	4.1
12	4000	960	37.8	3200	700	27.6	1600	320	12.6	1300	400	15.7	1100	110	4.3
16	3000	840	33.1	2400	620	24.4	1200	300	11.8	1000	360	14.2	800	110	4.3
20	2400	760	29.9	1900	560	22.0	1000	300	11.8	800	320	12.6	600	100	3.9
Depth of cut															

DC : Dia.

■Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti−6Al−4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
3	13000	720	28.3	11000	480	18.9	4800	190	7.5	3200	190	7.5	2100	25	1.0
4	9500	720	28.3	8000	480	18.9	3600	190	7.5	2400	190	7.5	1600	25	1.0
5	7600	720	28.3	6400	480	18.9	3200	190	7.5	1900	190	7.5	1300	25	1.0
6	6400	720	28.3	5300	480	18.9	2700	200	7.9	1600	200	7.9	1100	30	1.2
8	4800	800	31.5	4000	520	20.5	2000	220	8.7	1200	220	8.7	800	35	1.4
10	3800	800	31.5	3200	520	20.5	1600	220	8.7	1000	220	8.7	600	35	1.4
12	3200	750	29.5	2700	520	20.5	1300	210	8.3	800	210	8.3	500	40	1.6
16	2400	620	24.4	2000	450	17.7	1000	180	7.1	600	180	7.1	400	45	1.8
20	1900	540	21.3	1600	400	15.7	800	160	6.3	500	160	6.3	300	40	1.6
Depth of cut															

DC : Dia.

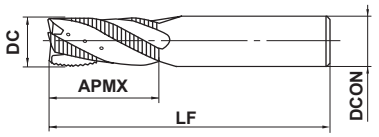
Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFSFPRCH

Roughing end mill, Short cut length, 4 flute, with multiple thru-coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		

CoolStar



Type1

h6	DCON=16	DCON=20			
	0 - 0.011	0 - 0.013			

● Roughing end mill with multiple internal through coolant holes suitable for difficult-to-cut materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFSFPRCHD1600	16	33	90	16	4	★	1
VFSFPRCHD2000	20	38	100	20	4	★	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Heat resistant alloy Inconel718		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	840	33.1	2400	620	24.4	1200	300	11.8	800	110	4.3
20	2400	760	29.9	1900	560	22.0	1000	300	11.8	600	100	3.9
Depth of cut	≤0.5DC 0.5DC−1.5DC									≤0.3DC 0.5DC−1.0DC		

■Slotting

DC:Dia.

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	2400	620	24.4	2000	450	17.7	800	100	3.9
20	1900	540	21.3	1600	400	15.4	600	80	3.1
Depth of cut	DC 0.5DC−1.0DC								

DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

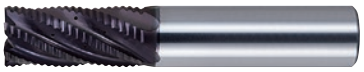
★ : Stocked in Japan

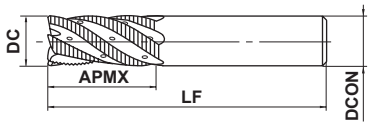
VF6SVRCH

Roughing end mill, Short cut length, 6 flute, Irregular helix flutes, with multiple thru-coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		

CoolStar





Type1

DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

● Roughing end mill with multiple internal through coolant holes suitable for difficult-to-cut materials.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6SVRCHD1600	16	33	90	16	6	★	1
VF6SVRCHD2000	20	38	100	20	6	★	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Heat resistant alloy Inconel718		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	1500	59.1	2400	1200	47.2	800	160	6.3
20	2400	1200	47.2	2000	1000	39.4	640	140	5.5
Depth of cut	≤0.3DC 0.5DC−1.5DC						≤0.2DC 0.5DC−1.5DC		

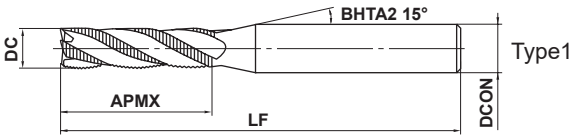
DC:Dia.

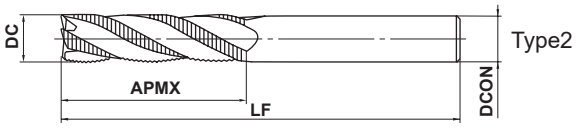
Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abonrmal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFMFPR

Roughing end mill, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		





h6

DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

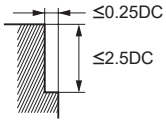
● Impact Miracle roughing end mills suitable for the machining of deep walled components.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMFPRD0500	5	15	60	6	4	★	1
VFMFPRD0600	6	17	60	6	4	★	2
VFMFPRD0700	7	22	75	8	4	★	1
VFMFPRD0800	8	28	75	8	4	★	2
VFMFPRD0900	9	28	100	10	4	★	1
VFMFPRD1000	10	34	100	10	4	★	2
VFMFPRD1200	12	40	110	12	4	★	2
VFMFPRD1600	16	48	125	16	4	★	2
VFMFPRD2000	20	57	140	20	4	★	2

RECOMMENDED CUTTING CONDITIONS

■Side milling

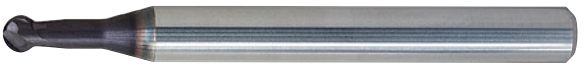
Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.			Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti−6Al−4V etc.			Hardened steel (45−55HRC) AISI H13 etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
5	3800	360	14.2	3200	290	11.4	2500	150	5.9	2500	150	5.9	1900	50	2.0
6	3200	360	14.2	2700	290	11.4	2100	160	6.3	2100	160	6.3	1600	60	2.4
8	2400	450	17.7	2000	360	14.2	1600	160	6.3	1600	160	6.3	1200	70	2.8
10	1900	450	17.7	1600	360	14.2	1300	180	7.1	1300	180	7.1	1000	75	3.0
12	1600	400	15.7	1300	320	12.6	1100	180	7.1	1100	180	7.1	800	80	3.1
16	1200	360	14.2	1000	290	11.4	800	160	6.3	800	160	6.3	600	80	3.1
20	1000	340	13.4	800	270	10.6	600	150	5.9	600	150	5.9	500	80	3.1
Depth of cut	 DC:Dia.														

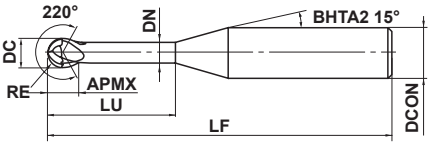
Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VF2WB

Wide ball nose, Medium cut length, 2 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○	○		◎	◎		





Type1

I≤RE≤3				
±0.01				
DCON=6				
0 - 0.008				

● Ball nose end mill suitable for machining of undercut geometries and complex geometries using a 5-axis machine.

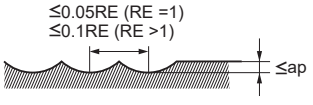
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2WBR0100N060	1	2	1.5	6	1.6	60	6	2	★	1
VF2WBR0150N080	1.5	3	2	8	2.4	60	6	2	★	1
VF2WBR0200N100	2	4	3	10	3.2	60	6	2	★	1
VF2WBR0300N120	3	6	4	12	4.8	80	6	2	★	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti−6Al−4V etc.				Hardened steel (45−55HRC) AISI H13 etc.			
RE (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
R1	40000	5000	196.9	0.07	40000	5000	196.9	0.06	32000	2500	98.4	0.05	32000	3000	118.1	0.03
R1.5	32000	5000	196.9	0.12	32000	5000	196.9	0.11	26000	2500	98.4	0.10	26000	3000	118.1	0.07
R2	24000	3800	149.6	0.15	24000	3800	149.6	0.13	20000	2000	98.4	0.12	20000	2800	110.2	0.10
R3	16000	2800	110.2	0.20	16000	2800	110.2	0.18	13000	1500	59.1	0.15	13000	2100	82.7	0.12

Depth of cut



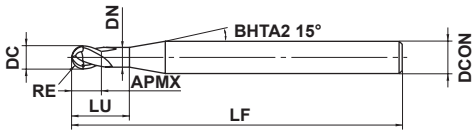
RE : Radius

Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.

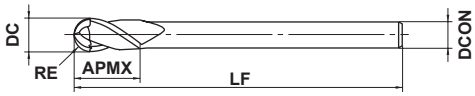
VF2SB – Inch sizes

Ball nose, Short cut length, 2 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎	○	○		



Type 1



Type 2

	.0156"≤RE≤.2500"				
	±.0002"				
h5	.2500"≤DCON≤.3750"				
	0 - .00024"				
h6	DCON=.5000"				
	0 - 0.00043"				

● 2 flute ball nose end mills with Impact Miracle coating for high hardness materials.

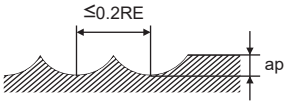
(inch)

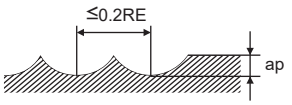
Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VF2SBD1/32	.0156	.0313	.0313	.0625	.0296	2.5	.2500	2	●	1
VF2SBD1/16	.0313	.0625	.0625	.1250	.0601	2.5	.2500	2	●	1
VF2SBD3/32	.0469	.0938	.0938	.1875	.0898	2.5	.2500	2	●	1
VF2SBD1/8	.0625	.1250	.1250	.2500	.1211	3.0	.2500	2	●	1
VF2SBD3/16	.0938	.1875	.1875	.3750	.1835	3.0	.2500	2	●	1
VF2SBD1/4	.1250	.2500	.5000	–	–	3.5	.2500	2	●	2
VF2SBD5/16	.1563	.3125	.6250	–	–	4.0	.3125	2	●	2
VF2SBD3/8	.1875	.3750	.7500	–	–	4.0	.3750	2	●	2
VF2SBD1/2	.2500	.5000	1.0000	–	–	4.5	.5000	2	●	2

VF2SB – Inch sizes

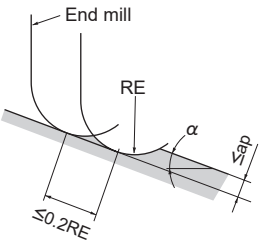
Ball nose, Short cut length, 2 flute, For hardened materials

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel(45–55HRC) AISI H13 etc.							Hardened steel (55–62HRC) AISI D2 etc.						
RE (inch)	α≤15°			α>15°			Depth of cut ap (inch)	α≤15°			α>15°			Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)		Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	
R .0156	40000	6400	252	40000	2400	94.5	.0020	40000	4000	157	40000	1600	63	.0016
R .0313	40000	9600	378	40000	4000	157	.0039	40000	8000	315	30000	2400	94.5	.0031
R .0469	40000	10000	394	33000	4600	182	.0047	36000	7900	312	20000	2400	94.5	.0043
R .0625	38000	11000	433	25000	4000	157	.0051	30000	7200	283	15000	2100	82.7	.0047
R .0938	27000	9700	383	17000	3100	122	.0067	20000	5600	220	10000	1800	70.9	.0055
R .1250	20000	8000	315	13000	2600	102	.0098	15000	4500	177	7500	1500	59.1	.0079
R .1563	16000	6400	252	10000	2000	78.7	.0118	12000	3600	142	6000	1200	47.2	.0079
R .1875	13000	5200	205	8400	1700	66.9	.0197	10000	3000	118	5000	1000	39.4	.0079
R .2500	8500	3400	134	5700	1100	43.3	.0197	6500	2100	82.7	3400	680	26.8	.0118
Depth of cut	 RE : Radius													

Workpiece Material	Hardened steel (62–70HRC) AISI W1, AISI M2 etc.						
RE (inch)	α≤15°			α>15°			Depth of cut ap (inch)
	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	
R .0156	40000	2800	110	40000	1600	63	.0012
R .0313	30000	4200	165	20000	1200	47.2	.0024
R .0469	20000	3600	142	13000	900	35.4	.0031
R .0625	15000	3000	118	10000	800	31.5	.0035
R .0938	10000	2200	86.6	6300	630	24.8	.0039
R .1250	7500	1700	66.9	4800	580	22.7	.0043
R .1563	6000	1400	55.1	4000	480	18.9	.0043
R .1875	5000	1100	43.3	3200	450	17.6	.0047
R .2500	3400	750	29.4	2000	280	11	.0047
Depth of cut	 RE : Radius						

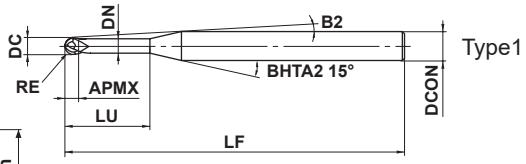
Note 1) α is the inclination of the machined surface.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

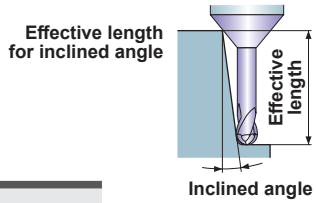


VF2XLBS

Ball nose, 2 flute, Long neck, Short shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





0.2≤RE≤1			
±0.007			
DCON=4			
0 -0.008			

- 2 flute long neck ball nose end mill for high-speed machining of hardened steel.
- Short shank type suitable for use with a shrink fit holder.

(mm)

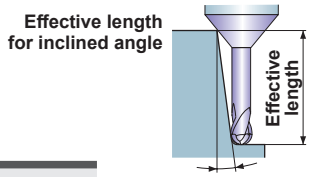
Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBSR0020N010	0.2	0.4	0.32	1	0.36	13.4°	40	4	2	★	1	1.0	1.0	1.1	1.2
VF2XLBSR0020N020	0.2	0.4	0.32	2	0.36	11.9°	40	4	2	★	1	2.0	2.1	2.3	2.5
VF2XLBSR0020N030	0.2	0.4	0.32	3	0.36	10.7°	40	4	2	★	1	3.1	3.2	3.4	3.7
VF2XLBSR0020N040	0.2	0.4	0.32	4	0.36	9.7°	40	4	2	★	1	4.1	4.3	4.6	4.9
VF2XLBSR0025N040	0.25	0.5	0.4	4	0.46	9.6°	40	4	2	★	1	4.1	4.3	4.6	4.9
VF2XLBSR0025N060	0.25	0.5	0.4	6	0.46	8.1°	40	4	2	★	1	6.2	6.4	6.9	7.4
VF2XLBSR0030N020	0.3	0.6	0.48	2	0.56	11.8°	40	4	2	★	1	2.1	2.2	2.3	2.5
VF2XLBSR0030N030	0.3	0.6	0.48	3	0.56	10.5°	40	4	2	★	1	3.1	3.3	3.5	3.8
VF2XLBSR0030N040	0.3	0.6	0.48	4	0.56	9.5°	40	4	2	★	1	4.2	4.3	4.6	5.0
VF2XLBSR0030N060	0.3	0.6	0.48	6	0.56	8.0°	40	4	2	★	1	6.3	6.5	6.9	7.5
VF2XLBSR0040N040	0.4	0.8	0.64	4	0.76	9.4°	40	4	2	★	1	4.2	4.3	4.6	5.0
VF2XLBSR0040N060	0.4	0.8	0.64	6	0.76	7.8°	40	4	2	★	1	6.3	6.5	6.9	7.5
VF2XLBSR0050N030	0.5	1	0.8	3	0.94	10.1°	40	4	2	★	1	3.2	3.3	3.6	3.9
VF2XLBSR0050N040	0.5	1	0.8	4	0.94	9.1°	40	4	2	★	1	4.2	4.4	4.8	5.2
VF2XLBSR0050N060	0.5	1	0.8	6	0.94	7.5°	40	4	2	★	1	6.3	6.6	7.1	7.7
VF2XLBSR0050N080	0.5	1	0.8	8	0.94	6.4°	40	4	2	★	1	8.4	8.8	9.4	10.2
VF2XLBSR0100N060	1	2	1.6	6	1.9	6.4°	40	4	2	★	1	6.2	6.5	6.9	7.4
VF2XLBSR0100N080	1	2	1.6	8	1.9	5.3°	40	4	2	★	1	8.3	8.7	9.2	9.9
VF2XLBSR0100N100	1	2	1.6	10	1.9	4.5°	40	4	2	★	1	10.4	10.8	11.5	12.4

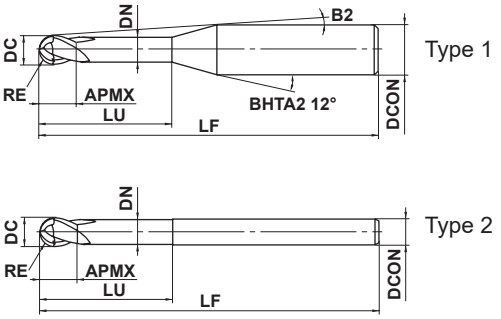
★ : Stocked in Japan

VF2XLB

Ball nose, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





RE≤1	RE>1		
±0.007	±0.010		
4≤DCON≤6			
0 - 0.008			

●2 flute long neck ball nose end mill with Impact Miracle coating for high hardened materials.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VF2XLBR0010N005S04	0.1	0.2	0.16	0.5	0.17	11.5°	50	4	2	★	1	0.5	0.5	0.6	0.6
VF2XLBR0010N005S06	0.1	0.2	0.16	0.5	0.17	11.7°	50	6	2	★	1	0.5	0.5	0.6	0.6
VF2XLBR0010N008S04	0.1	0.2	0.16	0.75	0.17	11.2°	50	4	2	★	1	0.7	0.8	0.9	1.0
VF2XLBR0010N010S04	0.1	0.2	0.16	1	0.17	10.9°	50	4	2	★	1	1.0	1.1	1.2	1.3
VF2XLBR0010N010S06	0.1	0.2	0.16	1	0.17	11.3°	50	6	2	★	1	1.0	1.1	1.2	1.3
VF2XLBR0010N013S04	0.1	0.2	0.16	1.25	0.17	10.7°	50	4	2	★	1	1.3	1.3	1.5	1.6
VF2XLBR0010N015S04	0.1	0.2	0.16	1.5	0.17	10.4°	50	4	2	★	1	1.5	1.6	1.8	2.0
VF2XLBR0010N015S06	0.1	0.2	0.16	1.5	0.17	10.9°	50	6	2	★	1	1.5	1.6	1.8	2.0
VF2XLBR0010N018S04	0.1	0.2	0.16	1.75	0.17	10.2°	50	4	2	★	1	1.8	1.9	2.1	2.3
VF2XLBR0010N020S04	0.1	0.2	0.16	2	0.17	10°	50	4	2	★	1	2.1	2.2	2.4	2.6
VF2XLBR0010N025S04	0.1	0.2	0.16	2.5	0.17	9.5°	50	4	2	★	1	2.6	2.7	3.0	3.3
VF2XLBR0015N010S04	0.15	0.3	0.24	1	0.27	11°	50	4	2	★	1	1.0	1.1	1.2	1.3
VF2XLBR0015N010S06	0.15	0.3	0.24	1	0.27	11.3°	50	6	2	★	1	1.0	1.1	1.2	1.3
VF2XLBR0015N013S04	0.15	0.3	0.24	1.25	0.27	10.7°	50	4	2	★	1	1.3	1.3	1.5	1.6
VF2XLBR0015N015S04	0.15	0.3	0.24	1.5	0.27	10.4°	50	4	2	★	1	1.5	1.6	1.8	1.9
VF2XLBR0015N015S06	0.15	0.3	0.24	1.5	0.27	10.9°	50	6	2	★	1	1.5	1.6	1.8	1.9
VF2XLBR0015N018S04	0.15	0.3	0.24	1.75	0.27	10.2°	50	4	2	★	1	1.8	1.9	2.1	2.3
VF2XLBR0015N020S04	0.15	0.3	0.24	2	0.27	9.9°	50	4	2	★	1	2.1	2.2	2.4	2.6
VF2XLBR0015N020S06	0.15	0.3	0.24	2	0.27	10.6°	50	6	2	★	1	2.1	2.2	2.4	2.6
VF2XLBR0015N025S04	0.15	0.3	0.24	2.5	0.27	9.5°	50	4	2	★	1	2.6	2.7	3.0	3.3
VF2XLBR0015N030S04	0.15	0.3	0.24	3	0.27	9.1°	50	4	2	★	1	3.1	3.2	3.6	3.9
VF2XLBR0015N040S04	0.15	0.3	0.24	4	0.27	8.4°	50	4	2	★	1	4.2	4.3	4.8	5.3
VF2XLBR0020N010S04	0.2	0.4	0.32	1	0.36	11°	50	4	2	●	1	1.0	1.0	1.1	1.2
VF2XLBR0020N010S06	0.2	0.4	0.32	1	0.36	11.3°	50	6	2	●	1	1.0	1.0	1.1	1.2
VF2XLBR0020N015S04	0.2	0.4	0.32	1.5	0.36	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
VF2XLBR0020N015S06	0.2	0.4	0.32	1.5	0.36	11°	50	6	2	●	1	1.5	1.6	1.7	1.9
VF2XLBR0020N020S04	0.2	0.4	0.32	2	0.36	10°	50	4	2	●	1	2.0	2.1	2.3	2.6
VF2XLBR0020N020S06	0.2	0.4	0.32	2	0.36	10.6°	50	6	2	●	1	2.0	2.1	2.3	2.6
VF2XLBR0020N025S04	0.2	0.4	0.32	2.5	0.36	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
VF2XLBR0020N025S06	0.2	0.4	0.32	2.5	0.36	10.3°	50	6	2	●	1	2.6	2.7	2.9	3.2
VF2XLBR0020N030S04	0.2	0.4	0.32	3	0.36	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0020N030S06	0.2	0.4	0.32	3	0.36	10°	50	6	2	●	1	3.1	3.2	3.5	3.9
VF2XLBR0020N040S04	0.2	0.4	0.32	4	0.36	8.4°	50	4	2	●	1	4.1	4.3	4.7	5.2
VF2XLBR0020N050S04	0.2	0.4	0.32	5	0.36	7.8°	50	4	2	●	1	5.2	5.4	5.9	6.6
VF2XLBR0025N015S04	0.25	0.5	0.4	1.5	0.46	10.5°	50	4	2	●	1	1.5	1.6	1.7	1.9
VF2XLBR0025N015S06	0.25	0.5	0.4	1.5	0.46	11°	50	6	2	●	1	1.5	1.6	1.7	1.9
VF2XLBR0025N020S04	0.25	0.5	0.4	2	0.46	10°	50	4	2	●	1	2.0	2.1	2.3	2.6
VF2XLBR0025N020S06	0.25	0.5	0.4	2	0.46	10.6°	50	6	2	●	1	2.0	2.1	2.3	2.6
VF2XLBR0025N025S04	0.25	0.5	0.4	2.5	0.46	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
VF2XLBR0025N030S04	0.25	0.5	0.4	3	0.46	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
VF2XLBR0025N030S06	0.25	0.5	0.4	3	0.46	10°	50	6	2	●	1	3.1	3.2	3.5	3.9
VF2XLBR0025N035S04	0.25	0.5	0.4	3.5	0.46	8.7°	50	4	2	●	1	3.6	3.8	4.1	4.5
VF2XLBR0025N040S04	0.25	0.5	0.4	4	0.46	8.3°	50	4	2	●	1	4.1	4.3	4.7	5.2
VF2XLBR0025N040S06	0.25	0.5	0.4	4	0.46	9.4°	50	6	2	●	1	4.1	4.3	4.7	5.2
VF2XLBR0025N050S04	0.25	0.5	0.4	5	0.46	7.7°	50	4	2	●	1	5.2	5.4	5.9	6.5
VF2XLBR0025N050S06	0.25	0.5	0.4	5	0.46	8.9°	50	6	2	●	1	5.2	5.4	5.9	6.5
VF2XLBR0025N060S04	0.25	0.5	0.4	6	0.46	7.2°	50	4	2	●	1	6.2	6.5	7.1	7.9
VF2XLBR0025N060S06	0.25	0.5	0.4	6	0.46	8.4°	60	6	2	●	1	6.2	6.5	7.1	7.9
VF2XLBR0030N020S04	0.3	0.6	0.48	2	0.56	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VF2XLBR0030N020S06	0.3	0.6	0.48	2	0.56	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
VF2XLBR0030N025S04	0.3	0.6	0.48	2.5	0.56	9.4°	50	4	2	●	1	2.6	2.7	3.0	3.3
VF2XLBR0030N030S04	0.3	0.6	0.48	3	0.56	9°	50	4	2	●	1	3.1	3.3	3.6	3.9
VF2XLBR0030N030S06	0.3	0.6	0.48	3	0.56	9.9°	50	6	2	●	1	3.1	3.3	3.6	3.9
VF2XLBR0030N035S04	0.3	0.6	0.48	3.5	0.56	8.6°	50	4	2	●	1	3.6	3.8	4.2	4.6
VF2XLBR0030N040S04	0.3	0.6	0.48	4	0.56	8.3°	50	4	2	●	1	4.2	4.4	4.8	5.2
VF2XLBR0030N040S06	0.3	0.6	0.48	4	0.56	9.3°	50	6	2	●	1	4.2	4.4	4.8	5.2
VF2XLBR0030N050S04	0.3	0.6	0.48	5	0.56	7.6°	50	4	2	●	1	5.2	5.4	6.0	6.6
VF2XLBR0030N050S06	0.3	0.6	0.48	5	0.56	8.8°	50	6	2	●	1	5.2	5.4	6.0	6.6
VF2XLBR0030N060S04	0.3	0.6	0.48	6	0.56	7.1°	50	4	2	●	1	6.3	6.5	7.1	7.9
VF2XLBR0030N060S06	0.3	0.6	0.48	6	0.56	8.4°	50	6	2	●	1	6.3	6.5	7.1	7.9
VF2XLBR0030N070S04	0.3	0.6	0.48	7	0.56	6.6°	50	4	2	●	1	7.3	7.6	8.3	9.2
VF2XLBR0030N080S04	0.3	0.6	0.48	8	0.56	6.2°	50	4	2	●	1	8.3	8.7	9.5	10.6
VF2XLBR0030N080S06	0.3	0.6	0.48	8	0.56	7.6°	60	6	2	●	1	8.3	8.7	9.5	10.6
VF2XLBR0040N020S04	0.4	0.8	0.64	2	0.76	9.9°	50	4	2	●	1	2.1	2.2	2.3	2.6
VF2XLBR0040N020S06	0.4	0.8	0.64	2	0.76	10.6°	50	6	2	●	1	2.1	2.2	2.3	2.6
VF2XLBR0040N030S04	0.4	0.8	0.64	3	0.76	8.9°	50	4	2	●	1	3.1	3.3	3.5	3.9
VF2XLBR0040N030S06	0.4	0.8	0.64	3	0.76	9.9°	50	6	2	●	1	3.1	3.3	3.5	3.9
VF2XLBR0040N040S04	0.4	0.8	0.64	4	0.76	8.2°	50	4	2	●	1	4.2	4.3	4.7	5.2
VF2XLBR0040N040S06	0.4	0.8	0.64	4	0.76	9.3°	50	6	2	●	1	4.2	4.3	4.7	5.2
VF2XLBR0040N050S04	0.4	0.8	0.64	5	0.76	7.5°	50	4	2	●	1	5.2	5.4	5.9	6.5
VF2XLBR0040N060S04	0.4	0.8	0.64	6	0.76	7°	50	4	2	●	1	6.3	6.5	7.1	7.9
VF2XLBR0040N060S06	0.4	0.8	0.64	6	0.76	8.3°	50	6	2	●	1	6.3	6.5	7.1	7.9
VF2XLBR0040N070S04	0.4	0.8	0.64	7	0.76	6.5°	50	4	2	●	1	7.3	7.6	8.3	9.2
VF2XLBR0040N080S04	0.4	0.8	0.64	8	0.76	6.1°	50	4	2	●	1	8.3	8.7	9.5	10.5
VF2XLBR0040N080S06	0.4	0.8	0.64	8	0.76	7.5°	50	6	2	●	1	8.3	8.7	9.5	10.5
VF2XLBR0040N100S04	0.4	0.8	0.64	10	0.76	5.4°	50	4	2	●	1	10.4	10.9	11.9	13.2
VF2XLBR0040N100S06	0.4	0.8	0.64	10	0.76	6.8°	60	6	2	●	1	10.4	10.9	11.9	13.2
VF2XLBR0050N030S04	0.5	1	0.8	3	0.94	8.8°	50	4	2	●	1	3.2	3.3	3.6	4.0
VF2XLBR0050N030S06	0.5	1	0.8	3	0.94	9.8°	50	6	2	●	1	3.2	3.3	3.6	4.0
VF2XLBR0050N040S04	0.5	1	0.8	4	0.94	8°	50	4	2	●	1	4.2	4.4	4.8	5.3
VF2XLBR0050N040S06	0.5	1	0.8	4	0.94	9.2°	50	6	2	●	1	4.2	4.4	4.8	5.3
VF2XLBR0050N050S04	0.5	1	0.8	5	0.94	7.3°	50	4	2	●	1	5.3	5.5	6.0	6.7

VF2XLB

Ball nose, 2 flute, Long neck

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0050N050S06	0.5	1	0.8	5	0.94	8.7°	50	6	2	●	1	5.3	5.5	6.0	6.7
VF2XLBR0050N060S04	0.5	1	0.8	6	0.94	6.8°	50	4	2	●	1	6.3	6.6	7.2	8.0
VF2XLBR0050N060S06	0.5	1	0.8	6	0.94	8.2°	50	6	2	●	1	6.3	6.6	7.2	8.0
VF2XLBR0050N070S04	0.5	1	0.8	7	0.94	6.3°	50	4	2	●	1	7.4	7.7	8.4	9.3
VF2XLBR0050N080S04	0.5	1	0.8	8	0.94	5.9°	50	4	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0050N080S06	0.5	1	0.8	8	0.94	7.4°	50	6	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0050N090S04	0.5	1	0.8	9	0.94	5.5°	50	4	2	●	1	9.5	9.9	10.8	12.0
VF2XLBR0050N100S04	0.5	1	0.8	10	0.94	5.2°	50	4	2	●	1	10.5	11.0	12.0	13.3
VF2XLBR0050N100S06	0.5	1	0.8	10	0.94	6.7°	50	6	2	●	1	10.5	11.0	12.0	13.3
VF2XLBR0050N120S04	0.5	1	0.8	12	0.94	4.6°	50	4	2	●	1	12.6	13.2	14.4	15.9
VF2XLBR0050N120S06	0.5	1	0.8	12	0.94	6.1°	60	6	2	●	1	12.6	13.2	14.4	15.9
VF2XLBR0050N140S04	0.5	1	0.8	14	0.94	4.2°	60	4	2	★	1	14.7	15.3	16.8	18.6
VF2XLBR0050N160S04	0.5	1	0.8	16	0.94	3.8°	60	4	2	★	1	16.8	17.5	19.2	21.3
VF2XLBR0050N160S06	0.5	1	0.8	16	0.94	5.3°	70	6	2	★	1	16.8	17.5	19.2	21.3
VF2XLBR0050N180S04	0.5	1	0.8	18	0.94	3.5°	60	4	2	★	1	18.9	19.7	21.6	23.9
VF2XLBR0050N200S04	0.5	1	0.8	20	0.94	3.3°	60	4	2	★	1	21.0	21.9	24.0	26.6
VF2XLBR0050N200S06	0.5	1	0.8	20	0.94	4.6°	70	6	2	★	1	21.0	21.9	24.0	26.6
VF2XLBR0060N060S04	0.6	1.2	0.96	6	1.14	6.6°	50	4	2	★	1	6.3	6.6	7.2	8.0
VF2XLBR0060N060S06	0.6	1.2	0.96	6	1.14	8.1°	50	6	2	★	1	6.3	6.6	7.2	8.0
VF2XLBR0060N080S04	0.6	1.2	0.96	8	1.14	5.7°	50	4	2	★	1	8.4	8.8	9.6	10.6
VF2XLBR0060N080S06	0.6	1.2	0.96	8	1.14	7.3°	50	6	2	★	1	8.4	8.8	9.6	10.6
VF2XLBR0060N100S04	0.6	1.2	0.96	10	1.14	5°	50	4	2	★	1	10.5	11.0	12.0	13.3
VF2XLBR0060N100S06	0.6	1.2	0.96	10	1.14	6.6°	50	6	2	★	1	10.5	11.0	12.0	13.3
VF2XLBR0060N120S04	0.6	1.2	0.96	12	1.14	4.5°	50	4	2	★	1	12.6	13.2	14.4	15.9
VF2XLBR0060N120S06	0.6	1.2	0.96	12	1.14	6°	50	6	2	★	1	12.6	13.2	14.4	15.9
VF2XLBR0060N140S04	0.6	1.2	0.96	14	1.14	4°	60	4	2	★	1	14.7	15.3	16.8	18.6
VF2XLBR0060N160S04	0.6	1.2	0.96	16	1.14	3.7°	60	4	2	★	1	16.8	17.5	19.2	21.2
VF2XLBR0060N160S06	0.6	1.2	0.96	16	1.14	5.2°	70	6	2	★	1	16.8	17.5	19.2	21.2
VF2XLBR0070N080S04	0.7	1.4	1.12	8	1.34	5.5°	50	4	2	★	1	8.4	8.8	9.6	10.6
VF2XLBR0070N120S04	0.7	1.4	1.12	12	1.34	4.3°	50	4	2	★	1	12.6	13.1	14.4	15.9
VF2XLBR0070N160S04	0.7	1.4	1.12	16	1.34	3.5°	60	4	2	★	1	16.8	17.5	19.2	21.2
VF2XLBR0075N060S04	0.75	1.5	1.2	6	1.44	6.3°	50	4	2	●	1	6.3	6.6	7.2	7.9
VF2XLBR0075N060S06	0.75	1.5	1.2	6	1.44	8°	50	6	2	●	1	6.3	6.6	7.2	7.9
VF2XLBR0075N080S04	0.75	1.5	1.2	8	1.44	5.4°	50	4	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0075N080S06	0.75	1.5	1.2	8	1.44	7.2°	50	6	2	●	1	8.4	8.8	9.6	10.6
VF2XLBR0075N100S04	0.75	1.5	1.2	10	1.44	4.7°	50	4	2	●	1	10.5	11.0	12.0	13.2
VF2XLBR0075N100S06	0.75	1.5	1.2	10	1.44	6.5°	50	6	2	●	1	10.5	11.0	12.0	13.2
VF2XLBR0075N120S04	0.75	1.5	1.2	12	1.44	4.2°	50	4	2	●	1	12.6	13.1	14.4	15.9
VF2XLBR0075N120S06	0.75	1.5	1.2	12	1.44	5.9°	50	6	2	●	1	12.6	13.1	14.4	15.9
VF2XLBR0075N140S04	0.75	1.5	1.2	14	1.44	3.8°	50	4	2	●	1	14.7	15.3	16.8	18.5
VF2XLBR0075N140S06	0.75	1.5	1.2	14	1.44	5.4°	50	6	2	●	1	14.7	15.3	16.8	18.5
VF2XLBR0075N160S04	0.75	1.5	1.2	16	1.44	3.4°	60	4	2	●	1	16.8	17.5	19.2	21.2
VF2XLBR0075N160S06	0.75	1.5	1.2	16	1.44	5°	60	6	2	●	1	16.8	17.5	19.2	21.2
VF2XLBR0075N180S04	0.75	1.5	1.2	18	1.44	3.1°	60	4	2	●	1	18.9	19.7	21.6	23.8
VF2XLBR0075N200S04	0.75	1.5	1.2	20	1.44	2.9°	60	4	2	★	1	21.0	21.9	23.9	*
VF2XLBR0075N200S06	0.75	1.5	1.2	20	1.44	4.3°	70	6	2	★	1	21.0	21.9	23.9	26.5
VF2XLBR0080N080S04	0.8	1.6	1.28	8	1.54	5.3°	50	4	2	★	1	8.4	8.8	9.6	10.5
VF2XLBR0080N120S04	0.8	1.6	1.28	12	1.54	4.1°	50	4	2	★	1	12.6	13.1	14.4	15.9
VF2XLBR0080N160S04	0.8	1.6	1.28	16	1.54	3.3°	60	4	2	★	1	16.8	17.5	19.1	21.2
VF2XLBR0080N200S04	0.8	1.6	1.28	20	1.54	2.8°	60	4	2	★	1	21.0	21.9	23.9	*
VF2XLBR0090N080S04	0.9	1.8	1.44	8	1.74	5.1°	50	4	2	★	1	8.4	8.8	9.6	10.5

* No interference

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0090N120S04	0.9	1.8	1.44	12	1.74	3.9°	50	4	2	★	1	12.6	13.1	14.3	15.8
VF2XLBR0090N160S04	0.9	1.8	1.44	16	1.74	3.1°	60	4	2	★	1	16.8	17.5	19.1	21.1
VF2XLBR0090N200S04	0.9	1.8	1.44	20	1.74	2.6°	60	4	2	★	1	20.9	21.8	23.9	*
VF2XLBR0100N060S04	1	2	1.6	6	1.9	5.8°	50	4	2	●	1	6.2	6.5	7.0	7.7
VF2XLBR0100N060S06	1	2	1.6	6	1.9	7.9°	50	6	2	●	1	6.2	6.5	7.0	7.7
VF2XLBR0100N080S04	1	2	1.6	8	1.9	4.9°	50	4	2	●	1	8.3	8.7	9.4	10.4
VF2XLBR0100N080S06	1	2	1.6	8	1.9	6.9°	50	6	2	●	1	8.3	8.7	9.4	10.4
VF2XLBR0100N100S04	1	2	1.6	10	1.9	4.2°	50	4	2	●	1	10.4	10.9	11.8	13.0
VF2XLBR0100N100S06	1	2	1.6	10	1.9	6.2°	50	6	2	●	1	10.4	10.9	11.8	13.0
VF2XLBR0100N120S04	1	2	1.6	12	1.9	3.7°	50	4	2	●	1	12.5	13.0	14.2	15.7
VF2XLBR0100N120S06	1	2	1.6	12	1.9	5.6°	50	6	2	●	1	12.5	13.0	14.2	15.7
VF2XLBR0100N140S04	1	2	1.6	14	1.9	3.3°	50	4	2	●	1	14.6	15.2	16.6	18.3
VF2XLBR0100N140S06	1	2	1.6	14	1.9	5.1°	50	6	2	●	1	14.6	15.2	16.6	18.3
VF2XLBR0100N160S04	1	2	1.6	16	1.9	2.9°	60	4	2	●	1	16.7	17.4	19.0	*
VF2XLBR0100N160S06	1	2	1.6	16	1.9	4.7°	60	6	2	●	1	16.7	17.4	19.0	21.0
VF2XLBR0100N180S04	1	2	1.6	18	1.9	2.7°	60	4	2	●	1	18.8	19.6	21.4	*
VF2XLBR0100N180S06	1	2	1.6	18	1.9	4.4°	60	6	2	●	1	18.8	19.6	21.4	23.6
VF2XLBR0100N200S04	1	2	1.6	20	1.9	2.5°	60	4	2	●	1	20.9	21.8	23.8	*
VF2XLBR0100N200S06	1	2	1.6	20	1.9	4.1°	60	6	2	●	1	20.9	21.8	23.8	26.3
VF2XLBR0100N220S04	1	2	1.6	22	1.9	2.3°	60	4	2	●	1	22.9	23.9	26.2	*
VF2XLBR0100N250S04	1	2	1.6	25	1.9	2°	70	4	2	★	1	26.1	27.2	*	*
VF2XLBR0100N250S06	1	2	1.6	25	1.9	3.5°	70	6	2	★	1	26.1	27.2	29.8	32.9
VF2XLBR0100N300S04	1	2	1.6	30	1.9	1.7°	70	4	2	★	1	31.3	32.6	*	*
VF2XLBR0100N300S06	1	2	1.6	30	1.9	3°	80	6	2	★	1	31.3	32.6	35.8	*
VF2XLBR0100N350S04	1	2	1.6	35	1.9	1.5°	80	4	2	★	1	36.5	38.1	*	*
VF2XLBR0125N100S06	1.25	2.5	2	10	2.4	5.9°	60	6	2	★	1	10.4	10.8	11.8	12.9
VF2XLBR0125N150S06	1.25	2.5	2	15	2.4	4.6°	60	6	2	★	1	15.6	16.3	17.8	19.6
VF2XLBR0125N200S06	1.25	2.5	2	20	2.4	3.7°	70	6	2	★	1	20.8	21.7	23.8	26.2
VF2XLBR0125N250S06	1.25	2.5	2	25	2.4	3.2°	70	6	2	★	1	26.1	27.2	29.7	32.9
VF2XLBR0125N300S06	1.25	2.5	2	30	2.4	2.8°	80	6	2	★	1	31.3	32.6	35.7	*
VF2XLBR0125N350S06	1.25	2.5	2	35	2.4	2.4°	80	6	2	★	1	36.5	38.1	41.7	*
VF2XLBR0150N080S06	1.5	3	2.4	8	2.9	6.3°	60	6	2	●	1	8.3	8.6	9.3	10.2
VF2XLBR0150N100S06	1.5	3	2.4	10	2.9	5.5°	60	6	2	●	1	10.4	10.8	11.7	12.9
VF2XLBR0150N120S06	1.5	3	2.4	12	2.9	4.9°	60	6	2	●	1	12.5	13.0	14.1	15.5
VF2XLBR0150N140S06	1.5	3	2.4	14	2.9	4.4°	60	6	2	●	1	14.6	15.2	16.5	18.2
VF2XLBR0150N160S06	1.5	3	2.4	16	2.9	4°	60	6	2	●	1	16.7	17.3	18.9	20.8
VF2XLBR0150N200S06	1.5	3	2.4	20	2.9	3.4°	70	6	2	●	1	20.8	21.7	23.7	26.1
VF2XLBR0150N250S06	1.5	3	2.4	25	2.9	2.8°	70	6	2	●	1	26.1	27.2	29.7	*
VF2XLBR0150N300S06	1.5	3	2.4	30	2.9	2.5°	70	6	2	●	1	31.3	32.6	35.7	*
VF2XLBR0150N350S06	1.5	3	2.4	35	2.9	2.2°	80	6	2	★	1	36.5	38.0	41.7	*
VF2XLBR0150N400S06	1.5	3	2.4	40	2.9	1.9°	90	6	2	★	1	41.7	43.5	*	*
VF2XLBR0175N160S06	1.75	3.5	2.8	16	3.4	3.6°	60	6	2	★	1	16.7	17.3	18.9	20.8
VF2XLBR0175N200S06	1.75	3.5	2.8	20	3.4	3°	70	6	2	★	1	20.8	21.7	23.7	*
VF2XLBR0175N250S06	1.75	3.5	2.8	25	3.4	2.5°	70	6	2	★	1	26.0	27.1	29.6	*
VF2XLBR0175N300S06	1.75	3.5	2.8	30	3.4	2.1°	80	6	2	★	1	31.3	32.6	35.6	*
VF2XLBR0175N350S06	1.75	3.5	2.8	35	3.4	1.9°	80	6	2	★	1	36.5	38.0	*	*
VF2XLBR0175N400S06	1.75	3.5	2.8	40	3.4	1.7°	90	6	2	★	1	41.7	43.5	*	*
VF2XLBR0200N100S06	2	4	3.2	10	3.9	4.5°	70	6	2	●	1	10.4	10.8	11.6	12.7
VF2XLBR0200N120S06	2	4	3.2	12	3.9	3.9°	70	6	2	●	1	12.5	12.9	14.0	15.4
VF2XLBR0200N140S06	2	4	3.2	14	3.9	3.4°	70	6	2	●	1	14.6	15.1	16.4	18.0
VF2XLBR0200N160S06	2	4	3.2	16	3.9	3.1°	70	6	2	●	1	16.6	17.3	18.8	20.7

* No interference

VF2XLB

Ball nose, 2 flute, Long neck

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLBR0200N200S06	2	4	3.2	20	3.9	2.6°	70	6	2	●	1	20.8	21.7	23.6	*
VF2XLBR0200N250S06	2	4	3.2	25	3.9	2.1°	70	6	2	●	1	26.0	27.1	29.6	*
VF2XLBR0200N300S06	2	4	3.2	30	3.9	1.8°	70	6	2	●	1	31.2	32.6	*	*
VF2XLBR0200N350S06	2	4	3.2	35	3.9	1.6°	80	6	2	●	1	36.5	38.0	*	*
VF2XLBR0200N400S06	2	4	3.2	40	3.9	1.4°	90	6	2	★	1	41.7	43.5	*	*
VF2XLBR0200N450S06	2	4	3.2	45	3.9	1.2°	90	6	2	★	1	46.9	48.9	*	*
VF2XLBR0200N500S06	2	4	3.2	50	3.9	1.1°	100	6	2	★	1	52.1	54.3	*	*
VF2XLBR0250N200S06	2.5	5	4	20	4.9	1.5°	70	6	2	★	1	20.8	21.6	*	*
VF2XLBR0250N250S06	2.5	5	4	25	4.9	1.2°	70	6	2	★	1	26.0	27.1	*	*
VF2XLBR0250N300S06	2.5	5	4	30	4.9	1°	80	6	2	★	1	31.2	*	*	*
VF2XLBR0250N350S06	2.5	5	4	35	4.9	0.9°	80	6	2	★	1	36.4	*	*	*
VF2XLBR0300N300S06	3	6	4.8	30	5.85	—	80	6	2	●	2	*	*	*	*
VF2XLBR0300N400S06	3	6	4.8	40	5.85	—	90	6	2	●	2	*	*	*	*
VF2XLBR0300N500S06	3	6	4.8	50	5.85	—	100	6	2	●	2	*	*	*	*

* No interference

VF2XLBS

Ball nose, 2 flute, Long neck, Short shank

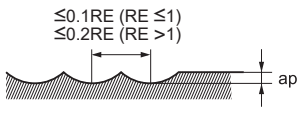
VF2XLB

Ball nose, 2 flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)
R 0.1	0.5	40000	300	11.8	0.003	40000	300	11.8	0.002
	1	40000	300	11.8	0.002	40000	300	11.8	0.002
	1.5	40000	300	11.8	0.001	40000	200	7.9	0.001
	2	40000	200	7.9	0.001	40000	100	3.9	0.001
	2.5	40000	100	3.9	0.001	40000	60	2.4	0.001
R 0.15	1	40000	500	19.7	0.007	40000	500	19.7	0.005
	1.5	40000	500	19.7	0.005	40000	500	19.7	0.003
	2	40000	500	19.7	0.003	40000	500	19.7	0.002
	2.5	40000	400	15.7	0.003	40000	400	15.7	0.002
	3	40000	300	11.8	0.002	40000	300	11.8	0.001
	4	30000	200	7.9	0.002	30000	200	7.9	0.001
R 0.2	1	40000	1400	55.1	0.015	40000	1400	55.1	0.01
	1.5	40000	1000	39.4	0.01	40000	1000	39.4	0.006
	2	40000	1000	39.4	0.01	40000	1000	39.4	0.006
	2.5	40000	700	27.6	0.005	40000	700	27.6	0.003
	3	40000	700	27.6	0.005	40000	700	27.6	0.003
	4	40000	600	23.6	0.004	40000	500	19.7	0.003
	5	40000	400	15.7	0.003	40000	300	11.8	0.002
R 0.25	1.5	40000	2000	78.7	0.02	40000	2000	78.7	0.015
	2	40000	2000	78.7	0.02	40000	2000	78.7	0.015
	3	40000	1200	47.2	0.015	40000	1200	47.2	0.01
	4	36000	900	35.4	0.01	36000	900	35.4	0.007
	5	36000	700	27.6	0.007	36000	600	23.6	0.005
	6	36000	600	23.6	0.006	36000	500	19.7	0.004
R 0.3	2	40000	2800	110.2	0.03	40000	2800	110.2	0.02
	3	40000	2800	110.2	0.03	40000	2800	110.2	0.02
	4	35000	2000	78.7	0.02	35000	2000	78.7	0.015
	5	30000	1000	39.4	0.01	30000	1000	39.4	0.007
	6	30000	800	31.5	0.008	30000	800	31.5	0.005
	7	30000	600	23.6	0.008	30000	600	23.6	0.005
	8	25000	400	15.7	0.006	25000	400	15.7	0.004
R 0.4	2	40000	3500	137.8	0.04	40000	3500	137.8	0.03
	3	40000	3000	118.1	0.04	40000	3000	118.1	0.03
	4	40000	3000	118.1	0.02	40000	3000	118.1	0.015
	6	30000	1600	63.0	0.02	30000	1600	63.0	0.01
	8	25000	1000	39.4	0.01	25000	1000	39.4	0.007
	10	25000	600	23.6	0.008	25000	600	23.6	0.005
R 0.5	3	40000	4000	157.5	0.05	40000	4000	157.5	0.04
	4	40000	4000	157.5	0.05	40000	4000	157.5	0.04
	5	40000	3000	118.1	0.03	40000	3000	118.1	0.02
	6	35000	2000	78.7	0.03	35000	2000	78.7	0.02
	8	30000	1600	63.0	0.02	30000	1600	63.0	0.01
	10	20000	1000	39.4	0.01	20000	1000	39.4	0.01
	12	20000	1000	39.4	0.01	18000	800	31.5	0.008
	14	18000	600	23.6	0.008	18000	480	18.9	0.008
	16	18000	500	19.7	0.008	18000	400	15.7	0.006
	18	13000	300	11.8	0.005	13000	240	9.4	0.004
	20	13000	250	9.8	0.005	13000	200	7.9	0.004
R 0.6	6	40000	4000	157.5	0.05	35000	3500	137.8	0.04
	8	40000	3000	118.1	0.05	27000	2000	78.7	0.04
	10	27000	1900	74.8	0.03	24000	1700	66.9	0.02
	12	16000	1100	43.3	0.02	16000	1000	39.4	0.01
	14	16000	850	33.5	0.01	16000	780	30.7	0.01
	16	15000	500	19.7	0.01	14000	400	15.7	0.006
R 0.7	8	40000	4500	177.2	0.06	28000	3200	126.0	0.05
	12	32000	3000	118.1	0.03	19000	1800	70.9	0.02
	16	15000	1000	39.4	0.02	14000	800	31.5	0.01
R 0.75	6	40000	5000	196.9	0.07	32000	4000	157.5	0.06
	8	40000	5000	196.9	0.07	28000	3500	137.8	0.06
	10	40000	4500	117.2	0.06	21000	2400	94.5	0.04
	12	32000	3400	133.9	0.04	19000	2000	78.7	0.03
	14	16000	1500	59.1	0.04	13000	1200	47.2	0.03
	16	13000	1200	47.2	0.03	13000	1200	47.2	0.02
R 0.75	18	13000	1100	43.3	0.02	10000	800	31.5	0.02
	20	12000	900	35.4	0.02	9000	700	27.6	0.01
R 0.8	8	40000	5000	196.9	0.08	26000	3200	126.0	0.07
	12	35000	3800	149.6	0.05	20000	2100	82.7	0.03
	16	13000	1200	47.2	0.04	12000	1100	43.3	0.02
	20	10000	750	29.5	0.02	8000	600	23.6	0.01
R 0.9	8	40000	5000	196.9	0.09	25000	3100	122.0	0.08
	12	36000	3800	149.6	0.06	18000	1900	74.8	0.04
	16	25000	2500	98.4	0.04	14000	1300	51.2	0.025
	20	10000	1000	39.4	0.03	8000	800	31.5	0.02
R 1	6	40000	6000	236.2	0.1	24000	3400	133.9	0.1
	8	40000	5000	196.9	0.1	24000	3000	118.1	0.1
	10	40000	5000	196.9	0.08	24000	3000	118.1	0.07
	12	40000	5000	196.9	0.08	24000	2600	102.4	0.05
	14	40000	5000	196.9	0.06	21000	2300	90.6	0.05
	16	32000	3500	137.8	0.05	16000	1700	66.9	0.03
	18	24000	2400	94.5	0.04	13000	1300	51.2	0.03
	20	10000	1000	39.4	0.04	10000	1000	39.4	0.03
	22	10000	1000	39.4	0.04	10000	1000	39.4	0.02
	25	10000	1000	39.4	0.04	8000	800	31.5	0.02
	30	10000	800	31.5	0.02	8000	800	31.5	0.015
	35	10000	500	19.7	0.02	8000	400	15.7	0.01
R 1.25	10	36000	5000	196.9	0.12	20000	2600	102.4	0.11
	15	36000	4600	181.1	0.08	18000	2000	78.7	0.075
	20	26000	3000	118.1	0.07	13000	1400	55.1	0.05
	25	10000	1100	43.3	0.06	8000	800	31.5	0.04
	30	8000	800	31.5	0.05	7000	700	27.6	0.03
	35	8000	500	19.7	0.03	5000	400	15.7	0.03
R 1.5	8	32000	6400	252.0	0.15	16000	3000	118.1	0.15
	10	32000	5100	200.8	0.15	16000	2200	86.6	0.15
	12	32000	5100	200.8	0.13	16000	2200	86.6	0.13
	14	32000	4500	177.2	0.13	16000	2200	86.6	0.1
	16	32000	4500	177.2	0.1	16000	1800	70.9	0.1
	20	27000	3800	149.6	0.1	14000	1600	63.0	0.06
	25	21000	2700	106.3	0.08	11000	1200	47.2	0.06
	30	9000	1000	39.4	0.08	7000	700	27.6	0.05
	35	6000	700	27.6	0.06	6000	600	23.6	0.04
	40	6000	600	23.6	0.04	5000	400	15.7	0.03
R 1.75	16	28000	4200	165.4	0.13	14000	1600	63.0	0.13
	20	26000	3800	149.6	0.13	13000	1600	63.0	0.11
	25	23000	3300	129.9	0.12	11000	1200	47.2	0.08
	30	13000	1900	74.8	0.09	9000	1000	39.4	0.07
	35	9000	1200	47.2	0.08	6000	600	23.6	0.06
	40	8500	1100	43.3	0.07	5500	500	19.7	0.04
R 2	10	24000	4800	189.0	0.2	12000	2200	86.6	0.2
	12	24000	4800	189.0	0.2	12000	2200	86.6	0.2
	14	24000	3800	149.6	0.15	12000	1500	59.1	0.15
	16	24000	3800	149.6	0.15	12000	1500	59.1	0.15
	20	24000	3800	149.6	0.15	12000	1500	59.1	0.15
	25	24000	3800	149.6	0.15	10000	1100	43.3	0.1
	30	20000	3000	118.1	0.1	10000	1100	43.3	0.08
	35	12000	1700	66.9	0.1	8000	900	35.4	0.08
	40	11000	1500	59.1	0.1	5000	500	19.7	0.06
	45	10000	1300	51.2	0.08	5000	500	19.7	0.05
	50	8000	1000	39.4	0.05	4000	400	15.7	0.04
R 2.5	20	19000	3400	133.9	0.2	10000	1400	55.1	0.2
	25	19000	3400	133.9	0.2	10000	1400	55.1	0.2
	30	19000	3200	126.0	0.15	8000	1000	39.4	0.15
	35	16000	2700	106.3	0.1	8000	900	35.4	0.1
R 3	30	16000	3500	137.8	0.2	8000	1000	39.4	0.2
	40	16000	3000	118.1	0.15	8000	800	31.5	0.15
	50	16000	2700	106.3	0.15	6000	500	19.7	0.15

Depth of cut



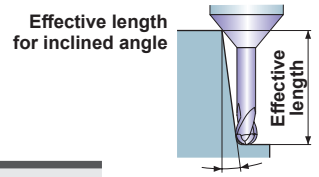
RE : Radius

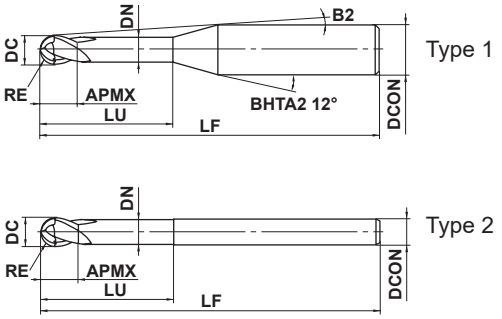
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

VF2XLB – Inch sizes

Ball nose, 2 flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





.0156"≤RE≤.1250"			
±0.002"			
DCON=.2500"			
0 - 0.00024"			

●2 flute long neck ball nose end mill with Impact Miracle coating for high hardened materials.

(inch)

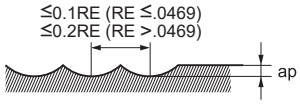
Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VF2XLB D1/32N4D	.0156	.0313	.0313	.1250	.0296	9.9°	2.5	.2500	2	●	1	.130	.134	.146	.161
VF2XLB D1/32N6D	.0156	.0313	.0313	.1875	.0296	9.1°	2.5	.2500	2	●	1	.197	.205	.221	.244
VF2XLB D1/16N4D	.0313	.0625	.0625	.2500	.0601	8.0°	2.5	.2500	2	●	1	.264	.276	.299	.331
VF2XLB D1/16N6D	.0313	.0625	.0625	.3750	.0601	6.8°	2.5	.2500	2	●	1	.394	.409	.449	.496
VF2XLB D3/32N4D	.0469	.0938	.0938	.3750	.0898	6.4°	2.5	.2500	2	●	1	.390	.406	.441	.484
VF2XLB D3/32N6D	.0469	.0938	.0938	.5625	.0898	5.1°	2.5	.2500	2	●	1	.587	.610	.665	.736
VF2XLB D1/8N4D	.0625	.1250	.1250	.5000	.1211	4.9°	3.0	.2500	2	●	1	.520	.539	.591	.646
VF2XLB D1/8N6D	.0625	.1250	.1250	.7500	.1211	3.7°	3.0	.2500	2	●	1	.780	.815	.886	.980
VF2XLB D3/16N4D	.0938	.1875	.1875	.7500	.1835	2.3°	3.0	.2500	2	●	1	.780	.811	.882	*
VF2XLB D3/16N6D	.0938	.1875	.1875	1.1250	.1835	1.6°	3.0	.2500	2	●	1	1.169	1.221	*	*
VF2XLB D1/4N4D	.1250	.2500	.2500	1.0000	.2441	–	3.5	.2500	2	●	2	*	*	*	*
VF2XLB D1/4N6D	.1250	.2500	.2500	1.5000	.2441	–	3.5	.2500	2	●	2	*	*	*	*

* No interference

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.			
RE (inch)	**LU** (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)
R .0156	**.1250**	40000	3000	118	.0016	40000	3000	118	.0012
R .0156	**.1875**	32000	1700	67	.0012	32000	1700	67	.0004
R .0313	**.2500**	40000	5000	197	.0031	26000	3300	129	.0028
R .0313	**.3750**	36000	3900	153	.0024	20000	2200	86	.0012
R .0469	**.3750**	37000	5200	204	.0047	20000	2600	102	.0043
R .0469	**.5625**	37000	4800	189	.0031	20000	2200	86.6	.0030
R .0625	**.5000**	30000	4800	189	.0051	15000	2100	82.6	.0051
R .0625	**.7500**	30000	4200	165	.0039	13000	1500	59	.0024
R .0938	**.7500**	20000	3600	142	.0079	10000	1400	55.1	.0071
R .0938	**1.1250**	20000	3400	134	.0059	8400	1100	43.3	.0055
R .1250	**1.0000**	15000	3300	130	.0079	7500	950	37.2	.0079
R .1250	**1.5000**	15000	3000	118	.0059	7500	750	29.5	.0059

Depth of cut



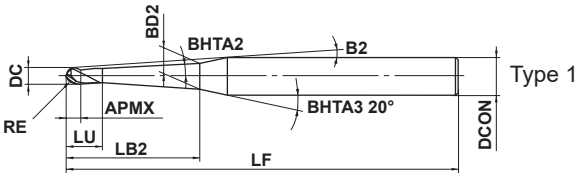
RE : Radius

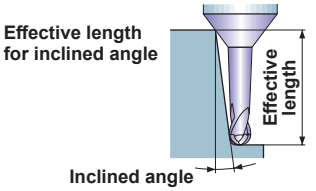
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Cutting conditions may differ considerably due to the overhang, depth of cut, and machine tool conditions. Please use the above table as a start reference point.

VF3XB

Ball nose, Medium cut length, 3 flute, Taper neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	◎	◎	◎				





0.4≤RE≤2.5				
±0.01				
4≤DCON≤6	DCON=8			
0 - 0.008	0 - 0.009			

● 3 flute ball end mill, high rigidity taper neck type.

(mm)

Order Number	RE	DC	BHTA2	APMX	LB2	LU	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VF3XBR0040T0024L006	0.4	0.8	0.4°	0.5	6	1.5	8.9°	0.82	60	4	3	★	1	6.3	6.6	6.9	7.3
VF3XBR0040T0024L008	0.4	0.8	0.4°	0.5	8	1.5	7.5°	0.85	60	4	3	★	1	8.4	8.6	9.1	9.5
VF3XBR0040T0024L012	0.4	0.8	0.4°	0.5	12	1.5	5.7°	0.91	60	4	3	★	1	12.4	12.7	13.4	14.1
VF3XBR0040T0054L008	0.4	0.8	0.9°	0.5	8	1.5	7.6°	0.96	60	4	3	★	1	—	8.4	8.9	9.3
VF3XBR0040T0054L012	0.4	0.8	0.9°	0.5	12	1.5	5.8°	1.09	60	4	3	★	1	—	12.4	13.1	13.8
VF3XBR0040T0054L016	0.4	0.8	0.9°	0.5	16	1.5	4.7°	1.22	60	4	3	★	1	—	16.5	17.3	18.3
VF3XBR0050T0024L008	0.5	1	0.4°	0.8	8	2.3	9.6°	1.02	60	6	3	●	1	8.5	8.8	9.3	9.8
VF3XBR0050T0024L010	0.5	1	0.4°	0.8	10	2.3	8.5°	1.05	60	6	3	●	1	10.5	10.9	11.4	12.1
VF3XBR0050T0024L012	0.5	1	0.4°	0.8	12	2.3	7.6°	1.08	60	6	3	●	1	12.6	13.0	13.6	14.4
VF3XBR0050T0024L016	0.5	1	0.4°	0.8	16	2.3	6.3°	1.13	70	6	3	●	1	16.6	17.1	18.0	18.9
VF3XBR0050T0024L020	0.5	1	0.4°	0.8	20	2.3	5.4°	1.19	70	6	3	★	1	20.6	21.2	22.3	23.5
VF3XBR0050T0024L025	0.5	1	0.4°	0.8	25	2.3	4.6°	1.26	70	6	3	★	1	25.7	26.3	27.7	29.3
VF3XBR0050T0024L030	0.5	1	0.4°	0.8	30	2.3	4.0°	1.33	80	6	3	★	1	30.7	31.5	33.1	35.0
VF3XBR0050T0024L035	0.5	1	0.4°	0.8	35	2.3	3.5°	1.40	80	6	3	★	1	35.7	36.6	38.6	40.7
VF3XBR0050T0054L008	0.5	1	0.9°	0.8	8	2.3	9.7°	1.12	60	6	3	●	1	—	8.6	9.1	9.6
VF3XBR0050T0054L012	0.5	1	0.9°	0.8	12	2.3	7.7°	1.24	60	6	3	●	1	—	12.6	13.3	14.1
VF3XBR0050T0054L016	0.5	1	0.9°	0.8	16	2.3	6.4°	1.37	70	6	3	●	1	—	16.7	17.6	18.5
VF3XBR0050T0054L020	0.5	1	0.9°	0.8	20	2.3	5.5°	1.50	70	6	3	●	1	—	20.7	21.8	23.0
VF3XBR0050T0054L025	0.5	1	0.9°	0.8	25	2.3	4.7°	1.65	70	6	3	★	1	—	25.7	27.1	28.6
VF3XBR0050T0054L030	0.5	1	0.9°	0.8	30	2.3	4.0°	1.81	80	6	3	★	1	—	30.8	32.4	34.2
VF3XBR0050T0054L035	0.5	1	0.9°	0.8	35	2.3	3.6°	1.97	80	6	3	★	1	—	35.8	37.7	39.8
VF3XBR0050T0054L040	0.5	1	0.9°	0.8	40	2.3	3.2°	2.12	80	6	3	★	1	—	40.8	43.0	45.4
VF3XBR0050T0054L050	0.5	1	0.9°	0.8	50	2.3	2.7°	2.44	110	6	3	★	1	—	50.9	53.6	*
VF3XBR0050T0054L060	0.5	1	0.9°	0.8	60	2.3	2.3°	2.75	110	6	3	★	1	—	60.9	64.1	*
VF3XBR0050T0054L070	0.5	1	0.9°	0.8	70	2.3	2.0°	3.07	110	6	3	★	1	—	71.0	74.7	*
VF3XBR0050T0130L012	0.5	1	1.5°	0.8	12	2.3	7.9°	1.45	60	6	3	★	1	—	—	13.0	13.7
VF3XBR0050T0130L016	0.5	1	1.5°	0.8	16	2.3	6.5°	1.66	70	6	3	★	1	—	—	17.1	18.0
VF3XBR0050T0130L020	0.5	1	1.5°	0.8	20	2.3	5.6°	1.87	70	6	3	★	1	—	—	21.2	22.4
VF3XBR0050T0130L025	0.5	1	1.5°	0.8	25	2.3	4.8°	2.13	70	6	3	★	1	—	—	26.3	27.8
VF3XBR0050T0130L030	0.5	1	1.5°	0.8	30	2.3	4.1°	2.39	80	6	3	★	1	—	—	31.5	33.2
VF3XBR0050T0130L035	0.5	1	1.5°	0.8	35	2.3	3.7°	2.65	80	6	3	★	1	—	—	36.6	38.6

* No interference

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	RE	DC	BHTA2	APMX	LB2	LU	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
VF3XBR0075T0024L010	0.75	1.5	0.4°	1.3	10	2.8	8.1°	1.54	60	6	3	●	1	10.6	10.9	11.4	12.0
VF3XBR0075T0024L015	0.75	1.5	0.4°	1.3	15	2.8	6.2°	1.61	60	6	3	●	1	15.6	16.0	16.9	17.8
VF3XBR0075T0024L020	0.75	1.5	0.4°	1.3	20	2.8	5.0°	1.68	70	6	3	●	1	20.6	21.2	22.3	23.5
VF3XBR0075T0024L030	0.75	1.5	0.4°	1.3	30	2.8	3.7°	1.82	80	6	3	●	1	30.7	31.5	33.1	35.0
VF3XBR0075T0054L015	0.75	1.5	0.9°	1.3	15	2.8	6.3°	1.82	60	6	3	●	1	—	15.7	16.5	17.4
VF3XBR0075T0054L020	0.75	1.5	0.9°	1.3	20	2.8	5.1°	1.98	70	6	3	●	1	—	20.7	21.8	23.0
VF3XBR0075T0054L030	0.75	1.5	0.9°	1.3	30	2.8	3.7°	2.29	80	6	3	●	1	—	30.8	32.4	34.2
VF3XBR0075T0054L040	0.75	1.5	0.9°	1.3	40	2.8	3.0°	2.61	80	6	3	★	1	—	40.8	43.0	45.3
VF3XBR0075T0130L015	0.75	1.5	1.5°	1.3	15	2.8	6.4°	2.08	60	6	3	★	1	—	—	16.1	17.0
VF3XBR0075T0130L020	0.75	1.5	1.5°	1.3	20	2.8	5.2°	2.34	70	6	3	★	1	—	—	21.2	22.4
VF3XBR0075T0130L030	0.75	1.5	1.5°	1.3	30	2.8	3.8°	2.86	80	6	3	★	1	—	—	31.5	33.2
VF3XBR0100T0024L016	1	2	0.4°	1.6	16	3.6	5.5°	2.07	70	6	3	●	1	16.7	17.1	18.0	19.0
VF3XBR0100T0024L020	1	2	0.4°	1.6	20	3.6	4.6°	2.13	70	6	3	●	1	20.7	21.3	22.3	23.5
VF3XBR0100T0024L025	1	2	0.4°	1.6	25	3.6	3.9°	2.20	70	6	3	●	1	25.8	26.4	27.8	29.3
VF3XBR0100T0024L030	1	2	0.4°	1.6	30	3.6	3.4°	2.27	80	6	3	●	1	30.8	31.6	33.2	35.0
VF3XBR0100T0024L035	1	2	0.4°	1.6	35	3.6	2.9°	2.34	80	6	3	●	1	35.8	36.7	38.6	*
VF3XBR0100T0024L040	1	2	0.4°	1.6	40	3.6	2.6°	2.41	80	6	3	●	1	40.8	41.9	44.0	*
VF3XBR0100T0054L020	1	2	0.9°	1.6	20	3.6	4.7°	2.42	70	6	3	●	1	—	20.8	21.9	23.0
VF3XBR0100T0054L025	1	2	0.9°	1.6	25	3.6	4.0°	2.57	70	6	3	●	1	—	25.8	27.2	28.6
VF3XBR0100T0054L030	1	2	0.9°	1.6	30	3.6	3.4°	2.73	80	6	3	●	1	—	30.9	32.5	34.2
VF3XBR0100T0054L035	1	2	0.9°	1.6	35	3.6	3.0°	2.89	80	6	3	●	1	—	35.9	37.7	39.8
VF3XBR0100T0054L040	1	2	0.9°	1.6	40	3.6	2.7°	3.04	80	6	3	●	1	—	40.9	43.0	*
VF3XBR0100T0054L050	1	2	0.9°	1.6	50	3.6	2.2°	3.36	110	6	3	★	1	—	51.0	53.6	*
VF3XBR0100T0054L060	1	2	0.9°	1.6	60	3.6	1.9°	3.67	110	6	3	★	1	—	61.0	*	*
VF3XBR0100T0054L070	1	2	0.9°	1.6	70	3.6	1.6°	3.99	110	6	3	★	1	—	71.1	*	*
VF3XBR0100T0130L025	1	2	1.5°	1.6	25	3.6	4.1°	3.02	70	6	3	★	1	—	—	26.4	27.9
VF3XBR0100T0130L030	1	2	1.5°	1.6	30	3.6	3.5°	3.28	80	6	3	★	1	—	—	31.6	33.3
VF3XBR0100T0130L035	1	2	1.5°	1.6	35	3.6	3.1°	3.54	80	6	3	★	1	—	—	36.7	38.7
VF3XBR0100T0130L040	1	2	1.5°	1.6	40	3.6	2.7°	3.81	80	6	3	★	1	—	—	41.8	*
VF3XBR0125T0054L020	1.25	2.5	0.9°	2	20	4.5	4.3°	2.89	60	6	3	★	1	—	20.8	21.9	23.1
VF3XBR0125T0054L030	1.25	2.5	0.9°	2	30	4.5	3.1°	3.20	80	6	3	★	1	—	30.9	32.5	34.2
VF3XBR0125T0054L040	1.25	2.5	0.9°	2	40	4.5	2.4°	3.52	80	6	3	★	1	—	40.9	43.1	*
VF3XBR0125T0130L020	1.25	2.5	1.5°	2	20	4.5	4.4°	3.21	60	6	3	★	1	—	—	21.4	22.5
VF3XBR0125T0130L030	1.25	2.5	1.5°	2	30	4.5	3.1°	3.74	80	6	3	★	1	—	—	31.6	33.3
VF3XBR0125T0130L040	1.25	2.5	1.5°	2	40	4.5	2.5°	4.26	80	6	3	★	1	—	—	41.9	*
VF3XBR0150T0024L020	1.5	3	0.4°	2	20	5	3.8°	3.11	60	6	3	●	1	20.7	21.3	22.3	23.5
VF3XBR0150T0024L025	1.5	3	0.4°	2	25	5	3.1°	3.18	80	6	3	●	1	25.8	26.4	27.7	29.2
VF3XBR0150T0024L030	1.5	3	0.4°	2	30	5	2.7°	3.25	80	6	3	●	1	30.8	31.6	33.2	*
VF3XBR0150T0024L040	1.5	3	0.4°	2	40	5	2.1°	3.39	80	6	3	●	1	40.9	41.9	44.0	*
VF3XBR0150T0024L050	1.5	3	0.4°	2	50	5	1.7°	3.53	100	6	3	●	1	50.9	52.2	*	*
VF3XBR0150T0054L020	1.5	3	0.9°	2	20	5	3.8°	3.37	60	6	3	●	1	—	20.9	21.9	23.0
VF3XBR0150T0054L030	1.5	3	0.9°	2	30	5	2.7°	3.69	80	6	3	●	1	—	30.9	32.5	*
VF3XBR0150T0054L040	1.5	3	0.9°	2	40	5	2.1°	4.00	80	6	3	●	1	—	41.0	43.1	*
VF3XBR0150T0054L050	1.5	3	0.9°	2	50	5	1.7°	4.31	100	6	3	●	1	—	51.0	*	*
VF3XBR0150T0054L060	1.5	3	0.9°	2	60	5	2.3°	4.63	110	8	3	●	1	—	61.1	64.2	*
VF3XBR0150T0054L070	1.5	3	0.9°	2	70	5	2.0°	4.94	120	8	3	●	1	—	71.1	74.8	*
VF3XBR0150T0130L040	1.5	3	1.5°	2	40	5	2.2°	4.73	80	6	3	★	1	—	—	41.9	*
VF3XBR0150T0130L050	1.5	3	1.5°	2	50	5	2.8°	5.26	110	8	3	★	1	—	—	52.2	*
VF3XBR0150T0130L060	1.5	3	1.5°	2	60	5	2.4°	5.78	110	8	3	★	1	—	—	62.4	*
VF3XBR0150T0130L070	1.5	3	1.5°	2	70	5	2.1°	6.30	120	8	3	★	1	—	—	72.7	*
VF3XBR0200T0054L030	2	4	0.9°	3	30	6	3.5°	4.65	90	8	3	●	1	—	30.9	32.5	34.2

* No interference

VF3XB

Ball nose, Medium cut length, 3 flute, Taper neck

(mm)

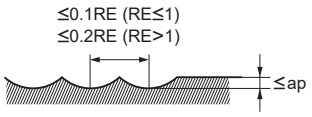
Order Number	RE	DC	BHTA2	APMX	LB2	LU	B2	BD2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
														0.5°	1°	2°	3°
VF3XBR0200T0054L040	2	4	0.9°	3	40	6	2.7°	4.97	90	8	3	●	1	—	41.0	43.0	*
VF3XBR0200T0054L050	2	4	0.9°	3	50	6	2.2°	5.28	110	8	3	●	1	—	51.0	53.6	*
VF3XBR0200T0054L060	2	4	0.9°	3	60	6	1.9°	5.60	110	8	3	●	1	—	61.1	*	*
VF3XBR0250T0054L035	2.5	5	0.9°	3.5	35	6.5	2.4°	5.80	90	8	3	●	1	—	35.9	37.7	*
VF3XBR0250T0054L040	2.5	5	0.9°	3.5	40	6.5	2.2°	5.95	90	8	3	●	1	—	41.0	43.0	*
VF3XBR0250T0054L050	2.5	5	0.9°	3.5	50	6.5	1.8°	6.27	110	8	3	●	1	—	51.0	*	*
VF3XBR0250T0054L060	2.5	5	0.9°	3.5	60	6.5	1.5°	6.58	110	8	3	●	1	—	61.1	*	*

* No interference

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
RE (mm)	BHTA2	LB2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R0.4	0.4°	6	34000	2700	106.3	0.03	31000	2200	86.6	0.025	24000	1700	66.9	0.02	19000	1400	55.1	0.015
		8	31000	2100	82.7	0.02	29000	1700	66.9	0.02	22000	1300	51.2	0.015	18000	1000	39.4	0.01
		12	28000	2000	78.7	0.015	26000	1600	63.0	0.01	20000	1200	47.2	0.01	16000	960	37.8	0.007
	0.9°	8	31000	2200	86.6	0.02	29000	1800	70.9	0.02	22000	1400	55.1	0.015	18000	1100	43.3	0.01
		12	28000	2100	82.7	0.015	26000	1700	66.9	0.01	20000	1300	51.2	0.01	16000	1000	39.4	0.007
		16	25000	1100	43.3	0.01	23000	910	35.8	0.01	18000	700	27.6	0.008	14000	560	22.0	0.006
R0.5	0.4°	8	27000	2700	106.3	0.04	25000	2200	86.6	0.04	19000	1700	66.9	0.03	15000	1400	55.1	0.02
		10	24000	2200	86.6	0.03	22000	1800	70.9	0.025	17000	1400	55.1	0.02	14000	1100	43.3	0.015
		12	24000	2200	86.6	0.03	22000	1800	70.9	0.025	17000	1400	55.1	0.02	14000	1100	43.3	0.015
		16	22000	2100	82.7	0.03	21000	1700	66.9	0.025	16000	1300	51.2	0.02	13000	1000	39.4	0.015
		20	20000	1400	55.1	0.015	18000	1200	47.2	0.01	14000	900	35.4	0.01	11000	720	28.3	0.007
		25	18000	1300	51.2	0.015	17000	1000	39.4	0.01	13000	800	31.5	0.009	10000	640	25.2	0.006
		30	15000	960	37.8	0.01	14000	780	30.7	0.01	11000	600	23.6	0.008	8800	480	18.9	0.006
		35	14000	800	31.5	0.008	13000	650	25.6	0.007	10000	500	19.7	0.006	8000	400	15.7	0.004
	0.9°	8	27000	2900	114.2	0.04	25000	2300	90.6	0.04	19000	1800	70.9	0.03	15000	1400	55.1	0.02
		12	24000	2400	94.5	0.03	22000	2000	78.7	0.025	17000	1500	59.1	0.02	14000	1200	47.2	0.015
		16	22000	2200	86.6	0.03	21000	1800	70.9	0.025	16000	1400	55.1	0.02	13000	1100	43.3	0.015
		20	20000	1600	63.0	0.015	18000	1300	51.2	0.01	14000	1000	39.4	0.01	11000	800	31.5	0.007
		25	18000	1400	55.1	0.015	17000	1200	47.2	0.01	13000	900	35.4	0.009	10000	720	28.3	0.006
		30	15000	1100	43.3	0.01	14000	910	35.8	0.009	11000	700	27.6	0.008	8800	560	22.0	0.006
		35	14000	960	37.8	0.008	13000	780	30.7	0.007	10000	600	23.6	0.006	8000	480	18.9	0.004
		40	11000	800	31.5	0.007	11000	650	25.6	0.006	8000	500	19.7	0.005	6400	400	15.7	0.003
		50	8400	610	24.0	0.006	7800	490	19.3	0.005	6000	380	15.0	0.004	4800	300	11.8	0.003
		60	7000	510	20.1	0.004	6500	400	15.7	0.004	5000	320	12.6	0.003	4000	260	10.2	0.002
		70	7000	480	18.9	0.003	6500	390	15.4	0.002	5000	300	11.8	0.002	4000	240	9.4	0.001
	1.5°	12	24000	2600	102.4	0.03	22000	2100	82.7	0.025	17000	1600	63.0	0.02	14000	1300	51.2	0.015
		16	22000	2400	94.5	0.03	21000	2000	78.7	0.025	16000	1500	59.1	0.02	13000	1200	47.2	0.015
		20	20000	1800	70.9	0.015	18000	1400	55.1	0.01	14000	1100	43.3	0.01	11000	880	34.6	0.007
		25	18000	1600	63.0	0.015	17000	1300	51.2	0.01	13000	1000	39.4	0.009	11000	800	31.5	0.006
		30	15000	1300	51.2	0.01	14000	1000	39.4	0.01	11000	800	31.5	0.008	8800	640	25.2	0.006
		35	14000	1100	43.3	0.008	13000	910	35.8	0.007	10000	700	27.6	0.006	8000	560	22.0	0.004

Depth of cut



RE : Radius

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

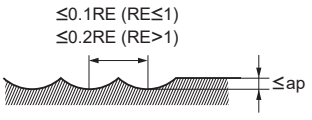
VF3XB

Ball nose, Medium cut length, 3 flute, Taper neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
RE (mm)	BHTA2	LB2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R0.75	0.4°	10	18000	2700	106.3	0.06	17000	2200	86.6	0.05	13000	1700	66.9	0.04	10000	1400	55.1	0.03
		15	17000	2200	86.6	0.04	16000	1800	70.9	0.04	12000	1400	55.1	0.03	9600	1100	43.3	0.02
		20	17000	2100	82.7	0.03	16000	1700	66.9	0.025	12000	1300	51.2	0.02	9600	1000	39.4	0.015
		30	14000	1600	63.0	0.015	13000	1300	51.2	0.01	10000	1000	39.4	0.01	8000	800	31.5	0.007
	0.9°	15	17000	2400	94.5	0.04	16000	2000	78.7	0.04	12000	1500	59.1	0.03	9600	1200	47.2	0.02
		20	17000	2200	86.6	0.03	16000	1800	70.9	0.025	12000	1400	55.1	0.02	9600	1100	43.3	0.015
		30	14000	1800	70.9	0.015	13000	1400	55.1	0.01	10000	1100	43.3	0.01	8000	880	34.6	0.007
		40	13000	1300	51.2	0.01	12000	1000	39.4	0.01	9000	800	31.5	0.008	7200	640	25.2	0.006
	1.5°	15	17000	2600	102.4	0.04	16000	2100	82.7	0.04	12000	1600	63.0	0.03	9600	1300	51.2	0.02
		20	17000	2400	94.5	0.03	16000	2000	78.7	0.025	12000	1500	59.1	0.02	9600	1200	47.2	0.015
		30	14000	2000	78.7	0.015	13000	1600	63.0	0.01	10000	1200	47.2	0.01	8000	960	37.8	0.007
R1	0.4°	16	15000	3200	126.0	0.07	14000	2600	102.4	0.06	11000	2000	78.7	0.05	8800	1600	63.0	0.03
		20	14000	2400	94.5	0.06	13000	2000	78.7	0.05	10000	1500	59.1	0.04	8000	1200	47.2	0.03
		25	14000	2100	82.7	0.04	13000	1700	66.9	0.04	10000	1300	51.2	0.03	8000	1000	39.4	0.02
		30	13000	1800	70.9	0.03	12000	1400	55.1	0.03	9000	1100	43.3	0.025	7200	880	34.6	0.02
		35	13000	1600	63.0	0.03	12000	1300	51.2	0.025	9000	1000	39.4	0.02	7200	800	31.5	0.015
		40	12000	1400	55.1	0.015	11000	1200	47.2	0.01	8500	900	35.4	0.01	6800	720	28.3	0.007
	0.9°	20	14000	2600	102.4	0.06	13000	2100	82.7	0.05	10000	1600	63.0	0.04	8000	1300	51.2	0.03
		25	14000	2200	86.6	0.05	13000	1800	70.9	0.04	10000	1400	55.1	0.03	8000	1100	43.3	0.025
		30	13000	1900	74.8	0.04	12000	1600	63.0	0.04	9000	1200	47.2	0.03	7200	960	37.8	0.02
		35	13000	1800	70.9	0.04	12000	1400	55.1	0.03	9000	1100	43.3	0.025	7200	880	34.6	0.02
		40	12000	1600	63.0	0.03	11000	1300	51.2	0.025	8500	1000	39.4	0.02	6800	800	31.5	0.015
		50	11000	1400	55.1	0.015	10000	1200	47.2	0.01	8000	900	35.4	0.01	6400	720	28.3	0.007
		60	9800	1100	43.3	0.007	9100	910	35.8	0.006	7000	700	27.6	0.005	5600	560	22.0	0.003
		70	8400	960	37.8	0.004	7800	780	30.7	0.004	6000	600	23.6	0.003	4800	480	18.9	0.002
	1.5°	25	14000	2400	94.5	0.05	13000	2000	78.7	0.04	10000	1500	59.1	0.03	8000	1200	47.2	0.025
		30	12600	2100	82.7	0.04	12000	1700	66.9	0.04	9000	1300	51.2	0.03	7200	1000	39.4	0.02
		35	13000	1900	74.8	0.04	12000	1600	63.0	0.03	9000	1200	47.2	0.025	7200	960	37.8	0.02
		40	12000	1800	70.9	0.03	11000	1400	55.1	0.025	8500	1100	43.3	0.02	6800	880	34.6	0.015
R1.25	0.9°	20	13000	2900	114.2	0.06	12000	2300	90.6	0.05	9000	1800	70.9	0.04	7200	1400	55.1	0.03
		30	12000	2600	102.4	0.05	11000	2100	82.7	0.04	8500	1600	63.0	0.03	6800	1300	51.2	0.025
		40	11000	2200	86.6	0.04	9800	1800	70.9	0.04	7500	1400	55.1	0.03	6000	1100	43.3	0.02
	1.5°	20	13000	3000	118.1	0.06	12000	2500	98.4	0.05	9000	1900	74.8	0.04	7200	1500	59.1	0.03
		30	12000	2700	106.3	0.05	11050	2200	86.6	0.04	8500	1700	66.9	0.03	6800	1400	55.1	0.025
		40	11000	2400	94.5	0.04	9800	2000	78.7	0.04	7500	1500	59.1	0.03	6000	1200	47.2	0.02

Depth of cut

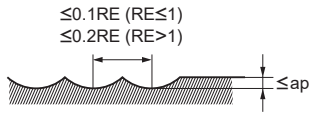


RE : Radius

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.				Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.				Hardened steel (45−55HRC) AISI H13 etc.				Hardened steel (55−62HRC) AISI D2 etc.			
RE (mm)	BHTA2	LB2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
R1.5	0.4°	20	12000	3700	145.7	0.13	11000	3000	118.1	0.1	8500	2300	90.6	0.09	6800	1800	70.9	0.06
		30	11000	2900	114.2	0.07	10000	2300	90.6	0.06	8000	1800	70.9	0.05	6400	1400	55.1	0.03
		40	11000	2400	94.5	0.06	10000	2000	78.7	0.05	8000	1500	59.1	0.04	6400	1200	47.2	0.03
		50	11000	2000	78.7	0.04	9800	1600	63.0	0.04	7500	1200	47.2	0.03	6000	960	37.8	0.02
	0.9°	20	12000	3800	149.6	0.13	11000	3100	122.0	0.1	8500	2400	94.5	0.09	6800	1900	74.8	0.06
		30	11000	3000	118.1	0.07	10000	2500	98.4	0.06	8000	1900	74.8	0.05	6400	1500	59.1	0.03
		40	11000	2600	102.4	0.06	10000	2100	82.7	0.05	8000	1600	63.0	0.04	6400	1300	51.2	0.03
		50	11000	2100	82.7	0.04	9800	1700	66.9	0.04	7500	1300	51.2	0.03	6000	1000	39.4	0.02
		60	9800	2000	78.7	0.03	9100	1600	63.0	0.025	7000	1200	47.2	0.02	5600	960	37.8	0.015
		70	9800	1800	70.9	0.015	9100	1400	55.1	0.01	7000	1100	43.3	0.01	5600	880	34.6	0.007
	1.5°	50	11000	2200	86.6	0.04	9800	1800	70.9	0.04	7500	1400	55.1	0.03	6000	1100	43.3	0.02
		60	9800	2100	82.7	0.03	9100	1700	66.9	0.025	7000	1300	51.2	0.02	5600	1000	39.4	0.015
		70	9800	2000	78.7	0.015	9100	1600	63.0	0.01	7000	1200	47.2	0.01	5600	960	37.8	0.007
R2	0.9°	30	10000	3200	126.0	0.3	9400	2600	102.4	0.25	7200	2000	78.7	0.2	5800	1600	63.0	0.15
		40	9500	2400	94.5	0.15	8800	2000	78.7	0.12	6800	1500	59.1	0.1	5400	1200	47.2	0.07
		50	9500	2100	82.7	0.1	8800	1700	66.9	0.1	6800	1300	51.2	0.08	5400	1000	39.4	0.06
		60	9000	1900	74.8	0.07	8300	1600	63.0	0.06	6400	1200	47.2	0.05	5100	960	37.8	0.03
R2.5	0.9°	35	8000	3500	137.8	0.3	7400	2900	114.2	0.25	5700	2200	86.6	0.2	4600	1800	70.9	0.15
		40	8000	3200	126.0	0.2	7400	2600	102.4	0.18	5700	2000	78.7	0.15	4600	1600	63.0	0.1
		60	7600	2400	94.5	0.15	7000	2000	78.7	0.12	5400	1500	59.1	0.1	4300	1200	47.2	0.07

Depth of cut



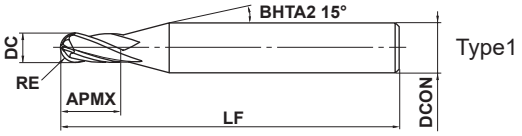
RE : Radius

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

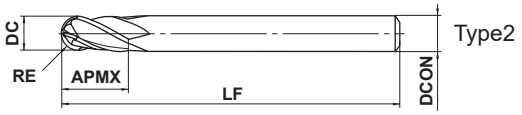
VF4MB

Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type1



Type2

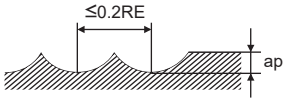
0.5≤RE≤6				
±0.01				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

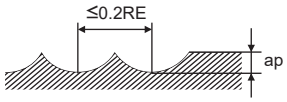
● 4 flute ball nose end mill for high-speed machining of hardened steel.

(mm)

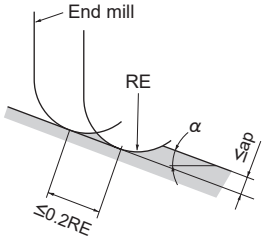
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VF4MBR0050	0.5	1	2.5	50	6	4	●	1
VF4MBR0100	1	2	6	60	6	4	●	1
VF4MBR0150	1.5	3	8	70	6	4	●	1
VF4MBR0200	2	4	8	70	6	4	●	1
VF4MBR0250	2.5	5	12	80	6	4	●	1
VF4MBR0300	3	6	12	80	6	4	●	2
VF4MBR0400	4	8	14	90	8	4	●	2
VF4MBR0500	5	10	18	100	10	4	●	2
VF4MBR0600	6	12	22	110	12	4	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45—55HRC) AISI H13 etc.							Hardened steel (55—62HRC) AISI D2 etc.						
RE (mm)	α≤15°			α>15°			Depth of cut ap (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed			Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)			(mm/min)	(IPM)		(mm/min)	(IPM)	
R0.5	40000	8000	315.0	40000	3800	149.6	0.06	40000	5600	220.5	40000	3100	122.0	0.05
R1	40000	9600	378.0	40000	5600	220.5	0.11	40000	8000	315.0	28000	3100	122.0	0.10
R1.5	40000	12000	472.4	32000	5600	220.5	0.13	32000	7700	303.1	19000	2900	114.2	0.12
R2	32000	11000	433.1	24000	4700	185.0	0.15	24000	6200	244.1	14000	2500	98.4	0.13
R2.5	25000	9000	354.3	19000	3800	149.6	0.20	19000	5300	208.7	12000	2200	86.6	0.15
R3	21000	8400	330.7	15000	3400	133.9	0.25	16000	4800	189.0	9600	2000	78.7	0.20
R4	16000	6400	252.0	12000	2600	102.4	0.30	12000	3600	141.7	7200	1600	63.0	0.20
R5	13000	5200	204.7	9600	2200	86.6	0.50	10000	3200	126.0	5800	1300	51.2	0.20
R6	9000	3600	141.7	7200	1700	66.9	0.50	7000	2200	86.6	4300	940	37.0	0.30
Depth of cut	 RE : Radius													

Workpiece Material	Hardened steel (62—70HRC) AISI W1, AISI M2 etc.						
RE (mm)	α≤15°			α>15°			Depth of cut ap (mm)
	Revolution (min^{-1})	Table feed		Revolution (min^{-1})	Table feed		
		(mm/min)	(IPM)		(mm/min)	(IPM)	
R0.5	40000	4700	185.0	32000	1700	66.9	0.03
R1	24000	5000	196.9	16000	1200	47.2	0.06
R1.5	16000	4200	165.4	11000	1100	43.3	0.07
R2	12000	3100	122.0	8000	1000	39.4	0.08
R2.5	9600	2700	106.3	6000	780	30.7	0.08
R3	8000	2300	90.6	5000	780	30.7	0.09
R4	6000	1900	74.8	4000	620	24.4	0.09
R5	4800	1500	59.1	3000	550	21.7	0.10
R6	3600	1100	43.3	2200	400	15.7	0.10
Depth of cut	 RE : Radius						

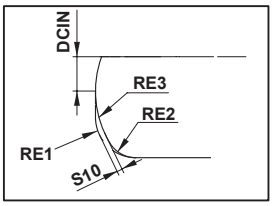
Note 1) α is the inclination of the machined surface.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

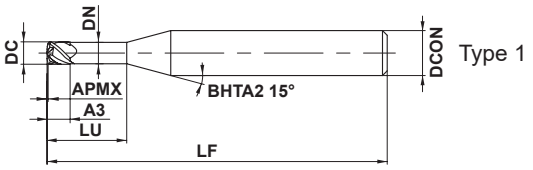


VFFDRB

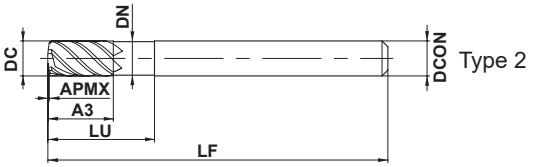
Multi-task corner radius end mill for impact miracle high speed cutting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				





Type 1



Type 2

DC≤12				
0 - 0.020				

DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

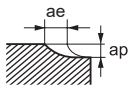
- Multi-task corner radius type allows more efficient high feed.
- Adoption of multiple cuttings realized high feed cutting.

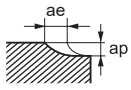
(mm)

Order Number	DC	*1 RE1	APMX	*3 A3	LU	DN	LF	DCON	No. of Flutes	Multi-task radius part S10	DCIN	RE2	RE3	*2 RMPX	Stock	Type
VFFDRBD0300	3	0.64	0.18	3	10	2.8	60	6	4	0.08	0.75	0.5	2	2.1°	●	1
VFFDRBD0400	4	0.71	0.25	4	12	3.8	60	6	4	0.13	1	0.5	3	1.9°	●	1
VFFDRBD0600	6	0.92	0.36	9	18	5.6	80	6	4	0.21	1.5	0.6	5	1.7°	●	2
VFFDRBD0800	8	1.16	0.44	12	24	7.6	90	8	6	0.22	3.2	0.8	4.5	1.7°	●	2
VFFDRBD1000	10	1.47	0.57	15	30	9.4	100	10	6	0.28	4	1	5.5	1.7°	●	2
VFFDRBD1200	12	1.77	0.7	18	36	11.4	110	12	6	0.34	4.8	1.2	6.5	1.8°	●	2

*1 RE1 : Approx. R
*2 RMPX : Max. Ramping Angle
*3 A3 : Cutting Edge Effective Length

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Carbon steel, Alloy steel (180–280HB), Alloy tool steel (≤350HB), Mild steel (≤180HB) AISI 1045, AISI 4140, ASTM A36, AISI 1010							Prehardened steel (35–45HRC) AISI P21, AISI P20, AISI 4340						
Dia. **DC** (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed (mm/min)	Table Feed (IPM)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed (mm/min)	Table Feed (IPM)	Depth of cut ap (mm)	Depth of cut ae (mm)
3	80	8500	0.07	2400	95.5	0.12	1.5	100	11000	0.07	3100	122.0	0.12	1.5
4	80	6400	0.1	2600	102.4	0.16	2	100	8000	0.1	3200	126.0	0.16	2
6	80	4200	0.17	2900	114.2	0.24	3	100	5300	0.17	3600	141.7	0.24	3
8	80	3200	0.17	3300	130.0	0.32	4.8	100	4000	0.17	4100	161.4	0.32	4.8
10	80	2500	0.2	3000	118.1	0.4	6	100	3200	0.2	3800	149.6	0.4	6
12	80	2100	0.22	2800	110.2	0.48	7.2	100	2700	0.22	3600	141.7	0.48	7.2
Depth of cut														

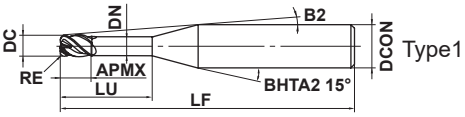
Workpiece Material	Hardened steel (40–55HRC), Ferritic and martensitic stainless steel (>200HB), Precipitation hardening stainless steel (<450HB), AISI H13, L6, AISI 431, AISI 420, 15-5PH, 17-4PH etc.							Hardened steel (55–62HRC) AISI D2 etc.						
Dia. **DC** (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed (mm/min)	Table Feed (IPM)	Depth of cut ap (mm)	Depth of cut ae (mm)	Cutting Speed (m/min)	Main Spindle Revolution (min^{-1})	Feed per Tooth (mm/t.)	Table Feed (mm/min)	Table Feed (IPM)	Depth of cut ap (mm)	Depth of cut ae (mm)
3	80	8500	0.07	2400	94.5	0.12	1.5	40	4200	0.05	840	33.1	0.12	1.5
4	80	6400	0.1	2600	102.4	0.16	2	40	3200	0.07	960	37.8	0.16	2
6	80	4200	0.17	2900	114.2	0.24	3	40	2100	0.15	1300	51.2	0.24	3
8	80	3200	0.17	3300	129.9	0.32	4.8	40	1600	0.15	1400	55.1	0.32	4.8
10	80	2500	0.2	3000	118.1	0.4	6	40	1300	0.17	1300	51.2	0.4	6
12	80	2100	0.22	2800	110.2	0.48	7.2	40	1100	0.2	1300	51.2	0.48	7.2
Depth of cut														

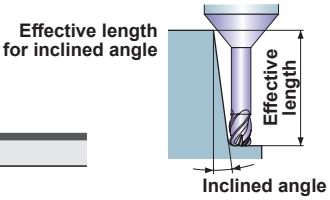
Note 1) When ramping process set the feed rate at 50%. A ramping angle of 1˚ is recommended.
Note 2) Use at a revolution of 70% and feed rate of 50% when the tool overhang exceeds 5D.

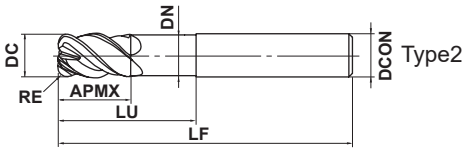
VFHVRB

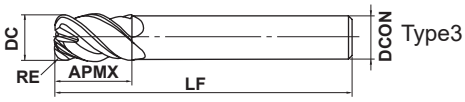
4 flute, Corner radius, Short cut length, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○	○	○		









DC≤10	DC>10		
±0.007	±0.01		
DC≤12	DC>12		
0 -0.02	0 -0.03		
DCON=6	8≤DCON≤10	12≤DCON≤16	
0 -0.008	0 -0.009	0 -0.011	

● Impact Miracle corner radius end mill for high feed and efficient machining.

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VFHVRBD0100R02N004	1	0.2	1	4	0.94	10.6°	60	6	4	●	1	4.2	4.5	4.7	5.3
VFHVRBD0100R02N006	1	0.2	1	6	0.94	9.2°	60	6	4	●	1	6.4	6.7	7.2	7.7
VFHVRBD0100R02N008	1	0.2	1	8	0.94	8.2°	60	6	4	●	1	8.5	8.8	9.5	10.2
VFHVRBD0100R02N010	1	0.2	1	10	0.94	7.4°	60	6	4	●	1	10.5	11	11.8	12.7
VFHVRBD0100R02N015	1	0.2	1	15	0.94	5.9°	60	6	4	★	1	15.8	16.3	17.5	18.9
VFHVRBD0100R02N020	1	0.2	1	20	0.94	4.9°	80	6	4	★	1	20.9	21.7	23.3	25.1
VFHVRBD0150R03N004	1.5	0.3	1.5	4	1.44	10.3°	60	6	4	●	1	4.2	4.5	4.6	5.2
VFHVRBD0150R03N006	1.5	0.3	1.5	6	1.44	8.9°	60	6	4	●	1	6.3	6.6	7.2	7.7
VFHVRBD0150R03N010	1.5	0.3	1.5	10	1.44	7°	60	6	4	●	1	10.5	10.9	11.8	12.7
VFHVRBD0150R03N015	1.5	0.3	1.5	15	1.44	5.5°	60	6	4	●	1	15.7	16.3	17.5	18.9
VFHVRBD0150R03N020	1.5	0.3	1.5	20	1.44	4.6°	80	6	4	★	1	20.9	21.6	23.3	25.1
VFHVRBD0150R03N025	1.5	0.3	1.5	25	1.44	3.9°	80	6	4	★	1	26.1	27	29	31.3
VFHVRBD0150R03N030	1.5	0.3	1.5	30	1.44	3.4°	80	6	4	★	1	31.3	32.3	34.7	37.5
VFHVRBD0200R05N006	2	0.5	2	6	1.9	8.7°	60	6	4	●	1	6.3	6.5	7	7.5
VFHVRBD0200R05N010	2	0.5	2	10	1.9	6.7°	60	6	4	●	1	10.5	10.8	11.6	12.5
VFHVRBD0200R05N015	2	0.5	2	15	1.9	5.2°	60	6	4	●	1	15.6	16.2	17.4	18.7
VFHVRBD0200R05N020	2	0.5	2	20	1.9	4.3°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRBD0200R05N025	2	0.5	2	25	1.9	3.6°	80	6	4	★	1	26	26.9	28.9	31.2
VFHVRBD0200R05N030	2	0.5	2	30	1.9	3.1°	80	6	4	★	1	31.2	32.2	34.6	37.4
VFHVRBD0200R05N035	2	0.5	2	35	1.9	2.8°	90	6	4	★	1	36.3	37.6	40.4	*
VFHVRBD0200R05N040	2	0.5	2	40	1.9	2.5°	90	6	4	★	1	41.5	42.9	46.1	*
VFHVRBD0300R05N010	3	0.5	3	10	2.9	5.6°	60	6	4	●	1	10.5	10.8	11.6	12.5
VFHVRBD0300R05N015	3	0.5	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.4	18.7
VFHVRBD0300R05N020	3	0.5	3	20	2.9	3.4°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRBD0300R05N030	3	0.5	3	30	2.9	2.5°	80	6	4	●	1	31.2	32.2	34.6	*
VFHVRBD0300R08N010	3	0.8	3	10	2.9	5.7°	60	6	4	●	1	10.4	10.8	11.6	12.4
VFHVRBD0300R08N015	3	0.8	3	15	2.9	4.3°	60	6	4	●	1	15.6	16.2	17.3	18.7
VFHVRBD0300R08N020	3	0.8	3	20	2.9	3.5°	80	6	4	●	1	20.8	21.5	23.1	24.9
VFHVRBD0300R08N030	3	0.8	3	30	2.9	2.5°	80	6	4	●	1	31.1	32.2	34.6	*
VFHVRBD0300R08N040	3	0.8	3	40	2.9	2°	90	6	4	★	1	41.5	42.9	*	*
VFHVRBD0300R08N050	3	0.8	3	50	2.9	1.6°	90	6	4	★	1	51.8	53.6	*	*
VFHVRBD0400R05N012	4	0.5	4	12	3.9	3.8°	60	6	4	●	1	12.5	13	13.9	15

* No interference

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFHVRBD0400R05N020	4	0.5	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23.1	*
VFHVRBD0400R05N030	4	0.5	4	30	3.9	1.8°	80	6	4	●	1	31.2	32.2	*	*
VFHVRBD0400R05N048	4	0.5	4	48	3.9	1.2°	90	6	4	★	1	49.8	51.5	*	*
VFHVRBD0400R10N012	4	1	4	12	3.9	3.9°	60	6	4	●	1	12.5	12.9	13.8	14.9
VFHVRBD0400R10N020	4	1	4	20	3.9	2.5°	80	6	4	●	1	20.8	21.5	23	*
VFHVRBD0400R10N030	4	1	4	30	3.9	1.8°	80	6	4	●	1	31.1	32.2	*	*
VFHVRBD0600R05N018	6	0.5	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R05N030	6	0.5	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0600R10N018	6	1	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R10N030	6	1	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0600R10N054	6	1	9	54	5.85	—	90	6	4	★	2	*	*	*	*
VFHVRBD0600R15N018	6	1.5	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R15N030	6	1.5	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0600R15N042	6	1.5	9	42	5.85	—	90	6	4	●	2	*	*	*	*
VFHVRBD0600R15N054	6	1.5	9	54	5.85	—	90	6	4	★	2	*	*	*	*
VFHVRBD0600R20N018	6	2	9	18	5.85	—	60	6	4	●	2	*	*	*	*
VFHVRBD0600R20N030	6	2	9	30	5.85	—	80	6	4	●	2	*	*	*	*
VFHVRBD0700R15	7	1.5	11	—	—	—	80	6	4	★	3	*	*	*	*
VFHVRBD0800R05N024	8	0.5	12	24	7.85	—	60	8	4	★	2	*	*	*	*
VFHVRBD0800R05N040	8	0.5	12	40	7.85	—	100	8	4	★	2	*	*	*	*
VFHVRBD0800R10N024	8	1	12	24	7.85	—	60	8	4	●	2	*	*	*	*
VFHVRBD0800R10N040	8	1	12	40	7.85	—	100	8	4	●	2	*	*	*	*
VFHVRBD0800R20N024	8	2	12	24	7.85	—	60	8	4	●	2	*	*	*	*
VFHVRBD0800R20N040	8	2	12	40	7.85	—	100	8	4	●	2	*	*	*	*
VFHVRBD0800R20N056	8	2	12	56	7.85	—	120	8	4	●	2	*	*	*	*
VFHVRBD0800R20N072	8	2	12	72	7.85	—	120	8	4	●	2	*	*	*	*
VFHVRBD0900R20	9	2	13.5	—	—	—	100	8	4	★	3	*	*	*	*
VFHVRBD1000R05N030	10	0.5	15	30	9.7	—	70	10	4	★	2	*	*	*	*
VFHVRBD1000R05N050	10	0.5	15	50	9.7	—	110	10	4	★	2	*	*	*	*
VFHVRBD1000R10N030	10	1	15	30	9.7	—	70	10	4	●	2	*	*	*	*
VFHVRBD1000R10N050	10	1	15	50	9.7	—	110	10	4	●	2	*	*	*	*
VFHVRBD1000R20N030	10	2	15	30	9.7	—	70	10	4	●	2	*	*	*	*
VFHVRBD1000R20N050	10	2	15	50	9.7	—	110	10	4	●	2	*	*	*	*
VFHVRBD1000R20N070	10	2	15	70	9.7	—	150	10	4	★	2	*	*	*	*
VFHVRBD1000R20N090	10	2	15	90	9.7	—	150	10	4	★	2	*	*	*	*
VFHVRBD1100R20	11	2	16.5	—	—	—	110	10	4	★	3	*	*	*	*
VFHVRBD1200R05N036	12	0.5	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R05N060	12	0.5	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1200R10N036	12	1	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R10N060	12	1	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1200R20N036	12	2	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R20N060	12	2	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1200R20N084	12	2	18	84	11.7	—	160	12	4	★	2	*	*	*	*
VFHVRBD1200R20N108	12	2	18	108	11.7	—	160	12	4	★	2	*	*	*	*
VFHVRBD1200R30N036	12	3	18	36	11.7	—	80	12	4	●	2	*	*	*	*
VFHVRBD1200R30N060	12	3	18	60	11.7	—	120	12	4	●	2	*	*	*	*
VFHVRBD1300R30	13	3	19.5	—	—	—	120	12	4	★	3	*	*	*	*
VFHVRBD1600R05N042	16	0.5	24	42	15.5	—	100	16	4	★	2	*	*	*	*
VFHVRBD1600R20N042	16	2	24	42	15.5	—	100	16	4	★	2	*	*	*	*
VFHVRBD1600R30N042	16	3	24	42	15.5	—	100	16	4	★	2	*	*	*	*
VFHVRBD1600R30N080	16	3	24	80	15.5	—	140	16	4	★	2	*	*	*	*
VFHVRBD1600R30N120	16	3	24	120	15.5	—	175	16	4	★	2	*	*	*	*

* No interference

VFHVRB

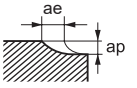
4 flute, Corner radius, Short cut length, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

■High feed conditions

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
1	**0.2**	**4**	40000	7200	283.5	0.04	0.45	33000	5100	200.8	0.03	0.45	27000	4100	161.4	0.025	0.45	20000	1800	70.9	0.013	0.45
1	**0.2**	**6**	40000	6500	255.9	0.03	0.45	33000	4600	181.1	0.022	0.45	27000	3700	145.7	0.018	0.45	20000	1600	63.0	0.01	0.45
1	**0.2**	**8**	32000	4500	177.2	0.022	0.45	27000	3200	126.0	0.018	0.45	21000	2600	102.4	0.012	0.45	16000	1100	43.3	0.008	0.45
1	**0.2**	**10**	24000	2700	106.3	0.015	0.45	20000	1900	74.8	0.01	0.45	16000	1500	59.1	0.008	0.45	12000	700	27.6	0.006	0.45
1	**0.2**	**15**	16000	1200	47.2	0.008	0.45	14000	700	27.6	0.005	0.45	12000	500	19.7	0.003	0.45	10000	400	15.7	0.003	0.45
1	**0.2**	**20**	14000	1000	39.4	0.005	0.45	12000	600	23.6	0.004	0.45	10000	400	15.7	0.002	0.45	9000	300	11.8	0.002	0.45
1.5	**0.3**	**4**	32000	10000	393.7	0.1	0.65	27000	7100	279.5	0.08	0.65	21000	5700	224.4	0.06	0.65	16000	2500	98.4	0.03	0.65
1.5	**0.3**	**6**	32000	7800	307.1	0.08	0.65	27000	5500	216.5	0.06	0.65	21000	4200	165.4	0.05	0.65	16000	2000	78.7	0.025	0.65
1.5	**0.3**	**10**	27000	5700	224.4	0.05	0.65	22000	4000	157.5	0.035	0.65	18000	3000	118.1	0.03	0.65	14000	1400	55.1	0.014	0.65
1.5	**0.3**	**15**	22000	3200	126.0	0.03	0.65	18000	2300	90.6	0.025	0.65	15000	1700	66.9	0.018	0.65	11000	1000	39.4	0.009	0.65
1.5	**0.3**	**20**	16000	1400	55.1	0.02	0.65	14000	1200	47.2	0.016	0.65	13000	1000	39.4	0.012	0.65	9000	700	27.6	0.007	0.65
1.5	**0.3**	**25**	13000	1000	39.4	0.015	0.65	11000	800	31.5	0.012	0.65	10000	700	27.6	0.009	0.65	7500	500	19.7	0.005	0.65
1.5	**0.3**	**30**	13000	900	35.4	0.01	0.65	11000	700	27.6	0.008	0.65	10000	600	23.6	0.006	0.65	7500	400	15.7	0.004	0.65
2	**0.5**	**6**	24000	10000	393.7	0.1	0.75	20000	7100	279.5	0.08	0.75	16000	5700	224.4	0.06	0.75	12000	2500	98.4	0.03	0.75
2	**0.5**	**10**	24000	10000	393.7	0.08	0.75	20000	7100	279.5	0.06	0.75	16000	5700	224.4	0.05	0.75	12000	2500	98.4	0.025	0.75
2	**0.5**	**15**	20000	7000	275.6	0.05	0.75	17000	5000	196.9	0.04	0.75	13000	3200	126.0	0.03	0.75	10000	1800	70.9	0.016	0.75
2	**0.5**	**20**	20000	3600	141.7	0.04	0.75	17000	2600	102.4	0.03	0.75	13000	1800	70.9	0.025	0.75	10000	900	35.4	0.012	0.75
2	**0.5**	**25**	16000	1800	70.9	0.03	0.75	14000	1400	55.1	0.025	0.75	12000	1100	43.3	0.02	0.75	9000	720	28.3	0.01	0.75
2	**0.5**	**30**	16000	1400	55.1	0.025	0.75	14000	1200	47.2	0.02	0.75	12000	900	35.4	0.016	0.75	9000	650	25.6	0.008	0.75
2	**0.5**	**35**	13000	1100	43.3	0.02	0.75	11000	800	31.5	0.018	0.75	10000	700	27.6	0.014	0.75	7000	500	19.7	0.007	0.75
2	**0.5**	**40**	13000	1000	39.4	0.02	0.75	11000	700	27.6	0.015	0.75	10000	600	23.6	0.012	0.75	7000	400	15.7	0.006	0.75
3	**0.5**	**10**	16000	11000	433.1	0.12	1.5	13000	7800	307.1	0.09	1.5	11000	6300	248.0	0.07	1.5	8000	2800	110.2	0.04	1.5
3	**0.5**	**15**	16000	9000	354.3	0.11	1.5	13000	6400	252.0	0.08	1.5	11000	5100	200.8	0.06	1.5	8000	2300	90.6	0.04	1.5
3	**0.5**	**20**	13000	7200	283.5	0.09	1.5	11000	5100	200.8	0.07	1.5	8700	4000	157.5	0.05	1.5	6500	1800	70.9	0.03	1.5
3	**0.5**	**30**	13000	5700	224.4	0.06	1.5	11000	4000	157.5	0.05	1.5	8700	3000	118.1	0.04	1.5	6500	1400	55.1	0.02	1.5
3	**0.8**	**10**	16000	11000	433.1	0.24	1	13000	7800	307.1	0.19	1	11000	6300	248.0	0.14	1	8000	2800	110.2	0.07	1
3	**0.8**	**15**	16000	9000	354.3	0.22	1	13000	6400	252.0	0.17	1	11000	5100	200.8	0.13	1	8000	2300	90.6	0.07	1
3	**0.8**	**20**	13000	7200	283.5	0.19	1	11000	5100	200.8	0.15	1	8700	4000	157.5	0.11	1	6500	1800	70.9	0.06	1
3	**0.8**	**30**	13000	5700	224.4	0.12	1	11000	4000	157.5	0.09	1	8700	3000	118.1	0.07	1	6500	1400	55.1	0.04	1
3	**0.8**	**40**	11000	3600	141.7	0.08	1	9100	2600	102.4	0.06	1	7400	2000	78.7	0.05	1	5500	1000	39.4	0.025	1
3	**0.8**	**50**	8000	2600	102.4	0.07	1	6600	1800	70.9	0.05	1	5800	1500	59.1	0.04	1	4600	800	31.5	0.02	1
4	**0.5**	**12**	8400	6000	236.2	0.15	2	7000	4300	169.3	0.12	2	5600	3400	133.9	0.09	2	4200	1500	59.1	0.05	2
4	**0.5**	**20**	8400	6000	236.2	0.14	2	7000	4300	169.3	0.11	2	5600	3400	133.9	0.08	2	4200	1500	59.1	0.04	2
4	**0.5**	**30**	6900	4900	192.9	0.12	2	5700	3500	137.8	0.09	2	4600	2800	110.2	0.07	2	3500	1200	47.2	0.03	2
4	**0.5**	**48**	5600	2000	78.7	0.07	2	4600	1400	55.1	0.05	2	3800	1100	43.3	0.04	2	2800	500	19.7	0.02	2
4	**1**	**12**	12000	12000	472.4	0.3	1.5	10000	8500	334.6	0.23	1.5	8000	6800	267.7	0.18	1.5	6000	3000	118.1	0.1	1.5
4	**1**	**20**	12000	12000	472.4	0.27	1.5	10000	8500	334.6	0.21	1.5	8000	6800	267.7	0.16	1.5	6000	3000	118.1	0.08	1.5
4	**1**	**30**	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
6	**0.5**	**18**	4000	3900	153.5	0.15	3.5	3300	2800	110.2	0.12	3.5	2700	2200	86.6	0.09	3.5	2000	1000	39.4	0.05	3.5
6	**0.5**	**30**	4000	3900	153.5	0.14	3.5	3300	2800	110.2	0.11	3.5	2700	2200	86.6	0.08	3.5	2000	1000	39.4	0.04	3.5
6	**1**	**18**	8000	13000	511.8	0.5	3	6600	9200	362.2	0.4	3	5400	7400	291.3	0.3	3	4000	3300	129.9	0.15	3
6	**1**	**30**	8000	13000	511.8	0.45	3	6600	9200	362.2	0.35	3	5400	7400	291.3	0.27	3	4000	3300	129.9	0.14	3
6	**1**	**54**	6600	11000	433.1	0.25	3	5500	7800	307.1	0.2	3	4400	6300	248.0	0.15	3	3300	2800	110.2	0.08	3
6	**1.5**	**18**	8000	13000	511.8	0.5	2	6600	9200	362.2	0.4	2	5400	7400	291.3	0.3	2	4000	3300	129.9	0.15	2
6	**1.5**	**30**	8000	13000	511.8	0.45	2	6600	9200	362.2	0.35	2	5400	7400	291.3	0.27	2	4000	3300	129.9	0.14	2
6	**1.5**	**42**	6600	11000	433.1	0.4	2	5500	7800	307.1	0.3	2	4400	6300	248.0	0.24	2	3300	2800	110.2	0.12	2
6	**1.5**	**54**	6600	11000	433.1	0.25	2	5500	7800	307.1	0.2	2	4400	6300	248.0	0.15	2	3300	2800	110.2	0.08	2
6	**2**	**18**	8000	13000	511.8	0.5	1.5	6600	9200	362.2	0.4	1.5	5400	7400	291.3	0.3	1.5	4000	3300	129.9	0.15	1.5
6	**2**	**30**	8000	13000	511.8	0.45	1.5	6600	9200	362.2	0.35	1.5	5400	7400	291.3	0.27	1.5	4000	3300	129.9	0.14	1.5

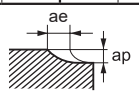
Depth of cut



Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Using air blow or mist is recommended.

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
7	**1.5**	—	6800	13000	511.8	0.5	3	5600	9200	362.2	0.4	3	4600	7400	291.3	0.3	3	3400	3300	129.9	0.15	3
8	**0.5**	**24**	3000	3900	153.5	0.18	5	2500	2800	110.2	0.14	5	2000	2200	86.6	0.11	5	1500	1000	39.4	0.05	5
8	**0.5**	**40**	3000	3900	153.5	0.16	5	2500	2800	110.2	0.12	5	2000	2200	86.6	0.1	5	1500	1000	39.4	0.05	5
8	**1**	**24**	4200	6500	255.9	0.3	4.5	3500	4600	181.1	0.23	4.5	2800	3700	145.7	0.18	4.5	2100	1600	63.0	0.09	4.5
8	**1**	**40**	4200	6500	255.9	0.27	4.5	3500	4600	181.1	0.21	4.5	2800	3700	145.7	0.16	4.5	2100	1600	63.0	0.08	4.5
8	**2**	**24**	6000	13000	511.8	0.6	3	5000	9200	362.2	0.46	3	4000	7400	291.3	0.36	3	3000	3300	129.9	0.18	3
8	**2**	**40**	6000	13000	511.8	0.54	3	5000	9200	362.2	0.42	3	4000	7400	291.3	0.32	3	3000	3300	129.9	0.16	3
8	**2**	**56**	5000	11000	433.1	0.48	3	4200	7800	307.1	0.37	3	3400	6300	248.0	0.3	3	2500	2800	110.2	0.14	3
8	**2**	**72**	5000	11000	433.1	0.3	3	4200	7800	307.1	0.23	3	3400	6300	248.0	0.2	3	2500	2800	110.2	0.09	3
9	**2**	—	5300	13000	511.8	0.6	3.5	4400	9200	362.2	0.46	3.5	3600	7400	291.3	0.36	3.5	2700	3300	129.9	0.18	3.5
10	**0.5**	**30**	2400	3900	153.5	0.18	6.5	2000	2800	110.2	0.14	6.5	1600	2200	86.6	0.11	6.5	1200	1000	39.4	0.05	6.5
10	**0.5**	**50**	2400	3900	153.5	0.16	6.5	2000	2800	110.2	0.12	6.5	1600	2200	86.6	0.1	6.5	1200	1000	39.4	0.05	6.5
10	**1**	**30**	3300	6500	255.9	0.3	6	2700	4600	181.1	0.23	6	2200	3700	145.7	0.18	6	1700	1600	63.0	0.09	6
10	**1**	**50**	3300	6500	255.9	0.27	6	2700	4600	181.1	0.21	6	2200	3700	145.7	0.16	6	1700	1600	63.0	0.08	6
10	**2**	**30**	4800	13000	511.8	0.6	4.5	4000	9200	362.2	0.46	4.5	3200	7400	291.3	0.36	4.5	2400	3300	129.9	0.18	4.5
10	**2**	**50**	4800	13000	511.8	0.54	4.5	4000	9200	362.2	0.42	4.5	3200	7400	291.3	0.32	4.5	2400	3300	129.9	0.16	4.5
10	**2**	**70**	4000	11000	433.1	0.48	4.5	3300	7800	307.1	0.37	4.5	2700	6300	248.0	0.3	4.5	2000	2800	110.2	0.14	4.5
10	**2**	**90**	4000	11000	433.1	0.48	4.5	3300	7800	307.1	0.37	4.5	2700	6300	248.0	0.3	4.5	2000	2800	110.2	0.14	4.5
11	**2**	—	4300	12000	472.4	0.6	5	3600	8500	334.6	0.46	5	2900	6800	267.7	0.36	5	2200	3000	118.1	0.18	5
12	**0.5**	**36**	2000	3600	141.7	0.27	8	1700	2600	102.4	0.21	8	1300	2100	82.7	0.14	8	1000	900	35.4	0.07	8
12	**0.5**	**60**	2000	3600	141.7	0.24	8	1700	2600	102.4	0.18	8	1300	2100	82.7	0.12	8	1000	900	35.4	0.06	8
12	**1**	**36**	2400	4800	189.0	0.36	7.5	2000	3400	133.9	0.28	7.5	1600	2700	106.3	0.18	7.5	1200	1200	47.2	0.09	7.5
12	**1**	**60**	2400	4800	189.0	0.32	7.5	2000	3400	133.9	0.25	7.5	1600	2700	106.3	0.16	7.5	1200	1200	47.2	0.08	7.5
12	**2**	**36**	4000	12000	472.4	0.9	6	3300	8500	334.6	0.7	6	2700	6800	267.7	0.45	6	2000	3000	118.1	0.23	6
12	**2**	**60**	4000	12000	472.4	0.8	6	3300	8500	334.6	0.6	6	2700	6800	267.7	0.4	6	2000	3000	118.1	0.2	6
12	**2**	**84**	3300	9900	389.8	0.7	6	2700	7000	275.6	0.55	6	2200	5600	220.5	0.36	6	1700	2500	98.4	0.18	6
12	**2**	**108**	3300	9900	389.8	0.45	6	2700	7000	275.6	0.35	6	2200	5600	220.5	0.23	6	1700	2500	98.4	0.11	6
12	**3**	**36**	4000	12000	472.4	0.9	4.5	3300	8500	334.6	0.7	4.5	2700	6800	267.7	0.45	4.5	2000	3000	118.1	0.23	4.5
12	**3**	**60**	4000	12000	472.4	0.8	4.5	3300	8500	334.6	0.6	4.5	2700	6800	267.7	0.4	4.5	2000	3000	118.1	0.2	4.5
13	**3**	—	3700	12000	472.4	0.9	5	3100	8500	334.6	0.7	5	2500	6800	267.7	0.45	5	1900	3000	118.1	0.23	5
16	**0.5**	**42**	1500	3000	118.1	0.27	11	1200	2100	82.7	0.21	11	1000	1700	66.9	0.12	11	750	750	29.5	0.05	11
16	**2**	**42**	2100	5000	196.9	0.45	9	1700	3600	141.7	0.35	9	1400	2900	114.2	0.2	9	1100	1300	51.2	0.08	9
16	**3**	**42**	3000	10000	393.7	0.9	7.5	2500	7100	279.5	0.7	7.5	2000	5700	224.4	0.4	7.5	1500	2500	98.4	0.15	7.5
16	**3**	**80**	3000	10000	393.7	0.8	7.5	2500	7100	279.5	0.6	7.5	2000	5700	224.4	0.37	7.5	1500	2500	98.4	0.14	7.5
16	**3**	**120**	2500	8300	326.8	0.7	7.5	2100	5900	232.3	0.55	7.5	1700	4700	185.0	0.32	7.5	1300	2100	82.7	0.12	7.5

Depth of cut



Note 3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece material and depth of cut.
Note 4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFHVRB

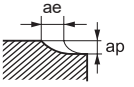
4 flute, Corner radius, Short cut length, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

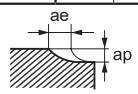
■High depth of cut conditions

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min⁻¹)	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
1	**0.2**	**4**	24000	2200	86.6	0.08	0.45	20000	1500	59.1	0.07	0.45	16000	1200	47.2	0.05	0.45	12000	550	21.7	0.025	0.45
1	**0.2**	**6**	24000	2000	78.7	0.07	0.45	20000	1400	55.1	0.05	0.45	16000	1100	43.3	0.04	0.45	12000	500	19.7	0.02	0.45
1	**0.2**	**8**	19000	1400	55.1	0.05	0.45	16000	1000	39.4	0.04	0.45	13000	800	31.5	0.03	0.45	9500	350	13.8	0.016	0.45
1	**0.2**	**10**	14000	800	31.5	0.04	0.45	12000	600	23.6	0.03	0.45	9000	400	15.7	0.025	0.45	7000	200	7.9	0.012	0.45
1	**0.2**	**15**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1	**0.2**	**20**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.5	**0.3**	**4**	19000	3000	118.1	0.2	0.65	16000	2100	82.7	0.16	0.65	13000	1700	66.9	0.12	0.65	9500	750	29.5	0.06	0.65
1.5	**0.3**	**6**	19000	2300	90.6	0.16	0.65	16000	1600	63.0	0.13	0.65	13000	1300	51.2	0.1	0.65	9500	580	22.8	0.05	0.65
1.5	**0.3**	**10**	16000	1700	66.9	0.1	0.65	13000	1200	47.2	0.07	0.65	11000	1000	39.4	0.05	0.65	8000	430	16.9	0.03	0.65
1.5	**0.3**	**15**	13000	1000	39.4	0.06	0.65	11000	700	27.6	0.05	0.65	9000	600	23.6	0.04	0.65	6500	250	9.8	0.018	0.65
1.5	**0.3**	**20**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.5	**0.3**	**25**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1.5	**0.3**	**30**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	**0.5**	**6**	14000	3000	118.1	0.2	0.75	12000	2100	82.7	0.16	0.75	9400	1700	66.9	0.12	0.75	7000	750	29.5	0.06	0.75
2	**0.5**	**10**	14000	3000	118.1	0.16	0.75	12000	2100	82.7	0.13	0.75	9400	1700	66.9	0.1	0.75	7000	750	29.5	0.05	0.75
2	**0.5**	**15**	12000	2100	82.7	0.1	0.75	10000	1500	59.1	0.08	0.75	8000	1200	47.2	0.06	0.75	6000	530	20.9	0.03	0.75
2	**0.5**	**20**	12000	1100	43.3	0.08	0.75	10000	800	31.5	0.06	0.75	8000	600	23.6	0.05	0.75	6000	280	11.0	0.025	0.75
2	**0.5**	**25**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	**0.5**	**30**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	**0.5**	**35**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	**0.5**	**40**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	**0.5**	**10**	9600	3300	129.9	0.24	1.5	8000	2300	90.6	0.2	1.5	6400	1800	70.9	0.14	1.5	4800	830	32.7	0.07	1.5
3	**0.5**	**15**	9600	2700	106.3	0.22	1.5	8000	1900	74.8	0.17	1.5	6400	1500	59.1	0.13	1.5	4800	680	26.8	0.06	1.5
3	**0.5**	**20**	7800	2200	86.6	0.18	1.5	6500	1500	59.1	0.14	1.5	5200	1200	47.2	0.11	1.5	3900	550	21.7	0.05	1.5
3	**0.5**	**30**	7800	1700	66.9	0.12	1.5	6500	1200	47.2	0.1	1.5	5200	1000	39.4	0.07	1.5	3900	430	16.9	0.04	1.5
3	**0.8**	**10**	9600	3300	129.9	0.5	1	8000	2300	90.6	0.4	1	6400	1800	70.9	0.3	1	4800	830	32.7	0.14	1
3	**0.8**	**15**	9600	2700	106.3	0.5	1	8000	1900	74.8	0.35	1	6400	1500	59.1	0.25	1	4800	680	26.8	0.13	1
3	**0.8**	**20**	7800	2200	86.6	0.4	1	6500	1500	59.1	0.3	1	5200	1200	47.2	0.23	1	3900	550	21.7	0.11	1
3	**0.8**	**30**	7800	1700	66.9	0.24	1	6500	1200	47.2	0.2	1	5200	1000	39.4	0.14	1	3900	430	16.9	0.05	1
3	**0.8**	**40**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
3	**0.8**	**50**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	**0.5**	**12**	5000	1800	70.9	0.3	2	4200	1300	51.2	0.24	2	3400	1000	39.4	0.18	2	2500	450	17.7	0.06	2
4	**0.5**	**20**	5000	1800	70.9	0.3	2	4200	1300	51.2	0.22	2	3400	1000	39.4	0.17	2	2500	450	17.7	0.06	2
4	**0.5**	**30**	4100	1500	59.1	0.24	2	3400	1100	43.3	0.19	2	2700	840	33.1	0.14	2	2100	380	15.0	0.05	2
4	**0.5**	**48**	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	**1**	**12**	7200	3600	141.7	0.6	1.5	6000	2500	98.4	0.5	1.5	4800	2000	78.7	0.36	1.5	3600	900	35.4	0.12	1.5
4	**1**	**20**	7200	3600	141.7	0.6	1.5	6000	2500	98.4	0.4	1.5	4800	2000	78.7	0.32	1.5	3600	900	35.4	0.11	1.5
4	**1**	**30**	6000	3000	118.1	0.5	1.5	5000	2100	82.7	0.4	1.5	4000	1700	66.9	0.3	1.5	3000	750	29.5	0.1	1.5
6	**0.5**	**18**	2400	1200	47.2	0.3	3.5	2000	840	33.1	0.24	3.5	1600	670	26.4	0.18	3.5	1200	300	11.8	0.06	3.5
6	**0.5**	**30**	2400	1200	47.2	0.3	3.5	2000	840	33.1	0.22	3.5	1600	670	26.4	0.17	3.5	1200	300	11.8	0.06	3.5
6	**1**	**18**	4800	3900	153.5	1	3	4000	2700	106.3	0.8	3	3200	2200	86.6	0.6	3	2400	980	38.6	0.2	3
6	**1**	**30**	4800	3900	153.5	0.9	3	4000	2700	106.3	0.7	3	3200	2200	86.6	0.5	3	2400	980	38.6	0.18	3
6	**1**	**54**	4000	3300	129.9	0.5	3	3300	2300	90.6	0.4	3	2700	1800	70.9	0.3	3	2000	830	32.7	0.1	3
6	**1.5**	**18**	4800	3900	153.5	1	2	4000	2700	106.3	0.8	2	3200	2200	86.6	0.6	2	2400	980	38.6	0.2	2
6	**1.5**	**30**	4800	3900	153.5	0.9	2	4000	2700	106.3	0.7	2	3200	2200	86.6	0.5	2	2400	980	38.6	0.18	2
6	**1.5**	**42**	4000	3300	129.9	0.8	2	3300	2300	90.6	0.6	2	2700	1800	70.9	0.5	2	2000	830	32.7	0.16	2
6	**1.5**	**54**	4000	3300	129.9	0.5	2	3300	2300	90.6	0.4	2	2700	1800	70.9	0.3	2	2000	830	32.7	0.1	2
6	**2**	**18**	4800	3900	153.5	1	1.5	4000	2700	106.3	0.8	1.5	3200	2200	86.6	0.6	1.5	2400	980	38.6	0.2	1.5
6	**2**	**30**	4800	3900	153.5	0.9	1.5	4000	2700	106.3	0.7	1.5	3200	2200	86.6	0.5	1.5	2400	980	38.6	0.18	1.5

Depth of cut



Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Using air blow or mist is recommended.

Workpiece Material			Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI 35, AISI P20 etc.					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1−10, AISI P21 etc.					Hardened steel (45−55HRC) AISI H13 etc.					Hardened steel (55−62HRC) AISI D2 etc.				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
7	**1.5**	—	4100	3900	153.5	1	3	3400	2700	106.3	0.8	3	2700	2200	86.6	0.6	3	2100	980	38.6	0.2	3
8	**0.5**	**24**	1800	1200	47.2	0.35	5	1500	840	33.1	0.3	5	1200	670	26.4	0.2	5	900	300	11.8	0.07	5
8	**0.5**	**40**	1800	1200	47.2	0.3	5	1500	840	33.1	0.25	5	1200	670	26.4	0.2	5	900	300	11.8	0.06	5
8	**1**	**24**	2500	2000	78.7	0.6	4.5	2100	1400	55.1	0.5	4.5	1700	1100	43.3	0.4	4.5	1300	500	19.7	0.12	4.5
8	**1**	**40**	2500	2000	78.7	0.5	4.5	2100	1400	55.1	0.4	4.5	1700	1100	43.3	0.3	4.5	1300	500	19.7	0.11	4.5
8	**2**	**24**	3600	3900	153.5	1.2	3	3000	2700	106.3	1	3	2400	2200	86.6	0.7	3	1800	980	38.6	0.24	3
8	**2**	**40**	3600	3900	153.5	1.1	3	3000	2700	106.3	0.9	3	2400	2200	86.6	0.7	3	1800	980	38.6	0.22	3
8	**2**	**56**	3000	3300	129.9	1	3	2500	2300	90.6	0.8	3	2000	1800	70.9	0.6	3	1500	830	32.7	0.2	3
8	**2**	**72**	3000	3300	129.9	0.6	3	2500	2300	90.6	0.5	3	2000	1800	70.9	0.4	3	1500	830	32.7	0.12	3
9	**2**	—	3200	3900	153.5	1.2	3.5	2700	2700	106.3	1	3.5	2100	2200	86.6	0.7	3.5	1600	980	38.6	0.24	3.5
10	**0.5**	**30**	1400	1200	47.2	0.35	6.5	1200	840	33.1	0.3	6.5	940	670	26.4	0.2	6.5	700	300	11.8	0.07	6.5
10	**0.5**	**50**	1400	1200	47.2	0.3	6.5	1200	840	33.1	0.25	6.5	940	670	26.4	0.2	6.5	700	300	11.8	0.06	6.5
10	**1**	**30**	2000	2000	78.7	0.6	6	1700	1400	55.1	0.5	6	1300	1100	43.3	0.4	6	1000	500	19.7	0.12	6
10	**1**	**50**	2000	2000	78.7	0.5	6	1700	1400	55.1	0.4	6	1300	1100	43.3	0.3	6	1000	500	19.7	0.11	6
10	**2**	**30**	2900	3900	153.5	1.2	4.5	2400	2700	106.3	1	4.5	1900	2200	86.6	0.7	4.5	1500	980	38.6	0.24	4.5
10	**2**	**50**	2900	3900	153.5	1.1	4.5	2400	2700	106.3	0.9	4.5	1900	2200	86.6	0.7	4.5	1500	980	38.6	0.22	4.5
10	**2**	**70**	2400	3300	129.9	1	4.5	2000	2300	90.6	0.8	4.5	1600	1800	70.9	0.6	4.5	1200	830	32.7	0.2	4.5
10	**2**	**90**	2400	3300	129.9	1	4.5	2000	2300	90.6	0.8	4.5	1600	1800	70.9	0.6	4.5	1200	830	32.7	0.2	4.5
11	**2**	—	2600	3600	141.7	1.2	5	2200	2500	98.4	1	5	1700	2000	78.7	0.7	5	1300	900	35.4	0.24	5
12	**0.5**	**36**	1200	1100	43.3	0.5	8	1000	770	30.3	0.4	8	800	620	24.4	0.3	8	600	280	11.0	0.11	8
12	**0.5**	**60**	1200	1100	43.3	0.5	8	1000	770	30.3	0.4	8	800	620	24.4	0.3	8	600	280	11.0	0.1	8
12	**1**	**36**	1400	1400	55.1	0.7	7.5	1200	1000	39.4	0.6	7.5	940	780	30.7	0.4	7.5	700	350	13.8	0.14	7.5
12	**1**	**60**	1400	1400	55.1	0.6	7.5	1200	1000	39.4	0.5	7.5	940	780	30.7	0.4	7.5	700	350	13.8	0.13	7.5
12	**2**	**36**	2400	3600	141.7	1.8	6	2000	2500	98.4	1.4	6	1600	2000	78.7	1.1	6	1200	900	35.4	0.4	6
12	**2**	**60**	2400	3600	141.7	1.6	6	2000	2500	98.4	1.3	6	1600	2000	78.7	1	6	1200	900	35.4	0.3	6
12	**2**	**84**	2000	3000	118.1	1.4	6	1700	2100	82.7	1.1	6	1300	1700	66.9	0.8	6	1000	750	29.5	0.3	6
12	**2**	**108**	2000	3000	118.1	0.9	6	1700	2100	82.7	0.7	6	1300	1700	66.9	0.5	6	1000	750	29.5	0.2	6
12	**3**	**36**	2400	3600	141.7	1.8	4.5	2000	2500	98.4	1.4	4.5	1600	2000	78.7	1.1	4.5	1200	900	35.4	0.4	4.5
12	**3**	**60**	2400	3600	141.7	1.6	4.5	2000	2500	98.4	1.3	4.5	1600	2000	78.7	1	4.5	1200	900	35.4	0.3	4.5
13	**3**	—	2200	3600	141.7	1.8	5	1800	2500	98.4	1.4	5	1500	2000	78.7	1.1	5	1100	900	35.4	0.4	5
16	**0.5**	**42**	900	900	35.4	0.5	11	750	630	24.8	0.4	11	600	500	19.7	0.3	11	450	230	9.1	0.1	11
16	**2**	**42**	1300	1500	59.1	0.9	9	1100	1100	43.3	0.7	9	870	840	33.1	0.5	9	650	380	15.0	0.2	9
16	**3**	**42**	1800	3000	118.1	1.8	7.5	1500	2100	82.7	1.4	7.5	1200	1700	66.9	0.9	7.5	900	750	29.5	0.4	7.5
16	**3**	**80**	1800	3000	118.1	1.6	7.5	1500	2100	82.7	1.3	7.5	1200	1700	66.9	0.8	7.5	900	750	29.5	0.3	7.5
16	**3**	**120**	1500	2500	98.4	1.4	7.5	1200	1800	70.9	1.1	7.5	1000	1400	55.1	0.7	7.5	750	630	24.8	0.3	7.5
Depth of cut																						

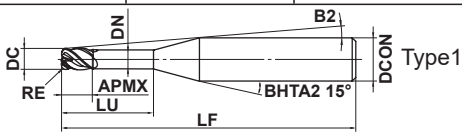
Note 3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece material and depth of cut.
Note 4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFHVRB – Inch sizes

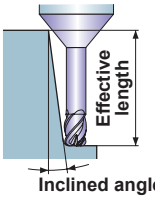
4 flute, Corner radius, Short cut length, Irregular helix flutes

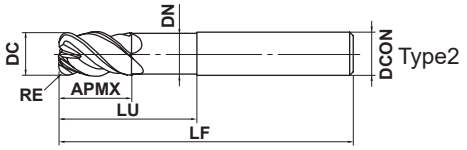
UWC VF γ 43° 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○	○	○		



Effective length for inclined angle





DC≤.5000"				
±.0004"				
DC≤.5000"				
0 - .0008"				
.2500"≤DCON≤.3750"	DCON=.5000"			
h6	0 - .00035	0 - .00043		

● Impact Miracle corner radius end mill for high feed and efficient machining.

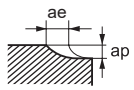
(inch)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VFHVRBD1/8N3DR0.03	.1250	.030	.125	.375	.1211	6.1°	2.25	.2500	4	●	1	9.9	10.3	11	11.9
VFHVRBD1/8N5DR0.03	.1250	.030	.125	.625	.1211	4.3°	2.25	.2500	4	●	1	16.5	17.1	18.3	19.8
VFHVRBD3/16N3DR0.05	.1875	.050	.188	.563	.1835	2.9°	2.25	.2500	4	●	1	14.9	15.4	16.4	*
VFHVRBD3/16N5DR0.05	.1875	.050	.188	.938	.1835	1.8°	2.25	.2500	4	●	1	24.7	25.6	*	*
VFHVRBD1/4N3DR0.06	.2500	.060	.375	.750	.2441	–	2.25	.2500	4	●	2	*	*	*	*
VFHVRBD1/4N5DR0.06	.2500	.060	.375	1.250	.2441	–	3.00	.2500	4	●	2	*	*	*	*
VFHVRBD5/16N3DR0.08	.3125	.080	.469	.938	.3066	–	3.00	.3125	4	●	2	*	*	*	*
VFHVRBD5/16N5DR0.08	.3125	.080	.469	1.563	.3066	–	4.00	.3125	4	●	2	*	*	*	*
VFHVRBD3/8N3DR0.08	.3750	.080	.563	1.125	.3691	–	3.00	.3750	4	●	2	*	*	*	*
VFHVRBD3/8N5DR0.08	.3750	.080	.563	1.875	.3691	–	4.00	.3750	4	●	2	*	*	*	*
VFHVRBD1/2N3DR0.12	.5000	.120	.750	1.500	.4882	–	4.00	.5000	4	●	2	*	*	*	*
VFHVRBD1/2N5DR0.12	.5000	.120	.750	2.500	.4882	–	5.00	.5000	4	●	2	*	*	*	*

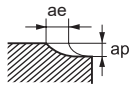
* No interference

RECOMMENDED CUTTING CONDITIONS

■High feed conditions

Workpiece Material			Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1049, AISI 30, AISI P20					Alloy steel, Tool steel, Pre-haedened steel AIAI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
DC (inch)	RE (inch)	LU (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
.1250	**.03**	**.375**	16000	11000	433.1	.009	.039	13000	7800	307.1	.007	.039	11000	6300	248	.006	.039	8000	2800	110.2	.003	.039
.1250	**.03**	**.625**	16000	9000	354.3	.009	.039	13000	6400	252	.007	.039	11000	5100	200.8	.006	.039	8000	2300	90.6	.003	.039
.1875	**.05**	**.563**	12000	12000	472.4	.012	.059	10000	8500	334.6	.009	.059	8000	6800	267.7	.007	.059	6000	3000	118.1	.004	.059
.1875	**.05**	**.938**	12000	12000	472.4	.011	.059	10000	8500	334.6	.008	.059	8000	6800	267.7	.006	.059	6000	3000	118.1	.003	.059
.2500	**.06**	**.750**	8000	13000	511.8	.020	.078	6600	9200	362.2	.016	.078	5400	7400	291.3	.012	.078	4000	3300	129.9	.006	.078
.2500	**.06**	**1.250**	8000	13000	511.8	.018	.078	6600	9200	362.2	.014	.078	5400	7400	291.3	.011	.078	4000	3300	129.9	.006	.078
.3125	**.08**	**.938**	6000	13000	511.8	.024	.118	5000	9200	362.2	.018	.118	4000	7400	291.3	.014	.118	3000	3300	129.9	.007	.118
.3125	**.08**	**1.563**	6000	13000	511.8	.021	.118	5000	9200	362.2	.017	.118	4000	7400	291.3	.013	.118	3000	3300	129.9	.006	.118
.3750	**.08**	**1.125**	4800	13000	511.8	.024	.177	4000	9200	362.2	.018	.177	3200	7400	291.3	.014	.177	2400	3300	129.9	.007	.177
.3750	**.08**	**1.875**	4800	13000	511.8	.021	.177	4000	9200	362.2	.017	.177	3200	7400	291.3	.013	.177	2400	3300	129.9	.006	.177
.5000	**.12**	**1.500**	4000	12000	472.4	.035	.177	3300	8500	334.6	.028	.177	2700	6800	267.7	.018	.177	2000	3000	118.1	.009	.177
.5000	**.12**	**2.500**	4000	12000	472.4	.031	.177	3300	8500	334.6	.024	.177	2700	6800	267.7	.016	.177	2000	3000	118.1	.008	.177
Depth of cut																						

■High depth of cut conditions

Workpiece Material			Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1049, AISI 30, AISI P20					Alloy steel, Tool steel, Pre-haedened steel AIAI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
DC (inch)	RE (inch)	LU (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (inch)	Width of cut ae (inch)
.1250	**.03**	**.375**	9600	3300	129.9	.020	.039	8000	2300	90.6	.016	.039	6400	1800	70.9	.012	.039	4800	830	32.7	.006	.039
.1250	**.03**	**.625**	9600	2700	106.3	.020	.039	8000	1900	74.8	.014	.039	6400	1500	59.1	.010	.039	4800	680	26.8	.005	.039
.1875	**.05**	**.563**	7200	3600	141.7	.024	.059	6000	2500	98.4	.020	.059	4800	2000	78.7	.014	.059	3600	900	35.4	.005	.059
.1875	**.05**	**.938**	7200	3600	141.7	.024	.059	6000	2500	98.4	.016	.059	4800	2000	78.7	.013	.059	3600	900	35.4	.004	.059
.2500	**.06**	**.750**	4000	3300	129.9	.020	.118	3300	2300	90.6	.016	.118	2700	1800	70.9	.012	.118	2000	830	32.7	.004	.118
.2500	**.06**	**1.250**	4800	3900	153.5	.040	.079	4000	2700	106.3	.031	.079	3200	2200	86.6	.024	.079	2400	980	38.6	.008	.079
.3125	**.08**	**.938**	3600	3900	153.5	.047	.118	3000	2700	106.3	.040	.118	2400	2200	86.6	.028	.118	1800	980	38.6	.009	.118
.3125	**.08**	**1.563**	3600	3900	153.5	.043	.118	3000	2700	106.3	.035	.118	2400	2200	86.6	.028	.118	1800	980	38.6	.009	.118
.3750	**.08**	**1.125**	2900	3900	153.5	.047	.177	2400	2700	106.3	.040	.177	1900	2200	86.6	.028	.177	1500	980	38.6	.009	.177
.3750	**.08**	**1.875**	2900	3900	153.5	.043	.177	2400	2700	106.3	.035	.177	1900	2200	86.6	.028	.177	1500	980	38.6	.009	.177
.5000	**.12**	**1.500**	2400	3600	141.7	.071	.177	2000	2500	98.4	.055	.177	1600	2000	78.7	.043	.177	1200	900	35.4	.016	.177
.5000	**.12**	**2.500**	2400	3600	141.7	.063	.177	2000	2500	98.4	.051	.177	1600	2000	78.7	.040	.177	1200	900	35.4	.012	.177
Depth of cut																						

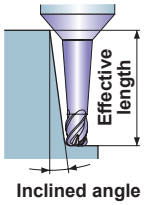
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) Using air blow or mist is recommended.
Note 3) When contour milling, cutting conditions can vary greatly due to the geometry of the workpiece material and depth of cut.
Note 4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

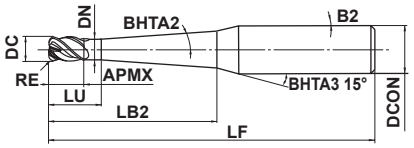
VFHVRB

4 flute, Corner radius, Short cut length, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎	○	○	○		

Taper neck type





DC≤10	DC>10		
±0.007	±0.01		
DC≤12			
0 - 0.02			
DCON=6	8≤DCON≤10	12≤DCON≤16	
0 - 0.008	0 - 0.009	0 - 0.011	

● Impact Miracle corner radius end mill for high feed and efficient machining.

(mm)

Order Number	DC	RE	BHTA2	APMX	LU	LB2	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle 0.5°	1°	2°	3°
VFHVRBD010R02N006T09	1	0.2	0.9°	1	2.5	6	0.94	9.3°	60	6	4	●	—	6.6	7.1	7.6
VFHVRBD010R02N010T09	1	0.2	0.9°	1	2.5	10	0.94	7.5°	60	6	4	●	—	10.6	11.4	12.3
VFHVRBD010R02N015T09	1	0.2	0.9°	1	2.5	15	0.94	6.1°	60	6	4	●	—	15.6	16.8	18.1
VFHVRBD010R02N020T09	1	0.2	0.9°	1	2.5	20	0.94	5.1°	80	6	4	★	—	20.6	22.1	23.9
VFHVRBD010R02N025T09	1	0.2	0.9°	1	2.5	25	0.94	4.4°	80	6	4	★	—	25.6	27.5	29.7
VFHVRBD010R02N030T09	1	0.2	0.9°	1	2.5	30	0.94	3.8°	80	6	4	★	—	30.6	32.9	35.5
VFHVRBD010R02N035T09	1	0.2	0.9°	1	2.5	35	0.94	3.4°	90	6	4	★	—	35.6	38.3	41.3
VFHVRBD010R02N040T09	1	0.2	0.9°	1	2.5	40	0.94	3.1°	90	6	4	★	—	40.6	43.6	47.2
VFHVRBD010R02N045T09	1	0.2	0.9°	1	2.5	45	0.94	2.8°	90	6	4	★	—	45.6	49	*
VFHVRBD010R02N050T09	1	0.2	0.9°	1	2.5	50	0.94	2.6°	90	6	4	★	—	50.6	54.4	*
VFHVRBD015R03N010T09	1.5	0.3	0.9°	1.5	3	10	1.44	7.1°	60	6	4	●	—	10.6	11.4	12.3
VFHVRBD015R03N015T09	1.5	0.3	0.9°	1.5	3	15	1.44	5.7°	60	6	4	●	—	15.6	16.8	18.1
VFHVRBD015R03N020T09	1.5	0.3	0.9°	1.5	3	20	1.44	4.7°	80	6	4	●	—	20.6	22.2	23.9
VFHVRBD015R03N030T09	1.5	0.3	0.9°	1.5	3	30	1.44	3.5°	80	6	4	★	—	30.6	32.9	35.6
VFHVRBD015R03N040T09	1.5	0.3	0.9°	1.5	3	40	1.44	2.8°	90	6	4	★	—	40.6	43.7	*
VFHVRBD015R03N050T09	1.5	0.3	0.9°	1.5	3	50	1.44	2.4°	90	6	4	★	—	50.6	54.4	*
VFHVRBD020R05N015T04	2	0.5	0.4°	2	4	15	1.9	5.2°	60	6	4	★	15.6	16.2	17.4	18.7
VFHVRBD020R05N020T04	2	0.5	0.4°	2	4	20	1.9	4.3°	80	6	4	★	20.6	21.3	22.9	24.7
VFHVRBD020R05N025T04	2	0.5	0.4°	2	4	25	1.9	3.6°	80	6	4	★	25.6	26.5	28.5	30.8
VFHVRBD020R05N030T04	2	0.5	0.4°	2	4	30	1.9	3.2°	80	6	4	★	30.6	31.7	34	36.8
VFHVRBD020R05N035T04	2	0.5	0.4°	2	4	35	1.9	2.8°	80	6	4	★	35.6	36.9	39.6	*
VFHVRBD020R05N040T04	2	0.5	0.4°	2	4	40	1.9	2.5°	80	6	4	★	40.6	42	45.2	*
VFHVRBD020R05N020T09	2	0.5	0.9°	2	4	20	1.9	4.4°	80	6	4	●	—	20.8	22.3	24.1
VFHVRBD020R05N025T09	2	0.5	0.9°	2	4	25	1.9	3.7°	90	6	4	●	—	25.8	27.7	29.9
VFHVRBD020R05N030T09	2	0.5	0.9°	2	4	30	1.9	3.2°	90	6	4	●	—	30.8	33	35.7
VFHVRBD020R05N035T09	2	0.5	0.9°	2	4	35	1.9	2.9°	90	6	4	●	—	35.8	38.4	*
VFHVRBD020R05N040T09	2	0.5	0.9°	2	4	40	1.9	2.6°	90	6	4	●	—	40.8	43.8	*
VFHVRBD020R05N045T09	2	0.5	0.9°	2	4	45	1.9	2.3°	90	6	4	★	—	45.8	49.2	*
VFHVRBD020R05N050T09	2	0.5	0.9°	2	4	50	1.9	2.2°	100	6	4	★	—	50.8	54.5	*
VFHVRBD020R05N055T09	2	0.5	0.9°	2	4	55	1.9	2°	100	6	4	★	—	55.8	59.9	*
VFHVRBD020R05N060T09	2	0.5	0.9°	2	4	60	1.9	1.8°	100	6	4	★	—	60.8	*	*

* No interference

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	DC	RE	BHTA2	APMX	LU	LB2	DN	B2	LF	DCON	No. of Flutes	Stock	Effective length for inclined angle			
													0.5°	1°	2°	3°
VFHVRBD030R08N020T09	3	0.8	0.9°	3	6	20	2.9	3.6°	80	6	4	●	—	20.9	22.4	24.1
VFHVRBD030R08N025T09	3	0.8	0.9°	3	6	25	2.9	3°	80	6	4	●	—	25.9	27.8	30
VFHVRBD030R08N030T09	3	0.8	0.9°	3	6	30	2.9	2.6°	80	6	4	●	—	30.9	33.1	*
VFHVRBD030R08N040T09	3	0.8	0.9°	3	6	40	2.9	2°	90	6	4	●	—	40.9	43.9	*
VFHVRBD030R08N050T09	3	0.8	0.9°	3	6	50	2.9	1.7°	90	6	4	●	—	50.9	*	*
VFHVRBD030R08N060T09	3	0.8	0.9°	3	6	60	2.9	1.4°	100	6	4	●	—	60.9	*	*
VFHVRBD040R10N025T04	4	1	0.4°	4	7	25	3.9	2.1°	80	6	4	★	25.7	26.6	28.5	*
VFHVRBD040R10N030T04	4	1	0.4°	4	7	30	3.9	1.8°	80	6	4	★	30.7	31.8	*	*
VFHVRBD040R10N035T04	4	1	0.4°	4	7	35	3.9	1.6°	80	6	4	★	35.7	36.9	*	*
VFHVRBD040R10N040T04	4	1	0.4°	4	7	40	3.9	1.4°	80	6	4	★	40.7	42.1	*	*
VFHVRBD040R10N045T04	4	1	0.4°	4	7	45	3.9	1.3°	90	6	4	★	45.7	47.3	*	*
VFHVRBD040R10N050T04	4	1	0.4°	4	7	50	3.9	1.2°	90	6	4	★	50.7	52.5	*	*
VFHVRBD040R10N025T09	4	1	0.9°	4	7	25	3.9	2.2°	90	6	4	●	—	25.9	27.8	*
VFHVRBD040R10N030T09	4	1	0.9°	4	7	30	3.9	1.9°	90	6	4	●	—	30.9	*	*
VFHVRBD040R10N040T09	4	1	0.9°	4	7	40	3.9	1.4°	100	6	4	●	—	40.9	*	*
VFHVRBD040R10N050T09	4	1	0.9°	4	7	50	3.9	1.2°	100	6	4	●	—	50.9	*	*
VFHVRBD040R10N060T09	4	1	0.9°	4	7	60	3.9	1°	100	6	4	●	—	60.9	*	*
VFHVRBD060R15N040T09	6	1.5	0.9°	9	12	40	5.85	1.4°	110	8	4	●	—	41.4	*	*
VFHVRBD060R15N050T09	6	1.5	0.9°	9	12	50	5.85	1.2°	110	8	4	●	—	51.4	*	*
VFHVRBD060R15N060T09	6	1.5	0.9°	9	12	60	5.85	1°	110	8	4	●	—	61.4	*	*
VFHVRBD060R15N070T09	6	1.5	0.9°	9	12	70	5.85	0.9°	110	8	4	●	—	*	*	*
VFHVRBD080R20N060T09	8	2	0.9°	12	15	60	7.85	1°	150	10	4	★	—	61.5	*	*
VFHVRBD080R20N080T09	8	2	0.9°	12	15	80	7.85	0.8°	150	10	4	★	—	*	*	*
VFHVRBD100R20N080T09	10	2	0.9°	15	18	80	9.7	2°	130	16	4	★	—	82	88	*
VFHVRBD100R20N120T09	10	2	0.9°	15	18	120	9.7	1.4°	180	16	4	★	—	122	*	*
VFHVRBD120R20N080T09	12	2	0.9°	18	28	80	11.7	1.4°	130	16	4	★	—	82.2	*	*
VFHVRBD120R20N120T09	12	2	0.9°	18	28	120	11.7	1°	180	16	4	★	—	122.2	*	*

* No interference

VFHVRB

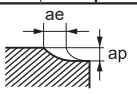
4 flute, Corner radius, Short cut length, Irregular helix flutes

RECOMMENDED CUTTING CONDITIONS

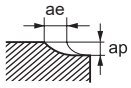
■High depth cut conditions

Workpiece Material				Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
DC (mm)	RE (mm)	BHTA2	LB2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)
1	**0.2**	**0.9°**	**6**	40000	6500	255.9	0.03	0.45	33000	4600	181.1	0.022	0.45	27000	3700	145.7	0.018	0.45	20000	1600	63.0	0.01	0.45
1	**0.2**	**0.9°**	**10**	24000	2700	106.3	0.015	0.45	20000	1900	74.8	0.01	0.45	16000	1500	59.1	0.008	0.45	12000	700	27.6	0.006	0.45
1	**0.2**	**0.9°**	**15**	16000	1200	47.2	0.013	0.45	14000	700	27.6	0.008	0.45	12000	500	19.7	0.007	0.45	10000	400	15.7	0.003	0.45
1	**0.2**	**0.9°**	**20**	14000	1000	39.4	0.01	0.45	12000	600	23.6	0.006	0.45	10000	400	15.7	0.005	0.45	9000	300	11.8	0.002	0.45
1	**0.2**	**0.9°**	**25**	9500	610	24.0	0.008	0.45	8000	440	17.3	0.005	0.45	6000	320	12.6	0.004	0.45	4800	160	6.3	0.002	0.45
1	**0.2**	**0.9°**	**30**	4900	320	12.6	0.007	0.45	4100	220	8.7	0.004	0.45	3000	160	6.3	0.003	0.45	2500	80	3.1	0.002	0.45
1	**0.2**	**0.9°**	**35**	4000	260	10.2	0.006	0.45	3400	190	7.5	0.003	0.45	3000	160	6.3	0.003	0.45	2000	70	2.8	0.001	0.45
1	**0.2**	**0.9°**	**40**	3500	180	7.1	0.005	0.45	2900	130	5.1	0.003	0.45	2000	90	3.5	0.003	0.45	1700	50	2.0	0.001	0.45
1	**0.2**	**0.9°**	**45**	2900	150	5.9	0.004	0.45	2400	100	3.9	0.002	0.45	2000	90	3.5	0.002	0.45	1400	40	1.6	0.001	0.45
1	**0.2**	**0.9°**	**50**	2900	110	4.3	0.003	0.45	2400	80	3.1	0.002	0.45	2000	60	2.4	0.002	0.45	1400	30	1.2	0.001	0.45
1.5	**0.3**	**0.9°**	**10**	27000	5700	224.4	0.05	0.65	22000	4000	157.5	0.035	0.65	18000	3000	118.1	0.03	0.65	14000	1400	55.1	0.014	0.65
1.5	**0.3**	**0.9°**	**15**	22000	3200	126.0	0.03	0.65	18000	2300	90.6	0.025	0.65	15000	1700	66.9	0.018	0.65	11000	1000	39.4	0.009	0.65
1.5	**0.3**	**0.9°**	**20**	16000	1400	55.1	0.02	0.65	14000	1200	47.2	0.016	0.65	13000	1000	39.4	0.012	0.65	9000	700	27.6	0.007	0.65
1.5	**0.3**	**0.9°**	**30**	13000	900	35.4	0.01	0.65	11000	700	27.6	0.008	0.65	10000	600	23.6	0.006	0.65	7500	400	15.7	0.004	0.65
1.5	**0.3**	**0.9°**	**40**	4500	230	9.1	0.008	0.65	3700	160	6.3	0.007	0.65	3000	120	4.7	0.005	0.65	2300	70	2.8	0.003	0.65
1.5	**0.3**	**0.9°**	**50**	3700	190	7.5	0.007	0.65	3000	130	5.1	0.006	0.65	3000	120	4.7	0.004	0.65	1900	60	2.4	0.002	0.65
2	**0.5**	**0.4°**	**15**	20000	7000	275.6	0.05	0.75	17000	5000	196.9	0.04	0.75	13000	3200	126.0	0.03	0.75	10000	1800	70.9	0.016	0.75
2	**0.5**	**0.4°**	**20**	20000	3600	141.7	0.04	0.75	17000	2600	102.4	0.03	0.75	13000	1800	70.9	0.025	0.75	10000	900	35.4	0.012	0.75
2	**0.5**	**0.4°**	**25**	16000	1800	70.9	0.03	0.75	14000	1400	55.1	0.025	0.75	12000	1100	43.3	0.02	0.75	9000	720	28.3	0.01	0.75
2	**0.5**	**0.4°**	**30**	16000	1400	55.1	0.025	0.75	14000	1200	47.2	0.02	0.75	12000	900	35.4	0.016	0.75	9000	650	25.6	0.008	0.75
2	**0.5**	**0.4°**	**35**	13000	1100	43.3	0.02	0.75	11000	800	31.5	0.018	0.75	10000	700	27.6	0.014	0.75	7000	500	19.7	0.007	0.75
2	**0.5**	**0.4°**	**40**	13000	1000	39.4	0.02	0.75	11000	700	27.6	0.015	0.75	10000	600	23.6	0.012	0.75	7000	400	15.7	0.006	0.75
2	**0.5**	**0.9°**	**20**	20000	3600	141.7	0.04	0.75	17000	2600	102.4	0.03	0.75	13000	1800	70.9	0.025	0.75	10000	900	35.4	0.012	0.75
2	**0.5**	**0.9°**	**25**	16000	1800	70.9	0.03	0.75	14000	1400	55.1	0.025	0.75	12000	1100	43.3	0.02	0.75	9000	720	28.3	0.01	0.75
2	**0.5**	**0.9°**	**30**	16000	1400	55.1	0.025	0.75	14000	1200	47.2	0.02	0.75	12000	900	35.4	0.016	0.75	9000	650	25.6	0.008	0.75
2	**0.5**	**0.9°**	**35**	13000	1100	43.3	0.02	0.75	11000	800	31.5	0.018	0.75	10000	700	27.6	0.014	0.75	7000	500	19.7	0.007	0.75
2	**0.5**	**0.9°**	**40**	13000	1000	39.4	0.02	0.75	11000	700	27.6	0.015	0.75	10000	600	23.6	0.012	0.75	7000	400	15.7	0.006	0.75
2	**0.5**	**0.9°**	**45**	8000	500	19.7	0.016	0.75	6800	360	14.2	0.012	0.75	5200	250	9.8	0.01	0.75	4000	120	4.7	0.005	0.75
2	**0.5**	**0.9°**	**50**	8000	500	19.7	0.016	0.75	6800	360	14.2	0.012	0.75	5200	250	9.8	0.01	0.75	4000	120	4.7	0.005	0.75
2	**0.5**	**0.9°**	**55**	4100	230	9.1	0.012	0.75	3500	170	6.7	0.009	0.75	2700	120	4.7	0.008	0.75	2000	60	2.4	0.004	0.75
2	**0.5**	**0.9°**	**60**	4100	230	9.1	0.012	0.75	3500	170	6.7	0.009	0.75	2700	120	4.7	0.008	0.75	2000	60	2.4	0.004	0.75
3	**0.8**	**0.9°**	**20**	13000	7200	283.5	0.19	1	11000	5100	200.8	0.15	1	8700	4000	157.5	0.11	1	6500	1800	70.9	0.06	1
3	**0.8**	**0.9°**	**25**	13000	7200	283.5	0.19	1	11000	5100	200.8	0.15	1	8700	4000	157.5	0.11	1	6500	1800	70.9	0.06	1
3	**0.8**	**0.9°**	**30**	13000	5700	224.4	0.12	1	11000	4000	157.5	0.09	1	8700	3000	118.1	0.07	1	6500	1400	55.1	0.04	1
3	**0.8**	**0.9°**	**40**	11000	3600	141.7	0.08	1	9100	2600	102.4	0.06	1	7400	2000	78.7	0.05	1	5500	1000	39.4	0.025	1
3	**0.8**	**0.9°**	**50**	8000	2600	102.4	0.07	1	6600	1800	70.9	0.05	1	5800	1500	59.1	0.04	1	4600	800	31.5	0.02	1
3	**0.8**	**0.9°**	**60**	7800	2480	97.6	0.06	1	6600	1740	68.5	0.05	1	5000	1250	49.2	0.04	1	3900	610	24.0	0.02	1

Depth of cut



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece material geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece material.
Note 4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

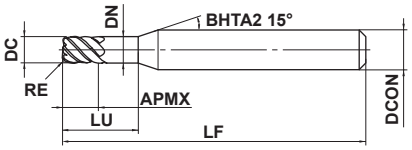
Workpiece Material				Carbon Steel, Cast Iron, Alloy Steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20					Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21					Hardened Steel (45−55HRC) AISI H13					Hardened Steel (55−62HRC) AISI D2				
DC (mm)	RE (mm)	BHTA2	LB2 (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap(mm)	Width of cut ae(mm)
4	**1**	**0.4°**	**25**	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
4	**1**	**0.4°**	**30**	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
4	**1**	**0.4°**	**35**	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	**1**	**0.4°**	**40**	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	**1**	**0.4°**	**45**	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	**1**	**0.4°**	**50**	8100	6300	248.0	0.14	1.5	6700	4420	174.0	0.11	1.5	5400	3500	137.8	0.08	1.5	4000	1600	63.0	0.04	1.5
4	**1**	**0.9°**	**25**	10000	9900	389.8	0.24	1.5	8300	7000	275.6	0.19	1.5	6700	5600	220.5	0.14	1.5	5000	2500	98.4	0.07	1.5
4	**1**	**0.9°**	**30**	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	**1**	**0.9°**	**40**	10000	9900	389.8	0.15	1.5	8300	7000	275.6	0.12	1.5	6700	5600	220.5	0.09	1.5	5000	2500	98.4	0.04	1.5
4	**1**	**0.9°**	**50**	8100	6300	248.0	0.14	1.5	6700	4420	174.0	0.11	1.5	5400	3500	137.8	0.08	1.5	4000	1600	63.0	0.04	1.5
4	**1**	**0.9°**	**60**	8100	6300	248.0	0.11	1.5	6700	4420	174.0	0.08	1.5	5400	3500	137.8	0.06	1.5	4000	1600	63.0	0.03	1.5
6	**1.5**	**0.9°**	**40**	6600	11000	433.1	0.4	2	5500	7600	299.2	0.32	2	4500	6100	240.2	0.24	2	3300	2700	106.3	0.12	2
6	**1.5**	**0.9°**	**50**	6600	11000	433.1	0.4	2	5500	7600	299.2	0.32	2	4500	6100	240.2	0.24	2	3300	2700	106.3	0.12	2
6	**1.5**	**0.9°**	**60**	6600	11000	433.1	0.25	2	5500	7600	299.2	0.2	2	4500	6100	240.2	0.15	2	3300	2700	106.3	0.08	2
6	**1.5**	**0.9°**	**70**	5400	8700	342.5	0.23	2	4400	6200	244.1	0.18	2	3600	5000	196.9	0.14	2	2700	2200	86.6	0.07	2
8	**2**	**0.9°**	**60**	5000	11000	433.1	0.48	3	4200	7600	299.2	0.37	3	3300	6100	240.2	0.29	3	2500	2700	106.3	0.14	3
8	**2**	**0.9°**	**80**	5000	11000	433.1	0.3	3	4200	7600	299.2	0.23	3	3300	6100	240.2	0.18	3	2500	2700	106.3	0.09	3
10	**2**	**0.9°**	**80**	4000	11000	433.1	0.48	4.5	3300	7600	299.2	0.37	4.5	2700	6100	240.2	0.29	4.5	2000	2700	106.3	0.14	4.5
10	**2**	**0.9°**	**120**	3200	8700	342.5	0.27	4.5	2700	6200	244.1	0.21	4.5	2100	5000	196.9	0.16	4.5	1600	2200	86.6	0.08	4.5
12	**2**	**0.9°**	**80**	3300	10000	393.7	0.72	6	2700	7100	279.5	0.56	6	2200	5600	220.5	0.36	6	1700	2500	98.4	0.18	6
12	**2**	**0.9°**	**120**	3300	10000	393.7	0.45	6	2700	7100	279.5	0.35	6	2200	5600	220.5	0.23	6	1700	2500	98.4	0.12	6
Depth of cut																								

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) Air blow or oil mist is recommended for good chip evacuation.
Note 3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece material geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece material.
Note 4) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

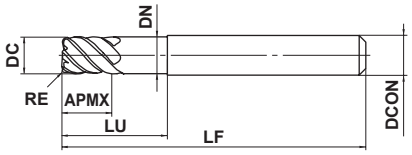
VFSDRB

Corner radius, Short cut length, 6 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type 1



Type 2

3≤DC≤12				
0 - 0.02				

DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 6 flute end mill with Impact Miracle coating for high hardened materials.

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFSDRBD0300R030	3	0.3	3	9	2.9	45	6	6	★	1
VFSDRBD0400R030	4	0.3	4	12	3.9	45	6	6	★	1
VFSDRBD0500R030	5	0.3	5	15	4.9	50	6	6	★	1
VFSDRBD0600R030	6	0.3	6	18	5.85	50	6	6	★	2
VFSDRBD0600R050	6	0.5	6	18	5.85	50	6	6	★	2
VFSDRBD0600R100	6	1	6	18	5.85	50	6	6	★	2
VFSDRBD0800R030	8	0.3	8	24	7.85	60	8	6	★	2
VFSDRBD0800R050	8	0.5	8	24	7.85	60	8	6	★	2
VFSDRBD0800R100	8	1	8	24	7.85	60	8	6	★	2
VFSDRBD1000R050	10	0.5	10	30	9.7	70	10	6	★	2
VFSDRBD1000R100	10	1	10	30	9.7	70	10	6	★	2
VFSDRBD1200R050	12	0.5	12	36	11.7	75	12	6	★	2
VFSDRBD1200R100	12	1	12	36	11.7	75	12	6	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.				Hardened steel (62—70HRC) AISI W1, AISI M2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
3	32000	3800	149.6	0.2	16000	1900	74.8	0.1	11000	1200	47.2	0.05
4	24000	4400	173.2	0.2	12000	2200	86.6	0.1	8000	1300	51.2	0.05
6	16000	5800	228.3	0.3	8000	2900	114.2	0.2	5300	1800	70.9	0.1
8	12000	5800	228.3	0.4	6000	2900	114.2	0.2	4000	1800	70.9	0.1
10	9600	5800	228.3	0.5	4800	2900	114.2	0.3	3200	1800	70.9	0.2
12	8000	4800	189.0	0.6	4000	2400	94.5	0.3	2700	1500	59.1	0.2
Depth of cut	≤Please refer to the list above for depth of cut. ≤1.5DC				≤Please refer to the list above for depth of cut. ≤1.0DC							

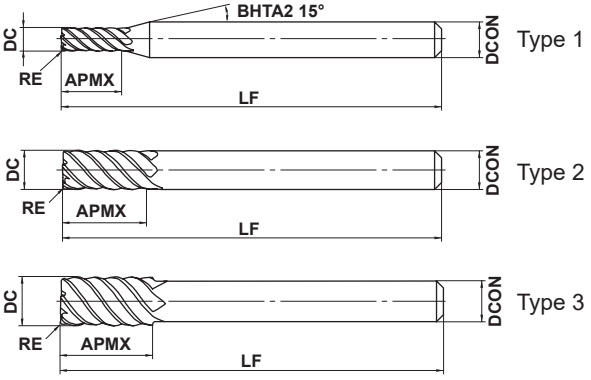
DC : Dia.

Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

VFMDRB

Corner radius, Medium cut length, 6 flute, For hardened materials

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



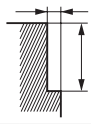
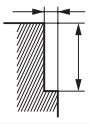
DC≤12	DC>12		
0 - 0.02	0 - 0.03		
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013

●6 flute corner radius end mill with Impact Miracle coating for high hardened materials.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMDRBD0300R030	3	0.3	10	60	6	6	★	1
VFMDRBD0400R030	4	0.3	12	60	6	6	★	1
VFMDRBD0500R030	5	0.3	15	60	6	6	★	1
VFMDRBD0600R030	6	0.3	15	60	6	6	★	2
VFMDRBD0600R050	6	0.5	15	60	6	6	★	2
VFMDRBD0600R100	6	1	15	60	6	6	★	2
VFMDRBD0800R030	8	0.3	20	75	8	6	★	2
VFMDRBD0800R050	8	0.5	20	75	8	6	★	2
VFMDRBD0800R100	8	1	20	75	8	6	★	2
VFMDRBD1000R030	10	0.3	25	80	10	6	★	2
VFMDRBD1000R050	10	0.5	25	80	10	6	★	2
VFMDRBD1000R100	10	1	25	80	10	6	★	2
VFMDRBD1200R050	12	0.5	30	100	12	6	★	2
VFMDRBD1200R100	12	1	30	100	12	6	★	2
VFMDRBD1600R100	16	1	40	110	16	6	★	2
VFMDRBD1600R150	16	1.5	40	110	16	6	★	2
VFMDRBD1800R100	18	1	40	120	16	6	★	3
VFMDRBD1800R150	18	1.5	40	120	16	6	★	3
VFMDRBD2000R100	20	1	45	125	20	6	★	2
VFMDRBD2000R150	20	1.5	45	125	20	6	★	2
VFMDRBD2000R200	20	2	45	125	20	6	★	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Hardened steel (45—55HRC) AISI H13 etc.				Hardened steel (55—62HRC) AISI D2 etc.				Hardened steel (62—70HRC) AISI W1, AISI M2 etc.			
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)
3	32000	3800	149.6	0.2	16000	1900	74.8	0.1	11000	1200	47.2	0.05
4	24000	4400	173.2	0.2	12000	2200	86.6	0.1	8000	1300	51.2	0.05
6	16000	5800	228.3	0.3	8000	2900	114.2	0.2	5300	1800	70.9	0.1
8	12000	5800	228.3	0.4	6000	2900	114.2	0.2	4000	1800	70.9	0.1
10	9600	5800	228.3	0.5	4800	2900	114.2	0.3	3200	1800	70.9	0.2
12	8000	4800	189.0	0.6	4000	2400	94.5	0.3	2700	1500	59.1	0.2
16	6000	3600	141.7	0.8	3000	1800	70.9	0.5	2000	1100	43.3	0.3
20	4800	2900	114.2	1.0	2400	1400	55.1	0.5	1600	880	34.6	0.3
Depth of cut	 ≤Please refer to the list above for depth of cut. ≤1.5DC				 ≤Please refer to the list above for depth of cut. ≤1.0DC							

DC : Dia.

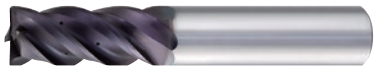
Note 1) If the depth of cut is smaller than this table, feed rate can be increased.
Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.

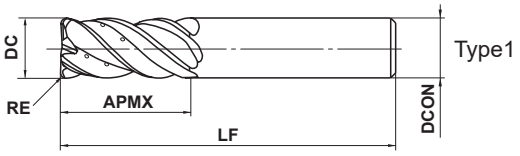
VFMHVRBCH

Corner radius, Medium cut length, 4 flute, Irregular helix flutes, with multiple thru-coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		

CoolStar





1≤RE≤3				
±0.015				
16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

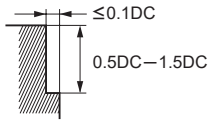
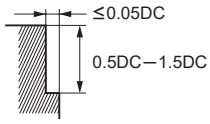
● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VFMHVRBCHD1600R100	16	1	35	90	16	4	★	1
VFMHVRBCHD1600R300	16	3	35	90	16	4	★	1
VFMHVRBCHD2000R100	20	1	45	110	20	4	★	1
VFMHVRBCHD2000R300	20	3	45	110	20	4	★	1

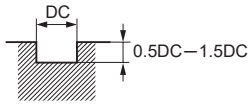
RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Heat resistant alloy Inconel718		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	3000	1140	44.9	2000	560	22.0	800	110	4.3
20	2400	860	33.9	1600	510	20.1	600	100	3.9
Depth of cut									

DC:Dia.

■Slotting

Workpiece Material	Carbon steel, Cast iron, Alloy steel (−30HRC) AISI 1050, AISI No 35 B, AISI P20			Alloy steel, Tool steel, Pre-hardened steel (−45HRC) AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	2400	670	26.4	1400	380	15.0	1400	170	6.7
20	1900	610	24.0	1100	350	13.8	1100	130	5.1
Depth of cut									

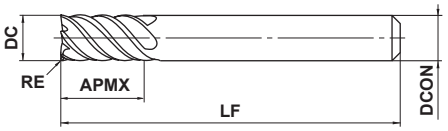
DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abonrmal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF6MHVRB

Corner radius, Medium cut length, 6 flute, Irregular helix flutes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		



Type1

0.5≤RE≤2				
±0.015				
DC≤12	DC>12			
0 -0.020	0 -0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	DCON=20	
0 -0.008	0 -0.009	0 -0.011	0 -0.013	

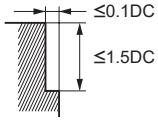
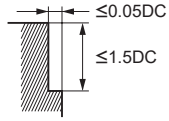
- Irregular helix 6 flute geometry reduces vibrations and achieves high efficiency machining.
- Suitable for machining of difficult-to-cut materials such as stainless steel, titanium alloy and inconel.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF6MHVRBD0600R050	6	0.5	13	50	6	6	★	1
VF6MHVRBD0600R100	6	1	13	50	6	6	★	1
VF6MHVRBD0800R050	8	0.5	19	60	8	6	★	1
VF6MHVRBD0800R100	8	1	19	60	8	6	★	1
VF6MHVRBD1000R050	10	0.5	22	70	10	6	★	1
VF6MHVRBD1000R100	10	1	22	70	10	6	★	1
VF6MHVRBD1200R050	12	0.5	26	75	12	6	★	1
VF6MHVRBD1200R100	12	1	26	75	12	6	★	1
VF6MHVRBD1600R100	16	1	32	90	16	6	★	1
VF6MHVRBD1600R200	16	2	32	90	16	6	★	1
VF6MHVRBD2000R100	20	1	38	100	20	6	★	1
VF6MHVRBD2000R200	20	2	38	100	20	6	★	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21 etc.			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V etc.			Heat resistant alloy Inconel718 etc.		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	10600	2900	114.2	8000	2000	78.7	2100	320	12.6
8	8000	2900	114.2	6000	2000	78.7	1600	300	11.8
10	6400	2700	106.3	4800	2000	78.7	1300	260	10.2
12	5300	2700	106.3	4000	2000	78.7	1100	230	9.1
16	4000	2200	86.6	3000	1600	63.0	800	180	7.1
20	3200	1900	74.8	2400	1400	55.1	640	150	5.9
Depth of cut									

DC : Dia.

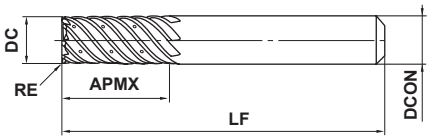
Note 1) When cutting austenitic stainless steel, the use of water-soluble cutting fluid is especially effective.
Note 2) If the depth of cut is smaller than this table, feed rate can be increased.
Note 3) The irregular helix flute end mill has a large effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is very low, then vibration can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VF8MHVRBCH

Corner radius, Medium cut length, 8 flute, Irregular helix flutes, with multiple thru-coolant

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
○	○			◎	◎		

CoolStar



Type1

1≤RE≤3				
±0.015				
16≤DC≤20				
0 - 0.03				
DCON=16	DCON=20			
0 - 0.011	0 - 0.013			

● Vibration control corner radius end mill with multiple internal through coolant holes ensures stable machining on difficult-to-cut materials and applications requiring long overhangs.

(mm)

Order Number	DC	RE	APMX	LF	DCON	No. of Flutes	Stock	Type
VF8MHVRBCHD1600R100	16	1	32	90	16	8	★	1
VF8MHVRBCHD1600R300	16	3	32	90	16	8	★	1
VF8MHVRBCHD2000R100	20	1	38	100	20	8	★	1
VF8MHVRBCHD2000R300	20	3	38	100	20	8	★	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V			Heat resistant alloy Inconel718		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	4000	2400	94.5	3000	2100	82.7	800	240	9.4
20	3200	1900	74.8	2400	1900	74.8	640	200	7.9
Depth of cut	≤0.08DC 0.5DC—1.5DC						≤0.05DC 0.5DC—1.5DC		

DC:Dia.

■Trochoidal milling

Workpiece Material	Alloy steel, Tool steel, Pre-hardened steel AISI H13, AISI W1-10, AISI P21			Austenitic stainless steel, Titanium alloy AISI 304, AISI 306, Ti-6Al-4V		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
16	4000	1900	74.8	3000	1400	55.1
20	3200	1500	59.1	2400	1200	47.2
Depth of cut	1.5DC≤ ≤0.08DC			0.5DC—1.5DC		

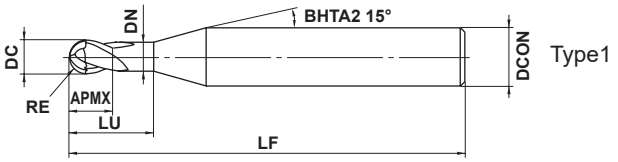
DC:Dia.

Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 2) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abonrmal sound can occur. In this case, please reduce the revolution and feed rate proportionately, or set a lower depth of cut.

VFR2SSB

Ball nose, Short cut length, 2 flute, Short shank

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type1

Type2

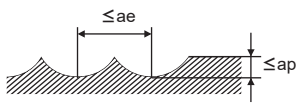
RE≤6			
±0.005			
4≤DCON≤6	8≤DCON≤10	DCON=12	
0 - 0.005	0 - 0.006	0 - 0.008	

● Optimization of the cutting edge curve, helix angle, and rake angle have improved the edge strength at all areas of the ball blades.

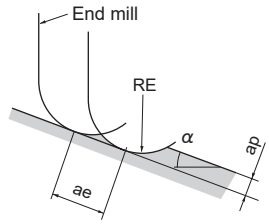
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFR2SSBR0050S04	0.5	1	1	2	0.94	40	4	2	●	1
VFR2SSBR0050	0.5	1	1	2	0.94	40	6	2	●	1
VFR2SSBR0075S04	0.75	1.5	1.5	3	1.44	40	4	2	●	1
VFR2SSBR0075	0.75	1.5	1.5	3	1.44	40	6	2	●	1
VFR2SSBR0100	1	2	2	4	1.9	45	6	2	●	1
VFR2SSBR0150	1.5	3	3	6	2.9	45	6	2	●	1
VFR2SSBR0200	2	4	4	8	3.9	45	6	2	●	1
VFR2SSBR0250	2.5	5	5	10	4.9	50	6	2	●	1
VFR2SSBR0300	3	6	6	12	5.85	50	6	2	●	2
VFR2SSBR0400	4	8	8	14	7.85	60	8	2	●	2
VFR2SSBR0500	5	10	10	18	9.7	70	10	2	●	2
VFR2SSBR0600	6	12	12	22	11.7	75	12	2	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45－55HRC) AISI H13						Hardened steel (55－62HRC) AISI D2						Hardened steel (62－70HRC) AISI W1, AISI M2					
RE		α≦15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)	α≦15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)	α≦15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)
(mm)	(inch)	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
0.5	**.020**	40000	315.0	40000	126.0	.0024	.0039	40000	220.5	40000	94.5	.0020	.0039	40000	141.7	32000	51.2	.0016	.0039
0.75	**.030**	40000	378.0	40000	157.5	.0035	.0059	40000	283.5	32000	98.4	.0030	.0059	32000	177.2	21000	47.2	.0020	.0059
1	**.039**	40000	378.0	39000	185.0	.0043	.0079	40000	315.0	24000	94.5	.0039	.0079	24000	149.6	16000	39.4	.0028	.0079
1.5	**.059**	40000	472.4	27000	169.3	.0051	.0118	32000	303.1	16000	86.6	.0047	.0118	16000	126.0	11000	34.6	.0035	.0118
2	**.079**	32000	428.3	20000	141.7	.0059	.0157	24000	244.1	12000	74.8	.0051	.0157	12000	94.5	8000	31.5	.0039	.0157
2.5	**.098**	25000	354.3	16000	114.2	.0079	.0197	19000	208.7	9600	66.9	.0059	.0197	9600	82.7	6000	23.6	.0039	.0197
3	**.118**	21000	330.7	13000	102.4	.0098	.0236	16000	189.0	8000	63.0	.0079	.0236	8000	66.9	5000	23.6	.0043	.0236
4	**.157**	16000	252.0	10000	78.7	.0118	.0315	12000	141.7	6000	47.2	.0079	.0315	6000	55.1	4000	18.9	.0043	.0315
5	**.197**	13000	204.7	8000	66.9	.0197	.0394	10000	126.0	4800	37.8	.0079	.0394	4800	43.3	3000	16.5	.0047	.0394
6	**.236**	9000	141.7	6000	51.2	.0197	.0472	7000	86.6	3600	28.3	.0118	.0472	3600	33.9	2200	12.2	.0047	.0472
Depth of cut																			

Note 1) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Please reduce the feed rate when the surface finish is important.
Note 3) α is the inclination angle of the machined surface.



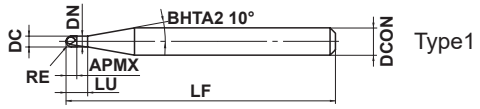
ae:Pick Feed

VFR2SB

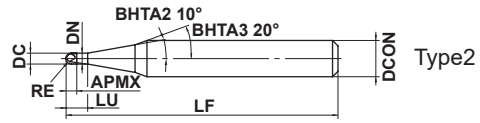
Ball nose, Short cut length, 2 flute

UWC VFR γ 0° RE<0.3 γ 20° RE≥0.3

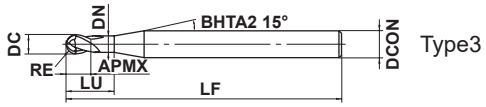
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



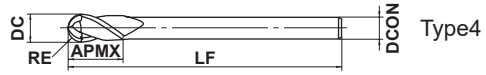
Type1



Type2



Type3



Type4

RE≤6	RE>6			
±0.005	±0.010			
DCON=3	4≤DCON≤6	8≤DCON≤10	12≤DCON≤16	DCON=20
0 - 0.004	0 - 0.005	0 - 0.006	0 - 0.008	0 - 0.009

h5

- Optimization of the cutting edge curve, helix angle, and rake angle have improved the edge strength at all areas of the ball blades.

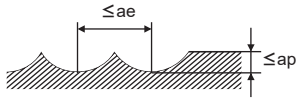
(mm)

Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFR2SBR0010	0.1	0.2	0.2	0.4	0.17	45	4	2	●	1
VFR2SBR0010S06	0.1	0.2	0.2	0.4	0.17	50	6	2	●	2
VFR2SBR0015	0.15	0.3	0.3	0.6	0.27	45	4	2	●	1
VFR2SBR0015S06	0.15	0.3	0.3	0.6	0.27	50	6	2	●	2
VFR2SBR0020	0.2	0.4	0.4	0.8	0.36	45	4	2	●	1
VFR2SBR0020S06	0.2	0.4	0.4	0.8	0.36	50	6	2	●	2
VFR2SBR0030	0.3	0.6	0.6	1.2	0.56	45	4	2	●	3
VFR2SBR0030S06	0.3	0.6	0.6	1.2	0.56	50	6	2	●	3
VFR2SBR0040	0.4	0.8	0.8	1.6	0.76	45	4	2	●	3
VFR2SBR0040S06	0.4	0.8	0.8	1.6	0.76	50	6	2	●	3
VFR2SBR0050	0.5	1	1	2	0.94	45	4	2	●	3
VFR2SBR0050S06	0.5	1	1	2	0.94	50	6	2	●	3
VFR2SBR0060	0.6	1.2	1.2	2.4	1.14	45	4	2	●	3
VFR2SBR0060S06	0.6	1.2	1.2	2.4	1.14	50	6	2	●	3
VFR2SBR0070	0.7	1.4	1.4	2.8	1.34	45	4	2	●	3
VFR2SBR0070S06	0.7	1.4	1.4	2.8	1.34	50	6	2	●	3
VFR2SBR0075	0.75	1.5	1.5	3	1.44	45	4	2	●	3
VFR2SBR0075S06	0.75	1.5	1.5	3	1.44	50	6	2	●	3
VFR2SBR0080	0.8	1.6	1.6	3.2	1.54	45	4	2	●	3
VFR2SBR0080S06	0.8	1.6	1.6	3.2	1.54	50	6	2	●	3
VFR2SBR0090	0.9	1.8	1.8	3.6	1.74	45	4	2	●	3
VFR2SBR0090S06	0.9	1.8	1.8	3.6	1.74	50	6	2	●	3
VFR2SBR0100	1	2	2	4	1.9	50	4	2	●	3
VFR2SBR0100S06	1	2	2	4	1.9	60	6	2	●	3
VFR2SBR0125S06	1.25	2.5	2.5	5	2.4	60	6	2	●	3
VFR2SBR0150S03	1.5	3	3	—	—	60	3	2	●	4
VFR2SBR0150	1.5	3	3	6	2.9	70	6	2	●	3
VFR2SBR0200S04	2	4	4	—	—	60	4	2	●	4
VFR2SBR0200	2	4	4	8	3.9	70	6	2	●	3
VFR2SBR0250	2.5	5	5	10	4.9	80	6	2	●	3
VFR2SBR0300	3	6	12	—	—	80	6	2	●	4
VFR2SBR0400	4	8	14	—	—	90	8	2	●	4
VFR2SBR0500	5	10	18	—	—	100	10	2	●	4
VFR2SBR0600	6	12	22	—	—	110	12	2	●	4
VFR2SBR0800	8	16	30	—	—	140	16	2	★	4
VFR2SBR1000	10	20	38	—	—	160	20	2	★	4

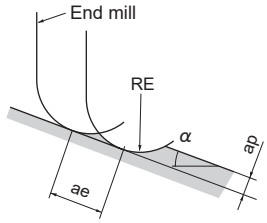
● : USA Stock ★ : Stocked in Japan

ISO13399 ➤ I002

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardened steel (45－55HRC) AISI H13						Hardened steel (55－62HRC) AISI D2						Hardened steel (62－70HRC) AISI W1, AISI M2					
RE		α≤15°		α>15°		Depth of cut	Depth of cut	α≤15°		α>15°		Depth of cut	Depth of cut	α≤15°		α>15°		Depth of cut	Depth of cut
(mm)	(inch)	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)	ap (inch)	ae (inch)	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)	ap (inch)	ae (inch)	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)	ap (inch)	ae (inch)
0.1	**.004**	40000	12.6	40000	9.4	.0001	.0008	40000	12.6	40000	6.3	.0001	.0008	40000	12.6	40000	6.3	.0001	.0008
0.15	**.006**	40000	25.2	40000	22.0	.0004	.0012	40000	25.2	40000	15.7	.0003	.0012	40000	25.2	40000	15.7	.0002	.0012
0.2	**.008**	40000	63.0	40000	47.2	.0008	.0016	40000	55.1	40000	39.4	.0006	.0016	40000	47.2	40000	39.4	.0004	.0016
0.3	**.012**	40000	126.0	40000	63.0	.0012	.0024	40000	110.2	40000	47.2	.0010	.0024	40000	78.7	40000	47.2	.0008	.0024
0.4	**.016**	40000	252.0	40000	94.5	.0020	.0031	40000	157.5	40000	63.0	.0016	.0031	40000	110.2	40000	63.0	.0012	.0031
0.5	**.020**	40000	315.0	40000	126.0	.0024	.0039	40000	220.5	40000	94.5	.0020	.0039	40000	141.7	32000	51.2	.0016	.0039
0.75	**.030**	40000	378.0	40000	157.5	.0035	.0059	40000	283.5	32000	98.4	.0030	.0059	32000	177.2	21000	47.2	.0020	.0059
1	**.039**	40000	378.0	39000	185.0	.0043	.0079	40000	315.0	24000	94.5	.0039	.0079	24000	149.6	16000	39.4	.0028	.0079
1.25	**.049**	40000	409.4	32000	177.2	.0047	.0098	37000	318.9	19000	90.6	.0043	.0098	19000	133.9	13000	39.4	.0031	.0098
1.5	**.059**	40000	472.4	27000	169.3	.0051	.0118	32000	303.1	16000	86.6	.0047	.0118	16000	126.0	11000	34.6	.0035	.0118
2	**.079**	32000	428.3	20000	141.7	.0059	.0157	24000	244.1	12000	74.8	.0051	.0157	12000	94.5	8000	31.5	.0039	.0157
2.5	**.098**	25000	354.3	16000	114.2	.0079	.0197	19000	208.7	9600	66.9	.0059	.0197	9600	82.7	6000	23.6	.0039	.0197
3	**.118**	21000	330.7	13000	102.4	.0098	.0236	16000	189.0	8000	63.0	.0079	.0236	8000	66.9	5000	23.6	.0043	.0236
4	**.157**	16000	252.0	10000	78.7	.0118	.0315	12000	141.7	6000	47.2	.0079	.0315	6000	55.1	4000	18.9	.0043	.0315
5	**.197**	13000	204.7	8000	66.9	.0197	.0394	10000	126.0	4800	37.8	.0079	.0394	4800	43.3	3000	16.5	.0047	.0394
6	**.236**	9000	141.7	6000	51.2	.0197	.0472	7000	86.6	3600	28.3	.0118	.0472	3600	33.9	2200	12.2	.0047	.0472
8	**.315**	6000	94.5	4000	39.4	.0197	.0630	5000	63.0	2500	19.7	.0118	.0630	2500	25.6	1500	9.4	.0059	.0630
10	**.394**	4500	70.9	3000	30.7	.0197	.0787	4000	51.2	1800	14.2	.0118	.0787	1800	18.5	1000	6.3	.0059	.787
Depth of cut																			

Note 1) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Please reduce the feed rate when the surface finish is important.
Note 3) α is the inclination angle of the machined surface.

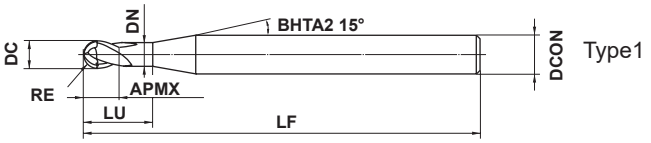


ae:Pick Feed

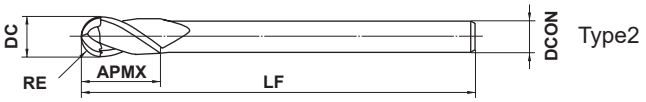
VFR2SBF

Ball nose, Short cut length, 2 flute, For Mirror finish cutting

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				



Type1



Type2

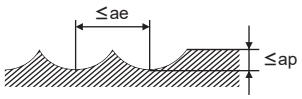
RE≤3				
±0.010				
4≤DCON≤6				
0 - 0.005				

● New ball geometry for mirror finish cutting.

(mm)

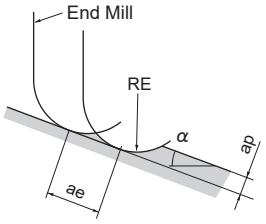
Order Number	RE	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
VFR2SBFR0050	0.5	1	1	2	0.94	45	4	2	●	1
VFR2SBFR0075	0.75	1.5	1.5	3	1.44	45	4	2	●	1
VFR2SBFR0100	1	2	2	4	1.9	60	6	2	●	1
VFR2SBFR0125	1.25	2.5	2.5	5	2.4	60	6	2	●	1
VFR2SBFR0150	1.5	3	3	6	2.9	70	6	2	●	1
VFR2SBFR0200	2	4	4	8	3.9	70	6	2	●	1
VFR2SBFR0250	2.5	5	5	10	4.9	80	6	2	●	1
VFR2SBFR0300	3	6	6	—	—	80	6	2	●	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon steel, Alloy steel (180−280HB) Alloy tool steel (≤350HB), Pre-hardened steel (35−45HRC) Hardened steel (45−52HRC), Hardened steel (55−62HRC) AISI 1045, AISI 4140, AISI P21, AISI P20, SKD, SKT, AISI H13, AISI L6, AISI D2						Hardened steel (62−70HRC) AISI W1, AISI M2					
RE		α≤15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)	α≤15°		α>15°		Depth of cut ap (inch)	Depth of cut ae (inch)
(mm)	(inch)	Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)			Revolution (min^{-1})	Table Feed (IPM)	Revolution (min^{-1})	Table Feed (IPM)		
0.5	**.020**	40000	31.5	40000	31.5	.0003	.0003	40000	22.0	40000	22.0	.0002	.0002
0.75	**.030**	40000	31.5	40000	31.5	.0004	.0004	40000	22.0	40000	22.0	.0003	.0003
1	**.039**	35000	41.3	35000	41.3	.0004	.0004	35000	27.6	35000	27.6	.0004	.0004
1.25	**.049**	35000	41.3	35000	41.3	.0005	.0005	35000	27.6	35000	27.6	.0004	.0004
1.5	**.059**	35000	41.3	35000	41.3	.0006	.0006	35000	27.6	35000	27.6	.0005	.0005
2	**.079**	25000	39.4	25000	39.4	.0007	.0007	25000	29.5	25000	29.5	.0006	.0006
2.5	**.098**	25000	39.4	25000	39.4	.0008	.0008	25000	29.5	25000	29.5	.0006	.0006
3	**.118**	25000	39.4	25000	39.4	.0008	.0008	25000	29.5	25000	29.5	.0006	.0006
Depth of cut													

Note 1) The tools are recommended for use only in finish machining.
Note 2) Air blowing and oil mist are recommended as coolants.
Note 3) Note the following points when using the tools.
- Avoid using equipment abruptly without proper preparation. After sufficiently energizing equipment, ensure that there will be no changes to the depth of cut such as due to elongation of the main axis during machining.
- If the tools are used immediately after rough machining of a surface, large uneven areas (cusp heights) will cause deflection of the tools and waviness of the machined surface. Therefore, it is recommended to add a medium finish machining process which uses the same value of ae as indicated in the table above.

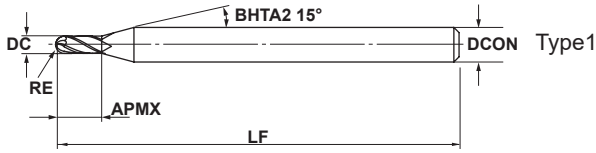
Note 4) α is the inclination angle of the machined surface.

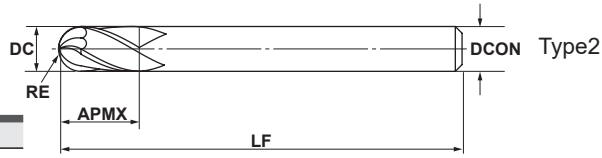


VFR4MB NEW

Ball nose, Medium cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				





RE				
±0.01				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● The 4 flute geometry with a cutting edge extending to the center achieves a long tool life and enables high efficiency machining.

(mm)

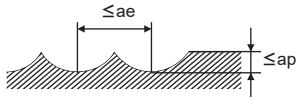
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
VFR4MBR0050	0.5	1	2.5	50	6	4	●	1
VFR4MBR0100	1	2	6	60	6	4	●	1
VFR4MBR0150	1.5	3	8	70	6	4	●	1
VFR4MBR0200	2	4	8	70	6	4	●	1
VFR4MBR0250	2.5	5	12	80	6	4	●	1
VFR4MBR0300	3	6	12	80	6	4	●	2
VFR4MBR0400	4	8	14	90	8	4	●	2
VFR4MBR0500	5	10	18	100	10	4	●	2
VFR4MBR0600	6	12	22	110	12	4	★	2

RECOMMENDED CUTTING CONDITIONS

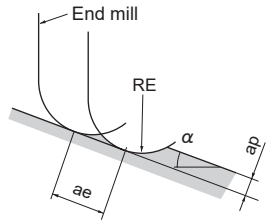
(inch)

Workpiece Material		Hardened Steel (45－55HRC)						Hardened Steel (55－65HRC)						Hardened Steel (65－70HRC)					
RE		α≤15°		α>15°		Depth of cut	Depth of cut	α≤15°		α>15°		Depth of cut	Depth of cut	α≤15°		α>15°		Depth of cut	Depth of cut
(mm)	(inch)	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	ap	ae	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	ap	ae	Revolution (min^{-1})	Table feed (IPM)	Revolution (min^{-1})	Table feed (IPM)	ap	ae
0.5	**.020**	40000	315.0	40000	149.6	.0024	.004	40000	220.5	40000	122.0	.0020	.004	40000	185.0	32000	66.9	.0012	.004
1.0	**.039**	40000	378.0	40000	220.5	.0043	.008	40000	315.0	28000	122.0	.0039	.008	24000	196.9	16000	47.2	.0024	.008
1.5	**.059**	40000	472.4	32000	220.5	.0051	.012	32000	303.2	19000	114.2	.0047	.012	16000	165.4	11000	43.3	.0028	.012
2.0	**.079**	32000	433.1	24000	185.0	.0059	.016	24000	244.1	14000	98.4	.0051	.016	12000	122.0	8000	39.4	.0031	.016
2.5	**.098**	25000	354.3	19000	149.6	.0079	.020	19000	208.7	12000	86.6	.0059	.020	9600	106.3	6000	30.7	.0031	.020
3.0	**.118**	21000	330.7	15000	133.9	.0098	.024	16000	189.0	9600	78.7	.0079	.024	8000	90.6	5000	30.7	.0035	.024
4.0	**.157**	16000	252.0	12000	102.4	.0118	.031	12000	141.7	7200	63.0	.0079	.031	6000	74.8	4000	24.4	.0035	.031
5.0	**.197**	13000	204.7	9600	86.6	.0197	.039	10000	126.0	5800	51.2	.0079	.039	4800	59.1	3000	21.7	.0039	.039
6.0	**.236**	9000	141.7	7200	66.9	.0197	.047	7000	86.6	4300	37.0	.0118	.047	3600	43.3	2200	15.7	.0039	.047

Depth of cut



Note 1) If the depth of cut is shallow, the revolution and feed rate can be increased.
Please reduce the feed rate when the surface finish is important.
Note 2) If the rigidity of the machine or the workpiece materials installation is very low, or chattering and noise are generated, please adjust the revolution, feed rate and depth of cut.
Note 3) α is the inclination angle of the machined surface.

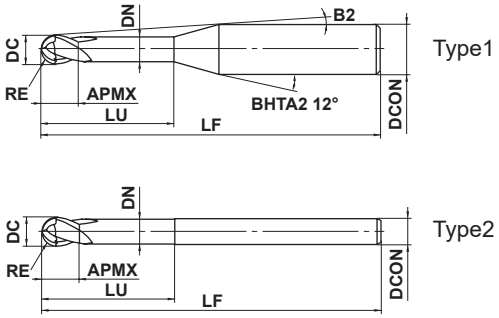


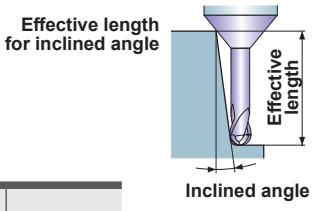
ae:Pick Feed

VFR2XLB NEW

Ball nose, 2 Flute, Long neck

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				





RE≤3					
±0.005					
4≤DCON≤6					
0 - 0.005					

● Precise machining of vertical walls is possible due to a back taper and a strong, seamless ball nose cutting edge geometry.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
VFR2XLBR0010N005	0.1	0.2	0.15	0.5	0.18	11.5°	50	4	2	★	1	0.5	0.5	0.6	0.7
VFR2XLBR0010N010	0.1	0.2	0.15	1	0.18	10.9°	50	4	2	●	1	1	1.1	1.2	1.3
VFR2XLBR0015N010	0.15	0.3	0.24	1	0.28	10.9°	50	4	2	●	1	1	1.1	1.2	1.3
VFR2XLBR0015N015	0.15	0.3	0.24	1.5	0.28	10.4°	50	4	2	●	1	1.6	1.6	1.8	2
VFR2XLBR0015N020	0.15	0.3	0.24	2	0.28	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VFR2XLBR0020N010	0.2	0.4	0.3	1	0.37	11°	50	4	2	●	1	1	1.1	1.2	1.3
VFR2XLBR0020N015	0.2	0.4	0.3	1.5	0.37	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
VFR2XLBR0020N020	0.2	0.4	0.3	2	0.37	9.9°	50	4	2	●	1	2.1	2.2	2.3	2.6
VFR2XLBR0020N025	0.2	0.4	0.3	2.5	0.37	9.5°	50	4	2	★	1	2.6	2.7	2.9	3.3
VFR2XLBR0020N030	0.2	0.4	0.3	3	0.37	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
VFR2XLBR0020N040	0.2	0.4	0.3	4	0.37	8.4°	50	4	2	★	1	4.2	4.3	4.7	5.2
VFR2XLBR0025N015	0.25	0.5	0.37	1.5	0.47	10.4°	50	4	2	●	1	1.5	1.6	1.7	1.9
VFR2XLBR0025N020	0.25	0.5	0.37	2	0.47	9.9°	50	4	2	●	1	2.1	2.1	2.3	2.6
VFR2XLBR0025N025	0.25	0.5	0.37	2.5	0.47	9.5°	50	4	2	●	1	2.6	2.7	2.9	3.2
VFR2XLBR0025N030	0.25	0.5	0.37	3	0.47	9.1°	50	4	2	●	1	3.1	3.2	3.5	3.9
VFR2XLBR0025N040	0.25	0.5	0.37	4	0.47	8.3°	50	4	2	●	1	4.1	4.3	4.7	5.2
VFR2XLBR0030N020	0.3	0.6	0.45	2	0.57	9.9°	50	4	2	●	1	2.1	2.2	2.4	2.6
VFR2XLBR0030N020S06	0.3	0.6	0.45	2	0.57	10.6°	50	6	2	●	1	2.1	2.2	2.4	2.6
VFR2XLBR0030N030	0.3	0.6	0.45	3	0.57	9°	50	4	2	●	1	3.1	3.3	3.6	4
VFR2XLBR0030N030S06	0.3	0.6	0.45	3	0.57	9.9°	50	6	2	★	1	3.1	3.3	3.6	4
VFR2XLBR0030N040	0.3	0.6	0.45	4	0.57	8.2°	50	4	2	★	1	4.2	4.4	4.8	5.3
VFR2XLBR0030N050	0.3	0.6	0.45	5	0.57	7.6°	50	4	2	★	1	5.2	5.5	6	6.6
VFR2XLBR0030N060	0.3	0.6	0.45	6	0.57	7.1°	50	4	2	●	1	6.3	6.6	7.2	7.9
VFR2XLBR0040N030	0.4	0.8	0.6	3	0.77	8.9°	50	4	2	●	1	3.1	3.3	3.6	3.9
VFR2XLBR0040N040	0.4	0.8	0.6	4	0.77	8.2°	50	4	2	●	1	4.2	4.4	4.8	5.2
VFR2XLBR0040N060	0.4	0.8	0.6	6	0.77	6.9°	50	4	2	●	1	6.3	6.5	7.2	7.9
VFR2XLBR0040N080	0.4	0.8	0.6	8	0.77	6°	50	4	2	★	1	8.4	8.7	9.5	10.6
VFR2XLBR0050N030	0.5	1	0.75	3	0.96	8.7°	50	4	2	●	1	3.2	3.4	3.7	4.1
VFR2XLBR0050N030S06	0.5	1	0.75	3	0.96	9.8°	50	6	2	●	1	3.2	3.4	3.7	4.1
VFR2XLBR0050N040	0.5	1	0.75	4	0.96	7.9°	50	4	2	●	1	4.3	4.5	4.9	5.4
VFR2XLBR0050N040S06	0.5	1	0.75	4	0.96	9.2°	50	6	2	●	1	4.3	4.5	4.9	5.4
VFR2XLBR0050N060	0.5	1	0.75	6	0.96	6.7°	50	4	2	●	1	6.3	6.5	7.2	7.9

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFR2XLBR0050N060S06	0.5	1	0.75	6	0.96	8.2°	50	6	2	●	1	6.3	6.5	7.2	7.9
VFR2XLBR0050N080	0.5	1	0.75	8	0.96	5.8°	50	4	2	●	1	8.5	8.9	9.7	10.7
VFR2XLBR0050N100	0.5	1	0.75	10	0.96	5.1°	50	4	2	●	1	10.6	11.1	12.1	13.4
VFR2XLBR0050N120	0.5	1	0.75	12	0.96	4.6°	50	4	2	●	1	12.7	13.2	14.5	16
VFR2XLBR0075N060	0.75	1.5	1.1	6	1.44	6.3°	50	4	2	●	1	6.3	6.6	7.2	7.9
VFR2XLBR0075N060S06	0.75	1.5	1.1	6	1.44	8°	50	6	2	●	1	6.3	6.6	7.2	7.9
VFR2XLBR0075N080	0.75	1.5	1.1	8	1.44	5.4°	50	4	2	●	1	8.4	8.8	9.6	10.6
VFR2XLBR0075N080S06	0.75	1.5	1.1	8	1.44	7.2°	50	6	2	●	1	8.4	8.8	9.6	10.6
VFR2XLBR0075N100	0.75	1.5	1.1	10	1.44	4.7°	50	4	2	★	1	10.5	11	12	13.2
VFR2XLBR0075N120	0.75	1.5	1.1	12	1.44	4.2°	50	4	2	●	1	12.6	13.1	14.4	15.9
VFR2XLBR0075N140	0.75	1.5	1.1	14	1.44	3.8°	50	4	2	★	1	14.7	15.3	16.8	18.5
VFR2XLBR0075N160	0.75	1.5	1.1	16	1.44	3.4°	60	4	2	★	1	16.8	17.5	19.2	21.2
VFR2XLBR0100N060	1	2	1.5	6	1.94	5.8°	50	4	2	●	1	6.3	6.6	7.1	7.8
VFR2XLBR0100N060S06	1	2	1.5	6	1.94	7.8°	50	6	2	●	1	6.3	6.6	7.1	7.8
VFR2XLBR0100N080	1	2	1.5	8	1.94	4.8°	50	4	2	●	1	8.4	8.8	9.5	10.5
VFR2XLBR0100N080S06	1	2	1.5	8	1.94	6.9°	50	6	2	●	1	8.4	8.8	9.5	10.5
VFR2XLBR0100N100	1	2	1.5	10	1.94	4.2°	50	4	2	★	1	10.5	10.9	11.9	13.1
VFR2XLBR0100N100S06	1	2	1.5	10	1.94	6.2°	50	6	2	●	1	10.5	10.9	11.9	13.1
VFR2XLBR0100N120	1	2	1.5	12	1.94	3.6°	50	4	2	●	1	12.6	13.1	14.3	15.8
VFR2XLBR0100N120S06	1	2	1.5	12	1.94	5.6°	50	6	2	●	1	12.6	13.1	14.3	15.8
VFR2XLBR0100N160	1	2	1.5	16	1.94	2.9°	60	4	2	●	1	16.8	17.5	19.1	*
VFR2XLBR0100N160S06	1	2	1.5	16	1.94	4.7°	60	6	2	★	1	16.8	17.5	19.1	21.1
VFR2XLBR0100N200	1	2	1.5	20	1.94	2.4°	60	4	2	●	1	20.9	21.8	23.9	*
VFR2XLBR0100N200S06	1	2	1.5	20	1.94	4°	60	6	2	★	1	20.9	21.8	23.9	26.4
VFR2XLBR0125N100	1.25	2.5	1.9	10	2.4	3.5°	60	4	2	★	1	10.4	10.8	11.8	12.9
VFR2XLBR0125N150	1.25	2.5	1.9	15	2.4	2.5°	60	4	2	★	1	15.6	16.3	17.8	*
VFR2XLBR0150N100	1.5	3	2.3	10	2.9	5.5°	60	6	2	●	1	10.4	10.8	11.7	12.9
VFR2XLBR0150N120	1.5	3	2.3	12	2.9	4.9°	60	6	2	●	1	12.5	13	14.1	15.5
VFR2XLBR0150N160	1.5	3	2.3	16	2.9	4°	70	6	2	●	1	16.7	17.3	18.9	20.8
VFR2XLBR0150N200	1.5	3	2.3	20	2.9	3.4°	70	6	2	●	1	20.8	21.7	23.7	26.1
VFR2XLBR0150N250	1.5	3	2.3	25	2.9	2.8°	70	6	2	●	1	26.1	27.2	29.7	*
VFR2XLBR0150N300	1.5	3	2.3	30	2.9	2.5°	70	6	2	●	1	31.3	32.6	35.7	*
VFR2XLBR0200N100	2	4	3	10	3.9	4.5°	70	6	2	●	1	10.4	10.8	11.6	12.7
VFR2XLBR0200N120	2	4	3	12	3.9	3.9°	70	6	2	●	1	12.5	12.9	14	15.4
VFR2XLBR0200N160	2	4	3	16	3.9	3.1°	70	6	2	●	1	16.6	17.3	18.8	20.7
VFR2XLBR0200N200	2	4	3	20	3.9	2.6°	70	6	2	●	1	20.8	21.7	23.6	*
VFR2XLBR0200N250	2	4	3	25	3.9	2.1°	70	6	2	●	1	26	27.1	29.6	*
VFR2XLBR0200N300	2	4	3	30	3.9	1.8°	70	6	2	★	1	31.2	32.6	*	*
VFR2XLBR0250N200	2.5	5	3.8	20	4.9	1.5°	70	6	2	●	1	20.8	21.6	*	*
VFR2XLBR0250N250	2.5	5	3.8	25	4.9	1.2°	70	6	2	★	1	26	27.1	*	*
VFR2XLBR0300N180	3	6	6	18	5.85	—	80	6	2	★	2	*	*	*	*
VFR2XLBR0300N300	3	6	6	30	5.85	—	80	6	2	●	2	*	*	*	*

* No interference

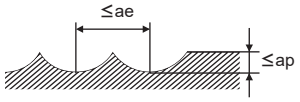
VFR2XLB

Ball nose, 2 Flute, Long neck

RECOMMENDED CUTTING CONDITIONS

Workpiece Material				Hardened Steels (45—55HRC)				Hardened Steels (55—70HRC)			
Corner Radius **RE**		Neck length **LU**		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)								
0.1	**.004**	**0.5**	**.020**	40000	11.8	.00012	.0004	40000	11.8	.00008	.0004
0.1	**.004**	**1**	**.039**	40000	11.8	.00008	.0004	40000	11.8	.00008	.0004
0.15	**.006**	**1**	**.039**	40000	19.7	.00028	.0006	40000	19.7	.00020	.0006
0.15	**.006**	**1.5**	**.059**	40000	19.7	.00020	.0006	40000	19.7	.00012	.0006
0.15	**.006**	**2**	**.079**	40000	19.7	.00012	.0006	40000	19.7	.00008	.0006
0.2	**.008**	**1**	**.039**	40000	55.1	.00059	.0008	40000	55.1	.00039	.0008
0.2	**.008**	**1.5**	**.059**	40000	39.4	.00039	.0008	40000	39.4	.00024	.0008
0.2	**.008**	**2**	**.079**	40000	39.4	.00039	.0008	40000	39.4	.00024	.0008
0.2	**.008**	**2.5**	**.098**	40000	27.6	.00020	.0008	40000	27.6	.00012	.0008
0.2	**.008**	**3**	**.118**	40000	27.6	.00020	.0008	40000	27.6	.00012	.0008
0.2	**.008**	**4**	**.157**	40000	23.6	.00016	.0008	40000	19.7	.00012	.0008
0.25	**.010**	**1.5**	**.059**	40000	78.7	.00079	.0010	40000	78.7	.00059	.0010
0.25	**.010**	**2**	**.079**	40000	78.7	.00079	.0010	40000	78.7	.00059	.0010
0.25	**.010**	**2.5**	**.098**	40000	59.1	.00059	.0010	40000	59.1	.00039	.0010
0.25	**.010**	**3**	**.118**	40000	47.2	.00059	.0010	40000	47.2	.00039	.0010
0.25	**.010**	**4**	**.157**	36000	35.4	.00394	.0010	36000	35.4	.00028	.0010
0.3	**.012**	**2**	**.079**	40000	110.2	.0012	.0012	40000	110.2	.0008	.0012
0.3	**.012**	**3**	**.118**	40000	110.2	.0012	.0012	40000	110.2	.0008	.0012
0.3	**.012**	**4**	**.157**	35000	78.7	.0008	.0012	35000	78.7	.0006	.0012
0.3	**.012**	**5**	**.197**	30000	39.4	.0004	.0012	30000	39.4	.0003	.0012
0.3	**.012**	**6**	**.236**	30000	31.5	.0003	.0012	30000	31.5	.0002	.0012
0.4	**.016**	**3**	**.118**	40000	118.1	.0016	.0016	40000	118.1	.0012	.0016
0.4	**.016**	**4**	**.157**	40000	118.1	.0008	.0016	40000	118.1	.0006	.0016
0.4	**.016**	**6**	**.236**	30000	63.0	.0008	.0016	30000	63.0	.0004	.0016
0.4	**.016**	**8**	**.315**	25000	39.4	.0004	.0016	25000	39.4	.0003	.0016
0.5	**.020**	**3**	**.118**	40000	157.5	.0020	.0020	40000	157.5	.0016	.0020
0.5	**.020**	**4**	**.157**	40000	157.5	.0020	.0020	40000	157.5	.0016	.0020
0.5	**.020**	**6**	**.236**	35000	78.7	.0012	.0020	35000	78.7	.0008	.0020
0.5	**.020**	**8**	**.315**	30000	63.0	.0008	.0020	30000	63.0	.0004	.0020
0.5	**.020**	**10**	**.394**	20000	39.4	.0004	.0020	20000	39.4	.0004	.0020
0.5	**.020**	**12**	**.472**	20000	39.4	.0004	.0020	20000	31.5	.0003	.0020
0.75	**.030**	**6**	**.236**	40000	196.9	.0028	.0030	40000	157.5	.0024	.0030
0.75	**.030**	**8**	**.315**	40000	196.9	.0028	.0030	40000	137.8	.0024	.0030
0.75	**.030**	**10**	**.394**	40000	177.2	.0024	.0030	40000	94.5	.0024	.0030
0.75	**.030**	**12**	**.472**	32000	133.9	.0016	.0030	32000	78.7	.0016	.0030
0.75	**.030**	**14**	**.551**	16000	59.1	.0016	.0030	16000	47.2	.0012	.0030
0.75	**.030**	**16**	**.630**	13000	47.2	.0012	.0030	13000	47.2	.0008	.0030
1	**.039**	**6**	**.236**	40000	236.2	.0039	.0039	40000	133.9	.0039	.0039
1	**.039**	**8**	**.315**	40000	196.9	.0039	.0039	40000	118.1	.0039	.0039
1	**.039**	**10**	**.394**	40000	196.9	.0031	.0039	40000	118.1	.0028	.0039
1	**.039**	**12**	**.472**	40000	196.9	.0031	.0039	40000	102.4	.0020	.0039
1	**.039**	**16**	**.630**	32000	137.8	.0020	.0039	32000	66.9	.0012	.0039
1	**.039**	**20**	**.787**	10000	39.4	.0016	.0039	10000	39.4	.0012	.0039
1.25	**.049**	**10**	**.394**	36000	196.9	.0047	.0098	36000	102.4	.0043	.0098
1.25	**.049**	**15**	**.591**	36000	181.1	.0031	.0098	36000	78.7	.0030	.0098

Depth of Cut



Note 1) When the inclination angle of machined surface is large, or machining with large cutting load such as corner area, reduce the revolution and feed rate.

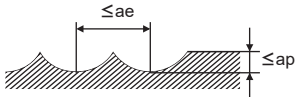
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.

Note 3) Cutting conditions may differ considerably due to the tool overhang, depth of cut and machine tool condition. Please use the table above as a reference starting point.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material				Hardened Steels (45—55HRC)				Hardened Steels (55—70HRC)			
Corner Radius **RE**		Neck length **LU**		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)								
1.5	**.059**	**10**	**.394**	32000	200.8	.0059	.0118	32000	86.6	.0059	.0118
1.5	**.059**	**12**	**.472**	32000	200.8	.0051	.0118	32000	86.6	.0051	.0118
1.5	**.059**	**16**	**.630**	32000	177.2	.0039	.0118	32000	70.9	.0039	.0118
1.5	**.059**	**20**	**.787**	27000	149.6	.0039	.0118	27000	63.0	.0024	.0118
1.5	**.059**	**25**	**.984**	21000	106.3	.0031	.0118	21000	47.2	.0024	.0118
1.5	**.059**	**30**	**1.181**	9000	39.4	.0031	.0118	9000	27.6	.0020	.0118
2	**.079**	**10**	**.394**	24000	189.0	.0079	.0157	24000	86.6	.0079	.0157
2	**.079**	**12**	**.472**	24000	189.0	.0079	.0157	24000	86.6	.0079	.0157
2	**.079**	**16**	**.630**	24000	149.6	.0059	.0157	24000	59.1	.0059	.0157
2	**.079**	**20**	**.787**	24000	149.6	.0059	.0157	24000	59.1	.0059	.0157
2	**.079**	**25**	**.984**	24000	149.6	.0059	.0157	24000	43.3	.0039	.0157
2	**.079**	**30**	**1.181**	24000	118.1	.0039	.0157	24000	43.3	.0031	.0157
2.5	**.098**	**20**	**.787**	19000	133.9	.0079	.0197	19000	55.1	.0079	.0197
2.5	**.098**	**25**	**.984**	19000	133.9	.0079	.0197	19000	55.1	.0079	.0197
3	**.118**	**18**	**.709**	16000	137.8	.0098	.0236	16000	39.4	.0079	.0236
3	**.118**	**30**	**1.181**	16000	137.8	.0079	.0236	16000	39.4	.0079	.0236

Depth of Cut



Note 1) When the inclination angle of machined surface is large, or machining with large cutting load such as corner area, reduce the revolution and feed rate.
Note 2) If the depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) Cutting conditions may differ considerably due to the tool overhang, depth of cut and machine tool condition. Please use the table above as a reference starting point.

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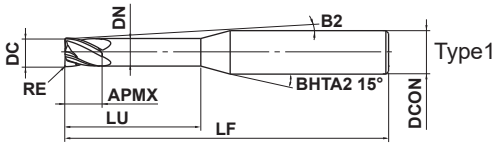
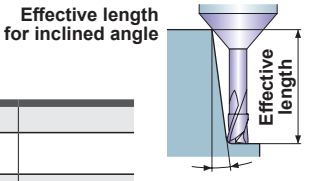
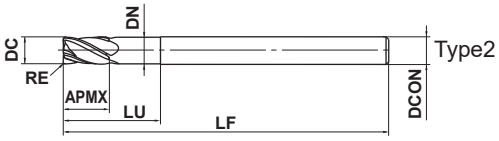
Corner radius, Short cut length, 4 Flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	○	◎	◎				







0.5≤DC≤6	6<DC≤12				
±0.005	±0.007				
0.5≤DC≤6	6<DC≤12				
0 - 0.01	0 - 0.015				
DCON=6	8≤DCON≤10	DCON=12			
0 - 0.005	0 - 0.006	0 - 0.008			

- Completely seamless curved R edge. DC≥1.5
- The wiper edge and strong back taper achieve high-precision machining. 1.5≤DC≤5

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFRPSRBD0050R005N020	0.5	0.05	0.5	2	0.47	12.6	50	6	4	★	1	2.1	2.2	2.3	2.5
VFRPSRBD0050R010N020	0.5	0.1	0.5	2	0.47	12.7	50	6	4	★	1	2.1	2.2	2.3	2.5
VFRPSRBD0060R005N020	0.6	0.05	0.6	2	0.57	12.5	50	6	4	●	1	2.1	2.2	2.4	2.6
VFRPSRBD0060R010N020	0.6	0.1	0.6	2	0.57	12.5	50	6	4	★	1	2.1	2.2	2.3	2.6
VFRPSRBD0060R010N040	0.6	0.1	0.6	4	0.57	10.8	50	6	4	★	1	4.2	4.4	4.7	5.1
VFRPSRBD0060R020N020	0.6	0.2	0.6	2	0.57	12.6	50	6	4	●	1	2.1	2.2	2.2	2.6
VFRPSRBD0080R005N040	0.8	0.05	0.8	4	0.77	10.7	50	6	4	★	1	4.2	4.4	4.7	5.1
VFRPSRBD0080R010N040	0.8	0.1	0.8	4	0.77	10.7	50	6	4	●	1	4.2	4.4	4.7	5.1
VFRPSRBD0080R020N040	0.8	0.2	0.8	4	0.77	10.8	50	6	4	●	1	4.2	4.4	4.7	5.1
VFRPSRBD0080R030N040	0.8	0.3	0.8	4	0.77	10.8	50	6	4	●	1	4.2	4.4	4.7	5
VFRPSRBD0100R005N040	1	0.05	1	4	0.96	10.4	50	6	4	★	1	4.3	4.5	4.9	5.4
VFRPSRBD0100R010N040	1	0.1	1	4	0.96	10.4	50	6	4	●	1	4.3	4.5	4.9	5.4
VFRPSRBD0100R010N060	1	0.1	1	6	0.96	9.1	50	6	4	●	1	6.4	6.7	7.3	7.9
VFRPSRBD0100R020N040	1	0.2	1	4	0.96	10.5	50	6	4	●	1	4.3	4.5	4.7	5.3
VFRPSRBD0100R020N060	1	0.2	1	6	0.96	9.2	50	6	4	★	1	6.4	6.7	7.3	7.8
VFRPSRBD0100R030N040	1	0.3	1	4	0.96	10.5	50	6	4	★	1	4.3	4.5	4.6	5.3
VFRPSRBD0100R040N040	1	0.4	1	4	0.96	10.6	50	6	4	★	1	4.3	4.5	4.5	5.3
VFRPSRBD0150R010N040	1.5	0.1	1.5	4	1.42	10.2	50	6	4	●	1	4.2	4.4	4.8	5.2
VFRPSRBD0150R010N060	1.5	0.1	1.5	6	1.42	8.8	50	6	4	●	1	6.3	6.6	7.1	7.7
VFRPSRBD0150R010N100	1.5	0.1	1.5	10	1.42	6.9	50	6	4	★	1	10.5	10.9	11.7	12.7
VFRPSRBD0150R020N040	1.5	0.2	1.5	4	1.42	10.2	50	6	4	●	1	4.2	4.4	4.6	5.2
VFRPSRBD0150R020N060	1.5	0.2	1.5	6	1.42	8.8	50	6	4	●	1	6.3	6.6	7.1	7.7
VFRPSRBD0150R020N100	1.5	0.2	1.5	10	1.42	7	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0150R030N040	1.5	0.3	1.5	4	1.42	10.3	50	6	4	★	1	4.2	4.4	4.5	5.2
VFRPSRBD0150R030N060	1.5	0.3	1.5	6	1.42	8.9	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0150R030N100	1.5	0.3	1.5	10	1.42	7	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0150R050N040	1.5	0.5	1.5	4	1.42	10.5	50	6	4	●	1	4.2	4.4	4.3	5.1
VFRPSRBD0150R050N060	1.5	0.5	1.5	6	1.42	9	50	6	4	●	1	6.3	6.6	7.1	7.6

● : USA Stock ★ : Stocked in Japan

(mm)

Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFRPSRBD0150R050N100	1.5	0.5	1.5	10	1.42	7.1	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0200R010N060	2	0.1	2	6	1.9	8.4	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0200R010N100	2	0.1	2	10	1.9	6.5	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0200R010N150	2	0.1	2	15	1.9	5.1	50	6	4	★	1	15.7	16.2	17.4	18.8
VFRPSRBD0200R020N060	2	0.2	2	6	1.9	8.4	50	6	4	●	1	6.3	6.6	7.1	7.6
VFRPSRBD0200R020N100	2	0.2	2	10	1.9	6.5	50	6	4	●	1	10.5	10.9	11.7	12.6
VFRPSRBD0200R020N150	2	0.2	2	15	1.9	5.1	50	6	4	●	1	15.7	16.2	17.4	18.8
VFRPSRBD0200R030N060	2	0.3	2	6	1.9	8.5	50	6	4	★	1	6.3	6.6	7	7.6
VFRPSRBD0200R030N100	2	0.3	2	10	1.9	6.6	50	6	4	●	1	10.5	10.8	11.6	12.6
VFRPSRBD0200R030N150	2	0.3	2	15	1.9	5.1	50	6	4	★	1	15.7	16.2	17.4	18.8
VFRPSRBD0200R030N200	2	0.3	2	20	1.9	4.2	60	6	4	★	1	20.8	21.5	23.1	25
VFRPSRBD0200R050N060	2	0.5	2	6	1.9	8.6	50	6	4	●	1	6.3	6.5	7	7.5
VFRPSRBD0200R050N100	2	0.5	2	10	1.9	6.6	50	6	4	●	1	10.5	10.8	11.6	12.5
VFRPSRBD0200R050N150	2	0.5	2	15	1.9	5.2	50	6	4	●	1	15.6	16.2	17.4	18.7
VFRPSRBD0200R050N200	2	0.5	2	20	1.9	4.2	60	6	4	●	1	20.8	21.5	23.1	24.9
VFRPSRBD0250R030N080	2.5	0.3	2.5	8	2.35	6.9	50	6	4	●	1	8.3	8.6	9.2	10
VFRPSRBD0250R030N150	2.5	0.3	2.5	15	2.35	4.7	50	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0250R050N080	2.5	0.5	2.5	8	2.35	7	50	6	4	●	1	8.3	8.6	9.2	9.9
VFRPSRBD0250R050N150	2.5	0.5	2.5	15	2.35	4.7	50	6	4	★	1	15.6	16.1	17.3	18.6
VFRPSRBD0250R100N080	2.5	1	2.5	8	2.35	7.3	50	6	4	●	1	8.3	8.6	9.1	9.8
VFRPSRBD0300R010N100	3	0.1	3	10	2.85	5.5	60	6	4	●	1	10.4	10.8	11.6	12.5
VFRPSRBD0300R010N150	3	0.1	3	15	2.85	4.2	60	6	4	★	1	15.6	16.1	17.3	18.7
VFRPSRBD0300R020N100	3	0.2	3	10	2.85	5.5	60	6	4	●	1	10.4	10.8	11.6	12.5
VFRPSRBD0300R020N150	3	0.2	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0300R020N200	3	0.2	3	20	2.85	3.4	60	6	4	●	1	20.7	21.5	23.1	24.9
VFRPSRBD0300R030N100	3	0.3	3	10	2.85	5.6	60	6	4	●	1	10.4	10.8	11.5	12.5
VFRPSRBD0300R030N150	3	0.3	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.7
VFRPSRBD0300R030N200	3	0.3	3	20	2.85	3.4	60	6	4	●	1	20.7	21.5	23	24.9
VFRPSRBD0300R050N100	3	0.5	3	10	2.85	5.6	60	6	4	●	1	10.4	10.7	11.5	12.4
VFRPSRBD0300R050N150	3	0.5	3	15	2.85	4.2	60	6	4	●	1	15.6	16.1	17.3	18.6
VFRPSRBD0300R050N200	3	0.5	3	20	2.85	3.4	60	6	4	●	1	20.7	21.4	23	24.8
VFRPSRBD0300R100N100	3	1	3	10	2.85	5.8	60	6	4	★	1	10.4	10.7	11.4	12.3
VFRPSRBD0300R100N150	3	1	3	15	2.85	4.3	60	6	4	●	1	15.5	16.1	17.2	18.5
VFRPSRBD0300R100N200	3	1	3	20	2.85	3.5	60	6	4	●	1	20.7	21.4	22.9	24.7
VFRPSRBD0400R010N120	4	0.1	4	12	3.85	3.6	60	6	4	●	1	12.5	12.9	13.9	15
VFRPSRBD0400R010N200	4	0.1	4	20	3.85	2.4	60	6	4	●	1	20.7	21.5	23.1	*
VFRPSRBD0400R020N120	4	0.2	4	12	3.85	3.7	60	6	4	★	1	12.5	12.9	13.9	15
VFRPSRBD0400R020N200	4	0.2	4	20	3.85	2.4	60	6	4	●	1	20.7	21.5	23.1	*
VFRPSRBD0400R030N120	4	0.3	4	12	3.85	3.7	60	6	4	●	1	12.5	12.9	13.8	15
VFRPSRBD0400R030N200	4	0.3	4	20	3.85	2.4	60	6	4	●	1	20.7	21.5	23	*
VFRPSRBD0400R030N300	4	0.3	4	30	3.85	1.7	70	6	4	★	1	31.1	32.2	*	*
VFRPSRBD0400R050N120	4	0.5	4	12	3.85	3.7	60	6	4	●	1	12.5	12.9	13.8	14.9
VFRPSRBD0400R050N200	4	0.5	4	20	3.85	2.5	60	6	4	●	1	20.7	21.4	23	*
VFRPSRBD0400R050N300	4	0.5	4	30	3.85	1.7	70	6	4	●	1	31.1	32.1	*	*
VFRPSRBD0400R100N120	4	1	4	12	3.85	3.8	60	6	4	●	1	12.4	12.8	13.7	14.8
VFRPSRBD0400R100N200	4	1	4	20	3.85	2.5	60	6	4	●	1	20.7	21.4	22.9	*

* No interference

VFRPSRB

Corner radius, Short cut length, 4 Flute

(mm)

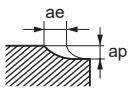
Order Number	DC	RE	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
VFRPSRBD0400R100N300	4	1	4	30	3.85	1.7	70	6	4	●	1	31.1	32.1	*	*
VFRPSRBD0500R050N150	5	0.5	5	15	4.85	1.7	60	6	4	★	1	15.6	16.1	*	*
VFRPSRBD0500R100N150	5	1	5	15	4.85	1.8	60	6	4	●	1	15.5	16.1	*	*
VFRPSRBD0600R010N180	6	0.1	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R020N180	6	0.2	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R030N180	6	0.3	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R050N180	6	0.5	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R100N180	6	1	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0600R200N180	6	2	9	18	5.85	—	70	6	4	●	2	*	*	*	*
VFRPSRBD0800R020N240	8	0.2	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R030N240	8	0.3	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R050N240	8	0.5	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R100N240	8	1	12	24	7.85	—	90	8	4	●	2	*	*	*	*
VFRPSRBD0800R200N240	8	2	12	24	7.85	—	90	8	4	★	2	*	*	*	*
VFRPSRBD1000R030N300	10	0.3	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R050N300	10	0.5	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R100N300	10	1	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R200N300	10	2	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1000R300N300	10	3	15	30	9.7	—	100	10	4	●	2	*	*	*	*
VFRPSRBD1200R050N360	12	0.5	18	36	11.7	—	110	12	4	★	2	*	*	*	*
VFRPSRBD1200R100N360	12	1	18	36	11.7	—	110	12	4	●	2	*	*	*	*
VFRPSRBD1200R200N360	12	2	18	36	11.7	—	110	12	4	★	2	*	*	*	*
VFRPSRBD1200R300N360	12	3	18	36	11.7	—	110	12	4	●	2	*	*	*	*

* No interference

RECOMMENDED CUTTING CONDITIONS

Workpiece Material						Hardened Steels (45－55HRC)				Hardened Steels (55－65HRC)				Hardened Steels (65－70HRC)			
Dia. **DC**		Corner Radius **RE**		Usable Length **LU**		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Feed Rate (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)	(mm)	(inch)												
0.5	**.020**	**0.05**	**.002**	**2**	**.079**	25000	39.4	.0002	.004	19000	29.9	.0002	.003	13000	20.1	.0001	.003
0.5	**.020**	**0.1**	**.004**	**2**	**.079**	25000	39.4	.0003	.004	19000	29.9	.0002	.003	13000	20.1	.0002	.003
0.6	**.024**	**0.05**	**.002**	**2**	**.079**	21000	39.4	.0002	.004	16000	29.9	.0002	.003	11000	20.1	.0001	.003
0.6	**.024**	**0.1**	**.004**	**2**	**.079**	21000	39.4	.0003	.004	16000	29.9	.0002	.003	11000	20.1	.0002	.003
0.6	**.024**	**0.1**	**.004**	**4**	**.157**	18000	35.0	.0002	.004	16000	29.9	.0002	.003	11000	20.1	.0002	.003
0.6	**.024**	**0.2**	**.008**	**2**	**.079**	24000	43.3	.0004	.004	19000	35.0	.0003	.003	16000	29.9	.0002	.003
0.8	**.031**	**0.05**	**.002**	**4**	**.157**	16000	29.9	.0006	.005	12000	22.4	.0004	.004	7900	15.0	.0004	.004
0.8	**.031**	**0.1**	**.004**	**4**	**.157**	16000	29.9	.0008	.005	12000	22.4	.0006	.004	7900	15.0	.0004	.004
0.8	**.031**	**0.2**	**.008**	**4**	**.157**	20000	37.4	.0012	.005	16000	29.9	.0010	.004	12000	22.4	.0008	.004
0.8	**.031**	**0.3**	**.012**	**4**	**.157**	20000	37.4	.0012	.005	16000	29.9	.0010	.004	12000	22.4	.0008	.004
1	**.039**	**0.05**	**.002**	**4**	**.157**	13000	39.4	.0006	.006	9500	29.9	.0004	.005	6400	20.1	.0004	.005
1	**.039**	**0.1**	**.004**	**4**	**.157**	13000	39.4	.0008	.006	9500	29.9	.0006	.005	6400	20.1	.0006	.005
1	**.039**	**0.1**	**.004**	**6**	**.236**	11000	35.0	.0006	.005	6400	20.1	.0004	.004	6400	20.1	.0004	.004
1	**.039**	**0.2**	**.008**	**4**	**.157**	16000	51.2	.0012	.006	9500	29.9	.0010	.005	6400	20.1	.0008	.005
1	**.039**	**0.2**	**.008**	**6**	**.236**	13000	39.4	.0008	.005	6400	20.1	.0008	.004	6400	20.1	.0006	.004
1	**.039**	**0.3**	**.012**	**4**	**.157**	16000	51.2	.0012	.006	9500	29.9	.0010	.005	6400	20.1	.0008	.005
1	**.039**	**0.4**	**.016**	**4**	**.157**	16000	51.2	.0016	.006	9500	29.9	.0012	.005	6400	20.1	.0010	.005
1.5	**.059**	**0.1**	**.004**	**4**	**.157**	14000	66.9	.0010	.009	11000	36.2	.0006	.008	7200	22.4	.0004	.008
1.5	**.059**	**0.1**	**.004**	**6**	**.236**	11000	55.1	.0010	.007	9200	28.7	.0006	.006	5700	18.1	.0004	.006
1.5	**.059**	**0.1**	**.004**	**10**	**.394**	11000	55.1	.0010	.007	9200	28.7	.0006	.006	5700	18.1	.0004	.006
1.5	**.059**	**0.2**	**.008**	**4**	**.157**	14000	66.9	.0020	.009	11000	36.2	.0014	.008	7200	22.4	.0010	.008
1.5	**.059**	**0.2**	**.008**	**6**	**.236**	11000	55.1	.0020	.007	9200	28.7	.0014	.006	5700	18.1	.0010	.006
1.5	**.059**	**0.2**	**.008**	**10**	**.394**	11000	55.1	.0020	.007	9200	28.7	.0014	.006	5700	18.1	.0010	.006
1.5	**.059**	**0.3**	**.012**	**4**	**.157**	16000	74.8	.0030	.009	13000	39.4	.0020	.008	8000	25.2	.0014	.008
1.5	**.059**	**0.3**	**.012**	**6**	**.236**	13000	59.1	.0030	.007	10000	31.9	.0020	.006	6400	20.1	.0014	.006
1.5	**.059**	**0.3**	**.012**	**10**	**.394**	13000	59.1	.0030	.007	10000	31.9	.0020	.006	6400	20.1	.0014	.006
1.5	**.059**	**0.5**	**.020**	**4**	**.157**	16000	74.8	.0031	.009	13000	39.4	.0022	.008	8000	25.2	.0016	.008
1.5	**.059**	**0.5**	**.020**	**6**	**.236**	13000	59.1	.0031	.007	10000	31.9	.0022	.006	6400	20.1	.0016	.006
1.5	**.059**	**0.5**	**.020**	**10**	**.394**	13000	59.1	.0031	.007	10000	31.9	.0022	.006	6400	20.1	.0016	.006
2	**.079**	**0.1**	**.004**	**6**	**.236**	11000	66.9	.0010	.012	8600	39.4	.0008	.011	5400	25.2	.0006	.011
2	**.079**	**0.1**	**.004**	**10**	**.394**	8600	55.1	.0010	.009	6900	32.7	.0008	.009	4300	20.5	.0006	.009
2	**.079**	**0.1**	**.004**	**15**	**.591**	6400	39.4	.0008	.007	5200	24.4	.0006	.007	3200	15.4	.0004	.007
2	**.079**	**0.2**	**.008**	**6**	**.236**	11000	66.9	.0022	.012	8600	39.4	.0014	.011	5400	25.2	.0010	.011
2	**.079**	**0.2**	**.008**	**10**	**.394**	8600	55.1	.0022	.009	6900	32.7	.0014	.009	4300	20.5	.0010	.009
2	**.079**	**0.2**	**.008**	**15**	**.591**	6400	39.4	.0016	.007	5200	24.4	.0010	.007	3200	15.4	.0008	.006
2	**.079**	**0.3**	**.012**	**6**	**.236**	12000	74.8	.0031	.012	6900	43.3	.0022	.011	6000	16.5	.0016	.011
2	**.079**	**0.3**	**.012**	**10**	**.394**	9500	59.1	.0031	.009	7600	36.2	.0022	.009	4800	22.4	.0016	.009
2	**.079**	**0.3**	**.012**	**15**	**.591**	7200	43.3	.0026	.007	5700	27.2	.0018	.007	3600	16.9	.0012	.006
2	**.079**	**0.3**	**.012**	**20**	**.787**	7200	43.3	.0026	.007	5700	27.2	.0018	.007	3600	16.9	.0012	.006
2	**.079**	**0.5**	**.020**	**6**	**.236**	12000	74.8	.0033	.012	9500	43.3	.0024	.011	6000	28.3	.0016	.011
2	**.079**	**0.5**	**.020**	**10**	**.394**	9500	59.1	.0033	.009	7600	36.2	.0024	.009	4800	22.4	.0016	.009
2	**.079**	**0.5**	**.020**	**15**	**.591**	7200	43.3	.0028	.007	5700	27.2	.0018	.007	3600	16.9	.0014	.006
2	**.079**	**0.5**	**.020**	**20**	**.787**	7200	43.3	.0028	.007	5700	27.2	.0018	.007	3600	16.9	.0014	.006
2.5	**.098**	**0.3**	**.012**	**8**	**.315**	9500	74.8	.0031	.015	7600	55.1	.0022	.014	4800	33.9	.0016	.013
2.5	**.098**	**0.3**	**.012**	**15**	**.591**	7600	59.1	.0031	.012	6100	43.3	.0022	.011	3800	27.2	.0016	.011
2.5	**.098**	**0.5**	**.020**	**8**	**.315**	9500	74.8	.0035	.015	7600	55.1	.0024	.014	4800	33.9	.0016	.013
2.5	**.098**	**0.5**	**.020**	**15**	**.591**	7600	59.1	.0035	.012	6100	43.3	.0024	.011	3800	27.2	.0016	.011
2.5	**.098**	**1**	**.039**	**8**	**.315**	9500	74.8	.0059	.013	7600	55.1	.0035	.012	4800	33.9	.0026	.012

Depth of Cut



Note 1) The cutting conditions above are a guide only to machining with cutting edges with a corner radius. When machining with peripheral cutting edges, use the minimum feed rate as a guide.
Note 2) If depth of cut is shallow, the revolution and feed rate can be increased.
Note 3) For profile machining such as moulds, machining conditions may differ considerably depending on the workpiece geometry, machining methods and depth of cut, Reduce the feed rate especially when machining the corner sections of workpiece.
Note 4) If the rigidity of the machine or the workpiece installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

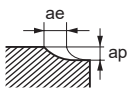
VFRPSRB

Corner radius, Short cut length, 4 Flute

RECOMMENDED CUTTING CONDITIONS

Workpiece Material						Hardened Steels (45—55HRC)				Hardened Steels (55—65HRC)				Hardened Steels (65—70HRC)			
Dia. DC		Corner Radius RE		Usable Length LU		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)	Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut **ap** (inch)	Width of Cut **ae** (inch)
(mm)	(inch)	(mm)	(inch)	(mm)	(inch)												
3	**.118**	**0.1**	**.004**	**10**	**.394**	8100	74.8	.0010	.024	6500	47.2	.0008	.022	4100	28.7	.0006	.022
3	**.118**	**0.1**	**.004**	**15**	**.591**	6500	63.0	.0010	.019	5200	37.0	.0008	.017	3200	22.8	.0006	.017
3	**.118**	**0.2**	**.008**	**10**	**.394**	8100	74.8	.0022	.024	6500	47.2	.0016	.022	4100	28.7	.0010	.022
3	**.118**	**0.2**	**.008**	**15**	**.591**	6500	63.0	.0022	.019	5200	37.0	.0016	.017	3200	22.8	.0010	.017
3	**.118**	**0.2**	**.008**	**20**	**.787**	6500	63.0	.0022	.019	5200	37.0	.0016	.017	3200	22.8	.0010	.017
3	**.118**	**0.3**	**.012**	**10**	**.394**	9000	86.6	.0033	.024	7200	51.2	.0022	.022	4500	31.9	.0016	.022
3	**.118**	**0.3**	**.012**	**15**	**.591**	7200	66.9	.0033	.019	5800	39.4	.0022	.017	3600	25.6	.0016	.017
3	**.118**	**0.3**	**.012**	**20**	**.787**	7200	66.9	.0033	.019	5800	39.4	.0022	.017	3600	25.6	.0016	.017
3	**.118**	**0.5**	**.020**	**10**	**.394**	9000	86.6	.0035	.024	7200	51.2	.0024	.022	4500	31.9	.0018	.022
3	**.118**	**0.5**	**.020**	**15**	**.591**	7200	66.9	.0035	.019	5800	39.4	.0024	.017	3600	25.6	.0018	.017
3	**.118**	**0.5**	**.020**	**20**	**.787**	7200	66.9	.0035	.019	5800	39.4	.0024	.017	3600	25.6	.0018	.017
3	**.118**	**1**	**.039**	**10**	**.394**	9000	86.6	.0059	.021	7200	51.2	.0039	.020	4500	31.9	.0028	.020
3	**.118**	**1**	**.039**	**15**	**.591**	7200	66.9	.0059	.017	5800	39.4	.0039	.016	3600	25.6	.0028	.016
3	**.118**	**1**	**.039**	**20**	**.787**	7200	78.7	.0059	.017	5800	39.4	.0039	.016	3600	25.6	.0028	.016
4	**.157**	**0.1**	**.004**	**12**	**.472**	6100	66.9	.0098	.031	4900	38.2	.0008	.029	3000	24.0	.0006	.029
4	**.157**	**0.1**	**.004**	**20**	**.787**	4900	55.1	.0098	.024	3900	30.7	.0008	.024	2400	19.3	.0006	.023
4	**.157**	**0.2**	**.008**	**12**	**.472**	6100	66.9	.0022	.031	4900	38.2	.0016	.029	3000	24.0	.0010	.029
4	**.157**	**0.2**	**.008**	**20**	**.787**	4900	55.1	.0022	.024	3900	30.7	.0016	.024	2400	19.3	.0010	.023
4	**.157**	**0.3**	**.012**	**12**	**.472**	6800	74.8	.0033	.031	5400	43.3	.0022	.030	3400	26.8	.0016	.029
4	**.157**	**0.3**	**.012**	**20**	**.787**	5400	59.1	.0033	.024	4300	34.3	.0022	.024	2700	21.3	.0016	.023
4	**.157**	**0.3**	**.012**	**30**	**1.181**	4100	43.3	.0026	.020	3200	25.6	.0018	.018	2000	16.1	.0014	.017
4	**.157**	**0.5**	**.020**	**12**	**.472**	6800	74.8	.0035	.031	5400	43.3	.0024	.030	3400	26.8	.0018	.029
4	**.157**	**0.5**	**.020**	**20**	**.787**	5400	59.1	.0035	.026	4300	34.3	.0024	.024	2700	21.3	.0018	.023
4	**.157**	**0.5**	**.020**	**30**	**1.181**	4100	43.3	.0030	.020	4300	25.6	.0020	.018	2000	16.1	.0014	.017
4	**.157**	**1**	**.039**	**12**	**.472**	6800	74.8	.0059	.028	5400	43.3	.0039	.026	3400	26.8	.0028	.026
4	**.157**	**1**	**.039**	**20**	**.787**	5400	59.1	.0059	.022	4300	34.3	.0039	.021	2700	21.3	.0028	.021
4	**.157**	**1**	**.039**	**30**	**1.181**	4100	43.3	.0039	.016	3200	25.6	.0030	.016	2000	16.1	.0022	.016
5	**.197**	**0.5**	**.020**	**15**	**.591**	6400	70.9	.0039	.051	5100	39.4	.0026	.047	3200	25.2	.0018	.043
5	**.197**	**1**	**.039**	**15**	**.591**	6400	70.9	.0059	.043	5100	39.4	.0039	.039	3200	25.2	.0030	.039
6	**.236**	**0.1**	**.004**	**18**	**.709**	4800	59.1	.0012	.059	3800	36.2	.0008	.055	2400	22.4	.0006	.051
6	**.236**	**0.2**	**.008**	**18**	**.709**	4800	59.1	.0024	.059	3800	36.2	.0016	.055	2400	22.4	.0012	.051
6	**.236**	**0.3**	**.012**	**18**	**.709**	5300	66.9	.0035	.059	4200	39.4	.0024	.055	2700	25.2	.0018	.051
6	**.236**	**0.5**	**.020**	**18**	**.709**	5300	66.9	.0039	.059	4200	39.4	.0026	.055	2700	25.2	.0018	.051
6	**.236**	**1**	**.039**	**18**	**.709**	5300	66.9	.0059	.055	4200	39.4	.0039	.047	2700	25.2	.0030	.047
6	**.236**	**2**	**.079**	**18**	**.709**	5300	66.9	.0118	.051	4200	39.4	.0079	.043	2700	25.2	.0059	.043
8	**.315**	**0.2**	**.008**	**24**	**.945**	3600	43.3	.0024	.079	2900	27.2	.0016	.071	1800	16.9	.0012	.071
8	**.315**	**0.3**	**.012**	**24**	**.945**	4000	51.2	.0035	.079	3200	29.9	.0024	.071	2000	18.9	.0018	.071
8	**.315**	**0.5**	**.020**	**24**	**.945**	4000	51.2	.0037	.079	3200	29.9	.0026	.071	2000	18.9	.0018	.071
8	**.315**	**1**	**.039**	**24**	**.945**	4000	51.2	.0059	.071	3200	29.9	.0039	.067	2000	18.9	.0030	.063
8	**.315**	**2**	**.079**	**24**	**.945**	4000	51.2	.0118	.067	3200	29.9	.0079	.063	2000	18.9	.0059	.059
10	**.394**	**0.3**	**.012**	**30**	**1.181**	3200	39.4	.0035	.098	2500	24.0	.0024	.091	1600	15.0	.0018	.091
10	**.394**	**0.5**	**.020**	**30**	**1.181**	3200	39.4	.0037	.098	2500	24.0	.0026	.091	1600	15.0	.0018	.091
10	**.394**	**1**	**.039**	**30**	**1.181**	3200	39.4	.0059	.091	2500	24.0	.0039	.083	1600	15.0	.0030	.079
10	**.394**	**2**	**.079**	**30**	**1.181**	3200	39.4	.0118	.083	2500	24.0	.0079	.079	1600	15.0	.0059	.075
10	**.394**	**3**	**.118**	**30**	**1.181**	3200	39.4	.0177	.075	2500	24.0	.0118	.067	1600	15.0	.0079	.067
12	**.472**	**0.5**	**.020**	**36**	**1.417**	2700	37.4	.0039	.118	2100	20.1	.0026	.110	1300	12.6	.0020	.106
12	**.472**	**1**	**.039**	**36**	**1.417**	2700	37.4	.0059	.106	2100	20.1	.0039	.098	1300	12.6	.0030	.094
12	**.472**	**2**	**.079**	**36**	**1.417**	2700	37.4	.0118	.102	2100	20.1	.0079	.094	1300	12.6	.0059	.091
12	**.472**	**3**	**.118**	**36**	**1.417**	2700	37.4	.0177	.091	2100	20.1	.0118	.083	1300	12.6	.0079	.079

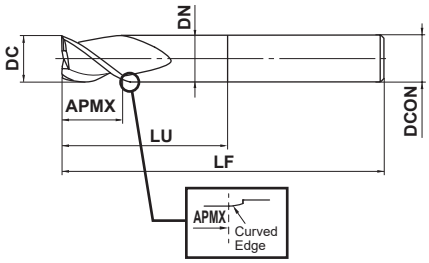
Depth of Cut



A3SA NEW

End mill, Short cut length, 3 flute, with multiple internal thru-coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

- Stability and reliability even when slotting, ramping and plunging.
- The cross sectional geometry of the flutes is perfect for efficient chip discharge.

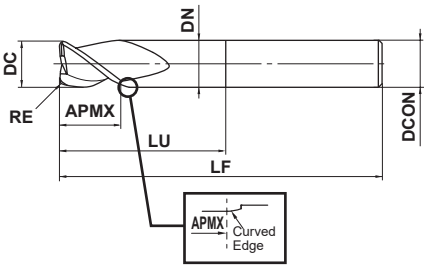
(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
A3SA120N36C	12	18	36	11.4	80	12	3	●
A3SA160N48C	16	24	48	15.4	90	16	3	●
A3SA200N55C	20	30	55	18	100	20	3	●
A3SA250N55C	25	37.5	55	23	100	25	3	●

A3SARB NEW

Corner radius end mill, Short cut length, 3 flute, with multiple internal thru-coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

- Stability and reliability even when slotting, ramping and plunging.
- The cross sectional geometry of the flutes is perfect for efficient chip discharge.

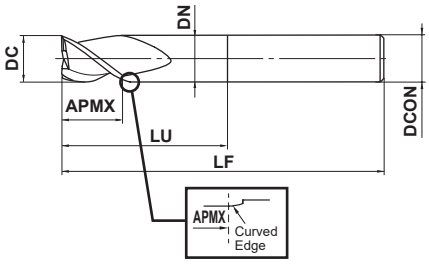
(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
A3SARB120R100N36C	12	1	18	36	11.4	80	12	3	●
A3SARB120R200N36C	12	2	18	36	11.4	80	12	3	●
A3SARB120R300N36C	12	3	18	36	11.4	80	12	3	●
A3SARB160R200N48C	16	2	24	48	15.4	90	16	3	●
A3SARB160R300N48C	16	3	24	48	15.4	90	16	3	●
A3SARB160R400N48C	16	4	24	48	15.4	90	16	3	●
A3SARB200R200N55C	20	2	30	55	18	100	20	3	●
A3SARB200R300N55C	20	3	30	55	18	100	20	3	●
A3SARB200R400N55C	20	4	30	55	18	100	20	3	●
A3SARB250R200N55C	25	2	37.5	55	23	100	25	3	●
A3SARB250R300N55C	25	3	37.5	55	23	100	25	3	●
A3SARB250R400N55C	25	4	37.5	55	23	100	25	3	●
A3SARB250R500N55C	25	5	37.5	55	23	100	25	3	●

DLC3SA NEW

End mill, Short cut length, 3 flute, with multiple internal thru-coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

- Stability and reliability even when slotting, ramping and plunging.
- DLC coating aids in providing excellent chip evacuation.

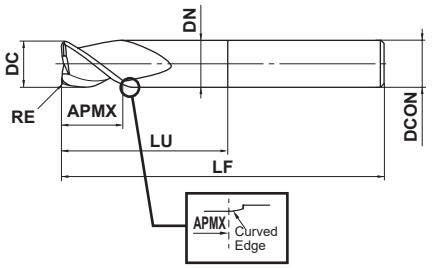
(mm)

Order Number	DC	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
DLC3SA120N36C	12	18	36	11.4	80	12	3	●
DLC3SA160N48C	16	24	48	15.4	90	16	3	●
DLC3SA200N55C	20	30	55	18	100	20	3	●
DLC3SA250N55C	25	37.5	55	23	100	25	3	●

DLC3SARB NEW

Corner radius end mill, Short cut length, 3 flute, with multiple internal thru-coolant holes

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



DC=12	DC>12			
0 - 0.020	0 - 0.030			
12≤DCON≤16	20≤DCON≤25			
0 - 0.011	0 - 0.013			

- Stability and reliability even when slotting, ramping and plunging.
- DLC coating aids in providing excellent chip evacuation.

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock
DLC3SARB120R100N36C	12	1	18	36	11.4	80	12	3	●
DLC3SARB120R200N36C	12	2	18	36	11.4	80	12	3	●
DLC3SARB120R300N36C	12	3	18	36	11.4	80	12	3	●
DLC3SARB160R200N48C	16	2	24	48	15.4	90	16	3	●
DLC3SARB160R300N48C	16	3	24	48	15.4	90	16	3	●
DLC3SARB160R400N48C	16	4	24	48	15.4	90	16	3	●
DLC3SARB200R200N55C	20	2	30	55	18	100	20	3	●
DLC3SARB200R300N55C	20	3	30	55	18	100	20	3	●
DLC3SARB200R400N55C	20	4	30	55	18	100	20	3	●
DLC3SARB250R200N55C	25	2	37.5	55	23	100	25	3	●
DLC3SARB250R300N55C	25	3	37.5	55	23	100	25	3	●
DLC3SARB250R400N55C	25	4	37.5	55	23	100	25	3	●
DLC3SARB250R500N55C	25	5	37.5	55	23	100	25	3	●

ISO13399 ➤ I002

A3SA/A3SARB, DLC3SA/DLC3SARB

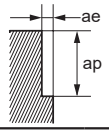
Square/Corner radius end mill, Short cut length, 3 flute, with multiple internal thru-coolant holes

RECOMMENDED CUTTING CONDITIONS

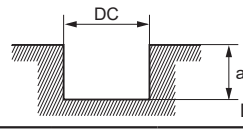
Use high efficiency cutting conditions when the machine and workpiece rigidity, and chip evacuation properties are sufficient. Use lower, general-purpose cutting conditions when the mechanical or workpiece rigidity or chip evacuation porperties are insufficient.

High Efficiency Conditions

■Side Milling

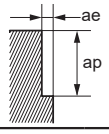
Workpiece Material		Aluminum Alloys				
Dia.**DC**		Cutting Speed	Revolution	Table Feed	Depth of Cut ae	Depth of Cut ap
(mm)	(inch)	(SFM)	(min^{-1})	(IPM)	(inch)	(inch)
12	**.472**	4070	33000	590.6	.236	.472
16	**.630**	5445	33000	787.4	.315	.630
20	**.787**	6790	33000	1023.6	.394	.787
25	**.984**	8495	33000	1259.8	.492	.984
Depth of Cut						

■Slot Milling

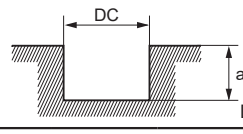
Workpiece Material		Aluminum Alloys			
Dia.**DC**		Cutting Speed	Revolution	Table Feed	Depth of Cut ae
(mm)	(inch)	(SFM)	(min^{-1})	(IPM)	(inch)
12	**.472**	4070	33000	590.6	.236
16	**.630**	5445	33000	787.4	.315
20	**.787**	6790	33000	1023.6	.394
25	**.984**	8495	33000	1259.8	.492
Depth of Cut					

General-purpose Conditions

■Side Milling

Workpiece Material		Aluminum Alloys				
Dia.**DC**		Cutting Speed	Revolution	Table Feed	Depth of Cut ae	Depth of Cut ap
(mm)	(inch)	(SFM)	(min^{-1})	(IPM)	(inch)	(inch)
12	**.472**	1970	16000	283.5	.236	.472
16	**.630**	1970	12000	283.5	.315	.630
20	**.787**	1970	9500	291.3	.394	.787
25	**.984**	1970	7600	287.4	.492	.984
Depth of Cut						

■Slot Milling

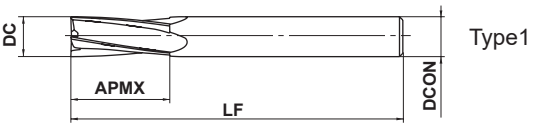
Workpiece Material		Aluminum Alloys			
Dia.**DC**		Cutting Speed	Revolution	Table Feed	Depth of Cut ae
(mm)	(inch)	(SFM)	(min^{-1})	(IPM)	(inch)
12	**.472**	1970	16000	283.5	.236
16	**.630**	1970	12000	283.5	.315
20	**.787**	1970	9500	291.3	.394
25	**.984**	1970	7600	287.4	.492
Depth of Cut					

Note 1) It is recommended to use a water-soluble coolant. It is also possible to use air blow (external/internal) for DLC coated types.
Note 2) Climb milling is recommended for side cutting.
Note 3) This table shows the cutting condition with less than 4D overhang length. If more than 4D, spindle speed, feed rate and depth of cut should be reduced.
Note 4) When ramping, consider the chip discharge and use a feed rate 50% lower than the slotting conditions above and also use a ramping angle of 5º or less.
Note 5) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately within the range described in the above table, or reduce the depth and width of cut.

DFC4JC

End mill, 4 flute, For CFRP

CFRP



6≤DC≤12				
0 - 0.03				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 4 flute end mill with original CVD diamond coating for CFRP machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DFC4JCD0600	6	20	70	6	4	●	1
DFC4JCD0800	8	30	80	8	4	●	1
DFC4JCD1000	10	30	90	10	4	●	1
DFC4JCD1200	12	30	100	12	4	●	1

Note 1) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

RECOMMENDED CUTTING CONDITIONS

Workpiece Material	CFRP		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	11000	950	37.4
8	8000	780	30.7
10	6400	700	27.6
12	5300	650	25.6

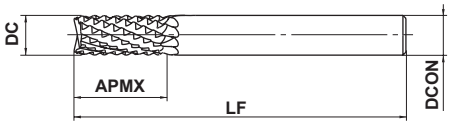
Note 1) Cutting conditions may differ considerably due to the kind of CFRP, the rigidity of the machine, or the clamping and geometry of the workpiece material. Please use the above table as a guideline.
Note 2) When high machining accuracy is needed or if large burrs or delamination occur, we recommend reducing the feed rate.
Note 3) When the depth of cut is greater than 0.8DC, we recommend reducing the feed rate.
Note 4) Please take precautions against dust.

DFCJRT

End mill with cross-nick, For CFRP

CFRP

◎



Type1

h6	DCON=6	8≤DCON≤10	DCON=12		
	0 - 0.008	0 - 0.009	0 - 0.011		

● Cross-nick type end mill with original CVD diamond coating for CFRP machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DFCJRTD0600	6	20	70	6	10	●	1
DFCJRTD0800	8	30	80	8	10	●	1
DFCJRTD1000	10	30	90	10	12	●	1
DFCJRTD1200	12	30	100	12	12	●	1

Note 1) Please contact Mitsubishi Materials for geometries and through coolant types that are non-standard.

RECOMMENDED CUTTING CONDITIONS

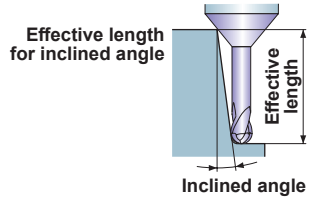
Workpiece Material	CFRP		
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)
6	11000	1200	47.2
8	8000	1000	39.4
10	6400	900	35.4
12	5300	850	33.4

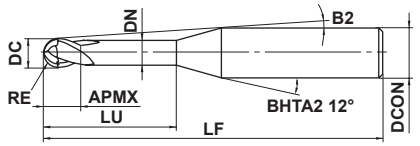
Note 1) Cutting conditions may differ considerably due to the kind of CFRP, the rigidity of the machine, or the clamping and geometry of the workpiece material. Please use the above table as a guideline.
Note 2) When high machining accuracy is needed or if large burrs or delamination occur, we recommend reducing the feed rate.
Note 3) When the depth of cut is greater than 0.8DC, we recommend reducing the feed rate.
Note 4) Please take precautions against dust.

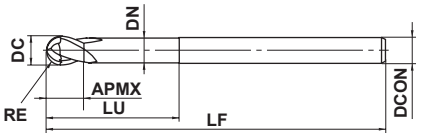
DF2XLB

Ball nose, Medium cut length, 2 flute, Long neck, For graphite

Aluminum Alloy	Copper Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○







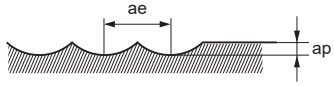
0.2≤RE≤2					
±0.01					
DCON=4					
0 - 0.008					

● 2 flute long neck ball nose end mill with Mitsubishi's unique diamond coating for graphite machining.

(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle 0.5°	1°	2°	3°
DF2XLBR0015N020	0.15	0.3	0.3	2	0.27	9.9°	50	4	2	★	1	2.1	2.2	2.4	2.6
DF2XLBR0020N040	0.2	0.4	0.6	4	0.36	8.4°	60	4	2	★	1	4.1	4.3	4.7	5.2
DF2XLBR0020N080	0.2	0.4	0.6	8	0.36	6.4°	60	4	2	★	1	8.3	8.7	9.5	10.5
DF2XLBR0025N040	0.25	0.5	0.6	4	0.46	8.3°	60	4	2	★	1	4.1	4.3	4.7	5.2
DF2XLBR0025N080	0.25	0.5	0.6	8	0.46	6.3°	60	4	2	★	1	8.3	8.7	9.5	10.5
DF2XLBR0030N060	0.3	0.6	0.9	6	0.56	7.1°	60	4	2	★	1	6.3	6.5	7.1	7.9
DF2XLBR0030N100	0.3	0.6	0.9	10	0.56	5.5°	60	4	2	★	1	10.4	10.9	11.9	13.2
DF2XLBR0040N080	0.4	0.8	1.2	8	0.76	6.1°	60	4	2	★	1	8.3	8.7	9.5	10.5
DF2XLBR0050N040	0.5	1	1.5	4	0.94	8.0°	60	4	2	★	1	4.2	4.4	4.8	5.3
DF2XLBR0050N100	0.5	1	1.5	10	0.94	5.2°	60	4	2	★	1	10.5	11.0	12.0	13.3
DF2XLBR0050N120	0.5	1	1.5	12	0.94	4.6°	60	4	2	★	1	12.6	13.2	14.4	15.9
DF2XLBR0050N160	0.5	1	1.5	16	0.94	3.8°	80	4	2	★	1	16.8	17.5	19.2	21.3
DF2XLBR0050N200	0.5	1	1.5	20	0.94	3.3°	80	4	2	★	1	21.0	21.9	24.0	26.6
DF2XLBR0050N300	0.5	1	1.5	30	0.94	2.4°	80	4	2	★	1	31.4	32.8	36.0	*
DF2XLBR0075N160	0.75	1.5	2.3	16	1.44	3.4°	80	4	2	★	1	16.8	17.5	19.2	21.2
DF2XLBR0100N160	1	2	3	16	1.9	2.9°	80	4	2	★	1	16.7	17.4	19.0	*
DF2XLBR0100N200	1	2	3	20	1.9	2.5°	80	4	2	★	1	20.9	21.8	23.8	*
DF2XLBR0100N250	1	2	3	25	1.9	2.0°	80	4	2	★	1	26.1	27.2	*	*
DF2XLBR0100N400	1	2	3	40	1.9	1.4°	100	4	2	★	1	41.7	43.5	*	*
DF2XLBR0150N160	1.5	3	4.5	16	2.9	1.7°	80	4	2	★	1	16.7	17.3	*	*
DF2XLBR0150N250	1.5	3	4.5	25	2.9	1.2°	80	4	2	★	1	26.1	27.2	*	*
DF2XLBR0200N300	2	4	6	30	3.9	—	80	4	2	★	2	*	*	*	*
DF2XLBR0200N600	2	4	6	60	3.9	—	100	4	2	★	2	*	*	*	*

* No interference

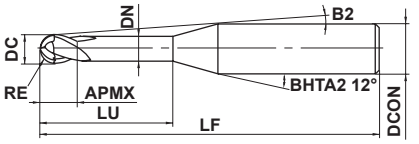
Workpiece Material		Graphite					Copper, Copper alloy				
RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut ap (mm)	Width of cut ae (mm)
R0.15	**2**	40000	1200	47.2	0.03	0.08	40000	800	31.5	0.003	0.03
R0.2	**4**	40000	1300	51.2	0.04	0.1	32000	600	23.6	0.004	0.04
	8	30000	800	31.5	0.03	0.1	—	—	—	—	—
R0.25	**4**	40000	1500	59.1	0.05	0.15	40000	800	31.5	0.01	0.05
	8	30000	1000	39.4	0.04	0.12	28000	500	19.7	0.002	0.05
R0.3	**6**	40000	1500	59.1	0.06	0.15	40000	1000	39.4	0.008	0.06
	10	35000	1000	39.4	0.05	0.15	—	—	—	—	—
R0.4	**8**	40000	1700	66.9	0.08	0.15	30000	1200	47.2	0.008	0.08
R0.5	**4**	40000	2500	98.4	0.12	0.3	40000	2000	78.7	0.05	0.1
	10	40000	2000	78.7	0.1	0.2	33000	1400	55.1	0.01	0.1
	12	40000	2000	78.7	0.1	0.2	30000	1000	39.4	0.007	0.1
	20	30000	1100	43.3	0.08	0.2	—	—	—	—	—
	30	20000	600	23.6	0.06	0.15	—	—	—	—	—
R0.75	**16**	35000	2000	78.7	0.15	0.3	20000	900	35.4	0.03	0.15
R1	**16**	30000	2000	78.7	0.2	0.5	30000	1800	70.9	0.05	0.2
	20	30000	2000	78.7	0.2	0.5	20000	1200	47.2	0.04	0.2
	25	25000	1500	59.1	0.18	0.45	20000	1000	39.4	0.03	0.2
	40	20000	1000	39.4	0.15	0.4	—	—	—	—	—
R1.5	**16**	28000	3000	118.1	0.3	0.9	28000	3000	118.1	0.3	0.3
	25	20000	2000	78.7	0.25	0.75	20000	2000	78.7	0.25	0.3
R2	**30**	15000	2000	78.7	0.4	1.2	15000	2000	78.7	0.3	0.4
	60	12000	1400	55.1	0.3	0.9	12000	1400	55.1	0.2	0.4
Depth of cut											

Note 1) When high machining accuracy is needed, or workpiece material becomes chipped, we recommend lowering feed rate.
Note 2) Use a milling machine dedicated for graphite.
Note 3) If rigidity of machine or workpiece material installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

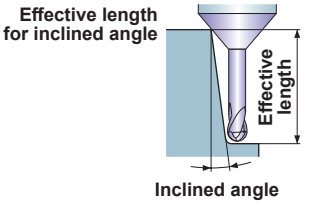
DF2XLBF (For Finishing)

Ball nose, Medium cut length, 2 flute, Long neck, For graphite

Aluminum Alloy	Copper Alloy	Graphite	Zirconia (Before Sintering)	Rigid Composite Resin (Composite Resin)	Machineable Ceramics
○	◎	◎	◎	◎	○



Type1



0.3≤RE≤1	1.5≤RE			
±0.005	±0.01			
DCON=4				
0 - 0.008				

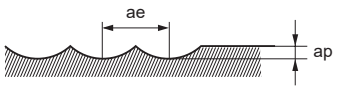
● Diamond coated long neck ball end mills are ideal for finished surfaces of non-ferrous metals.

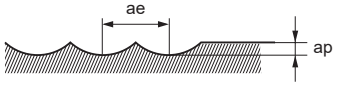
(mm)

Order Number	RE	DC	APMX	LU	DN	B2	LF	DCON	No. of Flutes	Stock	Type	Effective length for inclined angle			
												0.5°	1°	2°	3°
DF2XLBFR0030N100	0.3	0.6	0.45	10	0.57	5.5°	50	4	2	●	1	10.4	10.9	11.9	13.2
DF2XLBFR0050N120	0.5	1	1.5	12	0.86	4.6°	50	4	2	●	1	12.6	13.2	14.4	15.9
DF2XLBFR0050N160	0.5	1	1.5	16	0.86	3.8°	50	4	2	●	1	16.8	17.5	19.2	21.3
DF2XLBFR0050N200	0.5	1	1.5	20	0.86	3.2°	50	4	2	●	1	21	21.9	24	26.6
DF2XLBFR0100N160	1	2	3	16	1.86	2.9°	50	4	2	●	1	16.7	17.4	19	*
DF2XLBFR0100N200	1	2	3	20	1.86	2.4°	50	4	2	●	1	20.9	21.8	23.9	*
DF2XLBFR0150N160	1.5	3	4.5	16	2.86	1.7°	50	4	2	●	1	16.7	17.3	18.9	20.8
DF2XLBFR0150N200	1.5	3	4.5	20	2.86	1.4°	50	4	2	●	1	20.8	21.7	23.7	26.1

* No interference

RECOMMENDED CUTTING CONDITIONS

Workpiece Material			Graphite					Zirconia (Before Sintering)				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPR)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPR)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.6	**R0.3**	**10**	35000	1000	39.4	0.05	0.015	26000	600	23.6	0.06	0.03
1	**R0.5**	**12**	40000	2000	78.7	0.10	0.200	26000	600	23.6	0.10	0.05
		16	35000	1500	59.1	0.09	0.200	26000	600	23.6	0.08	0.04
		20	30000	1100	43.3	0.08	0.200	26000	600	23.6	0.08	0.04
2	**R1**	**16**	30000	2000	78.7	0.20	0.500	18000	1400	55.1	0.06	0.80
		20	30000	2000	78.7	0.20	0.500	18000	1200	47.2	0.50	0.60
3	**R1.5**	**16**	28000	3000	118.1	0.30	0.900	15000	1600	63.0	0.90	0.90
		20	25000	2500	98.4	0.20	0.900	15000	1400	55.1	0.60	0.80
Depth of cut												

Workpiece Material			Copper, Copper alloy					Rigid Composite Resin (Composite Resin)				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPR)	Depth of cut ap (mm)	Depth of cut ae (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPR)	Depth of cut ap (mm)	Depth of cut ae (mm)
0.6	**R0.3**	**10**	30000	600	23.6	0.005	0.040	28000	450	17.7	0.050	0.050
1	**R0.5**	**12**	33000	1400	55.1	0.010	0.100	25000	900	35.4	0.100	0.100
		16	25000	800	31.5	0.007	0.080	25000	700	27.6	0.080	0.080
		20	20000	500	19.7	0.005	0.050	25000	600	23.6	0.080	0.080
2	**R1**	**16**	30000	1800	70.9	0.050	0.200	25000	2100	82.7	0.800	0.800
		20	20000	1200	47.2	0.040	0.200	25000	1800	70.9	0.500	0.500
3	**R1.5**	**16**	28000	3000	118.1	0.300	0.300	25000	2400	94.5	1.000	1.000
		20	25000	2500	98.4	0.200	0.300	25000	2100	82.7	0.800	0.800
Depth of cut												

Note 1) When high machining accuracy is needed, or the workpiece material becomes chipped, we recommend lowering the feed rate and depth of cut.

Note 2) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately.

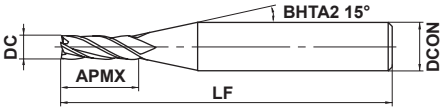
Note 3) When work on dry machining material that contain resin, be careful of tool breakage and mechanical problems (as there is a possibility of blockage caused by cutting chips).

Note 4) Use a milling machine dedicated for graphite.

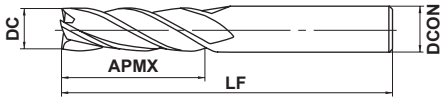
DF4JC

End mill, Semi long cut length, 4 flute, For graphite

Aluminum Alloy	Copper Alloy	Graphite	GFRP CFRP	Machineable Ceramics
○	◎	◎	○	○



Type1



Type2

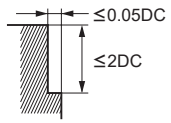
3≤DC≤12				
0 - 0.02				
DCON=6	8≤DCON≤10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

● 4 flute end mill with original diamond coating for graphite machining.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DF4JCD0300	3	12	60	6	4	★	1
DF4JCD0400	4	16	60	6	4	★	1
DF4JCD0600	6	24	60	6	4	★	2
DF4JCD0800	8	28	70	8	4	★	2
DF4JCD1000	10	35	90	10	4	★	2
DF4JCD1200	12	36	110	12	4	★	2

RECOMMENDED CUTTING CONDITIONS

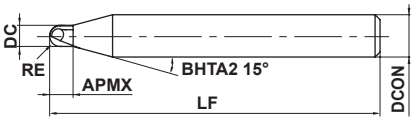
Workpiece Material	Graphite					Copper, Copper alloy				
DC (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut (mm)	Width of cut (mm)
3	22000	2500	98.4	6	0.15	10600	280	11.0	6	0.15
4	18000	2900	114.2	8	0.2	8000	330	13.0	8	0.2
6	14000	3200	126.0	12	0.3	6400	380	15.0	12	0.3
8	10500	2900	114.2	16	0.4	4000	420	16.5	16	0.4
10	8700	2600	102.4	20	0.5	3200	460	18.1	20	0.5
12	7200	2200	86.6	24	0.6	2700	460	18.1	24	0.6
Depth of cut	 DC : Dia.									

Note 1) When high machining accuracy is needed, or workpiece material becomes chipped, we recommend lowering feed rate.
Note 2) Use a milling machine dedicated for graphite.
Note 3) If rigidity of machine or workpiece material installation is very low, or chattering and noise are generated, reduce revolution and feed rate proportionately.

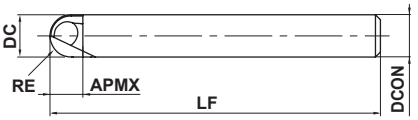
DC2SB

Ball nose, Short cut length, 2 flute, For hard brittle materials

Cemented carbide	Alumina Zirconia	Silicon carbide Silicon nitride	Quartz glass
◎	○	○	○



Type1



Type2

0.1≤RE≤3				
±0.01				
4≤DCON≤6				
0 - 0.008				

●Suitable DC ball end mill for cemented carbide and other hard brittle materials processing.

(mm)

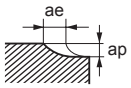
Order Number	RE	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
DC2SBR0010	0.1	0.2	0.12	50	4	2	★	1
DC2SBR0020	0.2	0.4	0.24	50	4	2	★	1
DC2SBR0030	0.3	0.6	0.42	50	4	2	★	1
DC2SBR0040	0.4	0.8	0.56	50	4	2	★	1
DC2SBR0050	0.5	1	0.7	50	4	2	★	1
DC2SBR0075	0.75	1.5	1	50	4	2	★	1
DC2SBR0100	1	2	1.4	50	4	2	★	1
DC2SBR0150	1.5	3	2.1	60	6	2	★	1
DC2SBR0200	2	4	2.8	60	6	2	★	1
DC2SBR0250	2.5	5	3.5	60	6	2	★	1
DC2SBR0300	3	6	4.2	60	6	2	★	2

RECOMMENDED CUTTING CONDITIONS

(mm)

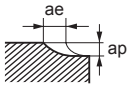
Workpiece Material		Cemented carbide					Alumina Zirconia				
DC (mm)	**RE** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)
0.2	**0.1**	30000	100	3.9	0.01	0.01	30000	100	3.9	0.01	0.01
0.4	**0.2**	30000	150	5.9	0.02	0.08	30000	150	5.9	0.02	0.08
0.6	**0.3**	30000	200	7.9	0.03	0.14	30000	200	7.9	0.03	0.14
0.8	**0.4**	30000	250	9.8	0.04	0.19	30000	250	9.8	0.04	0.19
1	**0.5**	30000	300	11.8	0.05	0.25	30000	300	11.8	0.05	0.25
1.5	**0.75**	30000	300	11.8	0.075	0.275	30000	300	11.8	0.075	0.275
2	**1**	30000	300	11.8	0.1	0.3	30000	300	11.8	0.1	0.3
3	**1.5**	27500	275	10.8	0.125	0.33	27500	275	10.8	0.125	0.33
4	**2**	24000	240	9.4	0.15	0.35	24000	240	9.4	0.15	0.35
5	**2.5**	22000	220	8.7	0.175	0.37	22000	220	8.7	0.175	0.37
6	**3**	20000	200	7.9	0.2	0.4	20000	200	7.9	0.2	0.4

Depth of cut



Workpiece Material		Silicon carbide Silicon nitride					Quartz glass				
DC (mm)	**RE** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)
0.2	**0.1**	30000	50	2.0	0.005	0.005	30000	150	5.9	0.015	0.015
0.4	**0.2**	30000	75	3.0	0.01	0.04	30000	225	8.9	0.03	0.12
0.6	**0.3**	30000	100	3.9	0.015	0.07	30000	300	11.8	0.045	0.21
0.8	**0.4**	30000	125	4.9	0.02	0.095	30000	375	14.8	0.06	0.285
1	**0.5**	30000	150	5.9	0.025	0.125	30000	450	17.7	0.075	0.375
1.5	**0.75**	30000	150	5.9	0.038	0.138	30000	450	17.7	0.113	0.413
2	**1**	30000	150	5.9	0.05	0.15	30000	450	17.7	0.15	0.45
3	**1.5**	27500	138	5.4	0.063	0.165	27500	413	16.3	0.188	0.495
4	**2**	24000	120	4.7	0.075	0.175	24000	360	14.2	0.225	0.525
5	**2.5**	22000	110	4.3	0.088	0.185	22000	330	13.0	0.263	0.555
6	**3**	20000	100	3.9	0.1	0.2	20000	300	11.8	0.3	0.6

Depth of cut



Note 1) The cemented carbide in the above mentioned cutting conditions table is based on CIS standard VM-40(90HRA).

Note 2) Air blow or dry processing is recommended with cemented carbide processing.

∗Note: Using coolants or oil mists may decrease tool longevity.

Note 3) The use of a water soluble cutting oil is recommended with the processing of hard brittle materials other than the cemented carbide mentioned in the above table. Be sure to refuel the oil and eliminate any chip discharge that adheres to the tool.

Note 4) Cutting conditions may need adjustments depending on the type of workpiece material.

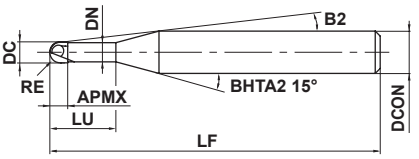
Note 5) Reduce the rotation speed and feed rate shown in the above table at a similar ratio when no rigidity in the machinery or work mounting and occurrence of chatter or abnormal sound.

Note 6) Implementation of special countermeasures is recommended since fine chip discharge may enter gaps in the processing machinery.

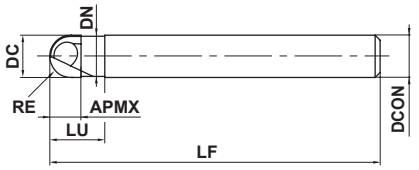
DC2XLB

Ball nose, Short cut length, 2 flute, For hard brittle materials

Cemented carbide	Alumina Zirconia	Silicon carbide Silicon nitride	Quartz glass
◎	○	○	○



Type1



Type2

0.1≤RE≤3				
±0.01				
4≤DCON≤6				
0 -0.008				

●Suitable DC long neck ball end mill for cemented carbide and other hard brittle materials processing.

(mm)

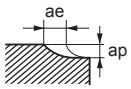
Order Number	RE	DC	APMX	LU	DN	LF	B2	DCON	No. of Flutes	Stock	Type
DC2XLBR0010N005	0.1	0.2	0.12	0.5	0.18	50	11.5°	4	2	★	1
DC2XLBR0020N010	0.2	0.4	0.24	1	0.36	50	11°	4	2	★	1
DC2XLBR0030N015	0.3	0.6	0.36	1.5	0.56	50	10.4°	4	2	★	1
DC2XLBR0040N020	0.4	0.8	0.48	2	0.76	50	9.9°	4	2	★	1
DC2XLBR0050N025	0.5	1	0.6	2.5	0.96	50	9.2°	4	2	★	1
DC2XLBR0050N050	0.5	1	0.6	5	0.96	50	7.3°	4	2	★	1
DC2XLBR0075N038	0.75	1.5	0.9	3.8	1.44	50	7.8°	4	2	★	1
DC2XLBR0100N060	1	2	1.2	6	1.94	50	5.8°	4	2	★	1
DC2XLBR0100N100	1	2	1.2	10	1.94	50	4.2°	4	2	★	1
DC2XLBR0150N080	1.5	3	1.8	8	2.9	60	6.3°	6	2	★	1
DC2XLBR0200N100	2	4	2.4	10	3.9	60	4.5°	6	2	★	1
DC2XLBR0250N100	2.5	5	3	10	4.9	60	2.9°	6	2	★	1
DC2XLBR0300N100	3	6	3.6	10	5.85	60	—	6	2	★	2

RECOMMENDED CUTTING CONDITIONS

(mm)

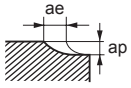
Workpiece Material			Cemented carbide					Alumina Zirconia				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)
0.2	**0.1**	**0.5**	30000	30	1.2	0.005	0.01	30000	30	1.2	0.005	0.01
0.4	**0.2**	**1**	30000	100	3.9	0.015	0.08	30000	100	3.9	0.015	0.08
0.6	**0.3**	**1.5**	30000	200	7.9	0.03	0.14	30000	200	7.9	0.03	0.14
0.8	**0.4**	**2**	30000	250	9.8	0.04	0.19	30000	250	9.8	0.04	0.19
1	**0.5**	**2.5**	30000	300	11.8	0.05	0.25	30000	300	11.8	0.05	0.25
1	**0.5**	**5**	30000	300	11.8	0.05	0.25	30000	300	11.8	0.05	0.25
1.5	**0.75**	**3.8**	30000	300	11.8	0.075	0.275	30000	300	11.8	0.075	0.275
2	**1**	**6**	30000	300	11.8	0.1	0.3	30000	300	11.8	0.1	0.3
2	**1**	**10**	30000	300	11.8	0.1	0.3	30000	300	11.8	0.1	0.3
3	**1.5**	**8**	27500	275	10.8	0.125	0.33	27500	275	10.8	0.125	0.33
4	**2**	**10**	24000	240	9.4	0.15	0.35	24000	240	9.4	0.15	0.35
5	**2.5**	**10**	22000	220	8.7	0.175	0.37	22000	220	8.7	0.175	0.37
6	**3**	**10**	20000	200	7.9	0.2	0.4	20000	200	7.9	0.2	0.4

Depth of cut



Workpiece Material			Silicon carbide Silicon nitride					Quartz glass				
DC (mm)	RE (mm)	LU (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)	Revolution (min^{-1})	Table feed (mm/min)	Table feed (IPM)	Depth of cut **ap** (mm)	Depth of cut **ae** (mm)
0.2	**0.1**	**0.5**	30000	15	.6	0.003	0.005	30000	45	1.8	0.008	0.015
0.4	**0.2**	**1**	30000	50	2.0	0.008	0.04	30000	150	5.9	0.023	0.12
0.6	**0.3**	**1.5**	30000	100	3.9	0.015	0.07	30000	300	11.8	0.045	0.21
0.8	**0.4**	**2**	30000	125	4.9	0.02	0.095	30000	375	14.8	0.06	0.285
1	**0.5**	**2.5**	30000	150	5.9	0.025	0.125	30000	450	17.7	0.075	0.375
1	**0.5**	**5**	30000	150	5.9	0.025	0.125	30000	450	17.7	0.075	0.375
1.5	**0.75**	**3.8**	30000	150	5.9	0.038	0.138	30000	450	17.7	0.113	0.413
2	**1**	**6**	30000	150	5.9	0.05	0.15	30000	450	17.7	0.15	0.45
2	**1**	**10**	30000	150	5.9	0.05	0.15	30000	450	17.7	0.15	0.45
3	**1.5**	**8**	27500	138	5.4	0.063	0.165	27500	413	16.3	0.188	0.495
4	**2**	**10**	24000	120	4.7	0.075	0.175	24000	360	14.2	0.225	0.525
5	**2.5**	**10**	22000	110	4.3	0.088	0.185	22000	330	13.0	0.263	0.555
6	**3**	**10**	20000	100	3.9	0.1	0.2	20000	300	11.8	0.3	0.6

Depth of cut

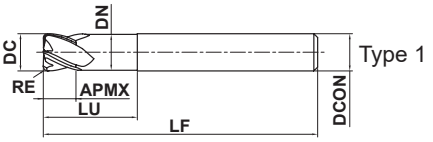


Note 1) The cemented carbide in the above mentioned cutting conditions table is based on CIS standard VM-40(90HRA).
Note 2) Air blow or dry processing is recommended with cemented carbide processing.
*Note: Using coolants or oil mists may decrease tool longevity.
Note 3) The use of a water soluble cutting oil is recommended with the processing of hard brittle materials other than the cemented carbide mentioned in the above table. Be sure to refuel the oil and eliminate any chip discharge that adheres to the tool.
Note 4) Cutting conditions may need adjustments depending on the type of workpiece material.
Note 5) Reduce the rotation speed and feed rate shown in the above table at a similar ratio when no rigidity in the machinery or work mounting and occurrence of chatter or abnormal sound.
Note 6) Implementation of special countermeasures is recommended since fine chip discharge may enter gaps in the processing machinery.

CE4SRB

Corner radius, short cut length, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



DC≤12				
0.02 - 0.02				
DC=6	DC=8,10	DC=12		
- 0.008 - 0.028	- 0.009 - 0.029	- 0.011 - 0.031		
DCON=6	DCON=8,10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

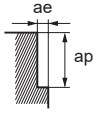
- Ceramic corner radius end mill with high heat resistance.
- Capable of softening Ni based alloys by generating heat during machining

(mm)

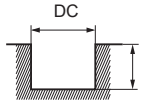
Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CE4SRBD0600R050	6	0.5	4.5	12	5.85	50	6	4	●	1
CE4SRBD0800R100	8	1.0	6.0	16	7.85	60	8	4	●	1
CE4SRBD1000R100	10	1.0	7.5	20	9.70	65	10	4	●	1
CE4SRBD1200R150	12	1.5	9.0	24	11.70	70	12	4	●	1

RECOMMENDED CUTTING CONDITIONS

■Side milling

Workpiece Material	Heat resistant alloy Inconel			
DC (mm)	Vc=1970SFM (1150-3300) RPM	fz=.0016IPT IPM	Depth of cut ap (inch)	Depth of cut ae (inch)
6	32000	151.2	.177	.047
8	24000	113.4	.236	.063
10	19000	89.8	.295	.079
12	16000	75.6	.354	.094
Cutting Condition				

■Slotting

Workpiece Material	Heat resistant alloy Inconel		
DC (mm)	Vc=1970SFM (1150-3300) RPM	fz=.0008IPT IPM	Depth of cut ap (inch)
6	32000	100.8	.059
8	24000	75.6	.098
10	19000	59.8	.118
12	16000	50.4	.157
Cutting Condition			

DC:Dia.

*Leave .012" of material on bottom and side

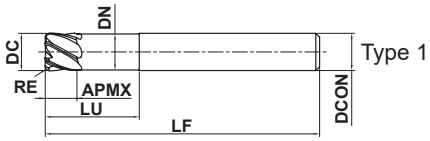
* Note 1) The outermost layer of the material may be affected by heat.
Ensure a minimum of 0.012" final machining allowance remains.
Note 2) The recommended ramping angle is 1.5 degree. When conducting ramping it is recommended to reduce the feed rate by 50% from the cutting conditions shown.
Note 3) Gradually increase the width of cut starting from 0.05 x DC (cutter diameter) to maximum width of cut, this will help maintain tool life.

CE6SRB

Corner radius, short cut length, 6 flute

CERAMIC 30°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
					◎		



DC≤12				
0.02 - 0.02				
DC=6	DC=8,10	DC=12		
- 0.008 - 0.028	- 0.009 - 0.029	- 0.011 - 0.031		
DCON=6	DCON=8,10	DCON=12		
0 - 0.008	0 - 0.009	0 - 0.011		

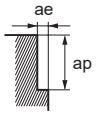
- Ceramic corner radius end mill with high heat resistance.
- Capable of softening Ni based alloys by generating heat during machining

(mm)

Order Number	DC	RE	APMX	LU	DN	LF	DCON	No. of Flutes	Stock	Type
CE6SRBD0600R050	6	0.5	4.5	12	5.85	50	6	6	●	1
CE6SRBD0800R100	8	1.0	6.0	16	7.85	60	8	6	●	1
CE6SRBD1000R100	10	1.0	7.5	20	9.70	65	10	6	●	1
CE6SRBD1200R150	12	1.5	9.0	24	11.70	70	12	6	●	1

RECOMMENDED CUTTING CONDITIONS

■ Side milling

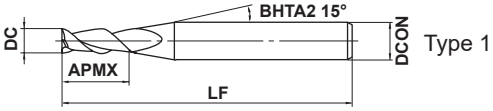
Workpiece Material	Heat resistant alloy Inconel			
DC (mm)	Vc=1970SFM (1150-3300) RPM	fz=.0016IPT IPM	Depth of cut ap (inch)	Depth of cut ae (inch)
6	32000	226.8	.177	.047
8	24000	170.1	.236	.063
10	19000	134.6	.295	.079
12	16000	113.4	.354	.094
Cutting Condition				

Note 1) The outermost layer of the material may be affected by heat.
Ensure a minimum of 0.012" final machining allowance remains.
Note 2) The recommended ramping angle is 1.5 degree. When conducting ramping it is recommended to reduce the feed rate by 50% from the cutting conditions shown.
Note 3) Gradually increase the width of cut starting from 0.05 x DC (cutter diameter) to maximum width of cut, this will help maintain tool life.

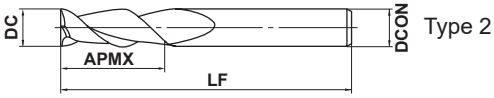
C2MHA

End mill, Medium cut length, 2 flute, For aluminum alloy

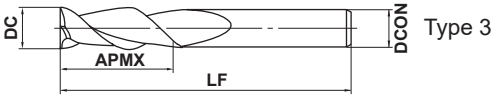
Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



Type 1



Type 2



Type 3

DC≤12	DC>12			
0 - 0.020	0 - 0.030			
DCON=6	8≤DCON≤10	12≤DCON≤16	20≤DCON≤25	
0 - 0.008	0 - 0.009	0 - 0.011	0 - 0.013	

● High efficiency machining for aluminum alloys.

(mm)

Order Number	DC	APMX	LF	DCON	No. of Flutes	Stock	Type
C2MHAD0300	3	9	60	6	2	★	1
C2MHAD0400	4	12	60	6	2	★	1
C2MHAD0500	5	15	60	6	2	★	1
C2MHAD0600	6	18	60	6	2	★	2
C2MHAD0800	8	20	75	8	2	★	2
C2MHAD1000	10	25	75	10	2	★	2
C2MHAD1200	12	25	75	12	2	★	2
C2MHAD1400	14	32	75	12	2	★	3
C2MHAD1600	16	32	100	16	2	★	2
C2MHAD2000	20	38	125	20	2	★	2
C2MHAD2500	25	38	125	25	2	★	2

RECOMMENDED CUTTING CONDITIONS

Side milling

Workpiece Material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	40000	2400	94.5
4	36000	2600	102.4
5	30000	4000	157.5
6	27000	4000	157.5
8	20000	4000	157.5
10	16000	4500	177.2
12	13000	4500	177.2
16	10000	4500	177.2
20	8000	4300	169.3
25	6000	3600	141.7
Depth of cut	≤0.2DC, ≤1.5DC, DC:Dia.		

Slotting

Work Material	Aluminum alloy		
DC (mm)	Revolution (min^{-1})	Table feed	
		(mm/min)	(IPM)
3	40000	1500	59.1
4	36000	1800	70.9
5	30000	2800	110.2
6	27000	2800	110.2
8	20000	2800	110.2
10	16000	3200	126.0
12	13000	3200	126.0
16	10000	3200	126.0
20	8000	3000	118.1
25	6000	2500	98.4
Depth of cut	DC, ≤1DC (MAX.20mm), DC:Dia.		

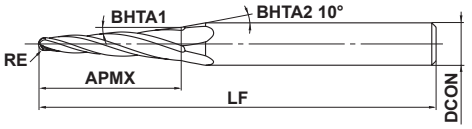
Note 1) Water-soluble cutting fluid is recommended.
Note 2) Down cutting is recommended for side milling.
Note 3) If the tooling clamping is insufficient, the tool can be pulled out of the holder therefore ensure that it is securely located.
Note 4) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.

C4LATB

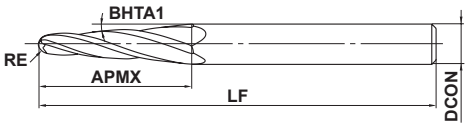
Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

UWC γ 20°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



Type 1



Type 2

RE≤2				
± 0.010				
±5'				
DCON=6	DCON=8			
0 - 0.008	0 - 0.009			

- The high-rigidity design with improved breakage resistance achieves high-efficiency machining of aluminum alloy impellers.
- First recommended for machining aluminum alloy impellers.

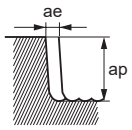
(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	No. of Flutes	Stock	Type
C4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
C4LATBR100T040AP20	1	4°	20	70	6	4	●	1
C4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
C4LATBR200T040AP30	2	4°	30	75	8	4	●	2

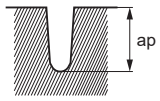
Note 1) A wide range of non-standard shapes are available. Please inquire for more information.
(Ex. Different coatings or RE sizes, of a minimum R0.3 and taper half angles.)

RECOMMENDED CUTTING CONDITIONS

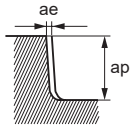
■Side Milling

Workpiece Material		Aluminum alloys			
RE		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)				
0.5	**.020**	20000	78.7	.591	.030
1.0	**.039**	20000	157.5	.591	.059
1.5	**.059**	20000	204.7	.591	.089
2.0	**.079**	20000	204.7	.906	.118
Depth of Cut					

■Slotting

Workpiece Material		Aluminum alloys		
RE		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut ap (inch)
(mm)	(inch)			
0.5	**.020**	20000	23.6	.394
1.0	**.039**	20000	110.2	.394
1.5	**.059**	20000	157.5	.394
2.0	**.079**	20000	157.5	.591
Depth of Cut				

■Side Milling (For Finishing)

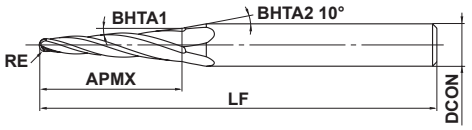
Workpiece Material		Aluminum alloys			
RE		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)				
0.5	**.020**	20000	31.5	.709	.004
1.0	**.039**	20000	78.7	.709	.008
1.5	**.059**	20000	94.5	.709	.012
2.0	**.079**	20000	94.5	1.063	.012
Depth of Cut					

Note 1) Water-soluble cutting fluid is recommended.
Note 2) Down cutting is recommended for side milling.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately, or set the depth of cut smaller.

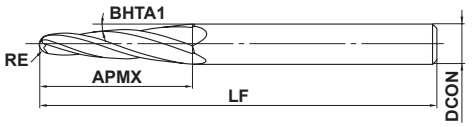
DLC4LATB NEW

Ball nose taper end mill, Long cut length, 4 flute, For aluminum impellers

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



Type1



Type2

RE≤2				
± 0.010				
±5'				
DCON=6	DCON=8			
0 - 0.008	0 - 0.009			

- The high-rigidity design with improved breakage resistance achieves high-efficiency machining of aluminum alloy impellers.
- High resistance to welding when there is an insufficient coolant supply or during high-speed cutting.

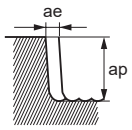
(mm)

Order Number	RE	BHTA1	APMX	LF	DCON	No. of Flutes	Stock	Type
DLC4LATBR050T040AP20	0.5	4°	20	70	6	4	●	1
DLC4LATBR100T040AP20	1	4°	20	70	6	4	●	1
DLC4LATBR150T040AP20	1.5	4°	20	75	8	4	●	1
DLC4LATBR200T040AP30	2	4°	30	75	8	4	●	2

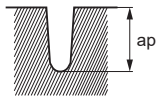
Note 1) A wide range of non-standard shapes are available. Please inquire for more information.
(ex.: RE sizes starting from a minimum of R0.3, half included taper angles) or coatings.

RECOMMENDED CUTTING CONDITIONS

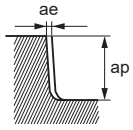
■Side Milling

Workpiece Material		Aluminum alloys			
RE		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)				
0.5	**.020**	20000	78.7	.591	.030
1.0	**.039**	20000	157.5	.591	.059
1.5	**.059**	20000	204.7	.591	.089
2.0	**.079**	20000	204.7	.906	.118
Depth of Cut					

■Slotting

Workpiece Material		Aluminum alloys		
RE		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut ap (inch)
(mm)	(inch)			
0.5	**.020**	20000	23.6	.394
1.0	**.039**	20000	110.2	.394
1.5	**.059**	20000	157.5	.394
2.0	**.079**	20000	157.5	.591
Depth of Cut				

■Side Milling (For Finishing)

Workpiece Material		Aluminum alloys			
RE		Revolution (min^{-1})	Table Feed (IPM)	Depth of Cut ap (inch)	Depth of Cut ae (inch)
(mm)	(inch)				
0.5	**.020**	20000	31.5	.709	.004
1.0	**.039**	20000	78.7	.709	.008
1.5	**.059**	20000	94.5	.709	.012
2.0	**.079**	20000	94.5	1.063	.012
Depth of Cut					

Note 1) Water-soluble cutting fluid is recommended.
Note 2) Down cutting is recommended for side milling.
Note 3) If the rigidity of the machine or the workpiece material installation is very low, or chattering and noise are generated, reduce the revolution and feed rate proportionately, or set the depth of cut smaller.

HOW TO READ THE STANDARD OF EXCHANGEABLE HEAD END MILLS

●How this section page is organized

①Organized according to cutting mode for milling. (Refer to END MILL LIST.)

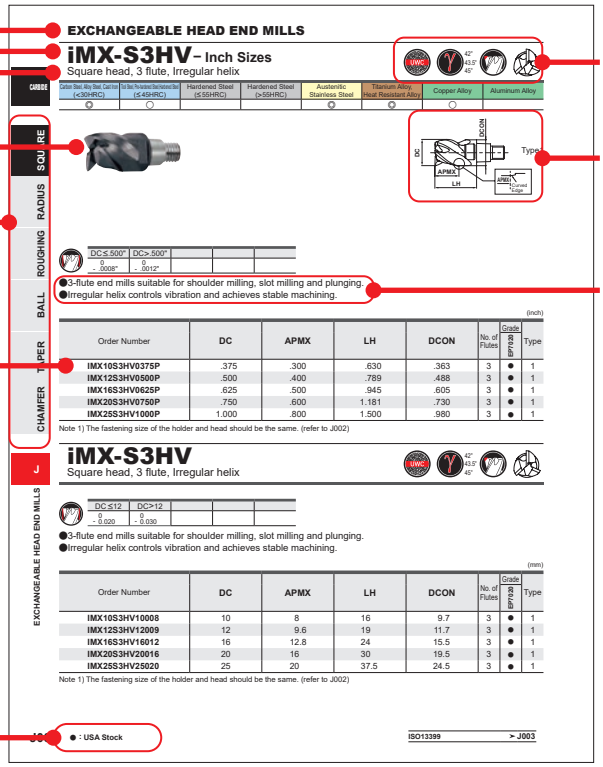
CUTTING EDGE GEOMETRY

PHOTO OF PRODUCT

PRODUCT TITLE

ITEM NUMBER

PRODUCT BLOCK



PRODUCT INFORMATION ICONS

GEOMETRY

PRODUCT FEATURES

LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PRODUCT STANDARDS
indicates order numbers, dimensions, and stock status.

●To Order: Please specify order number.

MILLING TOOLS

EXCHANGEABLE HEAD END MILLS

IDENTIFICATION J002
SYMBOL DESCRIPTIONS J003
GUIDE FOR ISO13399 SYMBOLS J003
CLASSIFICATION J004
CORRECTION FACTOR BY OVERHANG LENGTH (SHOULDER MILLING) ... J007

EXCHANGEABLE HEAD END MILLS STANDARDS
HEAD
SQUARE J008
RADIUS J024
TAPER RADIUS J050
ROUGHING J052
BALL J058
CHAMFER J072
HOLDER
CARBIDE J078
STEEL J080

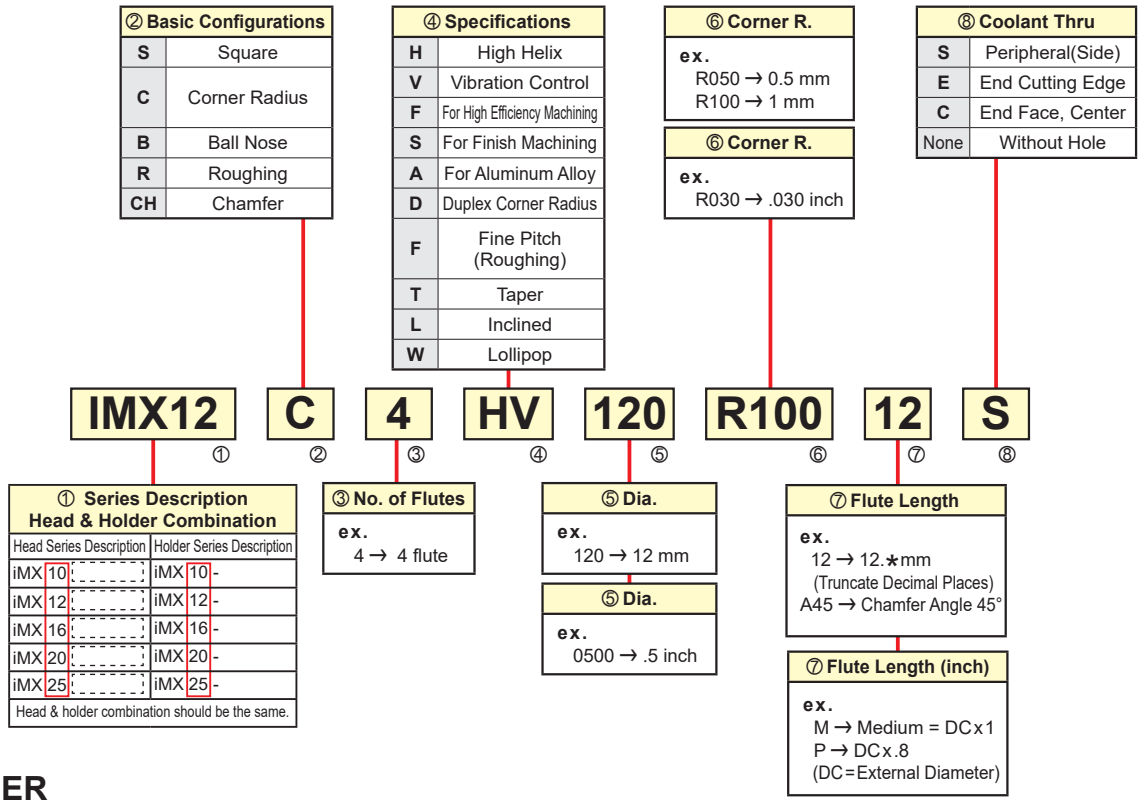
*Arranged by Alphabetical order

J058 **iMX-B2S**
J060 **iMX-B3FV**
J062 **iMX-B4HV (INCH)**
J063 **iMX-B4HV**
J064 **iMX-B4HV-E (INCH)**
J065 **iMX-B4HV-E**
J059 **iMX-B4S**
NEW J070 **iMX-B4WH-S (INCH)**
NEW J070 **iMX-B4WH-S**
J068 **iMX-B6HV (INCH)**
J068 **iMX-B6HV**
J046 **iMX-C3A (INCH)**
J047 **iMX-C3A**
J041 **iMX-C4FD-C (INCH)**
J042 **iMX-C4FD-C**
J044 **iMX-C4FV (INCH)**
J044 **iMX-C4FV**
J024 **iMX-C4HV (INCH)**
J025 **iMX-C4HV**
J028 **iMX-C4HV-S (INCH)**
J029 **iMX-C4HV-S**
J038 **iMX-C6HV (INCH)**
J039 **iMX-C6HV**
NEW J036 **iMX-C6HV-C**
J050 **iMX-C8T-C**
J038 **iMX-C10HV (INCH)**
J039 **iMX-C10HV**
J050 **iMX-C10T-C**
J038 **iMX-C12HV (INCH)**
J039 **iMX-C12HV**
J050 **iMX-C12T-C**
J050 **iMX-C15T-C**
J072 **iMX-CH3L (INCH)**
J073 **iMX-CH3L**
J076 **iMX-CH6V (INCH)**
J076 **iMX-CH6V**
J078 **iMX○○-○○○○○○○○L○○○C (INCH)**
J079 **iMX○○-○○○○○○○○L○○○C**
J080 **iMX○○-○○○○○○○○L○○○S (INCH)**
J081 **iMX○○-○○○○○○○○L○○○S**
J052 **iMX-R4F (INCH)**
J053 **iMX-R4F**
NEW J056 **iMX-RC4F-C**
J020 **iMX-S3A (INCH)**
J021 **iMX-S3A**
J008 **iMX-S3HV (INCH)**
J008 **iMX-S3HV**
J012 **iMX-S4HV (INCH)**
J013 **iMX-S4HV**
J014 **iMX-S4HV-S (INCH)**
J014 **iMX-S4HV-S**

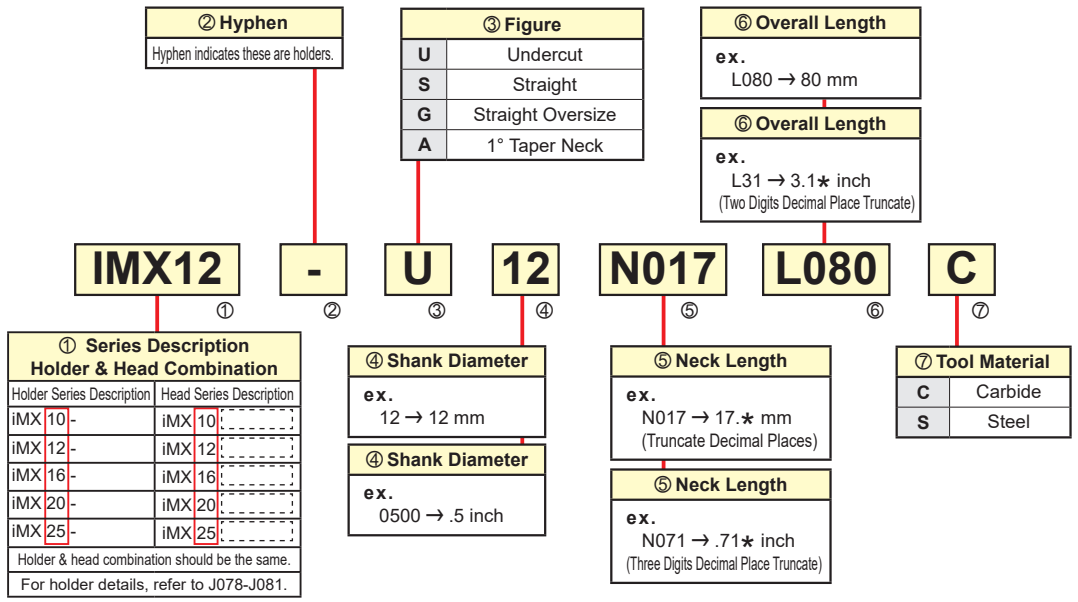
IDENTIFICATION

iMX End Mill Series

■HEAD



■HOLDER



■RUN-OUT ACCURACY AND HEAD EXCHANGE ACCURACY

Run-out Accuracy for the Peripheral Cutting Edge
.0006" (ø10—20 mm)
.0008" (ø25 mm)

∗ Use the carbide holder. (Except iMX-RC4F-C,iMX-R4F roughing head)

SYMBOL DESCRIPTIONS

Tool Material

Ultra Micro Grain Carbide
Ultra micro grain carbide is used as the substrate material.

Angle, Coolant thru, Sharp corner edge and Gash land

Helix Angle
Indicates the helix angle of the end mill.

End Cutting Edge with Coolant Thru

Peripheral Cutting Edge with Coolant Thru

Gash Land
Indicates the end mill cutting edge has a gash land.

Tolerances

Outside Diameter Tolerance
Indicates diameter tolerance of end mill.

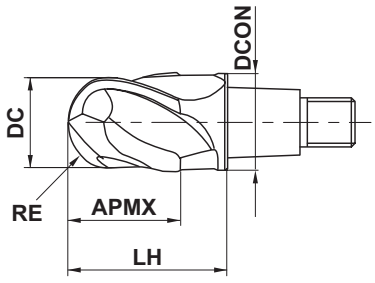
R Tolerance
Indicates the radial tolerance of a ball nose end mill.

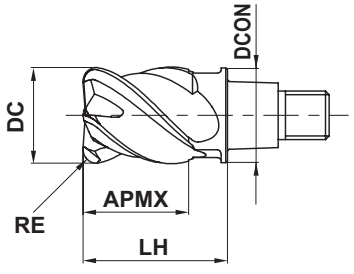
R Tolerance
Indicates the radial tolerance of an end mill with a corner radius.

Tolerance of Point Angle
Indicates the tolerance of the point angle.

Shank Diameter Tolerance
Indicates the shank diameter tolerance of end mill.

GUIDE FOR ISO13399 SYMBOLS





Symbol	Content
APMX	Depth of cut maximum
DC	Dia. (Cutting diameter)
DCON	Connection diameter
LH	Head length
RE	Corner radius

*There are exceptions other than those listed above. For more details, please refer to the technical data (page N002).

CLASSIFICATION

HEAD

Type	Applications	No. of Flutes	Product Code	Features	Shape	Coolant	Dia. DC	Head length APMX Max. DC	Head length APMX APMX / DC	Workpiece Material P Carbon Steel	P Tool Steel	H -55HRC	H 55HRC-	M Stainless Steel	S Titanium Alloy, Heat Resistant Alloy	N Copper Alloy	N Aluminum Alloy	Page
SQUARE																		
	For Difficult-to-cut Material	3	iMX-S3HV	Vibration Control		External	.375"—1.000"	.800	0.8DC	◎	○			◎	◎	○		J008
							10—25 mm	20	0.8DC									
		4	iMX-S4HV	Vibration Control			.375"—1.000"	1.000	1DC	◎	○			◎	◎	○		J012 J013
							10—32 mm	33	1DC									
				Irregular helix, Long cutting edge			16, 20 mm	40	2DC									J013
		4	iMX-S4HV-S	Vibration Control		Internal	.375"—1.000"	1.000	1DC	◎	○			◎	◎	○		J014
							10—25 mm	25	1DC									
	For Aluminum Alloy	3	iMX-S3A	Uncoated		External	.375"—1.000"	.800	0.8DC								◎	J020 J021
							10—28 mm	23.4	0.8DC									
RADIUS																		
	For Difficult-to-cut Material	4	iMX-C4HV	Vibration Control		External	.375"—1.000"	1.000	1DC	◎	○			◎	◎	○		J024 J025
							10—28 mm	29	1DC									
				Irregular helix, Long cutting edge			16, 20 mm	40	2DC									J027
		4	iMX-C4HV-S	Vibration Control		Internal	.375"—1.000"	1.000	1DC	◎	○			◎	◎	○		J028 J029
							10—25 mm	25	1DC									
		6	iMX-C6HV	Irregular helix, Multi-flute		External	.375"—.500"	.520	1DC	◎	○			◎	◎			J038 J039
							10, 12 mm	12	1DC									
		6	NEW iMX-C6HV-C	Irregular helix, Multi-flute		Internal	10—25 mm	25	1DC	◎	○			◎	◎			J036
		10	iMX-C10HV	Irregular helix, Multi-flute		External	.625"	.645	1DC	◎	○			◎	◎			J038 J039
							16 mm	16	1DC									
		12	iMX-C12HV	Irregular helix, Multi-flute			.750"—1.000"	1.050	1DC	◎	○			◎	◎			
							20, 25 mm	25	1DC									
	For High Feed Machining	4	iMX-C4FD-C	Duplex Corner Radius		Internal	.375"—1.000"	.067	0.07DC	◎	◎	◎		◎	◎	○		J041 J042
							10—25 mm	1.6	0.07DC									
	For High Efficiency Machining	4	iMX-C4FV	Vibration Control		External	.375"—1.000"	1.050	1DC	◎	◎	◎						J044
							10—25 mm	26	1DC									
	For Aluminum Alloy	3	iMX-C3A	Uncoated			.375"—1.000"	.800	0.8DC								◎	J046 J047
							10—28 mm	23.4	0.8DC									

Type	Applications	No. of Flutes	Product Code	Features	Shape	Coolant	Dia. DC	Head length APMX: Max. DC	Head length APMX: APMX / DC	Workpiece Material: P: Carbon Steel	P: Tool Steel	H: -55HRC	H: 55HRC-	M: Stainless Steel	S: Titanium Alloy, Heat Resistant Alloy	N: Copper Alloy	N: Aluminum Alloy	Page
	For Blade	8	iMX-C8T-C	Taper head, Long cutting edge		Internal	8 mm	7.12	0.8DC					◎	◎			J050
		10	iMX-C10T-C	Taper head, Long cutting edge			10 mm	7.12	0.7DC					◎	◎			
		12	iMX-C12T-C	Taper head, Long cutting edge			15, 19 mm	3.56	0.2DC					◎	◎			
		15	iMX-C15T-C	Taper head, Long cutting edge			15, 19 mm	3.56	0.2DC					◎	◎			
ROUGHING																		
	For Difficult-to-cut Material	4	iMX-R4F	Square		External	.375"—1.000"	1.050	1DC	◎	○			◎	◎	○		J052 J053
							10—25 mm	26	1DC									
	For Titanium Alloys	4	NEW iMX-RC4F-C	Corner radius		Internal	10—20 mm	21	1DC	◎				◎	◎			J056
BALL																		
	For Hardened Steel	2	iMX-B2S	Finish		External	16—20 mm	20	1DC				◎					J058
		4	iMX-B4S	Finish			16—20 mm	20	1DC				◎					J059
	For High Efficiency Machining	3	iMX-B3FV	Vibration Control			10—20 mm	16	0.8DC		◎	◎						J060
	For Difficult-to-cut Material	4	iMX-B4HV	Vibration Control			.375"—1.000"	1.050	1DC	◎	○			◎	◎	○		J062 J063
							10—25 mm	26	1DC									
		4	iMX-B4HV-E	Vibration Control		Internal	.375"—1.000"	1.050	1DC	◎	○			◎	◎	○		J064 J065
							10—25 mm	26	1DC									
		6	iMX-B6HV	Vibration Control		External	.375"—1.000"	1.050	1DC	◎	○			◎	◎			J068
							10—25 mm	26	1DC									
LOLLIPOP																		
	For Difficult-to-cut Material	6	NEW iMX-B4WH-S	5-axis machining		Internal	.500"—.750"	.563	0.8DC	◎	○			◎	◎	○		J070
							12—20 mm	15	0.8DC									
CHAMFER																		
	For Chamfering	3	iMX-CH3L	Hole and Shape		External	.375"—.750"	.345	0.5DC	◎	○	○		◎	◎			J072 J073
							10—20 mm	9.2	0.5DC									
		6	iMX-CH6V	Shape, Multi-flute			.500"—.750"	.315	0.4DC	◎	○	○		◎	◎			J076
							12—20 mm	8.5	0.4DC									

CLASSIFICATION

HOLDERS

The undercut type is available in medium, semi-long, and long lengths.

Figure			Length	Taper angle one side	Tool material	Page
Undercut			Medium Semi-long Long	—	Carbide	J078, 079
					Steel	J080, 081
Straight	Straight		Semi-long Long	—	Carbide	J079
	Straight Oversize		Medium	—	Steel	J080, 081
Taper neck			Long	1°	Carbide	J078, 079

CORRECTION FACTOR BY OVERHANG LENGTH (SHOULDER MILLING)

Reduce the cutting parameters by the coefficient values shown according to the length of overhang.
For long edge and oversize type heads refer to their specific recommended conditions.

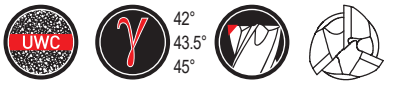
(inch)

Workpiece Material	Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy		
L/D	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**
2	100%	100%	100%	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%	100%	100%	100%
4	80%	90%	70%	80%	90%	70%	80%	90%	70%
5	60%	80%	40%	60%	80%	40%	60%	80%	40%
6	50%	70%	30%	50%	70%	30%	50%	70%	30%
7	40%	70%	20%	40%	70%	20%	30%	60%	20%
8	40%	60%	10%	40%	60%	10%	30%	50%	10%
9	30%	60%	10%	30%	60%	10%	20%	50%	10%

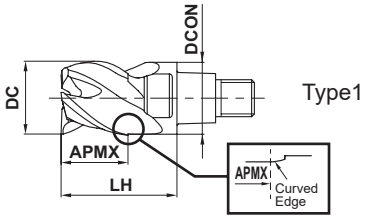
Workpiece Material	Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy			Heat Resistant Alloy Inconel718		
L/D	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed per Tooth **fz** (IPT)	Width of Cut **ae**
2	100%	100%	100%	100%	100%	100%
3	100%	100%	100%	100%	100%	100%
4	80%	90%	70%	80%	90%	70%
5	60%	80%	40%	60%	80%	40%
6	50%	70%	30%	50%	70%	30%
7	30%	60%	20%	30%	60%	20%
8	30%	50%	10%	30%	50%	10%
9	20%	50%	10%	20%	50%	10%

iMX-S3HV– Inch Sizes

Square head, 3 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

●3-flute end mills suitable for shoulder milling, slot milling and plunging.
●Irregular helix controls vibration and achieves stable machining.

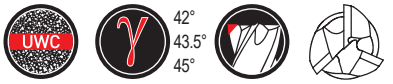
(inch)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S3HV0375P	.375	.300	.630	.363	3	●	1
IMX12S3HV0500P	.500	.400	.789	.488	3	●	1
IMX16S3HV0625P	.625	.500	.945	.605	3	●	1
IMX20S3HV0750P	.750	.600	1.181	.730	3	●	1
IMX25S3HV1000P	1.000	.800	1.500	.980	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-S3HV

Square head, 3 flute, Irregular helix



DC≤12	DC>12			
0 - 0.020	0 - 0.030			

●3-flute end mills suitable for shoulder milling, slot milling and plunging.
●Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S3HV10008	10	8	16	9.7	3	●	1
IMX12S3HV12009	12	9.6	19	11.7	3	●	1
IMX16S3HV16012	16	12.8	24	15.5	3	●	1
IMX20S3HV20016	20	16	30	19.5	3	●	1
IMX25S3HV25020	25	20	37.5	24.5	3	●	1

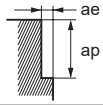
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

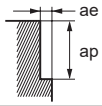
RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)												
	.3750	5000	52.5	.300	.075	4000	28.8	.300	.075	3400	30.6	.300	.075
10	**.3937**	4800	50.4	.315	.079	3800	27.4	.315	.079	3200	28.8	.315	.079
12	**.4724**	4000	42.0	.378	.094	3200	25.0	.378	.094	2700	25.1	.378	.094
	.5000	3700	38.9	.400	.100	3000	23.4	.400	.100	2500	23.3	.400	.100
	.6250	3000	35.1	.500	.125	2400	21.6	.500	.125	2000	21.0	.500	.125
16	**.6299**	3000	35.1	.504	.126	2400	21.6	.504	.126	2000	21.0	.504	.126
	.7500	2500	29.3	.600	.150	2000	18.0	.600	.150	1700	17.9	.600	.150
20	**.7874**	2400	28.1	.630	.157	1900	17.1	.630	.157	1600	16.8	.630	.157
25	**.9843**	1900	26.8	.787	.197	1500	13.5	.787	.197	1300	13.7	.787	.197
	1.0000	1900	26.8	.800	.200	1500	13.5	.800	.200	1300	13.7	.800	.200
Depth of Cut													

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)								
	.3750	2500	18.0	.300	.075	1300	6.2	.300	.038
10	**.3937**	2400	17.3	.315	.079	1300	6.2	.315	.039
12	**.4724**	2000	15.6	.378	.094	1100	5.9	.378	.047
	.5000	1900	14.8	.400	.100	990	5.3	.400	.050
	.6250	1500	13.5	.500	.125	790	4.7	.500	.063
16	**.6299**	1500	13.5	.504	.126	790	4.7	.504	.063
	.7500	1200	10.8	.600	.150	660	4.0	.600	.075
20	**.7874**	1200	10.8	.630	.157	630	3.8	.630	.079
25	**.9843**	950	8.6	.787	.197	500	3.0	.787	.098
	1.0000	940	8.5	.800	.200	500	3.0	.800	.100
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

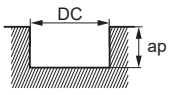
iMX-S3HV

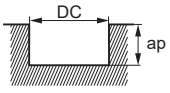
Square head, 3 flute, Irregular helix

RECOMMENDED CUTTING CONDITIONS

Slot Milling

(inch)

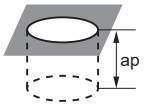
Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	3400	16.1	.188	2600	9.4	.188	2500	9.0	.188
10	.3937	3200	15.4	.197	2500	9.0	.197	2400	8.6	.197
12	.4724	2700	16.2	.236	2100	10.1	.236	2000	9.6	.236
	.5000	2500	15.0	.250	2000	9.6	.250	1900	9.1	.250
	.6250	2000	16.8	.313	1600	9.6	.313	1500	10.8	.313
16	.6299	2000	16.8	.315	1600	9.6	.315	1500	10.8	.315
	.7500	1700	14.3	.375	1300	7.8	.375	1200	8.6	.375
20	.7874	1600	13.4	.394	1300	7.8	.394	1200	8.6	.394
25	.9843	1300	12.1	.472	1000	6.0	.472	950	6.8	.472
	1.0000	1300	12.1	.480	990	5.9	.480	940	6.8	.480
Depth of Cut		 DC=Dia.								

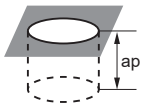
Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy			Heat Resistant Alloy Inconel718		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	2000	6.0	.188	1000	2.4	.075
10	.3937	1900	5.7	.197	970	2.3	.079
12	.4724	1600	6.7	.236	810	2.9	.094
	.5000	1500	6.3	.250	760	2.7	.100
	.6250	1200	7.2	.313	610	3.7	.125
16	.6299	1200	7.2	.315	610	3.7	.126
	.7500	990	5.9	.375	510	3.1	.150
20	.7874	950	5.7	.394	490	2.9	.157
25	.9843	760	4.6	.472	390	2.3	.197
	1.0000	740	4.4	.480	380	2.3	.200
Depth of Cut		 DC=Dia.					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

Plunging

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Step Feed **ap2**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Step Feed **ap2**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Step Feed **ap2**
	.3750	3400	18.7	.188	.100	2300	8.1	.188	.080	2000	2.4	.188	.023
10	**.3937**	3200	17.6	.197	.100	2200	7.7	.197	.080	1900	2.3	.197	.023
12	**.4724**	2700	14.9	.236	.100	1900	6.7	.236	.080	1600	1.9	.236	.023
	.5000	2500	13.8	.250	.100	1800	6.3	.250	.080	1500	1.8	.250	.023
	.6250	2000	11.0	.313	.100	1400	4.9	.313	.080	1200	1.4	.313	.023
16	**.6299**	2000	11.0	.315	.100	1400	4.9	.315	.080	1200	1.4	.315	.023
	.7500	1700	9.4	.375	.100	1200	4.2	.375	.080	990	1.2	.375	.023
20	**.7874**	1600	8.8	.394	.100	1100	3.9	.394	.080	950	1.1	.394	.023
25	**.9843**	1300	7.2	.492	.100	880	3.1	.492	.080	760	.9	.492	.023
	1.0000	1300	7.2	.500	.100	880	3.1	.500	.080	740	.9	.500	.023
Depth of Cut													

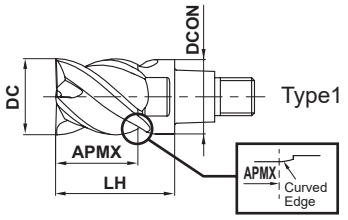
Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Step Feed **ap2**
	.3750	1300	1.6	.188	.023
10	**.3937**	1300	1.6	.197	.023
12	**.4724**	1100	1.3	.236	.023
	.5000	990	1.2	.250	.023
	.6250	790	.9	.313	.023
16	**.6299**	790	.9	.315	.023
	.7500	660	.8	.375	.023
20	**.7874**	630	.8	.394	.023
25	**.9843**	500	.6	.492	.023
	1.0000	500	.6	.500	.023
Depth of Cut					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-S4HV– Inch Sizes

Square head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

●Irregular helix controls vibration and achieves stable machining.

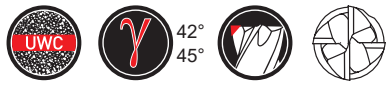
(inch)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S4HV0375M	.375	.375	.630	.363	4	●	1
IMX12S4HV0500M	.500	.500	.789	.488	4	●	1
IMX16S4HV0625M	.625	.625	.945	.605	4	●	1
IMX20S4HV0750M	.750	.750	1.181	.730	4	●	1
IMX25S4HV1000M	1.000	1.000	1.500	.980	4	●	1

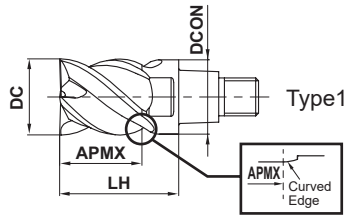
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

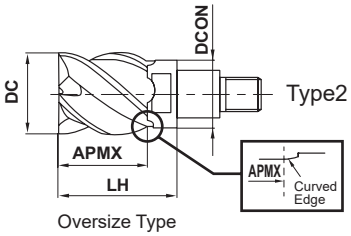
iMX-S4HV

Square head, 4 flute, Irregular helix



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





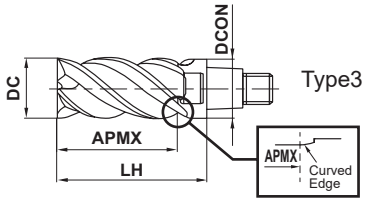
Oversize Type

DC ≤12	DC>12			
0 - 0.020	0 - 0.030			

● Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S4HV10010	10	10	16	9.7	4	●	1
IMX10S4HV12012	12	12.5	19	9.7	4	●	2
IMX12S4HV12012	12	12	19	11.7	4	●	1
IMX12S4HV14014	14	14.5	22.5	11.7	4	●	2
IMX16S4HV16016	16	16	24	15.5	4	●	1
IMX16S4HV18018	18	18.5	27	15.5	4	●	2
IMX20S4HV20020	20	20	30	19.5	4	●	1
IMX20S4HV22023	22	23	33	19.5	4	●	2
IMX25S4HV25025	25	25	37.5	24.5	4	●	1
IMX25S4HV28029	28	29	41.5	24.5	4	●	2
IMX25S4HV30031	30	31	43.5	24.5	4	●	2
IMX25S4HV32033	32	33	45.5	24.5	4	●	2



■ Long Cutting Edge Type

(mm)

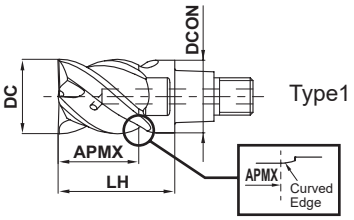
Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX16S4HV16032	16	32	40	15.5	4	●	3
IMX20S4HV20040	20	40	50	19.5	4	●	3

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-S4HV-S– Inch Sizes

Square head, 4 flute, Irregular helix, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Irregular helix controls vibration and achieves stable machining.
- Coolant thru for each cutting edge enables a stable coolant supply.

(inch)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S4HV0375MS	.375	.375	.630	.363	4	●	1
IMX12S4HV0500MS	.500	.500	.789	.488	4	●	1
IMX16S4HV0625MS	.625	.625	.945	.605	4	●	1
IMX20S4HV0750MS	.750	.750	1.181	.730	4	●	1
IMX25S4HV1000MS	1.000	1.000	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-S4HV-S

Square head, 4 flute, Irregular helix, With coolant thru

DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Irregular helix controls vibration and achieves stable machining.
- Coolant thru for each cutting edge enables a stable coolant supply.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10S4HV10010S	10	10	16	9.7	4	●	1
IMX12S4HV12012S	12	12	19	11.7	4	●	1
IMX16S4HV16016S	16	16	24	15.5	4	●	1
IMX20S4HV20020S	20	20	30	19.5	4	●	1
IMX25S4HV25025S	25	25	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-S4HV/iMX-S4HV-S

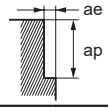
Square head, 4 flute, Irregular helix (With/Without coolant thru)

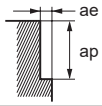
RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.3750	5000	70.0	.375	.075	4000	38.4	.375	.075	3400	40.8	.375	.075
10	.3937	4800	67.2	.394	.079	3800	36.5	.394	.079	3200	38.4	.394	.079
12	.4724	4000	56.0	.472	.094	3200	33.3	.472	.094	2700	33.5	.472	.094
	.5000	3700	51.8	.500	.100	3000	31.2	.500	.100	2500	31.0	.500	.100
	.6250	3000	46.8	.625	.125	2400	28.8	.625	.125	2000	28.0	.625	.125
16	.6299	3000	46.8	.630	.126	2400	28.8	.630	.126	2000	28.0	.630	.126
	.7500	2500	39.0	.750	.150	2000	24.0	.750	.150	1700	23.8	.750	.150
20	.7874	2400	37.4	.787	.157	1900	22.8	.787	.157	1600	22.4	.787	.157
25	.9843	1900	35.7	.984	.197	1500	18.0	.984	.197	1300	18.2	.984	.197
	1.0000	1900	35.7	1.000	.200	1500	18.0	1.000	.200	1300	18.2	1.000	.200
Depth of Cut													

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.3750	2500	24.0	.375	.075	1300	8.3	.375	.038
10	.3937	2400	23.0	.394	.079	1300	8.3	.394	.039
12	.4724	2000	20.8	.472	.094	1100	7.9	.472	.047
	.5000	1900	19.8	.500	.100	990	7.1	.500	.050
	.6250	1500	18.0	.625	.125	790	6.3	.625	.063
16	.6299	1500	18.0	.630	.126	790	6.3	.630	.063
	.7500	1200	14.4	.750	.150	660	5.3	.750	.075
20	.7874	1200	14.4	.787	.157	630	5.0	.787	.079
25	.9843	950	11.4	.984	.197	500	4.1	.984	.098
	1.0000	940	11.3	1.000	.200	500	4.0	1.000	.100
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-S4HV/iMX-S4HV-S

Square head, 4 flute, Irregular helix (With/Without coolant thru)

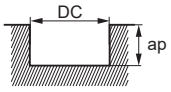
RECOMMENDED CUTTING CONDITIONS

Slot Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	3400	21.4	.188	2600	12.5	.188	2500	12.0	.188
10	.3937	3200	20.5	.197	2500	12.0	.197	2400	11.5	.197
12	.4724	2700	21.6	.236	2100	13.4	.236	2000	12.8	.236
	.5000	2500	20.0	.250	2000	12.8	.250	1900	12.2	.250
	.6250	2000	22.4	.313	1600	12.8	.313	1500	14.4	.313
16	.6299	2000	22.4	.315	1600	12.8	.315	1500	14.4	.315
	.7500	1700	19.0	.375	1300	10.4	.375	1200	11.5	.375
20	.7874	1600	17.9	.394	1300	10.4	.394	1200	11.5	.394
25	.9843	1300	16.1	.472	1000	8.0	.472	950	9.1	.472
	1.0000	1300	16.1	.480	990	7.9	.480	940	9.0	.480

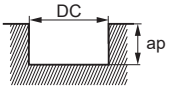
Depth of Cut



DC=Dia.

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy			Heat Resistant Alloy Inconel718		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	2000	8.0	.188	1000	3.2	.075
10	.3937	1900	7.6	.197	970	3.1	.079
12	.4724	1600	9.0	.236	810	3.9	.094
	.5000	1500	8.4	.250	760	3.6	.100
	.6250	1200	9.6	.313	610	4.9	.125
16	.6299	1200	9.6	.315	610	4.9	.126
	.7500	1000	7.9	.375	510	4.1	.150
20	.7874	950	7.6	.394	490	3.9	.157
25	.9843	760	6.1	.472	390	3.1	.197
	1.0000	740	5.9	.480	380	3.0	.200

Depth of Cut



DC=Dia.

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

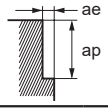
iMX-S4HV

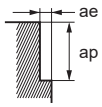
Square head, 4 flute, Irregular helix, Long cutting edge type

RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
L/D	**DC** (mm)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	2000	28.0	1.260	.031	1600	17.9	1.260	.031	1200	14.9	1.260	.031
	20	1600	22.4	1.575	.039	1300	14.6	1.575	.039	950	11.8	1.575	.039
6	**16**	1200	13.4	1.260	.031	990	8.0	1.260	.031	790	7.6	1.260	.031
	20	950	10.6	1.575	.039	800	6.4	1.575	.039	630	6.0	1.575	.039
Depth of Cut													

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
L/D	**DC** (mm)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	1000	11.2	1.260	.031	610	4.9	1.260	.016
	20	800	9.0	1.575	.039	490	3.9	1.575	.020
6	**16**	610	4.9	1.260	.031	390	2.5	1.260	.016
	20	490	3.9	1.575	.039	320	2.0	1.575	.020
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) L/D will be +1 when using a long cutting edge type head.
Note 4) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

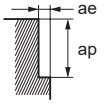
iMX-S4HV

Square head, 4 flute, Irregular helix, Oversize type head

RECOMMENDED CUTTING CONDITIONS

Shoulder Milling

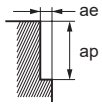
(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
L/D	DC (mm)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	4000	56.0	.472	.047	3200	30.7	.472	.047	2700	32.4	.472	.047
	14	3400	47.6	.551	.055	2700	28.1	.551	.055	2300	28.5	.551	.055
	18	2600	40.6	.709	.071	2100	25.2	.709	.071	1800	25.2	.709	.071
	22	2200	34.3	.866	.087	1700	20.4	.866	.087	1500	21.0	.866	.087
	28	1700	32.0	1.102	.110	1400	16.8	1.102	.110	1100	15.4	1.102	.110
	30	1600	30.1	1.181	.118	1300	15.6	1.181	.118	1100	15.4	1.181	.118
	32	1500	28.2	1.260	.126	1200	14.4	1.260	.126	1000	14.0	1.260	.126
5	**12**	2400	26.9	.472	.020	1900	15.2	.472	.020	1600	15.4	.472	.020
	14	2000	22.4	.551	.024	1600	12.8	.551	.024	1400	13.4	.551	.024
	18	1600	19.8	.709	.028	1200	11.5	.709	.028	1100	12.3	.709	.028
	22	1300	16.1	.866	.035	1000	9.6	.866	.035	860	9.6	.866	.035
	28	1000	15.6	1.102	.043	800	7.7	1.102	.043	680	7.6	1.102	.043
	30	950	14.8	1.181	.047	740	7.1	1.181	.047	630	7.1	1.181	.047
	32	890	13.9	1.260	.051	700	6.7	1.260	.051	590	6.6	1.260	.051
7	**12**	1600	15.4	.472	.008	1300	8.3	.472	.008	850	6.8	.472	.008
	14	1400	13.4	.551	.012	1100	8.8	.551	.012	730	7.0	.551	.012
	18	1100	12.3	.709	.016	890	7.1	.709	.016	570	5.5	.709	.016
	22	860	9.6	.866	.016	730	5.8	.866	.016	460	4.4	.866	.016
	28	680	8.4	1.102	.024	570	4.6	1.102	.024	360	3.5	1.102	.024
	30	630	7.8	1.181	.024	530	4.2	1.181	.024	340	3.3	1.181	.024
	32	590	7.3	1.260	.024	500	4.0	1.260	.024	320	3.1	1.260	.024
Depth of Cut													

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

■ Shoulder Milling

(inch)

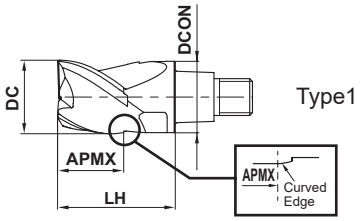
Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
L/D	**DC** (mm)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	2000	19.2	.472	.047	810	5.2	.472	.035
	14	1700	17.7	.551	.055	690	5.0	.551	.043
	18	1300	15.6	.709	.071	700	5.6	.709	.055
	22	1100	13.2	.866	.087	570	4.6	.866	.067
	28	850	10.2	1.102	.110	450	3.6	1.102	.083
	30	790	9.5	1.181	.118	420	3.4	1.181	.091
	32	740	8.9	1.260	.126	390	3.1	1.260	.094
5	**12**	1300	10.4	.472	.020	280	1.3	.472	.016
	14	1100	8.8	.551	.024	240	1.5	.551	.016
	18	890	8.5	.709	.028	320	2.0	.709	.024
	22	730	7.0	.866	.035	260	1.7	.866	.028
	28	570	5.5	1.102	.043	210	1.3	1.102	.031
	30	530	5.1	1.181	.047	190	1.2	1.181	.035
	32	500	4.8	1.260	.051	180	1.2	1.260	.039
7	**12**	650	4.2	.472	.008	–	–	–	–
	14	550	4.4	.551	.012	–	–	–	–
	18	430	3.4	.709	.016	–	–	–	–
	22	350	2.8	.866	.016	–	–	–	–
	28	280	2.2	1.102	.024	–	–	–	–
	30	260	2.1	1.181	.024	–	–	–	–
	32	240	1.9	1.260	.024	–	–	–	–
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-S3A– Inch Sizes

Square head, 3 flute, For aluminum alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- High efficiency machining is possible due to the polished rake face and sharp cutting edge.

(inch)

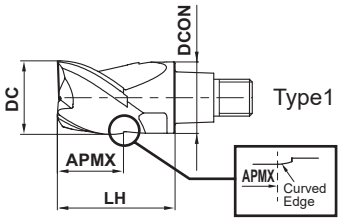
Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade ET2020	Type
IMX10S3A0375P	.375	.300	.630	.363	3	●	1
IMX12S3A0500P	.500	.400	.789	.488	3	●	1
IMX16S3A0625P	.625	.500	.945	.605	3	●	1
IMX20S3A0750P	.750	.600	1.181	.730	3	●	1
IMX25S3A1000P	1.000	.800	1.500	.980	3	●	1

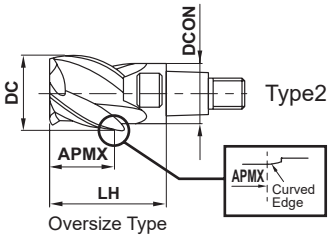
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-S3A

Square head, 3 flute, For aluminum alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Oversize Type

DC ≤12	DC>12			
0 - 0.020	0 - 0.030			

● High efficiency machining is possible due to the polished rake face and sharp cutting edge.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade ET2020	Type
IMX10S3A10008	10	8	16	9.7	3	●	1
IMX10S3A12010	12	10.1	19	9.7	3	●	2
IMX12S3A12009	12	9.6	19	11.7	3	●	1
IMX12S3A14011	14	11.7	22.5	11.7	3	●	2
IMX16S3A16012	16	12.8	24	15.5	3	●	1
IMX16S3A18014	18	14.9	27	15.5	3	●	2
IMX20S3A20016	20	16	30	19.5	3	●	1
IMX20S3A22018	22	18.6	33	19.5	3	●	2
IMX25S3A25020	25	20	37.5	24.5	3	●	1
IMX25S3A28023	28	23.4	41.5	24.5	3	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-S3A

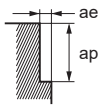
Square head, 3 flute, For aluminum alloy

RECOMMENDED CUTTING CONDITIONS

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

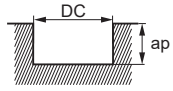
Shoulder Milling (L/D=3)

(inch)

Workpiece Material		Aluminum Alloy			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.3750	17000	234.6	.300	.113
10	.3937	16000	220.8	.315	.118
12	.4724	13000	179.4	.378	.142
	.5000	13000	179.4	.400	.150
	.6250	10000	180.0	.500	.188
16	.6299	9900	178.2	.504	.189
	.7500	8400	173.9	.600	.225
20	.7874	8000	165.6	.630	.236
25	.9843	6400	159.4	.787	.295
	1.0000	6300	156.9	.800	.300
Depth of Cut					

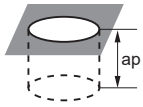
Slot Milling (L/D=3)

(inch)

Workpiece Material		Aluminum Alloy		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	17000	137.7	.188
10	.3937	16000	129.6	.197
12	.4724	13000	109.2	.236
	.5000	13000	109.2	.250
	.6250	10000	111.0	.313
16	.6299	9900	109.9	.315
	.7500	8400	108.4	.375
20	.7874	8000	103.2	.394
25	.9843	6400	96.0	.492
	1.0000	6300	94.5	.500
Depth of Cut		 DC=Dia.		

Plunging (L/D=3)

(inch)

Workpiece Material		Aluminum Alloy			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Step Feed ap2
	.3750	10000	39.0	.188	.10
10	.3937	9600	37.4	.197	.10
12	.4724	8000	31.2	.236	.10
	.5000	7500	29.3	.250	.10
	.6250	6000	23.4	.313	.10
16	.6299	6000	23.4	.315	.10
	.7500	5000	19.5	.375	.10
20	.7874	4800	18.7	.394	.10
25	.9843	3800	14.8	.492	.10
	1.0000	3800	14.8	.500	.10
Depth of Cut					

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) The use of water-soluble coolant is effective.

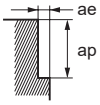
iMX-S3A

Square head, 3 flute, For aluminum alloy, Oversize type head

RECOMMENDED CUTTING CONDITIONS

Shoulder Milling

(inch)

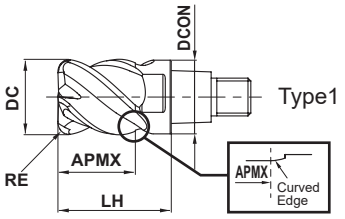
Workpiece Material			Aluminum Alloy			
L/D	DC (mm)	DC (inch)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	**.4720**	13000	181.1	.378	.094
	14	**.5510**	11000	153.5	.441	.110
	18	**.7090**	8800	157.5	.567	.142
	22	**.8660**	7200	149.6	.693	.173
	28	**1.1020**	5700	141.7	.882	.220
5	**12**	**.4720**	8000	86.6	.378	.039
	14	**.5510**	6800	70.9	.441	.043
	18	**.7090**	5300	74.8	.567	.055
	22	**.8660**	4300	70.9	.693	.071
	28	**1.1020**	3400	66.9	.882	.087
7	**12**	**.4720**	5300	51.2	.378	.020
	14	**.5510**	4500	43.3	.441	.024
	18	**.7090**	3500	47.2	.567	.028
	22	**.8660**	2900	39.4	.693	.035
	28	**1.1020**	2300	39.4	.882	.043
Depth of Cut						

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) The use of water-soluble coolant is effective.

iMX-C4HV – Inch Sizes

Corner radius head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

● Irregular helix controls vibration and achieves stable machining.

(inch)

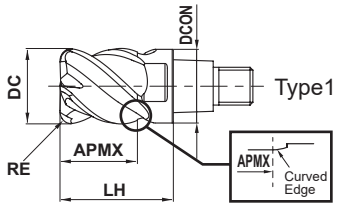
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C4HV0375R015M	.375	.015	.375	.630	.363	4	●	1
IMX10C4HV0375R030M	.375	.030	.375	.630	.363	4	●	1
IMX10C4HV0375R060M	.375	.060	.375	.630	.363	4	●	1
IMX12C4HV0500R015M	.500	.015	.500	.789	.488	4	●	1
IMX12C4HV0500R030M	.500	.030	.500	.789	.488	4	●	1
IMX12C4HV0500R060M	.500	.060	.500	.789	.488	4	●	1
IMX16C4HV0625R015M	.625	.015	.625	.945	.605	4	●	1
IMX16C4HV0625R030M	.625	.030	.625	.945	.605	4	●	1
IMX16C4HV0625R060M	.625	.060	.625	.945	.605	4	●	1
IMX20C4HV0750R030M	.750	.030	.750	1.181	.730	4	●	1
IMX20C4HV0750R060M	.750	.060	.750	1.181	.730	4	●	1
IMX20C4HV0750R125M	.750	.125	.750	1.181	.730	4	●	1
IMX20C4HV0750R190M	.750	.190	.750	1.181	.730	4	●	1
IMX20C4HV0750R250M	.750	.250	.750	1.181	.730	4	●	1
IMX25C4HV1000R030M	1.000	.030	1.000	1.500	.980	4	●	1
IMX25C4HV1000R060M	1.000	.060	1.000	1.500	.980	4	●	1
IMX25C4HV1000R125M	1.000	.125	1.000	1.500	.980	4	●	1
IMX25C4HV1000R190M	1.000	.190	1.000	1.500	.980	4	●	1
IMX25C4HV1000R250M	1.000	.250	1.000	1.500	.980	4	●	1

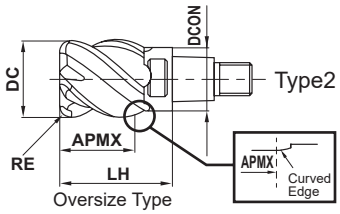
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C4HV

Corner radius head, 4 flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	





±0.020				
DC ≤12	DC>12			
0 - 0.020	0 - 0.030			

● Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C4HV100R03010	10	0.3	10	16	9.7	4	●	1
IMX10C4HV100R05010	10	0.5	10	16	9.7	4	●	1
IMX10C4HV100R10010	10	1	10	16	9.7	4	●	1
IMX10C4HV100R15010	10	1.5	10	16	9.7	4	●	1
IMX10C4HV100R20010	10	2	10	16	9.7	4	●	1
IMX10C4HV100R25010	10	2.5	10	16	9.7	4	●	1
IMX10C4HV100R30010	10	3	10	16	9.7	4	●	1
IMX10C4HV110R05011	11	0.5	11.5	18	9.7	4	●	2
IMX10C4HV110R10011	11	1	11.5	18	9.7	4	●	2
IMX10C4HV120R03012	12	0.3	12.5	19	9.7	4	●	2
IMX10C4HV120R05012	12	0.5	12.5	19	9.7	4	●	2
IMX10C4HV120R10012	12	1	12.5	19	9.7	4	●	2
IMX10C4HV120R20012	12	2	12.5	19	9.7	4	●	2
IMX12C4HV120R03012	12	0.3	12	19	11.7	4	●	1
IMX12C4HV120R05012	12	0.5	12	19	11.7	4	●	1
IMX12C4HV120R10012	12	1	12	19	11.7	4	●	1
IMX12C4HV120R15012	12	1.5	12	19	11.7	4	●	1
IMX12C4HV120R20012	12	2	12	19	11.7	4	●	1
IMX12C4HV120R25012	12	2.5	12	19	11.7	4	●	1
IMX12C4HV120R30012	12	3	12	19	11.7	4	●	1
IMX12C4HV120R40012	12	4	12	19	11.7	4	●	1
IMX12C4HV130R05013	13	0.5	13.5	21.5	11.7	4	●	2
IMX12C4HV130R10013	13	1	13.5	21.5	11.7	4	●	2
IMX12C4HV140R03014	14	0.3	14.5	22.5	11.7	4	●	2
IMX12C4HV140R05014	14	0.5	14.5	22.5	11.7	4	●	2
IMX12C4HV140R10014	14	1	14.5	22.5	11.7	4	●	2
IMX12C4HV140R20014	14	2	14.5	22.5	11.7	4	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

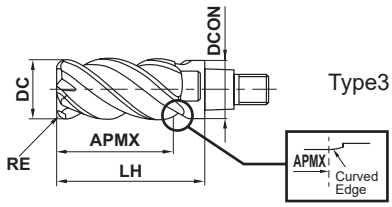
iMX-C4HV

Corner radius head, 4 flute, Irregular helix

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX16C4HV160R03016	16	0.3	16	24	15.5	4	●	1
IMX16C4HV160R05016	16	0.5	16	24	15.5	4	●	1
IMX16C4HV160R10016	16	1	16	24	15.5	4	●	1
IMX16C4HV160R15016	16	1.5	16	24	15.5	4	●	1
IMX16C4HV160R20016	16	2	16	24	15.5	4	●	1
IMX16C4HV160R25016	16	2.5	16	24	15.5	4	●	1
IMX16C4HV160R30016	16	3	16	24	15.5	4	●	1
IMX16C4HV160R40016	16	4	16	24	15.5	4	●	1
IMX16C4HV160R50016	16	5	16	24	15.5	4	●	1
IMX16C4HV170R05017	17	0.5	17	26	15.5	4	●	2
IMX16C4HV170R10017	17	1	17	26	15.5	4	●	2
IMX16C4HV180R03018	18	0.3	18	27	15.5	4	●	2
IMX16C4HV180R05018	18	0.5	18.5	27	15.5	4	●	2
IMX16C4HV180R10018	18	1	18.5	27	15.5	4	●	2
IMX16C4HV180R20018	18	2	18.5	27	15.5	4	●	2
IMX16C4HV180R30018	18	3	18.5	27	15.5	4	●	2
IMX20C4HV200R03020	20	0.3	20	30	19.5	4	●	1
IMX20C4HV200R05020	20	0.5	20	30	19.5	4	●	1
IMX20C4HV200R10020	20	1	20	30	19.5	4	●	1
IMX20C4HV200R15020	20	1.5	20	30	19.5	4	●	1
IMX20C4HV200R20020	20	2	20	30	19.5	4	●	1
IMX20C4HV200R25020	20	2.5	20	30	19.5	4	●	1
IMX20C4HV200R30020	20	3	20	30	19.5	4	●	1
IMX20C4HV200R40020	20	4	20	30	19.5	4	●	1
IMX20C4HV200R50020	20	5	20	30	19.5	4	●	1
IMX20C4HV200R60020	20	6	20	30	19.5	4	●	1
IMX20C4HV200R63520	20	6.35	20	30	19.5	4	●	1
IMX20C4HV220R05023	22	0.5	23	33	19.5	4	●	2
IMX20C4HV220R10023	22	1	23	33	19.5	4	●	2
IMX20C4HV220R20023	22	2	23	33	19.5	4	●	2
IMX20C4HV220R30023	22	3	23	33	19.5	4	●	2
IMX25C4HV250R10025	25	1	25	37.5	24.5	4	●	1
IMX25C4HV250R20025	25	2	25	37.5	24.5	4	●	1
IMX25C4HV250R30025	25	3	25	37.5	24.5	4	●	1
IMX25C4HV250R40025	25	4	25	37.5	24.5	4	●	1
IMX25C4HV250R50025	25	5	25	37.5	24.5	4	●	1
IMX25C4HV250R60025	25	6	25	37.5	24.5	4	●	1
IMX25C4HV250R63525	25	6.35	25	37.5	24.5	4	●	1
IMX25C4HV280R10029	28	1	29	41.5	24.5	4	●	2
IMX25C4HV280R30029	28	3	29	41.5	24.5	4	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to J002)



Type3

■ Long Cutting Edge Type

(mm)

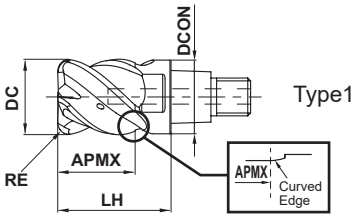
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX16C4HV160R10032	16	1	32	40	15.5	4	●	3
IMX16C4HV160R30032	16	3	32	40	15.5	4	●	3
IMX20C4HV200R10040	20	1	40	50	19.5	4	●	3
IMX20C4HV200R30040	20	3	40	50	19.5	4	●	3

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C4HV-S – Inch Sizes

Corner radius head, 4 flute, Irregular helix, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Irregular helix controls vibration and achieves stable machining.
- Coolant thru for each cutting edge enables a stable coolant supply.

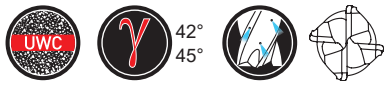
(inch)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C4HV0375R030MS	.375	.030	.375	.630	.363	4	●	1
IMX12C4HV0500R030MS	.500	.030	.500	.789	.488	4	●	1
IMX16C4HV0625R030MS	.625	.030	.625	.945	.605	4	●	1
IMX20C4HV0750R030MS	.750	.030	.750	1.181	.730	4	●	1
IMX25C4HV1000R030MS	1.000	.030	1.000	1.500	.980	4	●	1

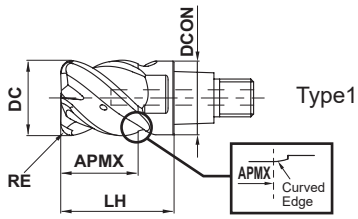
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C4HV-S

Corner radius head, 4 flute, Irregular helix, With coolant thru



Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



±0.020				
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular helix controls vibration and achieves stable machining.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C4HV100R03010S	10	0.3	10	16	9.7	4	●	1
IMX10C4HV100R05010S	10	0.5	10	16	9.7	4	●	1
IMX10C4HV100R10010S	10	1	10	16	9.7	4	●	1
IMX10C4HV100R15010S	10	1.5	10	16	9.7	4	●	1
IMX10C4HV100R20010S	10	2	10	16	9.7	4	●	1
IMX10C4HV100R30010S	10	3	10	16	9.7	4	●	1
IMX12C4HV120R03012S	12	0.3	12	19	11.7	4	●	1
IMX12C4HV120R05012S	12	0.5	12	19	11.7	4	●	1
IMX12C4HV120R10012S	12	1	12	19	11.7	4	●	1
IMX12C4HV120R15012S	12	1.5	12	19	11.7	4	●	1
IMX12C4HV120R20012S	12	2	12	19	11.7	4	●	1
IMX12C4HV120R30012S	12	3	12	19	11.7	4	●	1
IMX12C4HV120R40012S	12	4	12	19	11.7	4	●	1
IMX16C4HV160R05016S	16	0.5	16	24	15.5	4	●	1
IMX16C4HV160R10016S	16	1	16	24	15.5	4	●	1
IMX16C4HV160R15016S	16	1.5	16	24	15.5	4	●	1
IMX16C4HV160R20016S	16	2	16	24	15.5	4	●	1
IMX16C4HV160R30016S	16	3	16	24	15.5	4	●	1
IMX16C4HV160R40016S	16	4	16	24	15.5	4	●	1
IMX20C4HV200R05020S	20	0.5	20	30	19.5	4	●	1
IMX20C4HV200R10020S	20	1	20	30	19.5	4	●	1
IMX20C4HV200R15020S	20	1.5	20	30	19.5	4	●	1
IMX20C4HV200R20020S	20	2	20	30	19.5	4	●	1
IMX20C4HV200R30020S	20	3	20	30	19.5	4	●	1
IMX20C4HV200R40020S	20	4	20	30	19.5	4	●	1
IMX20C4HV200R60020S	20	6	20	30	19.5	4	●	1
IMX20C4HV200R63520S	20	6.35	20	30	19.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C4HV-S

Corner radius head, 4 flute, Irregular helix, With coolant thru

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX25C4HV250R10025S	25	1	25	37.5	24.5	4	●	1
IMX25C4HV250R15025S	25	1.5	25	37.5	24.5	4	●	1
IMX25C4HV250R20025S	25	2	25	37.5	24.5	4	●	1
IMX25C4HV250R30025S	25	3	25	37.5	24.5	4	●	1
IMX25C4HV250R40025S	25	4	25	37.5	24.5	4	●	1
IMX25C4HV250R60025S	25	6	25	37.5	24.5	4	●	1
IMX25C4HV250R63525S	25	6.35	25	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C4HV/iMX-C4HV-S

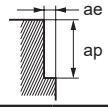
Corner radius head, 4 flute, Irregular helix (With/Without coolant thru)

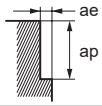
RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
DC		Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
(mm)	(inch)												
	.3750	5000	70.0	.375	.075	4000	38.4	.375	.075	3400	40.8	.375	.075
10	.3937	4800	67.2	.394	.079	3800	36.5	.394	.079	3200	38.4	.394	.079
12	.4724	4000	56.0	.472	.094	3200	33.3	.472	.094	2700	33.5	.472	.094
	.5000	3700	51.8	.500	.100	3000	31.2	.500	.100	2500	31.0	.500	.100
	.6250	3000	46.8	.625	.125	2400	28.8	.625	.125	2000	28.0	.625	.125
16	.6299	3000	46.8	.630	.126	2400	28.8	.630	.126	2000	28.0	.630	.126
	.7500	2500	39.0	.750	.150	2000	24.0	.750	.150	1700	23.8	.750	.150
20	.7874	2400	37.4	.787	.157	1900	22.8	.787	.157	1600	22.4	.787	.157
25	.9843	1900	35.7	.984	.197	1500	18.0	.984	.197	1300	18.2	.984	.197
	1.0000	1900	35.7	1.000	.200	1500	18.0	1.000	.200	1300	18.2	1.000	.200
Depth of Cut													

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
DC		Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
(mm)	(inch)								
	.3750	2500	24.0	.375	.075	1300	8.3	.375	.038
10	.3937	2400	23.0	.394	.079	1300	8.3	.394	.039
12	.4724	2000	20.8	.472	.094	1100	7.9	.472	.047
	.5000	1900	19.8	.500	.100	990	7.1	.500	.050
	.6250	1500	18.0	.625	.125	790	6.3	.625	.063
16	.6299	1500	18.0	.630	.126	790	6.3	.630	.063
	.7500	1200	14.4	.750	.150	660	5.3	.750	.075
20	.7874	1200	14.4	.787	.157	630	5.0	.787	.079
25	.9843	950	11.4	.984	.197	500	4.1	.984	.098
	1.0000	940	11.3	1.000	.200	500	4.0	1.000	.100
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-C4HV/iMX-C4HV-S

Corner radius head, 4 flute, Irregular helix (With/Without coolant thru)

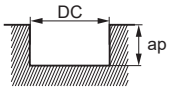
RECOMMENDED CUTTING CONDITIONS

Slot Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	3400	21.4	.188	2600	12.5	.188	2500	12.0	.188
10	.3937	3200	20.5	.197	2500	12.0	.197	2400	11.5	.197
12	.4724	2700	21.6	.236	2100	13.4	.236	2000	12.8	.236
	.5000	2500	20.0	.250	2000	12.8	.250	1900	12.2	.250
	.6250	2000	22.4	.313	1600	12.8	.313	1500	14.4	.313
16	.6299	2000	22.4	.315	1600	12.8	.315	1500	14.4	.315
	.7500	1700	19.0	.375	1300	10.4	.375	1200	11.5	.375
20	.7874	1600	17.9	.394	1300	10.4	.394	1200	11.5	.394
25	.9843	1300	16.1	.472	1000	8.0	.472	950	9.1	.472
	1.0000	1300	16.1	.480	990	7.9	.480	940	9.0	.480

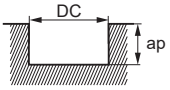
Depth of Cut



DC=Dia.

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy			Heat Resistant Alloy Inconel718		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	2000	8.0	.188	1000	3.2	.075
10	.3937	1900	7.6	.197	970	3.1	.079
12	.4724	1600	9.0	.236	810	3.9	.094
	.5000	1500	8.4	.250	760	3.6	.100
	.6250	1200	9.6	.313	610	4.9	.125
16	.6299	1200	9.6	.315	610	4.9	.126
	.7500	1000	7.9	.375	510	4.1	.150
20	.7874	950	7.6	.394	490	3.9	.157
25	.9843	760	6.1	.472	390	3.1	.197
	1.0000	740	5.9	.480	380	3.0	.200

Depth of Cut



DC=Dia.

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

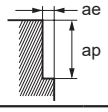
iMX-C4HV

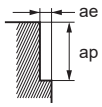
Corner radius head, 4 flute, Irregular helix, Long cutting edge type

RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	2000	28.0	1.260	.031	1600	17.9	1.260	.031	1200	14.9	1.260	.031
	20	1600	22.4	1.575	.039	1300	14.6	1.575	.039	950	11.8	1.575	.039
6	**16**	1200	13.4	1.260	.031	990	8.0	1.260	.031	790	7.6	1.260	.031
	20	950	10.6	1.575	.039	800	6.4	1.575	.039	630	6.0	1.575	.039
Depth of Cut													

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
L/D	DC (mm)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
4	**16**	1000	11.2	1.260	.031	610	4.9	1.260	.016
	20	800	9.0	1.575	.039	490	3.9	1.575	.020
6	**16**	610	4.9	1.260	.031	390	2.5	1.260	.016
	20	490	3.9	1.575	.039	320	2.0	1.575	.020
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) L/D will be +1 when using a long cutting edge type head.
Note 4) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

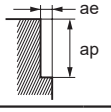
iMX-C4HV

Corner radius head, 4 flute, Irregular helix, Oversize type head

RECOMMENDED CUTTING CONDITIONS

Shoulder Milling

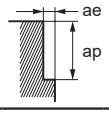
(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
L/D	DC (mm)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**11**	4300	60.2	.433	.043	3500	33.6	.433	.043	2900	34.8	.433	.043
	12	4000	56.0	.472	.047	3200	30.7	.472	.047	2700	32.4	.472	.047
	13	3700	51.8	.512	.051	2900	30.2	.512	.051	2500	31.0	.512	.051
	14	3400	47.6	.551	.055	2700	28.1	.551	.055	2300	28.5	.551	.055
	17	2800	43.7	.669	.067	2300	27.6	.669	.067	1900	23.6	.669	.067
	18	2600	40.6	.709	.071	2100	25.2	.709	.071	1800	25.2	.709	.071
	22	2200	34.3	.866	.087	1700	20.4	.866	.087	1500	21.0	.866	.087
	28	1700	32.0	1.102	.110	1400	16.8	1.102	.110	1100	15.4	1.102	.110
5	**11**	2600	29.1	.433	.016	2000	16.0	.433	.016	1700	16.3	.433	.016
	12	2400	26.9	.472	.020	1900	15.2	.472	.020	1600	15.4	.472	.020
	13	2200	24.6	.512	.020	1700	13.6	.512	.020	1500	14.4	.512	.020
	14	2000	22.4	.551	.024	1600	12.8	.551	.024	1400	13.4	.551	.024
	17	1700	21.1	.669	.028	1300	12.5	.669	.028	1100	12.3	.669	.028
	18	1600	19.8	.709	.028	1200	11.5	.709	.028	1100	12.3	.709	.028
	22	1300	16.1	.866	.035	1000	9.6	.866	.035	860	9.6	.866	.035
	28	1000	15.6	1.102	.043	800	7.7	1.102	.043	680	7.6	1.102	.043
7	**11**	1700	16.3	.433	.008	1500	9.6	.433	.008	930	7.4	.433	.008
	12	1600	15.4	.472	.008	1300	8.3	.472	.008	850	6.8	.472	.008
	13	1500	14.4	.512	.012	1200	9.6	.512	.012	780	7.5	.512	.012
	14	1400	13.4	.551	.012	1100	8.8	.551	.012	730	7.0	.551	.012
	17	1100	12.3	.669	.012	940	7.5	.669	.012	600	5.8	.669	.012
	18	1100	12.3	.709	.016	890	7.1	.709	.016	570	5.5	.709	.016
	22	860	9.6	.866	.016	730	5.8	.866	.016	460	4.4	.866	.016
	28	680	8.4	1.102	.024	570	4.6	1.102	.024	360	3.5	1.102	.024
Depth of Cut													

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

■Shoulder Milling

(inch)

Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
L/D	**DC** (mm)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**11**	2200	21.1	.433	.043	880	5.6	.433	.032
	12	2000	19.2	.472	.047	810	5.2	.472	.035
	13	1800	18.7	.512	.051	750	5.4	.512	.039
	14	1700	17.7	.551	.055	690	5.0	.551	.043
	17	1400	14.6	.669	.067	740	5.3	.669	.051
	18	1300	15.6	.709	.071	700	5.6	.709	.055
	22	1100	13.2	.866	.087	570	4.6	.866	.067
	28	850	10.2	1.102	.110	450	3.6	1.102	.083
5	**11**	1500	12.0	.433	.016	310	1.5	.433	.012
	12	1300	10.4	.472	.020	280	1.3	.472	.016
	13	1200	9.6	.512	.020	260	1.7	.512	.016
	14	1100	8.8	.551	.024	240	1.5	.551	.016
	17	940	9.0	.669	.028	340	2.2	.669	.020
	18	890	8.5	.709	.028	320	2.0	.709	.024
	22	730	7.0	.866	.035	260	1.7	.866	.028
	28	570	5.5	1.102	.043	210	1.3	1.102	.031
7	**11**	710	4.5	.433	.008	–	–	–	–
	12	650	4.2	.472	.008	–	–	–	–
	13	600	4.8	.512	.012	–	–	–	–
	14	550	4.4	.551	.012	–	–	–	–
	17	460	3.7	.669	.012	–	–	–	–
	18	430	3.4	.709	.016	–	–	–	–
	22	350	2.8	.866	.016	–	–	–	–
	28	280	2.2	1.102	.024	–	–	–	–
Depth of Cut									

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

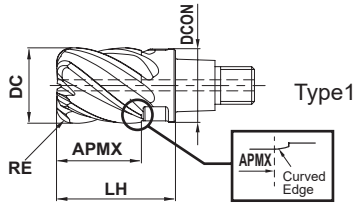
iMX-C6HV-C NEW

Corner radius head, 6 flute, Irregular helix, with coolant thru

UWC

36°
40°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		



Type1

RE≤3				
±0.020				
DC=10	12≤DC<16	20≤DC≤25		
0 - 0.030	0 - 0.040	0 - 0.050		

- Chatter and vibration are suppressed and stable machining is enabled by using irregular helix flutes.
- Equipped with center through coolant thru to improve chip evacuation.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C6HV100R05010C	10	0.5	10	16	9.7	6	●	1
IMX10C6HV100R10010C	10	1	10	16	9.7	6	●	1
IMX12C6HV120R05012C	12	0.5	12	19	11.7	6	●	1
IMX12C6HV120R10012C	12	1	12	19	11.7	6	●	1
IMX16C6HV160R10016C	16	1	16	24	15.5	6	●	1
IMX16C6HV160R30016C	16	3	16	24	15.5	6	★	1
IMX20C6HV200R10020C	20	1	20	30	19.5	6	★	1
IMX20C6HV200R30020C	20	3	20	30	19.5	6	●	1
IMX25C6HV250R10025C	25	1	25	37.5	24.5	6	●	1
IMX25C6HV250R30025C	25	3	25	37.5	24.5	6	★	1

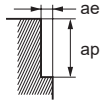
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

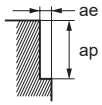
RECOMMENDED CUTTING CONDITIONS

■ Shoulder milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel				Precipitation Hardening Stainless Steel, Cobalt Chromium Alloys, Titanium Alloys			
DC		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)												
10	**.394**	6400	106.3	.394	.039	4800	78.7	.394	.039	3200	51.2	.394	.039
12	**.472**	5300	106.3	.472	.047	4000	78.7	.472	.047	2700	55.1	.472	.047
16	**.630**	4000	82.7	.630	.063	3000	63.0	.630	.063	2000	43.3	.630	.063
20	**.787**	3200	74.8	.787	.079	2400	55.1	.787	.079	1600	39.4	.787	.079
25	**.984**	2500	59.1	.984	.098	1900	43.3	.984	.098	1300	31.5	.984	.098
Depth of Cut													

Workpiece Material		Heat Resistant Alloys Inconel718			
DC		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)				
10	**.394**	1300	10.2	.394	.020
12	**.472**	1100	9.1	.472	.024
16	**.630**	800	7.1	.630	.031
20	**.787**	640	5.9	.787	.039
25	**.984**	510	4.7	.984	.051
Depth of Cut					

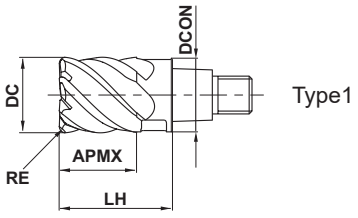
Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-C6HV/C10HV/C12HV – Inch Sizes

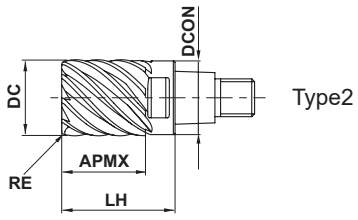
Corner radius head, Multi-flute, Irregular helix

UWC | 43.5° 45° DC ≤.500" | 44.5° 45° DC>.500" | DC ≤.500" | DC>.500"

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		



Type1



Type2

±.0008"				
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Irregular helix controls vibration and achieves stable machining.
- High machining efficiency due to multi-flute design.

(inch)

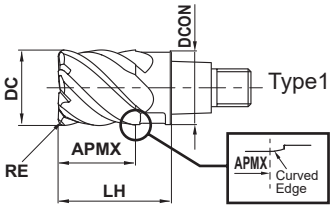
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C6HV0375R030M	.375	.030	.395	.630	.363	6	●	1
IMX12C6HV0500R030M	.500	.030	.520	.789	.488	6	●	1
IMX16C10HV0625R030M	.625	.030	.645	.945	.605	10	●	2
IMX20C12HV0750R030M	.750	.030	.800	1.181	.730	12	●	2
IMX25C12HV1000R030M	1.000	.030	1.050	1.500	.980	12	●	2

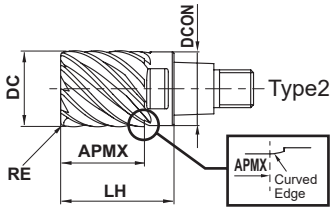
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C6HV/C10HV/C12HV

Corner radius head, Multi-flute, Irregular helix

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		





±0.020					
DC≤12	DC>12				
0 - 0.020	0 - 0.030				

- Irregular helix controls vibration and achieves stable machining.
- High machining efficiency due to multi-flute design.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10C6HV100R05010	10	0.5	10	16	9.7	6	●	1
IMX10C6HV100R10010	10	1	10	16	9.7	6	●	1
IMX12C6HV120R10012	12	1	12	19	11.7	6	●	1
IMX16C10HV160R10016	16	1	16	24	15.5	10	●	2
IMX20C12HV200R10020	20	1	20	30	19.5	12	●	2
IMX25C12HV250R10025	25	1	25	37.5	24.5	12	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C6HV/C10HV/C12HV

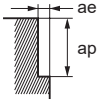
Corner radius head, Multi-flute, Irregular helix

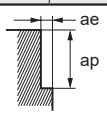
RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy				Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)												
	.3750	6700	112.6	.375	.038	5000	84.0	.375	.038	3400	57.1	.375	.038
10	**.3937**	6400	107.5	.394	.039	4800	80.6	.394	.039	3200	53.8	.394	.039
12	**.4724**	5300	104.9	.472	.047	4000	79.2	.472	.047	2700	53.5	.472	.047
	.5000	5000	99.0	.500	.050	3700	73.3	.500	.050	2500	49.5	.500	.050
	.6250	4000	140.0	.625	.025	3000	105.0	.625	.025	2000	70.0	.625	.025
16	**.6299**	4000	140.0	.630	.025	3000	105.0	.630	.025	2000	70.0	.630	.025
	.7500	3300	154.4	.750	.030	2500	117.0	.750	.030	1700	79.6	.750	.030
20	**.7874**	3200	149.8	.787	.031	2400	112.3	.787	.031	1600	74.9	.787	.031
25	**.9843**	2500	117.0	.984	.039	1900	88.9	.984	.039	1300	60.8	.984	.039
	1.0000	2500	117.0	1.000	.040	1900	88.9	1.000	.040	1300	60.8	1.000	.040
Depth of Cut													

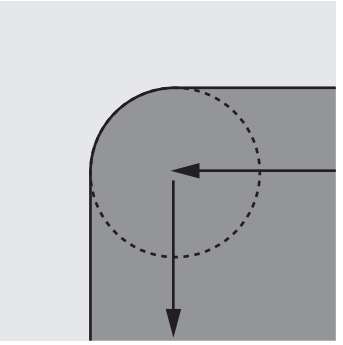
Workpiece Material		Heat Resistant Alloy Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)				
	.3750	1300	10.1	.375	.019
10	**.3937**	1300	10.1	.394	.020
12	**.4724**	1100	9.2	.472	.024
	.5000	990	8.3	.500	.025
	.6250	790	11.9	.625	.025
16	**.6299**	790	11.9	.630	.025
	.7500	660	12.7	.750	.030
20	**.7874**	630	12.1	.787	.031
25	**.9843**	500	9.6	.984	.039
	1.0000	500	9.6	1.000	.040
Depth of Cut					

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.

Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.

Note 3) If the machining radius at the corner is the same as the tool radius when using a head with more than 10 flutes, please set the depth of cut and feed rate to half of the above.

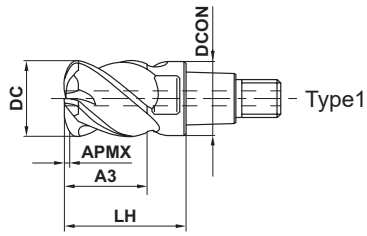
Note 4) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.



iMX-C4FD-C – Inch Sizes

Duplex corner radius head, 4 flute, For high feed, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		◎	◎	○	



DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- The duplex corner radius and 4 flute geometry enables efficient machining at higher feed rates.
- End face center coolant thru provides a stable supply of coolant.

(inch)

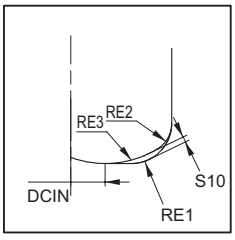
Order Number	DC	RE1	APMX	A3	LH	DCON	No. of Flutes	RMPX	Grade EP7020	Type
IMX10C4FD0375MC	.375	.076	.024	.395	.630	.363	4	2.3°	●	1
IMX12C4FD0500MC	.500	.086	.033	.520	.789	.488	4	3.6°	●	1
IMX16C4FD0625MC	.625	.110	.039	.645	.945	.605	4	2.8°	●	1
IMX20C4FD0750MC	.750	.117	.047	.800	1.181	.730	4	3.6°	●	1
IMX25C4FD1000MC	1.000	.171	.067	1.050	1.500	.980	4	4.5°	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) Duplex corner radius end mill is not suitable for corner radius machining due to the possibility of leaving unmachined areas.

RE1 = Approximate Radius
RMPX = Max. Ramping Angle

(inch)

Order Number	RE1	Duplex Corner Radius			
		S10	DCIN	RE2	RE3
IMX10C4FD0375MC	.076	.009	.134	.060	.181
IMX12C4FD0500MC	.086	.014	.196	.060	.236
IMX16C4FD0625MC	.110	.017	.236	.080	.315
IMX20C4FD0750MC	.117	.020	.314	.080	.354
IMX25C4FD1000MC	.171	.028	.394	.120	.472

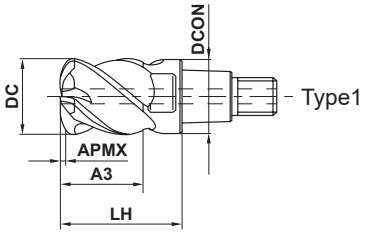


When using this iMX-C4FD-C, please program as an radius cutter.
The approximate remaining stocks for program are as the left table.

iMX-C4FD-C

Duplex corner radius head, 4 flute, For high feed, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎		◎	◎	○	



DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- The duplex corner radius and 4 flute geometry enables efficient machining at higher feed rates.
- End face center coolant thru provides a stable supply of coolant.

(mm)

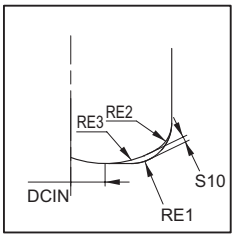
Order Number	DC	RE1	APMX	A3	LH	DCON	No. of Flutes	RMPX	Grade EP7020	Type
IMX10C4FD10010C	10	1.99	0.7	10.5	16	9.7	4	2.1°	●	1
IMX12C4FD12012C	12	2.1	0.8	12.5	19	11.7	4	2.8°	●	1
IMX16C4FD16016C	16	2.75	1	16.5	24	15.5	4	3°	●	1
IMX20C4FD20021C	20	3.07	1.3	21	30	19.5	4	3.3°	●	1
IMX25C4FD25026C	25	4.21	1.6	26	37.5	24.5	4	4.5°	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) Duplex corner radius end mill is not suitable for corner radius machining due to the possibility of leaving unmachined areas.

RE1 = Approximate Radius
RMPX = Max. Ramping Angle

(mm)

Order Number	RE1	Duplex Corner Radius			
		S10	DCIN	RE2	RE3
IMX10C4FD10010C	1.99	0.27	3.4	1.5	5
IMX12C4FD12012C	2.1	0.33	4.5	1.5	6
IMX16C4FD16016C	2.75	0.42	6.2	2	8
IMX20C4FD20021C	3.07	0.59	8	2	10
IMX25C4FD25026C	4.21	0.67	10	3	12



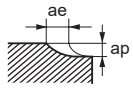
When using this iMX-C4FD-C, please program as a radius cutter.
The approximate remaining stocks for program are as the left table.

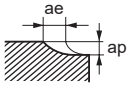
RECOMMENDED CUTTING CONDITIONS

L/D=3

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Carbon steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Hardened Steel, Precipitation Hardening Stainless Steel, Ferritic and Martensitic Stainless Steel			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)												
	.3750	5000	314.0	.019	.225	4500	282.6	.019	.225	4000	188.8	.019	.225
10	**.3937**	4800	301.4	.020	.236	4300	270.0	.020	.236	3800	179.4	.020	.236
12	**.4724**	4000	283.2	.024	.283	3600	254.9	.024	.283	3200	151.0	.024	.283
	.5000	3700	262.0	.025	.300	3400	240.7	.025	.300	3000	141.6	.025	.300
	.6250	3000	236.4	.031	.375	2700	212.8	.031	.375	2400	150.7	.031	.375
16	**.6299**	3000	236.4	.031	.378	2700	212.8	.031	.378	2400	150.7	.031	.378
	.7500	2500	197.0	.038	.450	2300	181.2	.038	.450	2000	125.6	.038	.450
20	**.7874**	2400	189.1	.039	.472	2200	173.4	.039	.472	1900	119.3	.039	.472
25	**.9843**	1900	149.7	.049	.591	1700	134.0	.049	.591	1500	94.2	.049	.591
	1.0000	1900	149.7	.050	.600	1700	134.0	.050	.600	1500	94.2	.050	.600
Depth of Cut													

Workpiece Material		Austenitic Stainless Steel, Titanium Alloy, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
DC		Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
(mm)	(inch)								
	.3750	1300	41.1	.019	.225	810	12.6	.019	.225
10	**.3937**	1300	41.1	.020	.236	780	12.2	.020	.236
12	**.4724**	1100	34.8	.024	.283	650	10.1	.024	.283
	.5000	990	31.3	.025	.300	610	9.5	.025	.300
	.6250	790	37.3	.031	.375	490	11.6	.031	.375
16	**.6299**	790	37.3	.031	.378	490	11.6	.031	.378
	.7500	660	31.2	.038	.450	410	9.7	.038	.450
20	**.7874**	630	29.7	.039	.472	390	9.2	.039	.472
25	**.9843**	500	23.6	.049	.591	310	7.3	.049	.591
	1.0000	500	23.6	.050	.600	310	7.3	.050	.600
Depth of Cut									

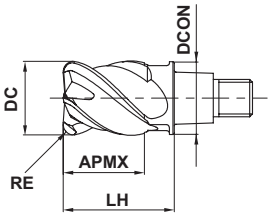
Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) Please reduce the feed rate by half when ramping.
Note 4) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-C4FV – Inch Sizes

Corner radius head, 4 flute, Irregular helix, For high efficiency machining

UWC | γ 43° 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	◎	◎					



Type1

DC≤.750"	DC=1.000"			
±.0004"	±.0008"			
DC≤.500"	DC>.500"			
0 - .0008"	0 - .0012"			

- Corner radius end mill for high efficiency machining.
- Irregular helix controls vibration and achieves stable machining.

(inch)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP6120	Type
IMX10C4FV0375R090M	.375	.090	.395	.630	.363	4	●	1
IMX12C4FV0500R090M	.500	.090	.520	.789	.488	4	●	1
IMX16C4FV0625R125M	.625	.125	.645	.945	.605	4	●	1
IMX20C4FV0750R125M	.750	.125	.800	1.181	.730	4	●	1
IMX25C4FV1000R190M	1.000	.190	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C4FV

Corner radius head, 4 flute, Irregular helix, For high efficiency machining

UWC | γ 43° 45°

DC≤20	DC=25			
±0.010	±0.020			
DC≤12	DC>12			
0 - 0.020	0 - 0.030			

- Corner radius end mill for high efficiency machining.
- Irregular helix controls vibration and achieves stable machining.

(mm)

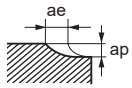
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP6120	Type
IMX10C4FV100R20010	10	2	10.5	16	9.7	4	●	1
IMX12C4FV120R20012	12	2	12.5	19	11.7	4	●	1
IMX16C4FV160R30016	16	3	16.5	24	15.5	4	●	1
IMX20C4FV200R30021	20	3	21	30	19.5	4	●	1
IMX25C4FV250R40026	25	4	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

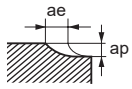
■ Large Depth of Cut Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Gray Cast Iron				Pre-hardened Steel, Alloy Tool Steel				Hardened Steel (45—55HRC)			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.3750	3000	117.6	.045	.169	2500	91.0	.038	.169	2000	69.6	.026	.169
10	**.3937**	2900	113.7	.047	.177	2400	87.4	.039	.177	1900	66.1	.028	.177
12	**.4724**	2400	94.1	.071	.236	2000	72.8	.055	.236	1600	55.7	.035	.236
	.5000	2300	90.2	.075	.250	1900	69.2	.058	.250	1500	52.2	.038	.250
	.6250	1800	70.6	.070	.293	1500	54.6	.055	.293	1200	41.8	.035	.293
16	**.6299**	1800	70.6	.071	.295	1500	54.6	.055	.295	1200	41.8	.035	.295
	.7500	1500	58.8	.068	.338	1300	43.7	.053	.338	990	34.5	.034	.338
20	**.7874**	1400	54.9	.071	.354	1200	43.7	.055	.354	950	33.1	.035	.354
25	**.9843**	1100	43.1	.094	.453	950	34.6	.071	.453	760	26.4	.047	.453
	1.0000	1100	43.1	.096	.460	940	34.2	.072	.460	740	25.8	.048	.460
Depth of Cut													

■ High Speed Milling

(inch)

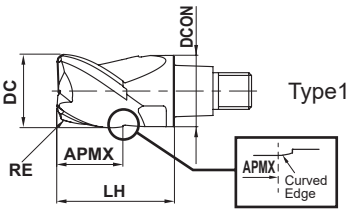
Workpiece Material		Carbon Steel, Alloy Steel, Gray Cast Iron				Pre-hardened Steel, Alloy Tool Steel				Hardened Steel (40—55HRC)			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.3750	5000	314.0	.023	.169	4200	231.8	.017	.169	3400	160.5	.014	.169
10	**.3937**	4800	301.4	.024	.177	4000	220.8	.018	.177	3200	151.0	.014	.177
12	**.4724**	4000	283.2	.035	.236	3300	207.2	.028	.236	2700	127.4	.018	.236
	.5000	3700	262.0	.038	.250	3100	194.7	.029	.250	2500	118.0	.019	.250
	.6250	3000	236.4	.035	.293	2500	177.0	.027	.293	2000	94.4	.018	.293
16	**.6299**	3000	236.4	.035	.295	2500	177.0	.028	.295	2000	94.4	.018	.295
	.7500	2500	197.0	.034	.338	2100	148.7	.026	.338	1700	93.8	.017	.338
20	**.7874**	2400	189.1	.035	.354	2000	141.6	.028	.354	1600	88.3	.018	.354
25	**.9843**	1900	149.7	.047	.453	1600	113.3	.035	.453	1300	71.8	.024	.453
	1.0000	1900	149.7	.048	.460	1600	113.3	.036	.460	1300	71.8	.024	.460
Depth of Cut													

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For profile machining such as molds, machining conditions may differ considerably depending on the workpiece material geometry, machining methods and depth of cut. Reduce the feed rate especially when machining the corner sections of a workpiece material.
Note 4) Air blow or oil mist is recommended for good chip evacuation.

iMX-C3A – Inch Sizes

Corner radius head, 3 flute, For aluminum alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎



±.0008"					
DC≤.500"	DC>.500"				
0 - .0008"	0 - .0012"				

● High efficiency machining is possible due to the polished rake face and sharp cutting edge.

(inch)

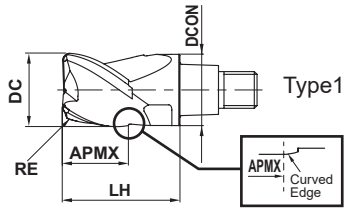
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade ET2020	Type
IMX10C3A0375R015P	.375	.015	.300	.630	.363	3	●	1
IMX10C3A0375R030P	.375	.030	.300	.630	.363	3	●	1
IMX12C3A0500R015P	.500	.015	.400	.789	.488	3	●	1
IMX12C3A0500R030P	.500	.030	.400	.789	.488	3	●	1
IMX16C3A0625R030P	.625	.030	.500	.945	.605	3	●	1
IMX16C3A0625R060P	.625	.060	.500	.945	.605	3	●	1
IMX20C3A0750R030P	.750	.030	.600	1.181	.730	3	●	1
IMX20C3A0750R060P	.750	.060	.600	1.181	.730	3	●	1
IMX25C3A1000R060P	1.000	.060	.800	1.500	.980	3	●	1
IMX25C3A1000R125P	1.000	.125	.800	1.500	.980	3	●	1

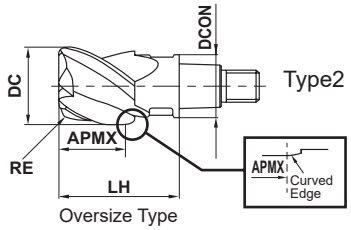
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C3A

Corner radius head, 3 flute, For aluminum alloy

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
							◎





Oversize Type

±0.020					
DC ≤12	DC>12				
0 - 0.020	0 - 0.030				

● High efficiency machining is possible due to the polished rake face and sharp cutting edge.

(mm)

Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade ET2020	Type
IMX10C3A100R10008	10	1	8	16	9.7	3	●	1
IMX10C3A100R25008	10	2.5	8	16	9.7	3	●	1
IMX10C3A120R10010	12	1	10.1	19	9.7	3	●	2
IMX12C3A120R10009	12	1	9.6	19	11.7	3	●	1
IMX12C3A120R32009	12	3.2	9.6	19	11.7	3	●	1
IMX12C3A140R10011	14	1	11.7	22.5	11.7	3	●	2
IMX16C3A160R10012	16	1	12.8	24	15.5	3	●	1
IMX16C3A160R32012	16	3.2	12.8	24	15.5	3	●	1
IMX16C3A180R32014	18	3.2	14.9	27	15.5	3	●	2
IMX20C3A200R10016	20	1	16	30	19.5	3	●	1
IMX20C3A200R32016	20	3.2	16	30	19.5	3	●	1
IMX20C3A220R32018	22	3.2	18.6	33	19.5	3	●	2
IMX25C3A250R10020	25	1	20	37.5	24.5	3	●	1
IMX25C3A250R32020	25	3.2	20	37.5	24.5	3	●	1
IMX25C3A250R50020	25	5	20	37.5	24.5	3	●	1
IMX25C3A280R32023	28	3.2	23.4	41.5	24.5	3	●	2

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-C3A

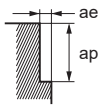
Corner radius head, 3 flute, For aluminum alloy

RECOMMENDED CUTTING CONDITIONS

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

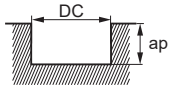
Shoulder Milling (L/D=3)

(inch)

Workpiece Material		Aluminum Alloy			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
	.3750	17000	234.6	.300	.113
10	.3937	16000	220.8	.315	.118
12	.4724	13000	179.4	.378	.142
	.5000	13000	179.4	.400	.150
	.6250	10000	180.0	.500	.188
16	.6299	9900	178.2	.504	.189
	.7500	8400	173.9	.600	.225
20	.7874	8000	165.6	.630	.236
25	.9843	6400	159.4	.787	.295
	1.0000	6300	156.9	.800	.300
Depth of Cut					

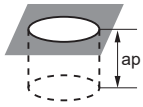
Slot Milling (L/D=3)

(inch)

Workpiece Material		Aluminum Alloy		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
	.3750	17000	137.7	.188
10	.3937	16000	129.6	.197
12	.4724	13000	109.2	.236
	.5000	13000	109.2	.250
	.6250	10000	111.0	.313
16	.6299	9900	109.9	.315
	.7500	8400	108.4	.375
20	.7874	8000	103.2	.394
25	.9843	6400	96.0	.492
	1.0000	6300	94.5	.500
Depth of Cut		 DC=Dia.		

Plunging (L/D=3)

(inch)

Workpiece Material		Aluminum Alloy			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Step Feed ap2
	.3750	10000	39.0	.188	.10
10	.3937	9600	37.4	.197	.10
12	.4724	8000	31.2	.236	.10
	.5000	7500	29.3	.250	.10
	.6250	6000	23.4	.313	.10
16	.6299	6000	23.4	.315	.10
	.7500	5000	19.5	.375	.10
20	.7874	4800	18.7	.394	.10
25	.9843	3800	14.8	.492	.10
	1.0000	3800	14.8	.500	.10
Depth of Cut					

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) The use of water-soluble coolant is effective.

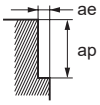
iMX-C3A

Corner radius head, 3 flute, For aluminum alloy, Oversize type head

RECOMMENDED CUTTING CONDITIONS

Shoulder Milling

(inch)

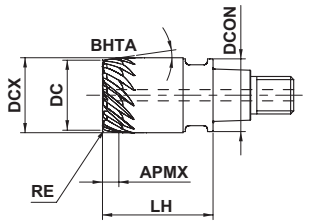
Workpiece Material			Aluminum Alloy			
L/D	DC (mm)	DC (inch)	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
3	**12**	**.4720**	13000	181.1	.378	.094
	14	**.5510**	11000	153.5	.441	.110
	18	**.7090**	8800	157.5	.567	.142
	22	**.8660**	7200	149.6	.693	.173
	28	**1.1020**	5700	141.7	.882	.220
5	**12**	**.4720**	8000	86.6	.378	.039
	14	**.5510**	6800	70.9	.441	.043
	18	**.7090**	5300	74.8	.567	.055
	22	**.8660**	4300	70.9	.693	.071
	28	**1.1020**	3400	66.9	.882	.087
7	**12**	**.4720**	5300	51.2	.378	.020
	14	**.5510**	4500	43.3	.441	.024
	18	**.7090**	3500	47.2	.567	.028
	22	**.8660**	2900	39.4	.693	.035
	28	**1.1020**	2300	39.4	.882	.043
Depth of Cut						

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) The use of water-soluble coolant is effective.

iMX-C8T/C10T/C12T/C15T-C

Corner radius, Taper head, Multi-flute, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
				◎	◎		



Type1

±0.015				
DC ≤12	DC>12			
0 - 0.020	0 - 0.030			

- Suitable for 3-dimensional free-form surface cutting such as blades.
- High feed cutting is possible due to multiple cutting edges.

(mm)

Order Number	DC	RE	APMX	DCX	LH	DCON	BHTA	No. of Flutes	Grade EP7020	Type
IMX10C8T080R05T080C	8	0.5	7.12	10	16	9.7	8°	8	●	1
IMX10C8T080R10T080C	8	1	7.12	10	16	9.7	8°	8	●	1
IMX12C10T100R05T080C	10	0.5	7.12	12	19	11.7	8°	10	●	1
IMX12C10T100R10T080C	10	1	7.12	12	19	11.7	8°	10	●	1
IMX16C15T150R05T080C	15	0.5	3.56	16	24	15.5	8°	15	●	1
IMX16C15T150R10T080C	15	1	3.56	16	24	15.5	8°	15	●	1
IMX16C12T150R20T080C	15	2	3.56	16	24	15.5	8°	12	●	1
IMX20C15T190R05T080C	19	0.5	3.56	20	30	19.5	8°	15	●	1
IMX20C15T190R10T080C	19	1	3.56	20	30	19.5	8°	15	●	1
IMX20C12T190R20T080C	19	2	3.56	20	30	19.5	8°	12	●	1

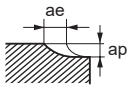
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

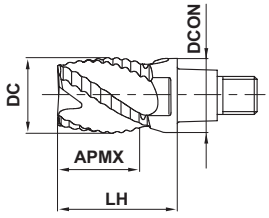
Workpiece Material		Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel				Precipitation Hardening Stainless Steel, Titanium Alloy				Heat Resistant Alloy			
DC (mm)	No. of Flutes	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min^{-1})	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
8	**8**	12000	378.0	.012	.047	8000	252.0	.012	.047	2400	59.1	.012	.031
10	**10**	9500	374.0	.012	.059	6400	252.0	.012	.059	1900	59.1	.012	.039
15	**12**	6400	362.2	.012	.087	4200	236.2	.012	.087	1300	63.0	.012	.059
15	**15**	6400	378.0	.012	.087	4200	248.0	.012	.087	1300	63.0	.012	.059
19	**12**	5000	283.5	.012	.110	3400	192.9	.012	.110	1000	47.2	.012	.075
19	**15**	5000	295.3	.012	.110	3400	200.8	.012	.110	1000	47.2	.012	.075
Depth of Cut													

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) The use of water-soluble coolant is effective.

iMX-R4F – Inch Sizes

Roughing head, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

● The roughing edge geometry reduces cutting resistance.
Effective when rigidity of the machine or workpiece material is low.

(inch)

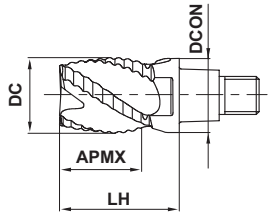
Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10R4F0375M	.375	.395	.630	.363	4	●	1
IMX12R4F0500M	.500	.520	.789	.488	4	●	1
IMX16R4F0625M	.625	.645	.945	.605	4	●	1
IMX20R4F0750M	.750	.800	1.181	.730	4	●	1
IMX25R4F1000M	1.000	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-R4F

Roughing head, 4 flute

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

● The roughing edge geometry reduces cutting resistance.
Effective when rigidity of the machine or workpiece material is low.

(mm)

Order Number	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10R4F10010	10	10.5	16	9.7	4	●	1
IMX12R4F12012	12	12.5	19	11.7	4	●	1
IMX16R4F16016	16	16.5	24	15.5	4	●	1
IMX20R4F20021	20	21	30	19.5	4	●	1
IMX25R4F25026	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-R4F

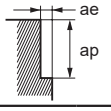
Roughing head, 4 flute

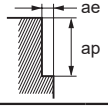
RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

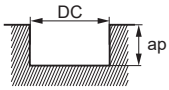
Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy				Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.3750	5000	36.0	.300	.015	4000	19.2	.300	.150	3400	20.4	.300	.150
10	**.3937**	4800	34.6	.320	.160	3800	18.2	.320	.160	3200	19.2	.320	.160
12	**.4724**	4000	28.8	.380	.190	3200	16.6	.380	.190	2700	17.3	.380	.190
	.5000	3700	26.6	.400	.200	3000	15.6	.400	.200	2500	16.0	.400	.200
	.6250	3000	24.0	.500	.250	2400	14.4	.500	.250	2000	14.4	.500	.250
16	**.6299**	3000	24.0	.500	.250	2400	14.4	.500	.250	2000	14.4	.500	.250
	.7500	2500	20.0	.600	.300	2000	12.0	.600	.300	1700	12.2	.600	.300
20	**.7874**	2400	19.2	.630	.320	1900	11.4	.630	.320	1600	11.5	.630	.320
25	**.9843**	1900	18.2	.790	.390	1500	9.0	.790	.390	1300	9.4	.790	.390
	1.0000	1900	18.2	.800	.400	1500	9.0	.800	.400	1300	9.4	.800	.400
Depth of Cut													

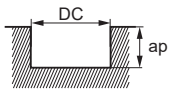
Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy				Heat Resistant Alloy Inconel718			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.3750	2500	12.0	.300	.150	1300	8.3	.300	.038
10	**.3937**	2400	11.5	.320	.160	1300	8.3	.320	.039
12	**.4724**	2000	10.4	.380	.190	1100	7.9	.380	.047
	.5000	1900	9.9	.400	.200	990	7.1	.400	.050
	.6250	1500	9.0	.500	.250	790	6.3	.500	.063
16	**.6299**	1500	9.0	.500	.250	790	6.3	.500	.063
	.7500	1200	7.2	.600	.300	660	5.3	.600	.075
20	**.7874**	1200	7.2	.630	.320	630	5.0	.630	.079
25	**.9843**	950	5.7	.790	.390	500	4.0	.790	.098
	1.0000	940	5.6	.800	.400	500	4.0	.800	.100
Depth of Cut									

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

Slot Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Copper, Copper Alloy			Pre-hardened Steel, Carbon Steel, Alloy Steel, Alloy Tool Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy		
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.3750	3400	21.4	.190	2600	12.5	.190	2000	6.4	.150
10	**.3937**	3200	20.5	.200	2500	12.0	.200	1900	6.1	.160
12	**.4724**	2700	19.4	.240	2100	10.9	.240	1600	6.4	.190
	.5000	2500	18.0	.250	2000	10.4	.250	1500	6.0	.200
	.6250	2000	16.0	.310	1600	9.6	.310	1200	5.8	.250
16	**.6299**	2000	16.0	.320	1600	9.6	.320	1200	5.8	.250
	.7500	1700	13.6	.380	1300	7.8	.380	990	5.1	.300
20	**.7874**	1600	12.8	.390	1300	7.8	.390	950	4.9	.320
25	**.9843**	1300	12.5	.470	1000	6.0	.470	760	4.0	.390
	1.0000	1300	12.5	.480	990	5.9	.480	740	3.8	.400
Depth of Cut		 DC=Dia.								

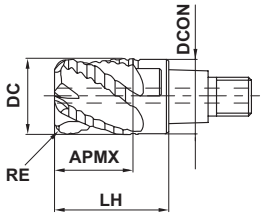
Workpiece Material		Precipitation Hardening Stainless Steel, Cobalt Chromium Alloy		
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**
	.3750	1300	3.1	.150
10	**.3937**	1300	3.1	.160
12	**.4724**	1100	3.5	.190
	.5000	990	3.2	.200
	.6250	790	2.8	.250
16	**.6299**	790	2.8	.250
	.7500	660	2.9	.300
20	**.7874**	630	2.8	.320
25	**.9843**	500	2.2	.390
	1.0000	500	2.2	.400
Depth of Cut		 DC=Dia.		

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

iMX-RC4F-C NEW

Roughing head, 4 flute, with coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎				◎	◎		



Type1

●The roughing edge geometry reduces cutting resistance. Effective when the rigidity of the machine or workpiece material is low.
●Center through coolant thru provides excellent chip evacuation.

(mm)

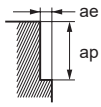
Order Number	DC	RE	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10RC4F100R05010C	10	0.5	10.5	16	9.7	4	●	1
IMX10RC4F100R10010C	10	1	10.5	16	9.7	4	●	1
IMX12RC4F120R05012C	12	0.5	12.5	19	11.7	4	●	1
IMX12RC4F120R10012C	12	1	12.5	19	11.7	4	●	1
IMX12RC4F120R15012C	12	1.5	12.5	19	11.7	4	●	1
IMX12RC4F120R20012C	12	2	12.5	19	11.7	4	●	1
IMX16RC4F160R05016C	16	0.5	16.5	24	15.5	4	●	1
IMX16RC4F160R10016C	16	1	16.5	24	15.5	4	●	1
IMX16RC4F160R15016C	16	1.5	16.5	24	15.5	4	●	1
IMX16RC4F160R20016C	16	2	16.5	24	15.5	4	●	1
IMX16RC4F160R30016C	16	3	16.5	24	15.5	4	●	1
IMX20RC4F200R05021C	20	0.5	21	30	19.5	4	●	1
IMX20RC4F200R10021C	20	1	21	30	19.5	4	●	1
IMX20RC4F200R20021C	20	2	21	30	19.5	4	●	1
IMX20RC4F200R30021C	20	3	21	30	19.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

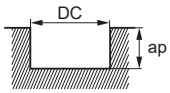
Shoulder Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel				Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy				Precipitation Hardening Stainless Steel			
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Width of Cut ae
10	**.394**	4800	33.9	.315	.157	2000	12.6	.315	.157	1900	9.1	.315	.157
12	**.472**	4000	31.5	.378	.189	1900	13.4	.378	.189	1600	9.1	.378	.189
16	**.630**	3000	23.6	.504	.252	1400	11.0	.504	.252	1200	7.9	.504	.252
20	**.787**	2400	20.9	.630	.315	1100	8.7	.630	.315	950	7.1	.630	.315
Depth of Cut													

Slot Milling

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel			Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Titanium Alloy			Precipitation Hardening Stainless Steel		
DC (mm)	DC (inch)	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of Cut ap
10	**.394**	3200	20.1	.197	1900	9.1	.197	1300	3.9	.197
12	**.472**	2700	19.3	.236	1600	10.2	.236	1100	4.3	.236
16	**.630**	2000	15.7	.315	1200	8.7	.315	800	3.8	.315
20	**.787**	1600	13.8	.394	950	6.7	.394	640	3.5	.394
Depth of Cut										

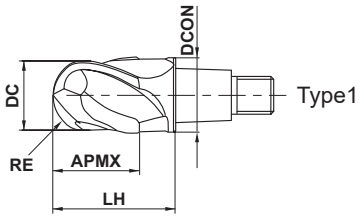
DC = Dia.

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel and titanium alloys, the use of water-soluble coolant is effective.

iMX-B2S

Ball nose head, 2 flute, For hardened steel

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (55–65HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
			◎				



RE≥8				
±0.020				

●Ideal for machining with long overhangs.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP8110	Type
IMX16B2S16016	8	16	16	24	15.5	2	●	1
IMX20B2S20020	10	20	20	30	19.5	2	●	1

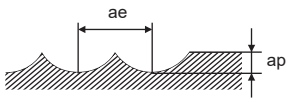
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

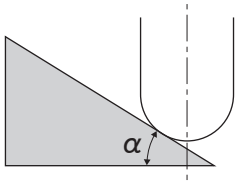
■Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material			Hardened Steel (55–65HRC)					
Inclination Angle			α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC		**RE**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)	(mm) (inch)						
16	**.630**	**8** **.315**	6000	66.9	3000	18.9	.012	.063
20	**.787**	**10** **.394**	4800	51.2	2400	15.0	.012	.079
Depth of Cut								

Note 1) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 2) α is the inclination angle of the machined surface.

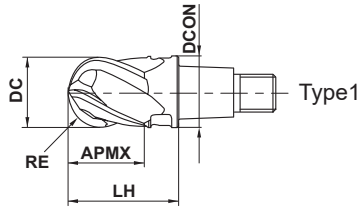


iMX-B4S

Ball nose head, 4 flute, For hardened steel

UWC γ 30°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (55–65HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
			◎				



RE ≥8				
±0.020				

●High efficiency machining is realized even with machining using the tip.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP8110	Type
IMX16B4S16016	8	16	16	24	15.5	4	●	1
IMX20B4S20020	10	20	20	30	19.5	4	●	1

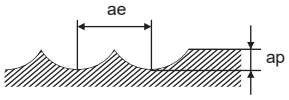
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

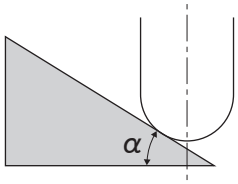
■Shoulder Milling (L/D=3)

Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material				Hardened Steel (55–65HRC)					
Inclination Angle				α ≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC		RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)	(mm)	(inch)						
16	**.630**	**8**	**.315**	6000	66.9	3000	28.3	.012	.063
20	**.787**	**10**	**.394**	4800	51.2	2400	22.8	.012	.079
Depth of Cut									

Note 1) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 2) α is the inclination angle of the machined surface.

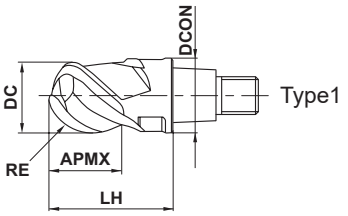


iMX-B3FV

Ball nose head, 3 flute, Irregular pitch flutes, For high efficiency machining

UWC γ 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
	◎	◎					



RE≤6	RE>6			
±0.010	±0.020			

●High efficiency machining is possible in deep engraving processing(DCx5).

(mm)

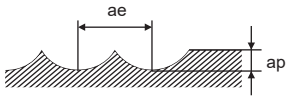
Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP8120	Type
IMX10B3FV10008	5	10	8	16	9.7	3	●	1
IMX12B3FV12009	6	12	9.6	19	11.7	3	●	1
IMX16B3FV16012	8	16	12.8	24	15.5	3	●	1
IMX20B3FV20016	10	20	16	30	19.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

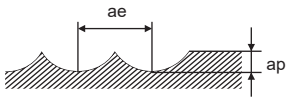
■Shoulder Milling (L/D=5)

(inch)

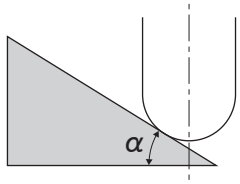
Workpiece Material				Pre-hardened Steel, Alloy Tool Steel						Hardened Steel (40–55HRC)					
Inclination Angle				α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC		RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)			Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)	(mm)	(inch)												
10	**.394**	**5**	**.197**	5600	145.7	3700	66.9	.028	.102	4800	102.4	3200	47.2	.020	.079
12	**.472**	**6**	**.236**	4600	118.1	3100	55.1	.039	.126	4000	86.6	2700	38.2	.028	.098
16	**.630**	**8**	**.315**	3500	90.6	2300	39.4	.043	.150	3000	63.0	2000	28.3	.035	.138
20	**.787**	**10**	**.394**	2800	70.9	1800	31.9	.047	.189	2400	51.2	1600	22.8	.043	.165
Depth of Cut															

■Shoulder Milling (L/D=7)

(inch)

Workpiece Material				Pre-hardened Steel, Alloy Tool Steel						Hardened Steel (40–55HRC)					
Inclination Angle				α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
DC		RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)			Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)	(mm)	(inch)												
10	**.394**	**5**	**.197**	3800	90.6	2500	38.6	.020	.051	3200	47.2	2100	21.3	.016	.039
12	**.472**	**6**	**.236**	3200	74.8	2100	32.3	.028	.063	2700	43.3	1700	16.9	.024	.051
16	**.630**	**8**	**.315**	2400	55.1	1600	24.4	.031	.075	2000	30.7	1300	13.0	.028	.071
20	**.787**	**10**	**.394**	1900	43.3	1300	20.1	.035	.094	1600	24.4	1000	10.2	.031	.083
Depth of Cut															

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) α is the inclination angle of the machined surface.

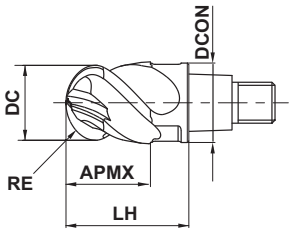


iMX-B4HV – Inch Sizes

Ball nose head, 4 flute, Irregular pitch flutes

UWC γ 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

RE≤.250"	RE>.250"			
±.0004"	±.0008"			

● Irregular pitch flutes cutting edge controls vibration and achieves stable machining.

(inch)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4HV0375M	.1875	.375	.395	.630	.363	4	●	1
IMX12B4HV0500M	.2500	.500	.520	.789	.488	4	●	1
IMX16B4HV0625M	.3125	.625	.645	.945	.605	4	●	1
IMX20B4HV0750M	.3750	.750	.800	1.181	.730	4	●	1
IMX25B4HV1000M	.5000	1.000	1.050	1.500	.980	4	●	1

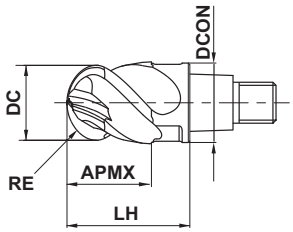
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-B4HV

Ball nose head, 4 flute, Irregular pitch flutes

UWC γ 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

RE≤6	RE>6			
±0.010	±0.020			

●Irregular pitch flutes cutting edge controls vibration and achieves stable machining.

(mm)

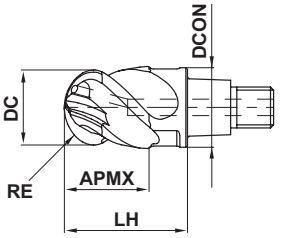
Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4HV10010	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021	10	20	21	30	19.5	4	●	1
IMX25B4HV25026	12.5	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-B4HV-E – Inch Sizes

Ball nose head, 4 flute, Irregular pitch flutes, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

RE≤.250"	RE>.250"			
±.0004"	±.0008"			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular pitch flutes cutting edge controls vibration and achieves stable machining.

(inch)

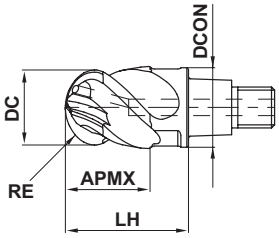
Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4HV0375ME	.1875	.375	.395	.630	.363	4	●	1
IMX12B4HV0500ME	.2500	.500	.520	.789	.488	4	●	1
IMX16B4HV0625ME	.3125	.625	.645	.945	.605	4	●	1
IMX20B4HV0750ME	.3750	.750	.800	1.181	.730	4	●	1
IMX25B4HV1000ME	.5000	1.000	1.050	1.500	.980	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-B4HV-E

Ball nose head, 4 flute, Irregular pitch flutes, With coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

RE≤6	RE>6			
±0.010	±0.020			

- Coolant thru for each cutting edge enables a stable coolant supply.
- Irregular pitch flutes cutting edge controls vibration and achieves stable machining.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4HV10010E	5	10	10.5	16	9.7	4	●	1
IMX12B4HV12012E	6	12	12.5	19	11.7	4	●	1
IMX16B4HV16016E	8	16	16.5	24	15.5	4	●	1
IMX20B4HV20021E	10	20	21	30	19.5	4	●	1
IMX25B4HV25026E	12.5	25	26	37.5	24.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-B4HV/iMX-B4HV-E

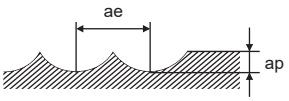
Ball nose head, 4 flute, Irregular pitch flutes (With/Without coolant thru)

RECOMMENDED CUTTING CONDITIONS

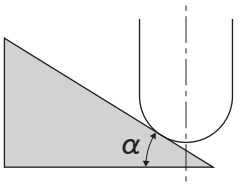
■ Shoulder Milling (L/D=3)

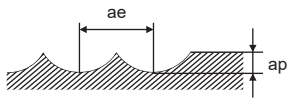
Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

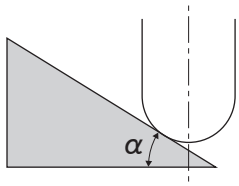
Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Pre-hardened Steel						Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Cobalt Chromium Alloy, Titanium Alloy					
Inclination Angle		$\alpha \leq 15°$		$\alpha > 15°$		Depth of Cut **ap**	Width of Cut **ae**	$\alpha \leq 15°$		$\alpha > 15°$		Depth of Cut **ap**	Width of Cut **ae**
RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)			Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)												
	.1875	10000	168.0	6700	75.0	.038	.100	7500	123.0	5000	52.0	.038	.100
5	**.1969**	9500	157.5	6400	71.7	.039	.100	7200	118.1	4800	49.9	.039	.100
6	**.2362**	8000	156.8	5300	70.0	.047	.120	6000	117.6	4000	49.6	.047	.120
	.2500	7500	147.0	5000	66.0	.050	.120	5700	111.7	3700	45.9	.050	.120
	.3125	6000	127.2	4000	56.0	.063	.160	4500	99.0	3000	42.0	.063	.160
8	**.3150**	6000	127.2	4000	56.0	.063	.160	4500	99.0	3000	42.0	.063	.160
	.3750	5000	122.0	3300	51.5	.075	.190	3800	95.8	2500	41.0	.075	.190
10	**.3937**	4800	117.1	3200	49.9	.079	.200	3600	90.7	2400	39.4	.079	.200
12.5	**.4921**	3800	95.8	2500	39.0	.098	.240	2900	73.1	1900	31.2	.098	.240
	.5000	3800	95.8	2500	39.0	.100	.240	2800	70.6	1900	31.2	.100	.240
Depth of Cut													

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 4) α is the inclination angle of the machined surface.



Workpiece Material		Heat Resistant Alloy Inconel718					
Inclination Angle		$\alpha \leq 15°$		$\alpha > 15°$		Depth of Cut **ap**	Width of Cut **ae**
RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)						
	.1875	2000	17.6	1300	7.3	.019	.038
5	**.1969**	1900	16.7	1300	7.3	.020	.039
6	**.2362**	1600	14.1	1100	6.2	.024	.047
	.2500	1500	13.2	990	5.5	.025	.050
	.3125	1200	11.5	790	5.1	.031	.063
8	**.3150**	1200	11.5	790	5.1	.031	.063
	.3750	990	9.5	660	4.2	.038	.075
10	**.3937**	950	9.1	630	4.0	.039	.079
12.5	**.4921**	760	7.3	500	3.2	.047	.100
	.5000	740	7.1	500	3.2	.048	.100
Depth of Cut							

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 4) α is the inclination angle of the machined surface.

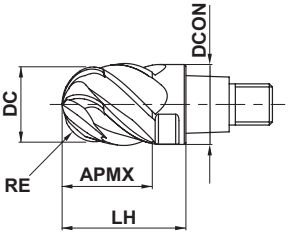


iMX-B6HV – Inch Sizes

Ball nose head, 6 flute, Irregular pitch flutes

UWC γ 45°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎		



Type1

RE≤.250"	RE>.250"			
±.0004"	±.0008"			

- Irregular pitch flutes cutting edge controls vibration and achieves stable machining.
- 6 flutes enables high machining efficiency.

(inch)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B6HV0375M	.1875	.375	.395	.630	.363	6	●	1
IMX12B6HV0500M	.2500	.500	.520	.789	.488	6	●	1
IMX16B6HV0625M	.3125	.625	.645	.945	.605	6	●	1
IMX20B6HV0750M	.3750	.750	.800	1.181	.730	6	●	1
IMX25B6HV1000M	.5000	1.000	1.050	1.500	.980	6	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-B6HV

Ball nose head, 6 flute, Irregular pitch flutes

UWC γ 45°

RE≤6	RE>6			
±0.010	±0.020			

- Irregular pitch flutes cutting edge controls vibration and achieves stable machining.
- 6 flutes enables high machining efficiency.

(mm)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B6HV10010	5	10	10.5	16	9.7	6	●	1
IMX12B6HV12012	6	12	12.5	19	11.7	6	●	1
IMX16B6HV16016	8	16	16.5	24	15.5	6	●	1
IMX20B6HV20021	10	20	21	30	19.5	6	●	1
IMX25B6HV25026	12.5	25	26	37.5	24.5	6	●	1

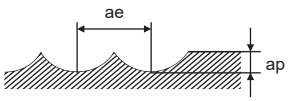
Note 1) The fastening size of the holder and head should be the same. (refer to J002)

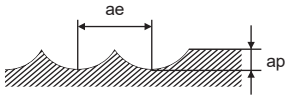
RECOMMENDED CUTTING CONDITIONS

■ Shoulder Milling (L/D=3)

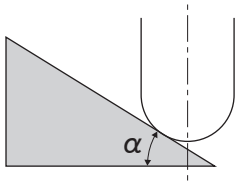
Other than the L/D = 3, use following recommended cutting conditions by multiplying the J007 page correction factor by overhang length.

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Mild Steel, Pre-hardened Steel						Austenitic Stainless Steel, Ferritic and Martensitic Stainless Steel, Cobalt Chromium Alloy, Titanium Alloy					
Inclination Angle		α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**	α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)			Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)												
	.1875	10000	252.0	6700	112.6	.019	.075	7500	184.5	5000	78.0	.019	.075
5	**.1969**	9500	236.2	6400	107.5	.020	.079	7200	177.1	4800	74.9	.020	.079
6	**.2362**	8000	235.2	5300	104.9	.024	.094	6000	176.4	4000	74.4	.024	.094
	.2500	7500	220.5	5000	99.0	.025	.100	5700	167.6	3700	68.8	.025	.100
	.3125	6000	190.8	4000	84.0	.031	.125	4500	148.5	3000	63.0	.031	.125
8	**.3150**	6000	190.8	4000	84.0	.031	.126	4500	148.5	3000	63.0	.031	.126
	.3750	5000	183.0	3300	77.2	.038	.150	3800	143.6	2500	61.5	.038	.150
10	**.3937**	4800	175.7	3200	74.9	.039	.157	3600	136.1	2400	59.0	.039	.157
12.5	**.4921**	3800	143.6	2500	58.5	.047	.197	2900	109.6	1900	46.7	.047	.197
	.5000	3800	143.6	2500	58.5	.048	.200	2800	105.8	1900	46.7	.048	.200
Depth of Cut													

Workpiece Material		Heat Resistant Alloy Inconel718					
Inclination Angle		α≤15°		α>15°		Depth of Cut **ap**	Width of Cut **ae**
RE		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)		
(mm)	(inch)						
	.1875	2000	26.4	1300	10.9	.019	.038
5	**.1969**	1900	25.1	1300	10.9	.020	.039
6	**.2362**	1600	21.1	1100	9.2	.024	.047
	.2500	1500	19.8	990	8.3	.025	.050
	.3125	1200	17.3	790	7.6	.031	.063
8	**.3150**	1200	17.3	790	7.6	.031	.063
	.3750	990	14.3	660	6.3	.038	.075
10	**.3937**	950	13.7	630	6.0	.039	.079
12.5	**.4921**	760	10.9	500	4.8	.047	.098
	.5000	740	10.7	500	4.8	.048	.100
Depth of Cut							

Note 1) The irregular helix flute end mill has a larger effect on controlling vibration when compared to standard end mills. However, if the rigidity of the machine or the workpiece material installation is poor, vibration or abnormal sound can occur.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.
Note 4) α is the inclination angle of the machined surface.

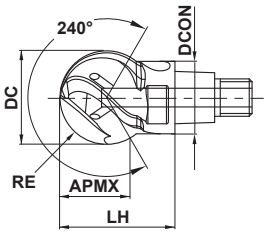


iMX-B4WH-S – Inch Sizes

NEW

Lollipop head, 4 flute, with coolant thru

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-Hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○			◎	◎	○	



Type1

RE≥.250"				
±.0006"				

- Optimal choice for machining undercut and complex shapes when using a 5-axis machine.
- A stable supply of coolant is maintained even when machining complex component geometries.

(inch)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4WH0500MS	.2500	.500	.375	.693	.382	4	●	1
IMX12B4WH0625MS	.3125	.625	.469	.799	.488	4	●	1
IMX16B4WH0750MS	.3750	.750	.563	.925	.606	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

iMX-B4WH-S

NEW

Lollipop head, 4 flute, with coolant thru

RE≥6				
±0.015				

- Optimal choice for machining undercut and complex shapes when using a 5-axis machine.
- A stable supply of coolant is maintained even when machining complex component geometries.

(inch)

Order Number	RE	DC	APMX	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10B4WH12008S	6	12	9	16.5	9.7	4	●	1
IMX12B4WH16008S	8	16	12	20.9	11.7	4	●	1
IMX16B4WH20008S	10	20	15	24.7	15.5	4	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)

RECOMMENDED CUTTING CONDITIONS

Internal Profile Milling, Undercut Machining (L/D=3)

(inch)

Workpiece Material				Mild Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel, Copper Alloys			Austenitic, Ferritic and Martensitic Stainless Steel, Precipitation Hardening Stainless Steel, Cobalt Chrome Alloys, Titanium Alloys			Heat Resistant Alloys		
DC		RE		Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae
(mm)	(inch)	(mm)	(inch)									
12	**.472**	**6**	**.236**	2700	38.2	.018	2100	24.8	.018	800	5.1	.014
	.500		**.250**	2500	35.4	.019	2000	23.6	.019	750	4.7	.015
	.625		**.313**	2000	31.5	.024	1600	20.1	.024	600	4.3	.019
16	**.630**	**8**	**.315**	2000	31.5	.024	1600	20.1	.024	600	4.3	.019
	.750		**.375**	1700	26.8	.028	1300	18.5	.028	500	3.9	.022
20	**.787**	**10**	**.394**	1600	25.2	.030	1300	18.5	.030	480	3.8	.024

Internal Profile Milling, Undercut Machining (L/D=5)

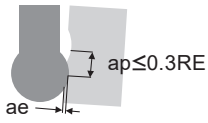
(inch)

Workpiece Material				Mild Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel, Copper Alloys			Austenitic, Ferritic and Martensitic Stainless Steel, Precipitation Hardening Stainless Steel, Cobalt Chrome Alloys, Titanium Alloys			Heat Resistant Alloys		
DC		RE		Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae
(mm)	(inch)	(mm)	(inch)									
12	**.472**	**6**	**.236**	1900	20.9	.012	1300	10.2	.012	530	2.5	.009
	.500		**.250**	1800	19.7	.013	1300	10.2	.013	500	2.4	.010
	.625		**.313**	1400	17.7	.016	1000	9.4	.016	400	2.5	.013
16	**.630**	**8**	**.315**	1400	17.7	.016	990	9.4	.016	400	2.5	.013
	.750		**.375**	1200	15.0	.019	840	9.4	.019	330	2.1	.015
20	**.787**	**10**	**.394**	1100	13.8	.020	800	8.7	.020	320	2.0	.016

Internal Profile Milling, Undercut Machining (L/D=7)

(inch)

Workpiece Material				Mild Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel, Copper Alloys			Austenitic, Ferritic and Martensitic Stainless Steel, Precipitation Hardening Stainless Steel, Cobalt Chrome Alloys, Titanium Alloys		
DC		RE		Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae	Revolution n (min-1)	Feed Rate vf (IPM)	Depth of cut ae
(mm)	(inch)	(mm)	(inch)						
12	**.472**	**6**	**.236**	1300	6.3	.006	800	3.1	.006
	.500		**.250**	1300	6.3	.006	750	3.5	.006
	.625		**.313**	1000	5.5	.008	600	3.3	.008
16	**.630**	**8**	**.315**	990	5.5	.008	600	2.8	.008
	.750		**.375**	840	5.1	.009	500	2.8	.009
20	**.787**	**10**	**.394**	800	5.1	.010	480	2.6	.010



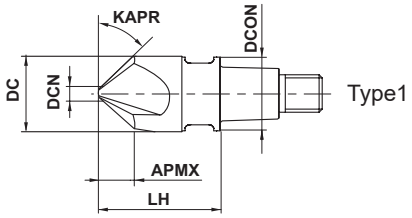
Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately, or set a lower depth of cut.
Note 2) If the depth of cut is smaller, the revolution and the feed rate can be increased.
Note 3) In case of L/D >5, it is recommended to use a taper neck type holder.
Note 4) For stainless steel, titanium alloys and heat resistant alloys, the use of water-soluble coolant is effective.

iMX-CH3L – Inch Sizes

Chamfer head, 3 flute

UWC γ 5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○	○		◎	◎		



DCN=.060"				
±0.0008"				

- Chamfered cutting head suitable for inner and outer circumference.
- Anti-vibration priority design.

(inch)

Order Number	DC	APMX	KAPR	DCN	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10CH3L0375A45	.375	.157	45°	.060	.630	.363	3	●	1
IMX12CH3L0500A45	.500	.220	45°	.060	.789	.488	3	●	1
IMX16CH3L0625A45	.625	.283	45°	.060	.945	.605	3	●	1
IMX20CH3L0750A45	.750	.345	45°	.060	1.181	.730	3	●	1

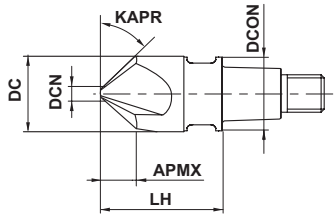
Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) This end mill is not capable of drilling.

iMX-CH3L

Chamfer head, 3 flute

UWC γ 5°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel,Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○	○		◎	◎		



Type1

	DCN=1.5				
	±0.020				

- Chamfered cutting head suitable for inner and outer circumference.
- Anti-vibration priority design.

(mm)

Order Number	DC	APMX	KAPR	DCN	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX10CH3L100A45	10	4.2	45°	1.5	16	9.7	3	●	1
IMX12CH3L120A45	12	5.2	45°	1.5	19	11.7	3	●	1
IMX16CH3L160A45	16	7.2	45°	1.5	24	15.5	3	●	1
IMX20CH3L200A45	20	9.2	45°	1.5	30	19.5	3	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) This end mill is not capable of drilling.

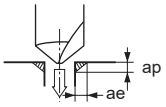
iMX-CH3L

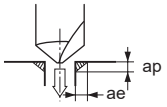
Chamfer head, 3 flute

RECOMMENDED CUTTING CONDITIONS

Chamfer Milling (Hole Circumference)

(inch)

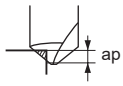
Workpiece Material		Carbon Steel, Alloy Steel, Gray Cast Iron				Alloy Tool Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel				Austenitic Stainless Steel, Titanium Alloy			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.3750	1300	6.2	.071	.071	1300	4.7	.071	.071	1000	3.6	.071	.071
10	**.3937**	1300	6.2	.071	.071	1300	4.7	.071	.071	970	3.5	.071	.071
12	**.4724**	1100	5.3	.085	.085	1100	4.0	.085	.085	810	2.9	.085	.085
	.5000	990	4.8	.085	.085	990	3.6	.085	.085	760	2.7	.085	.085
	.6250	790	3.8	.094	.094	790	2.8	.094	.094	610	2.2	.094	.094
16	**.6299**	790	3.8	.094	.094	790	2.8	.094	.094	610	2.2	.094	.094
	.7500	660	3.2	.102	.102	660	2.4	.102	.102	510	1.8	.102	.102
20	**.7874**	630	3.0	.102	.102	630	2.3	.102	.102	490	1.8	.102	.102
Depth of Cut													

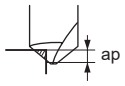
Workpiece Material		Hardenned Steel (40-55HRC)				Heat Resistant Alloy Inconel718			
DC (mm)	DC (inch)	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Width of Cut **ae**
	.3750	1000	2.4	.071	.071	1000	4.8	.071	.071
10	**.3937**	970	2.3	.071	.071	970	4.7	.071	.071
12	**.4724**	810	1.9	.085	.085	810	3.9	.085	.085
	.5000	760	1.8	.085	.085	760	3.6	.085	.085
	.6250	610	1.5	.094	.094	610	2.9	.094	.094
16	**.6299**	610	1.5	.094	.094	610	2.9	.094	.094
	.7500	510	1.2	.102	.102	510	2.4	.102	.102
20	**.7874**	490	1.2	.102	.102	490	2.4	.102	.102
Depth of Cut									

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately.
Note 2) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

■ Chamfer Milling (Shape Circumference)

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Gray Cast Iron			Alloy Tool Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel			Austenitic Stainless Steel, Titanium Alloy		
DC		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**
(mm)	(inch)									
	.3750	3400	20.4	.079	2300	12.4	.079	2000	9.6	.079
10	**.3937**	3200	19.2	.079	2200	11.9	.079	1900	9.1	.079
12	**.4724**	2700	16.2	.094	1900	10.3	.094	1600	7.7	.094
	.5000	2500	15.0	.094	1800	9.7	.094	1500	7.2	.094
	.6250	2000	12.0	.107	1400	7.6	.107	1200	5.8	.107
16	**.6299**	2000	12.0	.107	1400	7.6	.107	1200	5.8	.107
	.7500	1700	10.2	.126	1200	6.5	.126	990	4.8	.126
20	**.7874**	1600	9.6	.126	1100	5.9	.126	950	4.6	.126
Depth of Cut										

Workpiece Material		Hardenned Steel (40-55HRC)			Heat Resistant Alloy Inconel718		
DC		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**
(mm)	(inch)						
	.3750	1700	6.1	.079	1000	4.8	.079
10	**.3937**	1600	5.8	.079	970	4.7	.079
12	**.4724**	1300	4.7	.094	810	3.9	.094
	.5000	1300	4.7	.094	760	3.6	.094
	.6250	1000	3.6	.107	610	2.9	.107
16	**.6299**	1000	3.6	.107	610	2.9	.107
	.7500	840	3.0	.126	510	2.4	.126
20	**.7874**	800	2.9	.126	490	2.4	.126
Depth of Cut							

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately.
Note 2) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

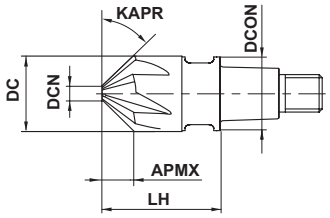
iMX-CH6V – Inch Sizes

Chamfer head, 6 flute

UWC

γ 1° 3°

Carbon Steel, Alloy Steel, Cast Iron (<30HRC)	Tool Steel, Pre-hardened Steel, Hardened Steel (≤45HRC)	Hardened Steel (≤55HRC)	Hardened Steel (>55HRC)	Austenitic Stainless Steel	Titanium Alloy, Heat Resistant Alloy	Copper Alloy	Aluminum Alloy
◎	○	○		◎	◎		



Type1

DCN=.120"				
±0.0008"				

- Suitable for outer circumference.
- Multiple cutting design for extended tool life.

(inch)

Order Number	DC	APMX	KAPR	DCN	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX12CH6V0500A45	.500	.190	45°	.120	.789	.488	6	●	1
IMX16CH6V0625A45	.625	.252	45°	.120	.945	.605	6	●	1
IMX20CH6V0750A45	.750	.315	45°	.120	1.181	.730	6	●	1

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) This end mill is not capable of drilling.

iMX-CH6V

Chamfer head, 6 flute

UWC

γ 1° 3°

DCN=3.0				
±0.020				

- Suitable for outer circumference.
- Multiple cutting design for extended tool life.

(mm)

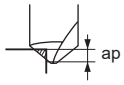
Order Number	DC	APMX	KAPR	DCN	LH	DCON	No. of Flutes	Grade EP7020	Type
IMX12CH6V120A45	12	4.5	45°	3	19	11.7	6	●	1
IMX16CH6V160A45	16	6.5	45°	3	24	15.5	6	●	1
IMX20CH6V200A45	20	8.5	45°	3	30	19.5	6	●	1

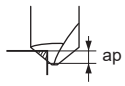
Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) This end mill is not capable of drilling.

RECOMMENDED CUTTING CONDITIONS

■ Chamfer Milling (Shape Circumference)

(inch)

Workpiece Material		Carbon Steel, Alloy Steel, Gray Cast Iron			Alloy Tool Steel, Carbon Steel, Alloy Steel, Pre-hardened Steel			Austenitic Stainless Steel, Titanium Alloy		
DC		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**
(mm)	(inch)									
12	**.4724**	2700	32.4	.094	1900	20.5	.094	1600	15.4	.094
	.5000	2500	30.0	.094	1800	19.4	.094	1500	14.4	.094
	.6250	2000	24.0	.107	1400	15.1	.107	1200	11.5	.107
16	**.6299**	2000	24.0	.107	1400	15.1	.107	1200	11.5	.107
	.7500	1700	20.4	.126	1200	13.0	.126	990	9.5	.126
20	**.7874**	1600	19.2	.126	1100	11.9	.126	950	9.1	.126
Depth of Cut										

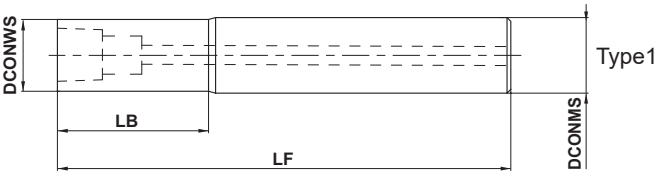
Workpiece Material		Hardenned Steel (40-55HRC)			Heat Resistant Alloy Inconel718		
DC		Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**	Revolution **n** (min-1)	Feed Rate **vf** (IPM)	Depth of Cut **ap**
(mm)	(inch)						
12	**.4724**	1300	9.4	.094	810	7.8	.094
	.5000	1300	9.4	.094	760	7.3	.094
	.6250	1000	7.2	.107	610	5.9	.107
16	**.6299**	1000	7.2	.107	610	5.9	.107
	.7500	840	6.0	.126	510	4.9	.126
20	**.7874**	800	5.8	.126	490	4.7	.126
Depth of Cut							

Note 1) Vibration may occur if the rigidity of machine or workpiece material is low.
In this case, please reduce the revolution and the feed rate proportionately.
Note 2) For stainless steel, titanium alloy and heat resistant alloy, the use of water-soluble coolant is effective.

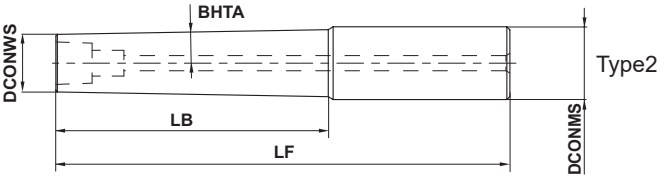
iMX – Inch Sizes

Carbide Holder

■ Undercut



■ Taper Neck Type



h6

DCONMS=.375	.500 ≤DCONMS ≤.625	.750 ≤DCONMS ≤1.000		
0 - .00035"	0 - .00043"	0 - .00051"		

■ Carbide Holder

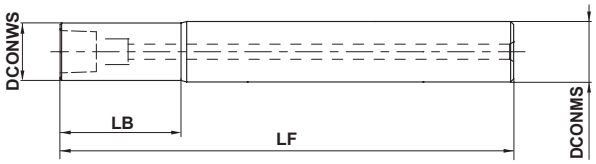
(inch)

Order Number	BHTA	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U0375N049L27C	—	.495	.363	2.755	.375	●	1	IMX10	IMX10-WR
IMX10-U0375N124L35C	—	1.245	.363	3.543	.375	●	1	IMX10	IMX10-WR
IMX10-U0375N199L43C	—	1.995	.363	4.330	.375	●	1	IMX10	IMX10-WR
IMX10-A0500N199L43C	1°	1.995	.363	4.330	.500	●	2	IMX10	IMX10-WR
IMX12-U0500N071L31C	—	.711	.488	3.149	.500	●	1	IMX12	IMX12-WR
IMX12-U0500N171L39C	—	1.711	.488	3.937	.500	●	1	IMX12	IMX12-WR
IMX12-U0500N271L51C	—	2.711	.488	5.118	.500	●	1	IMX12	IMX12-WR
IMX12-A0625N271L51C	1°	2.711	.488	5.118	.625	●	2	IMX12	IMX12-WR
IMX16-U0625N093L31C	—	.930	.605	3.149	.625	●	1	IMX16	IMX16-WR
IMX16-U0625N218L43C	—	2.180	.605	4.330	.625	●	1	IMX16	IMX16-WR
IMX16-U0625N343L59C	—	3.430	.605	5.905	.625	●	1	IMX16	IMX16-WR
IMX16-A0750N343L59C	1°	3.430	.605	5.905	.750	●	2	IMX16	IMX16-WR
IMX20-U0750N106L35C	—	1.069	.730	3.543	.750	●	1	IMX20	IMX20-WR
IMX20-U0750N256L51C	—	2.569	.730	5.118	.750	●	1	IMX20	IMX20-WR
IMX20-U0750N406L70C	—	4.069	.730	7.086	.750	●	1	IMX20	IMX20-WR
IMX20-A1000N406L70C	1°	4.069	.730	7.086	1.000	●	2	IMX20	IMX20-WR
IMX25-U1000N150L43C	—	1.500	.980	4.330	1.000	●	1	IMX25	IMX25-WR
IMX25-U1000N350L62C	—	3.500	.980	6.299	1.000	●	1	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) Inch head should be mounted in inch holder.
* See page J082 and J083 regarding how to install the head.

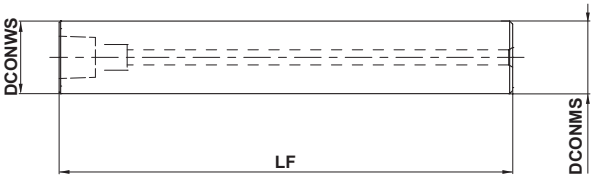
iMX
Carbide Holder

■Undercut



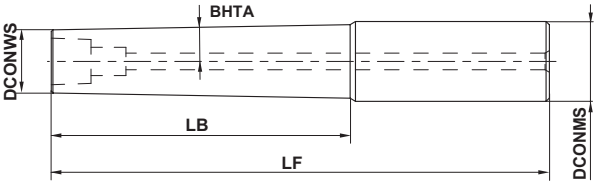
Type1

■Straight



Type2

■Taper Neck Type



Type3

h6

DCONMS=10	12 ≤DCONMS ≤16	20 ≤DCONMS ≤25		
0 - 0.009	0 - 0.011	0 - 0.013		

■Carbide Holder

(mm)

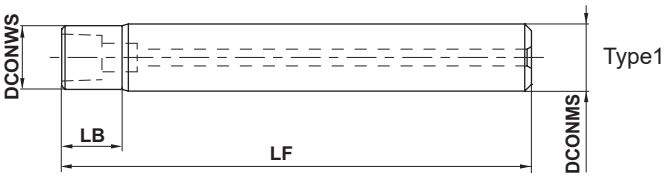
Order Number	BHTA	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U10N014L070C	—	14	9.7	70	10	●	1	IMX10	IMX10-WR
IMX10-S10L090C	—	—	10	90	10	●	2	IMX10	IMX10-WR
IMX10-U10N034L090C	—	34	9.7	90	10	●	1	IMX10	IMX10-WR
IMX10-S10L110C	—	—	10	110	10	●	2	IMX10	IMX10-WR
IMX10-U10N054L110C	—	54	9.7	110	10	●	1	IMX10	IMX10-WR
IMX10-A12N054L110C	1°	54	9.7	110	12	●	3	IMX10	IMX10-WR
IMX12-U12N017L080C	—	17	11.7	80	12	●	1	IMX12	IMX12-WR
IMX12-S12L100C	—	—	12	100	12	●	2	IMX12	IMX12-WR
IMX12-U12N041L100C	—	41	11.7	100	12	●	1	IMX12	IMX12-WR
IMX12-S12L130C	—	—	12	130	12	●	2	IMX12	IMX12-WR
IMX12-U12N065L130C	—	65	11.7	130	12	●	1	IMX12	IMX12-WR
IMX12-A16N065L130C	1°	65	11.7	130	16	●	3	IMX12	IMX12-WR
IMX16-U16N024L080C	—	24	15.5	80	16	●	1	IMX16	IMX16-WR
IMX16-S16L110C	—	—	16	110	16	●	2	IMX16	IMX16-WR
IMX16-U16N056L110C	—	56	15.5	110	16	●	1	IMX16	IMX16-WR
IMX16-S16L150C	—	—	16	150	16	●	2	IMX16	IMX16-WR
IMX16-U16N088L150C	—	88	15.5	150	16	●	1	IMX16	IMX16-WR
IMX16-A20N088L150C	1°	88	15.5	150	20	●	3	IMX16	IMX16-WR
IMX20-U20N030L090C	—	30	19.5	90	20	●	1	IMX20	IMX20-WR
IMX20-S20L130C	—	—	20	130	20	●	2	IMX20	IMX20-WR
IMX20-U20N070L130C	—	70	19.5	130	20	●	1	IMX20	IMX20-WR
IMX20-S20L180C	—	—	20	180	20	●	2	IMX20	IMX20-WR
IMX20-U20N110L180C	—	110	19.5	180	20	●	1	IMX20	IMX20-WR
IMX20-A25N110L180C	1°	110	19.5	180	25	●	3	IMX20	IMX20-WR
IMX25-U25N037L110C	—	37.5	24.5	110	25	●	1	IMX25	IMX25-WR
IMX25-S25L160C	—	—	25	160	25	●	2	IMX25	IMX25-WR
IMX25-U25N087L160C	—	87.5	24.5	160	25	●	1	IMX25	IMX25-WR
IMX25-S25L210C	—	—	25	210	25	●	2	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) Metric head should be mounted in metric holder.

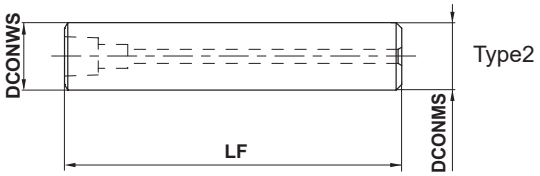
iMX – Inch Sizes

Steel Holder

■ Undercut



■ Straight Oversize



h6

DCONMS=.375"	.500" ≤DCONMS ≤.625"	.750"≤DCONMS≤1.000"	DCONMS=1.250"	
0 - 0.00035"	0 - 0.00043"	0 - 0.00051"	0 - 0.00063"	

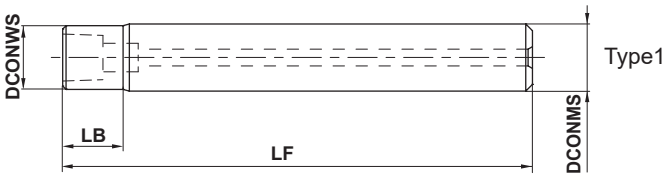
■ Steel Holder

(inch)

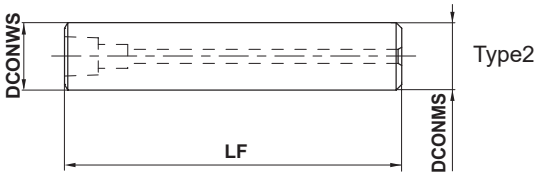
Order Number	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U0375N030L27S	.308	.363	2.755	.375	●	1	IMX10	IMX10-WR
IMX10-G0500L23S	—	.500	2.362	.500	●	2	IMX10	IMX10-WR
IMX12-U0500N046L31S	.461	.488	3.149	.500	●	1	IMX12	IMX12-WR
IMX12-G0625L27S	—	.625	2.755	.625	●	2	IMX12	IMX12-WR
IMX16-U0625N061L31S	.618	.605	3.149	.625	●	1	IMX16	IMX16-WR
IMX16-G0750L27S	—	.750	2.755	.750	●	2	IMX16	IMX16-WR
IMX20-U0750N069L35S	.694	.730	3.543	.750	●	1	IMX20	IMX20-WR
IMX20-G1000L31S	—	1.000	3.149	1.000	●	2	IMX20	IMX20-WR
IMX25-U1000N100L43S	1.000	.980	4.330	1.000	●	1	IMX25	IMX25-WR
IMX25-G1250L39S	—	1.250	3.937	1.250	●	2	IMX25	IMX25-WR

Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) Inch head should be mounted in inch holder.
∗ See page J082 and J083 regarding how to install the head.

■Undercut



■Straight Oversize



h6

DCONMS=10	12 ≤DCONMS ≤16	20 ≤DCONMS ≤25	DCONMS=32	
0 - 0.009	0 - 0.011	0 - 0.013	0 - 0.160	

■Steel Holder

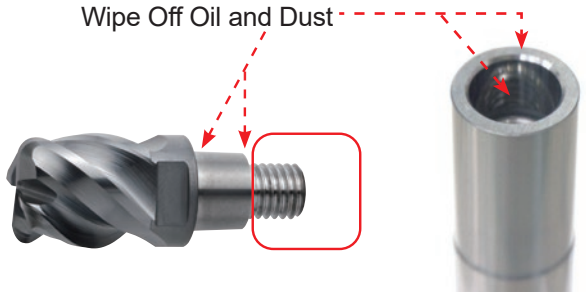
(mm)

Order Number	LB	DCONWS	LF	DCONMS	Stock	Type	Suitable Head	Wrench
IMX10-U10N009L070S	9	9.7	70	10	●	1	IMX10	IMX10-WR
IMX10-G12L060S	—	12	60	12	●	2	IMX10	IMX10-WR
IMX12-U12N011L080S	11	11.7	80	12	●	1	IMX12	IMX12-WR
IMX12-G16L070S	—	16	70	16	●	2	IMX12	IMX12-WR
IMX16-U16N016L080S	16	15.5	80	16	●	1	IMX16	IMX16-WR
IMX16-G20L070S	—	20	70	20	●	2	IMX16	IMX16-WR
IMX20-U20N020L090S	20	19.5	90	20	●	1	IMX20	IMX20-WR
IMX20-G25L080S	—	25	80	25	●	2	IMX20	IMX20-WR
IMX25-U25N025L110S	25	24.5	110	25	●	1	IMX25	IMX25-WR
IMX25-G32L100S	—	32	100	32	●	2	IMX25	IMX25-WR

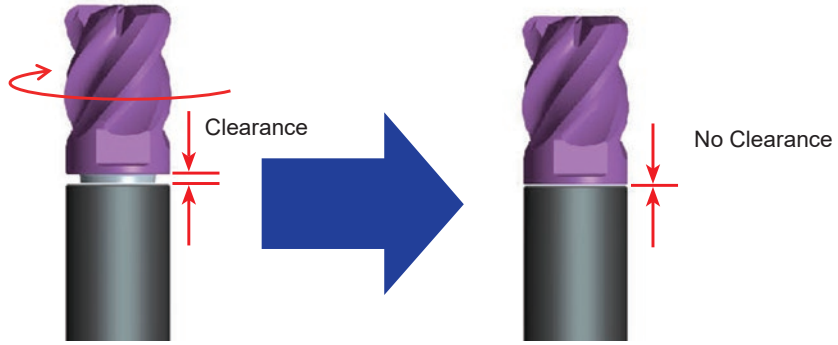
Note 1) The fastening size of the holder and head should be the same. (refer to J002)
Note 2) Metric head should be mounted in metric holder.
∗ See page J082 and J083 regarding how to install the head.

How to Install the Head

1 Using a clean cloth, wipe away oil and dust from the taper and end surfaces of the head and holder.

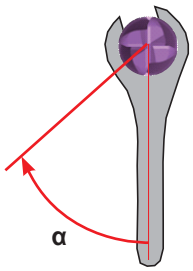


2 Be careful to avoid the possibility of cutting hands when fastening with bare hands directly near the blade tip.
Securely fasten the head and holder end surfaces using the enclosed wrench to close off any remaining gap.



3 Refer to the table at below regarding angles for recommended torque when necessary.
For stricter usage, refer to the table below for torque wrench fastening.

Fastening Size	Reference Tightening Angle α	Recommended Clamping Torque (lbf-in)
IMX10	50°	88
IMX12	50°	132
IMX16	50°	265
IMX20	40°	440
IMX25	35°	660

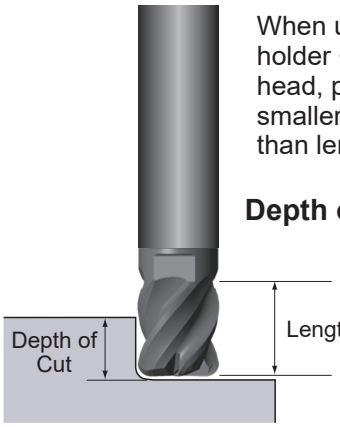


Note 1) Use the enclosed wrench only.
(Typical wrenches differ in thickness.)

How to Select iMX Holders

- When using straight holder + standard head, interference will occur in cases where the depth of cut is larger than the length of cut of the head.
- When using straight holder + oversize head, larger depths of cut are possible because the diameter of the head is larger than the holder.

Straight + Standard Head

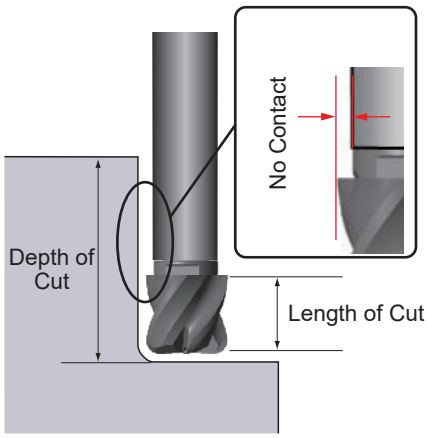


When using straight holder + standard head, please use at smaller depth of cut than length of cut.

Depth of Cut < Length of Cut

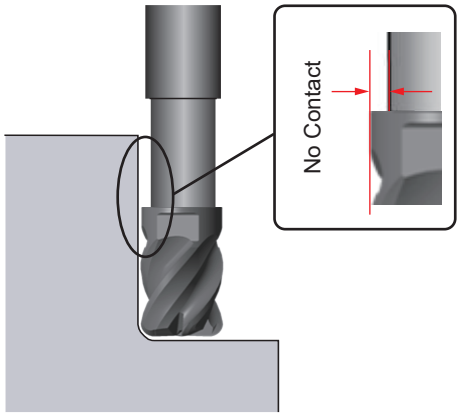
Less than DC x 3 overhang is recommended when depth of cut < length of cut.

Straight + Oversize Head

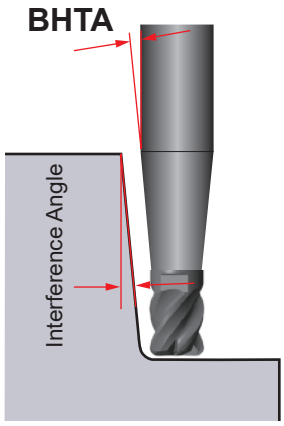


- Undercut type with relieved neck is suitable for vertical wall machining.
- The large diameter of the taper neck holder provides stability in long overhang applications.
- Undercut and taper neck types are now also available. (Please refer to diameter DC of each type for minimum diameter.)

Undercut + Standard Head



Taper Neck + Standard Head



HOW TO READ THE STANDARD OF INDEXABLE MILLING

●How this section page is organized

①Organized according to the face milling cutting mode.
(Refer to the index on the next page.)

SCOPE OF AVAILABLE WORKPIECE MATERIAL
provides a graph depicting the scope of the available workpiece material for machining.

CORNER ANGLE ICON

TYPE/ NAME OF PRODUCT

APPLICATION ICON
represents available machining applications, such as finishing and roughing.

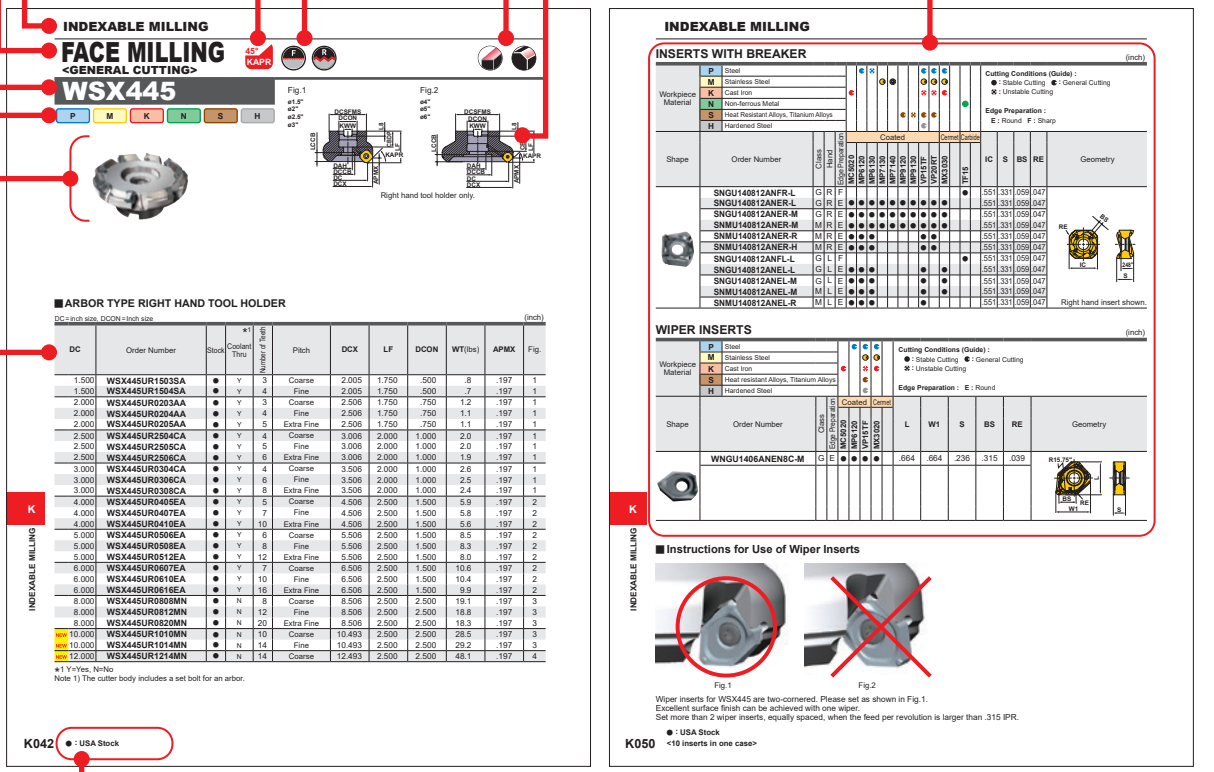
APPLICATION

CUTTING MODE ICON
represents available cutting modes, such as face milling and shoulder milling.

STANDARDS FOR APPLICABLE INSERTS
indicates stock status, dimensions, etc. for applicable inserts.

PRODUCT SECTION

GEOMETRY



LEGEND FOR STOCK STATUS MARK
is shown on the left hand page of each double-page spread.

PRODUCT STANDARDS
indicates tool types, order numbers, stock status (per right/left hand), dimensions, etc.

PHOTO OF PRODUCT

●To Order : For title product, please specify order number and hand of tool (right/left).
For insert, please specify insert number and grade.

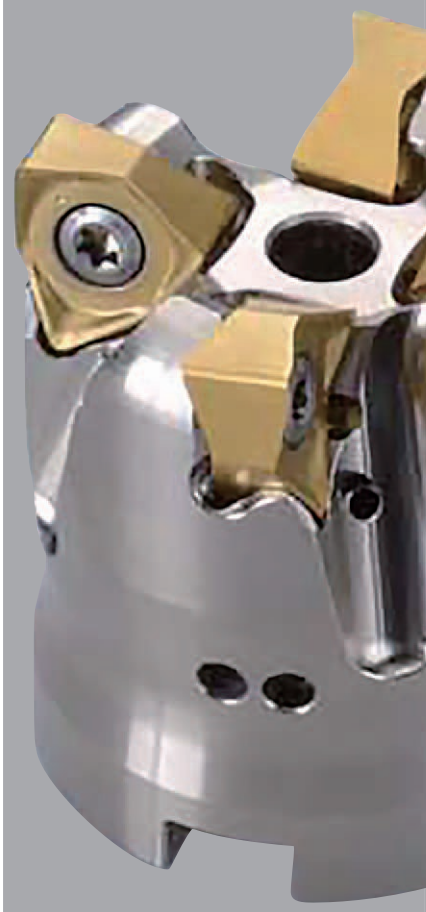
MILLING TOOLS

INDEXABLE MILLING

SYMBOL DESCRIPTIONS ····· K002
GUIDE FOR ISO13399 SYMBOLS····· K003
CLASSIFICATION····· K004
SELECTION CHART ····· K016
IDENTIFICATION OF CUTTER INSERTS ··· K018
GRADES FOR MILLING····· K020
MILLING APPLICATION RANGE····· K021
COATED CARBIDE (CVD&PVD) ····· K024
CERMET ····· K026
CEMENTED CARBIDE····· K027
CBN (SINTERED CBN) ····· K028
PCD (SINTERED DIAMOND) ····· K029
CLASSIFICATION OF CUTTER INSERTS··· K030
LIST OF CUTTING EDGE DIAMETER TOLERANCES··· K040
MAXIMUM ALLOWABLE REVOLUTION FOR CUTTER··· K041

STANDARD OF MILLING

FACE MILLING
WSX445 ····· K042
ASX445 ····· K056
AHX440S····· K064
AHX475S····· K070
AHX640S····· K074
AHX640W····· K086
AOX445····· K095
NEW WSF406W ····· K103
FACE MILLING (HIGH FEED)
FMAX ····· K096
SHOULDER MILLING
VOX400 ····· K106
NEW WWX200 ····· K112
NEW WWX400 ····· K120
ASX400 ····· K138
SIDE CUTTER
VAS400 ····· K144
VOS400 ····· K148
VAS500 ····· K149
ASX400 ····· K152
MULTI FUNCTIONAL MILLING
APX3000 ····· K154
APX4000 ····· K168
VPX200 ····· K182
VPX300 ····· K193
AXD4000 ····· K226
NEW AXD4000A ····· K240
AXD7000 ····· K246
BXD4000 ····· K258
AQX····· K276
AJX····· K286
NEW WJX09····· K308
WJX14····· K318
ARP ····· K328
ARX ····· K340
BRP ····· K344
DEEP SHOULDER MILLING
APX3000 LONG CUTTING EDGE TYPE··· K164
APX4000 LONG CUTTING EDGE TYPE··· K178
NEW VPX200 LONG CUTTING EDGE TYPE··· K188
NEW VPX300 LONG CUTTING EDGE TYPE··· K199
LER ····· K274
NEW ASPX····· K262
SPX ····· K268
BALL NOSE AND RADIUS END MILLING
SRF/SUF ····· K350
SRM2····· K362
SRM2φ40,φ50 ····· K374
CHAMFER MILLING
CFSP····· K348
VERTICAL FEED MILLING
PMC····· K376
PMF ····· K378
PMR····· K379
BORING CUTTER
BMR ····· K380
ARBOR STANDARDS FOR SCREW-IN HOLDERS ····· K382



*Arranged by Alphabetical order

K064 AHX440S
K070 AHX475S
K074 AHX640S
K086 AHX640W
K286 AJX
K095 AOX445
K154 APX3000
K164 APX3000 LONG CUTTING EDGE TYPE
K168 APX4000
K178 APX4000 LONG CUTTING EDGE TYPE
K276 AQX
K328 ARP
K340 ARX
K262 ASPX
K138 ASX400
K152 ASX400(SIDE CUTTER)
K056 ASX445
K226 AXD4000
K240 AXD4000A
K246 AXD7000
K380 BMR
K344 BRP
K258 BXD4000
K348 CFSP
K096 FMAX
K274 LER
K376 PMC
K378 PMF
K379 PMR
K382 SCREW-IN HOLDERS
K268 SPX
K350 SRF/SUF
K362 SRM2
K374 SRM2φ40,φ50
K144 VAS400
K149 VAS500
K148 VOS400
K106 VOX400
K182 VPX200
K188 VPX200 LONG CUTTING EDGE TYPE
K193 VPX300
K199 VPX300 LONG CUTTING EDGE TYPE
K308 WJX09
K318 WJX14
K103 WSF406W
K042 WSX445
K112 WWX200
K120 WWX400

SYMBOL DESCRIPTIONS

KAPR (Cutting Edge Angle) List

15° KAPR	15°
35° KAPR	35°
45° KAPR	45°
50° KAPR	50°
84° KAPR	84°
90° KAPR	90°
R KAPR	R

● : USA Stock
★ : Stocked in Japan
□ : Made to Order

Application

	Face Milling
	Chamfer Milling
	Shoulder Milling with R
	Face Milling Near the Wall
	Shoulder Milling
	Wall Milling
	Slot Milling
	Step Copy Milling
	Pocket Milling
	Slot Milling with R
	Curved Copy Milling
	Helical Milling

Accuracy

- **Finish Cutting**
- **Medium Cutting**
- **Rough Cutting**

Workpiece Material Range

1st Recommendation

P M K N S H

2nd Recommendation

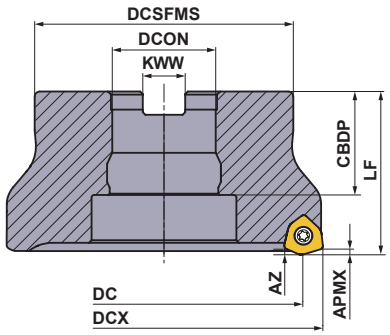
P M K N S H

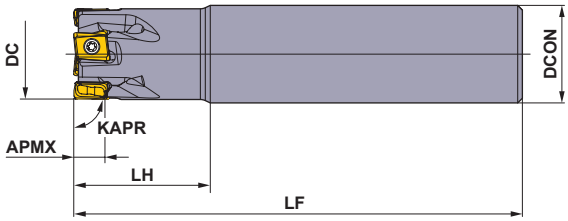
GUIDE FOR ISO13399 SYMBOLS

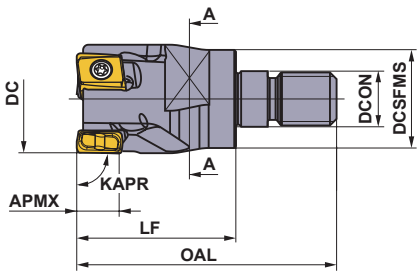
Symbol	Content
APMX	Depth of cut maximum
AZ	Plunge depth maximum
BD	Body diameter
BDX	Body diameter maximum
BS	Wiper edge length
CBDP	Connection bore depth
CRKS	Connection retention knob thread size
CW	Cutting width
DC	Cutting diameter
DCB	Connection bore diameter
DCON	Connection diameter
DCSFMS	Contact surface diameter machine side

Symbol	Content
DCX	Cutting diameter maximum
H	Shank height
KWW	Keyway length
LBX	Body length maximum
LE	Cutting edge effective length
LF	Functional length
LH	Head length
LU	Usable length
OAL	Overall length
RE	Corner radius
RMPX	Ramping angle maximum
WT	Weight of item

*There are exceptions other than those listed above. For more details, please refer to the technical data (page N002).







CLASSIFICATION (ARBOR TYPE)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
General Cutting **WSX445** 45° KAPR	.197"	●Double sided Z Geometry. ●Smooth chip discharge.	Ø1.500" | Ø12.000"	P M K N S H	K042
General Cutting **ASX445** 45° KAPR	.236"	●Precision molded 20° positive insert. ●A wide range of chip breakers. ●Screw-on type. ●High rigidity due to employment of a carbide shim.	Ø2.500" | Ø10.000"	P M K N S H	K056
General Cutting **AHX440S** 50° KAPR	.118"	●Heptagonal double sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining.	Ø1.500" | Ø6.000"	P M K H	K062 K064
High Feed Cutting **AHX475S** 15° KAPR	.063"	●For General Cutting. ●Heptagonal double-sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining.	Ø2.000" | Ø6.000"	P K H	K062 K070
General Cutting **AHX640S** 50° KAPR	.236"	●Heptagonal double sided insert. ●Economical 14 cutting edge inserts. ●Multi insert design for high feed machining.	Ø2.500" | Ø8.000"	P M K S H	K062 K074
High Feed Cutting for Cast Iron **AHX640W** 50° KAPR	.236"	●Heptagonal double-sided insert. ●Economical 14 corner use. ●Fine pitch design allows high feed milling.	Ø3.000" | Ø12.000"	K	K086
High Efficiency Cutting for Cast Iron **WSF406W** NEW 84° KAPR	.276"	●Uniquely designed double-sided insert. ●Adjustable cutting edge run-out system. ●Improved surface finish. ●Suppression of edge chipping.	Ø80 mm | Ø250 mm	K	K103
High Efficiency Cutting for Cast Iron **AOX445** 45° KAPR	8 mm	●Octagonal double-sided solid CBN insert. ●Economical 16 corner use. (when depth of cut is 3mm or less) ●High efficiency machining from roughing to finishing. ●Easy operation and cleaning.	Ø63 mm | Ø160 mm	K	K095
High-efficiency Finishing of Aluminum Alloy **FMAX** 90° KAPR	≤.118"	●For high-efficiency finishing of aluminum alloys. ●Feed Maximum (FMAX) milling cutter for ultra efficient and accurate finishing.	Ø40 mm | Ø160 mm Ø3.000" | Ø5.000"	K N	K096

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
Multi Functional Milling **WJX09** NEW	.047"	●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special designed insert with 6 cutting edges. ●Through coolant holes.	1.500" | 2.5000"	P M K S H	K308
Multi Functional Milling **WJX14**	.079"	●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special designed insert with 6 cutting edges. ●Through coolant holes.	Ø2.000" | Ø6.000"	P M K S H	K318
Multi Functional Milling **AJX**	.079"	●15° positive insert. ●Air / coolant through. ●High rigidity due to double clamp structure. ●Suitable for high feed cutting. ●Special designed insert with the use of 3 cutting edges.	Ø2.000" | Ø6.299"	P M K S H	K288
Multi Functional Milling of Difficult-to-cut Materials **ARP** R KAPR	.236"	●Air / coolant through. ●Round Insert Cutter for Difficult-to-cut Materials. ●High run-out accuracy when indexing inserts. ●Solid clamping system. ●Standardized stock of extra fine pitch.	Ø1.500" | Ø4.000"	M S	K328
Multi Functional Milling **BRP** R KAPR	.302"	●11° positive insert. ●Round shape insert gives strong cutting edge. ●A wide variety of lengths available. ●Suitable for machining of die and mold.	Ø1.500" | Ø4.000"	P M K S H	K345
For General Cutting **WWX200** NEW 90° KAPR	.197"	●High-stability clamping and high-quality machining. ●The optimized “X-type” insert meets the demand for greater strength. ●Economical double-sided 6 corners.	Ø1.500" | Ø6.000"	P M K S H	K112
For General Cutting **WWX400** NEW 90° KAPR	.323"	●High-stability clamping and high-quality machining. ●The optimized “X-type” insert meets the demand for greater strength. ●Economical double-sided 6 corners.	Ø2.000" | Ø10.000"	P M K N S H	K120
For Cast Iron **VOX400** 90° KAPR	.394"	●Vertical inserts with high strength cutting edge. ●Economical 8 cutting edge inserts. ●Screw-on type.	Ø2.000" | Ø10.000"	K	K106
For General Cutting **ASX400** 90° KAPR	.394"	●Economical due to the use of 4 cutting edges. ●Low resistance due to the 3D design of the curved cutting edge. ●Curved cutting edge and high rigidity holder.	Ø2.000" | Ø10.000"	P M K N S H	K138

CLASSIFICATION (ARBOR TYPE)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
Multi Functional Cutting **APX3000** 90° KAPR	.394"	●Air / coolant through. ●Low resistance insert and high rigidity body. ●Ideal chip control. ●High wall accuracy can be produced by using this cutter and unique insert geometry.	Ø1.500" | Ø3.000"	P M K N S H	K156
Multi Functional Cutting **APX4000** 90° KAPR	.591"	●Air / coolant through. ●Low resistance insert and high rigidity body. ●Ideal chip control. ●High wall accuracy can be produced by using this cutter and unique insert geometry.	Ø2.000" | Ø4.000"	P M K S H	K169
Multi Functional Milling **VPX200** 90° KAPR	.315"	●Special designed insert with 4 cutting edges. ●High precision, high quality insert cutting edge with finishing blade. ●Through coolant holes.	Ø1.250" | Ø2.500"	P M K N S H	K184
Multi Functional Milling **VPX300** 90° KAPR	.433"	●Special designed insert with 4 cutting edges. ●High precision, high quality insert cutting edge with finishing blade. ●Through coolant holes.	Ø1.250" | Ø3.000"	P M K N S H	K195
For Aluminum Alloy and Difficult-to-cut Material Cutting **AXD4000** 90° KAPR	.610"	●Air / coolant through. ●Low resistance inserts. ●High balance quality. ●Excellent wall accuracy. ●Multi functional milling.	Ø1.500" | Ø5.000"	P N S	K227
For Aluminum Alloy Material Cutting **AXD4000A** NEW 90° KAPR	.610"	●Air / coolant through. ●Low resistance insert. ●High balance quality. ●Excellent wall accuracy. ●Multi functional milling. ●For ultra-high-speed machining.	Ø2.000"	N	K240
For Aluminum Alloy and Difficult-to-cut Material Cutting **AXD7000** 90° KAPR	.827"	●Air / coolant through. ●Low resistance inserts. ●High balance quality. ●Excellent wall accuracy. ●Multi functional milling.	Ø2.000" | Ø5.000"	P N S	K246
For Aluminum Alloy and Difficult-to-cut Material Cutting **BXD4000** 90° KAPR	.591"	●Air / coolant through. ●Low resistance inserts & high rigidity body. ●The Anti Fly Insert mechanism guarantees secure high-revolution milling.	Ø1.500" | Ø4.000"	P M N S H	K259

CLASSIFICATION (SIDE CUTTER)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
VAS400 Side Cutter 90° KAPR	.480"	●Insert with 4 cutting edges secure clamping. ●Excellent sharpness with low cutting resistance insert. ●Holders can load all corner R. ∗Cutter bodies are only available through special orders.	Ø4.000" | Ø8.000"	P K	K144
VAS500 Side Cutter 90° KAPR	.638"	●Insert with 4 cutting edges secure clamping. ●Excellent sharpness with low cutting resistance insert. ●Holders can load all corner R. ∗Cutter bodies are only available through special orders.	Ø100 mm | Ø200 mm	P K	K149
VOS400 Side Cutter 90° KAPR	.394"	●For cast iron. ●Cutter body with high-rigidity design. ●Innovative vertical insert. ●Economical 8 cutting edge insert. ∗Cutter bodies are only available through special orders.	Ø80 mm | Ø160 mm	K	K148
ASX400 Side Cutter 90° KAPR	.394"	●High precision non-grinding insert. ●Economical 4 cutting edge insert. ●Excellent wall surface precision with curved cutting edges and high precision body. ∗Cutter bodies are only available through special orders.	Ø80 mm | Ø160 mm	P M K	K152

CLASSIFICATION (BORE BORING TOOLS)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
BMR 35° KAPR	—	●Double positive breaker. ●12-corner type with right hand. ●Body with peripheral cutting edge run-out regulator. ∗Cutter bodies are only available through special orders.	—	K	**K380**

CLASSIFICATION (SHANK TYPE)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
WSX445 45° KAPR	.197"	● Double sided Z Geometry. ● Smooth chip discharge. ● End mill style.	Ø1.500" | Ø3.000"	P M K N S H	K048
ASX445 45° KAPR	6 mm	● Precision molded 20° positive insert. ● A wide range of chip breakers. ● Screw-on type. ● High rigidity due to employment of a carbide shim.	Ø50 mm Ø63 mm Ø80 mm	P M K N S H	K057
AOX445 45° KAPR	8 mm	● Octagonal double-sided solid CBN insert. ● Economical 16 corner use. (when depth of cut is 3mm or less) ● High efficiency machining from roughing to finishing. ● Easy operation and cleaning.	Ø50 mm Ø63 mm	K	K095
AJX	.079"	● 13°, 15° positive insert. ● Air / coolant through. ● High rigidity due to double clamp structure. ● Suitable for high feed cutting. ● Special designed insert with the use of 3 cutting edges.	Ø.625" | Ø2.000"	P M K S H	K286
WWX200 NEW 90° KAPR	.197"	● High-stability clamping and high-quality machining. ● The optimized “X-type” insert meets the demand for greater strength. ● Economical double-sided 6 corners.	Ø1.000" | Ø1.500"	P M K S H	K114
WWX400 NEW 90° KAPR	.323"	● High-stability clamping and high-quality machining. ● The optimized “X-type” insert meets the demand for greater strength. ● Economical double-sided 6 corners.	Ø2.000" | Ø3.000"	P M K N S H	K123
ASX400 90° KAPR	.394"	● Economical due to the use of 4 cutting edges. ● Low resistance due to the 3D design of the curved cutting edge. ● Curved cutting edge and high rigidity holder. ● Max. depth of cut .394".	Ø1.250" | Ø2.000"	P M K N S H	K140
VPX200 90° KAPR	.315"	● Special designed insert with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● Through coolant holes.	Ø.625" | Ø1.500"	P M K N S H	K182
VPX200 Long Cutting Edge NEW 90° KAPR	1.654"	● Special designed insert with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● Through coolant holes.	Ø.875" | Ø1.500"	P M K N S	K188

CLASSIFICATION (SHANK TYPE)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
VPX200 Shell Type NEW 90° KAPR	1.654"	●Special designed insert with 4 cutting edges. ●High precision, high quality insert cutting edge with finishing blade. ●Through coolant holes.	Ø1.250" | Ø2.000"	P M K N S	K189
VPX300 90° KAPR	.433"	●Special designed insert with 4 cutting edges. ●High precision, high quality insert cutting edge with finishing blade. ●Through coolant holes.	Ø1.000" | Ø1.500"	P M K N S H	K193
VPX300 Long Cutting Edge NEW 90° KAPR	1.654"	●Special designed insert with 4 cutting edges. ●High precision, high quality insert cutting edge with finishing blade. ●Through coolant holes.	Ø1.500"	P M K N S	K199
VPX300 Shell Type NEW 90° KAPR	2.874"	●Special designed insert with 4 cutting edges. ●High precision, high quality insert cutting edge with finishing blade. ●Through coolant holes.	Ø1.500" | Ø3.000"	P M K N S	K200
APX3000 90° KAPR	.394"	● Air / coolant through. ● Low resistance insert and high rigidity body. ● Ideal chip control. ● High wall accuracy can be produced by using this cutter and unique insert geometry.	Ø.500" | Ø1.500"	P M K N S H	K154
APX3000 Long Cutting Edge 90° KAPR	2.165"	●High accuracy, high quality vertical wall. ●Low cutting force insert.	Ø.750" | Ø1.500"	P M K N S	K164
APX3000 Shell Type 90° KAPR	1.811"	●High accuracy, high quality vertical wall. ●Low cutting force insert. ●Through coolant holes.	Ø2.000"	P M K N S	K164
APX4000 90° KAPR	.591"	● Air / coolant through. ● Low resistance insert and high rigidity body. ● Ideal chip control. ● High wall accuracy can be produced by using this cutter and unique insert geometry.	Ø.750" | Ø1.500"	P M K S H	K168
APX4000 Long Cutting Edge 90° KAPR	3.300"	●High accuracy, high quality vertical wall. ●Low cutting force insert. ●Through air & coolant holes.	Ø1.500" | Ø2.000"	P M K S	K178

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
APX4000 **Shell Type** 90° KAPR	2.200"	●High accuracy, high quality vertical wall. ●Low cutting force insert. ●Through coolant holes.	Ø2.000" Ø2.500"	P M K S	K178
AXD4000 90° KAPR	.610"	● Air / coolant through. ● Low resistance insert. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling.	Ø1.000" | Ø1.500"	P N S	K226
AXD7000 90° KAPR	.827"	● Air / coolant through. ● Low resistance insert. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling.	Ø1.250" Ø1.500"	P N S	K246
BXD4000 90° KAPR	.591"	● Air / coolant through. ● Low resistance insert & high rigidity body. ● The Anti Fly Insert mechanism guarantees secure high-revolution milling.	Ø1.000" | Ø1.500"	P M N S H	K258
AQX 90° KAPR	1.500"	● Air / coolant through. ● The center bottom cutting edge enables drilling and end milling without prepared hole.	Ø.625" | Ø1.500"	P M K N S H	K276
ARP R KAPR	.236"	● Air / coolant through. ● Round Insert Cutter for Difficult-to-cut Material. ● High run-out accuracy when indexing inserts. ● Solid clamping system.	Ø1.000" | Ø2.000"	M S	K329
ARX R KAPR	.138"	● Precision M-class 15°positive insert. ● Effective for various machining applications. ● Air / coolant through.	Ø10 mm | Ø25 mm	P M K H	K340
WJX09 NEW 	.047"	●Multi functional milling. ●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special designed insert with 6 cutting edges. ●Through coolant holes.	1.000" | 1.500"	P M K S H	K309
WJX14 	.079"	●Multi functional milling. ●Negative inserts. ●Stable clamp with dovetail structure. ●Suitable for high feed machining. ●Special designed insert with 6 cutting edges. ●Through coolant holes.	Ø50 mm	P M K S H	K322

CLASSIFICATION (SHANK TYPE)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
BRP R KAPR	.302"	● 11° positive insert. ● Round shape insert gives strong cutting edge. ● A wide variety of lengths available. ● Suitable for machining of die and mold. ● Max.depth of cut .146"–.302".	Ø.500" | Ø2.500"	P M K S H	K344
LER 90° KAPR	2.500"	● Different helical flute angles prevents chattering. ● Suitable for heavy cutting due to holder rigidity.	Ø1.000" | Ø2.000"	P M K	K274
SPX 90° KAPR	6.200"	● The wavy cutting edge helps to reduce cutting resistance. ● Suitable for heavy machining due to holder rigidity.	Ø1.969" Ø2.000"	P M K S	K268
SPX Shell Type 90° KAPR	2.280"	● The wavy cutting edge helps to reduce cutting resistance. ● Suitable for heavy machining due to holder rigidity.	Ø2.500" Ø3.000"	P M K S	K269
ASPX Shell Type NEW 90° KAPR	2.953"	● Highly reliable clamping mechanism. ● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity.	Ø2.000" | Ø3.000"	S	K262
ASPX NEW 90° KAPR	5.000"	● Highly reliable clamping mechanism. ● Low cutting resistance due to the use of wavy inserts. ● Suitable for heavy cutting due to holder rigidity.	Ø3.000"	S	K263
SRF R KAPR	.669"	●S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills. ●Highly accurate corner radius tolerance allows for high precision finishing. ●Carbide shank type available.	Ø.375" | Ø1.260"	P K N H	K350
SUF R KAPR	.205"	●Highly accurate corner radius tolerance allows for high precision finishing. ●Seamless gash.	Ø.394" | Ø1.250"	P M K H	K350
SRM2 R KAPR	1.732"	● Air / coolant through. ● Suitable for roughing to semi-finishing of small and medium molds. ● High rigidity body design. ● Low resistance chip breaker. ● Key type clamp. ● Shrink fit ready.	Ø.625" | Ø1.250"	P M K S H	K362

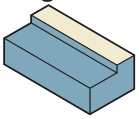
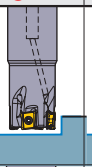
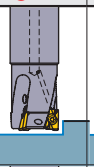
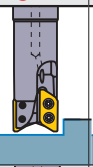
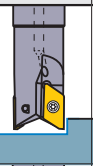
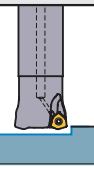
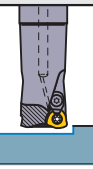
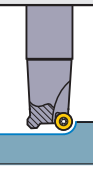
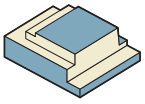
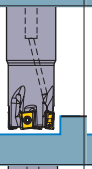
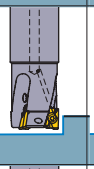
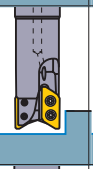
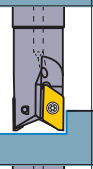
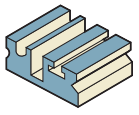
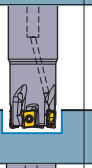
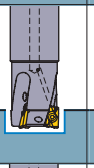
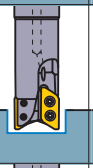
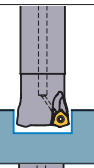
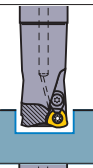
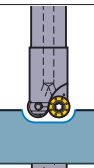
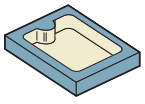
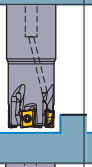
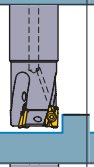
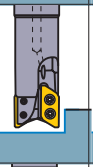
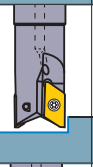
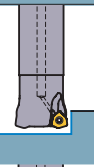
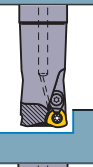
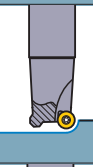
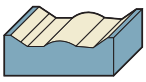
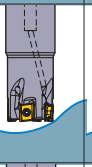
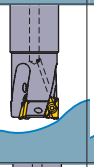
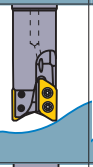
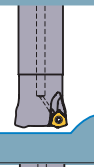
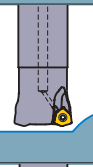
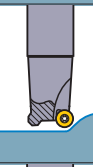
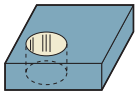
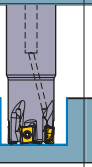
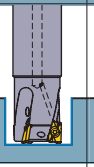
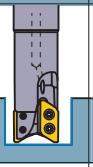
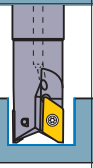
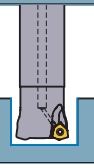
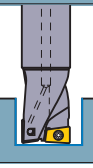
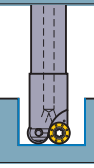
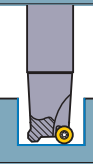
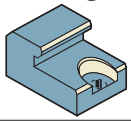
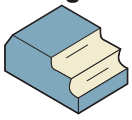
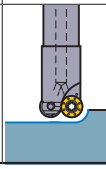
Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
SRM2 ϕ40/ϕ50 (ϕ1.575"/ϕ1.969") R KAPR	2.480"	● Best for roughing of molds. ● Low resistance chip breaker. ● Highly rigid body.	Ø40 mm (Ø1.575") Ø50 mm (Ø1.969")	P K	K374
CFSP 45° KAPR	.327"	● Excellent sharpness with 11°positive inserts. ● 45°chamfer series.	Ø.313" | Ø1.250"	P K	K348
PMF	—	● 2 directional cutting with large overhang. ● No burring so no need for hand finishing. ● High precision multi directional insert ensures highly accurate surfaces.	Ø50 mm | Ø80 mm	P K	K378
PMR	.433"	● 1 directional cutting with large overhang. ● Unique shape of curved edge gives high rigidity and low resistance.	Ø50 mm | Ø80 mm	P K	K379

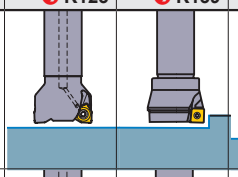
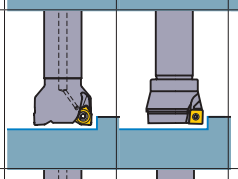
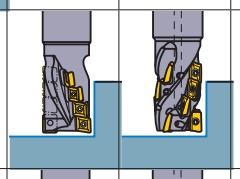
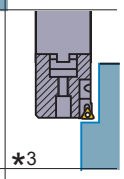
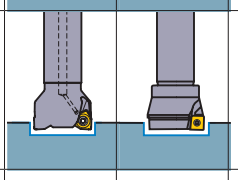
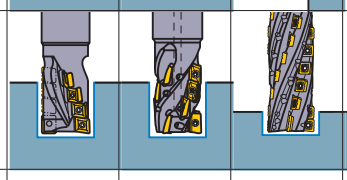
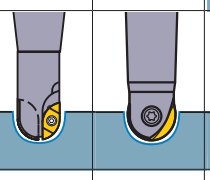
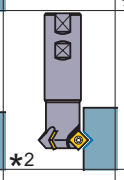
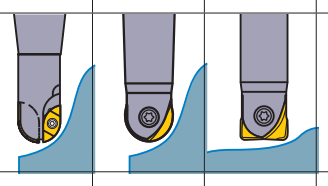
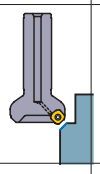
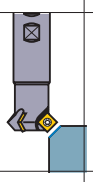
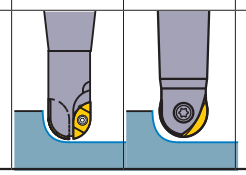
CLASSIFICATION (SCREW-IN TOOLS)

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
ASX400 90° KAPR	.394"	● Economical due to the use of 4 cutting edges. ● Low resistance due to the 3D design of the curved cutting edge. ● Curved cutting edge and high rigidity holder. ● Max. depth of cut .394".	Ø32 mm Ø40 mm	P M K N S H	K139
APX3000 90° KAPR	.394"	● Air / coolant through. ● Low resistance insert and high rigidity body. ● Ideal chip control. ● High wall accuracy can be produced by using this cutter and unique insert geometry.	Ø.625" | Ø1.375"	P M K N S H	K160
APX4000 90° KAPR	.591"	● Air / coolant through. ● Low resistance insert and high rigidity body. ● Ideal chip control. ● High wall accuracy can be produced by using this cutter and unique insert geometry.	Ø1.000" | Ø1.375"	P M K S H	K173
AXD4000 NEW 90° KAPR	.591"	● Air / coolant through. ● Low resistance insert. ● High balance quality. ● Excellent wall accuracy. ● Multi functional milling.	Ø25 mm | Ø40 mm	P N S	K232
AQX 90° KAPR	.709"	● Air / coolant through. ● The center bottom cutting edge enables drilling and end milling without prepared hole.	Ø16 mm | Ø40 mm	P M K N S H	K279
VPX200 90° KAPR	.315"	● Special designed insert with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● Through coolant holes.	Ø.625" | Ø1.500"	P M K N S H	K183
VPX300 90° KAPR	.433"	● Special designed insert with 4 cutting edges. ● High precision, high quality insert cutting edge with finishing blade. ● Through coolant holes.	Ø1.000" | Ø1.500"	P M K N S H	K194
AJX	.079"	● 13°, 15° positive insert. ● Air / coolant through. ● High rigidity due to double clamp structure. ● Suitable for high feed cutting. ● Special designed insert with the use of 3 cutting edges.	Ø.625" | Ø1.375"	P M K S H	K290

Product Name · Shape	APMX	Features	Cutter Dia.	Workpiece Material	Page
WJX09 NEW	.047"	● Multi functional milling. ● Negative inserts. ● Stable clamp with dovetail structure. ● Suitable for high feed machining. ● Special designed insert with 6 cutting edges. ● Through coolant holes.	1.000" | 1.375"	P M K S H	K310
ARP R KAPR	.236"	● Air / coolant through. ● Round Insert Cutter for Difficult-to-cut Material. ● High run-out accuracy when indexing inserts. ● Solid clamping system.	Ø1.000" | Ø1.500"	M S	K330
ARX R KAPR	.118"	● Precision M-class 15°positive insert. ● Effective for various machining applications. ● Air / coolant through.	Ø16 mm | Ø25 mm	P M K H	K341
SRF R KAPR	.433"	●S-shaped cutting edge provides sharpness similar to that of solid ball nose end mills. ●Highly accurate corner radius tolerance allows for high precision finishing. ●Through coolant holes.	Ø.625" Ø.750"	P K N H	K355
SUF R KAPR	.205"	●Highly accurate corner radius tolerance allows for high precision finishing. ●Seamless gash. ●Through coolant holes.	Ø16 mm | Ø32 mm	P M K H	K356
SRM2 R KAPR	1.102"	●Suitable for roughing to semi-finishing of small and medium molds. ●High rigidity body design. ●Low resistance chip breaker. ●Through coolant holes.	Ø.750" | Ø1.250"	P M K S H	K366
PMC	.138"	●For under-cutting trimmed part of press mold. ●2 directional cutting with large overhang. ●Through coolant holes.	Ø25 mm Ø32 mm Ø40 mm	P K	K376

SELECTION CHART

Cutting Mode \ Product Name	Multi Functional Type								
	VPX200 VPX300	APX3000 APX4000	AXD4000 AXD7000	BXD4000	NEW WJX09 WJX14	AJX	AQX	ARX	ARP BRP
	K182 K193	K154 K168	K226 K246	K258	K309 K322	K286	K276	K340	K329 K344
Face Milling 									
Shoulder Milling 									
Slot Milling 									
Pocket Milling 									
Copy Milling 									
Helical Drilling 									
Chamfer Milling 									
Radius Milling 									

	General Type				Long Cutting Edge Type			Ball/Radius Type			Special Purpose Type	
	NEW **WWX200** **WWX400** K114 K123	**ASX400** K139	**ASX445** **WSX445** K057 K048	**AOX445** K095	**LER** K274	NEW **VPX200** **VPX300** **APX3000** **APX4000** Long Cutting Edge Type K188 K154 K193 K168	NEW **ASPX** **SPX** K262 K268	**SRM2** K362 K374	**SRF** For Finishing K350	**SUF** For Finishing K350	**CFSP** K348	**PMC** ✶1 **PMF** **PMR** K376 K378 K379
												
											 ✶3	
											 ✶2	
												
												
												

✶1 Vertical Feed Milling ✶2 V-Slot Milling ✶3 Plunging

IDENTIFICATION OF CUTTER INSERTS

■ ISO CODES FOR MILLING

Symbol	Insert Shape	
6	Special Design	–
S	Square	
T	Triangular	
C	Rhombic 80°	
N	Regular Heptagon	
O	Octagonal	
M	Rhombic 86°	
A	Parallelogram 85°	
R	Round	
L	Rectangular	
J	Special Design	–
X	Special Design	–
W	Wiper	–

① Insert Shape

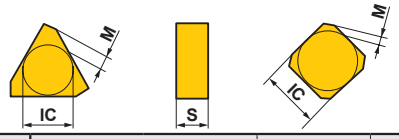
Symbol	Relief Angle **AN**
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Other
X	Other

Major Relief Angle

② Relief Angle

	①	②	③	④
INCH	S	E	E	R
METRIC	S	E	E	R

③ Tolerance Class



Class	IC		M	S
A	.500	±.001	±.0002	±.001
C	.250 .375	±.001	±.0005	±.001
E	.500 .625	±.001	±.001	±.001
H	.394 .492	±.0005	±.0005	±.001
G	.551	±.001	±.001	±.005
K	.250	±.002	±.0005	±.001
	.375	±.002	±.0005	±.001
	.500	±.003	±.0005	±.001
	.625	±.003	±.0005	±.001
N	.250	±.002	±.003	±.001
	.375	±.002	±.003	±.001
	.500	±.003	±.006	±.001
	.625	±.004	±.006	±.001
M	.250	±.002	±.003	±.005
	.375	±.002	±.003	±.005
	.500	±.003	±.005	±.005
	.625	±.004	±.006	±.005

④ Chip Breaker With or Without Hole

Metric

Symbol	Hole	Hole Configuration	Chip Breaker	Figure
W	With Hole	Cylindrical Hole + One Countersink (40°–60°)	No	
T	With Hole		Onesided	
U	With Hole	Cylindrical Hole + Countersink (40°–60°)	Double sided	
B	With Hole	Cylindrical Hole + One Countersink (70°–90°)	No	
N	Without Hole	–	No	
R	Without Hole	–	Onesided	
X	–	–	–	Special Design

Note 1) Dimension symbols conforming to ISO13399.
See pages N002-N005 for details.

Inch S	Inch T	Diameter of Inscribed Circle (inch)	Metric R	Metric C	Metric S	Metric T
		.250		06	06	11
		.313		08	07	13
3	3	.375		09	09	16
		.394	10			
		.472	12			
4	4	.500		12	12	22
5		.625		16	15	27
		.787	20			

⑤ Insert Size

Inch	Thickness (inch)	Metric
2.5	.156	T3
2	.125	03
3	.187	04

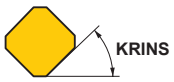
⑥ Insert Thickness

E	Round
F	Sharp
T	Chamfer
S	Chamfer+Hone
Z	Chamfer

⑨ Cutting Edge Condition

⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫
4	2	A	F	E	R	1	- JS
12	03	A	F	E	R	1	- JS

⑦ Cutting Edge Angle



A	45°
E	75°
P	90°
Z	Other Angle

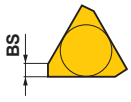
⑧ Wiper Edge Relief Angle

D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

⑩ Cutting Direction

L	Left
N	Neutral
R	Right

⑪ Width of Wiper Edge



1	.055 (.076 only for TEKN)
2	.094 (.094 for SFAN,SFCN)

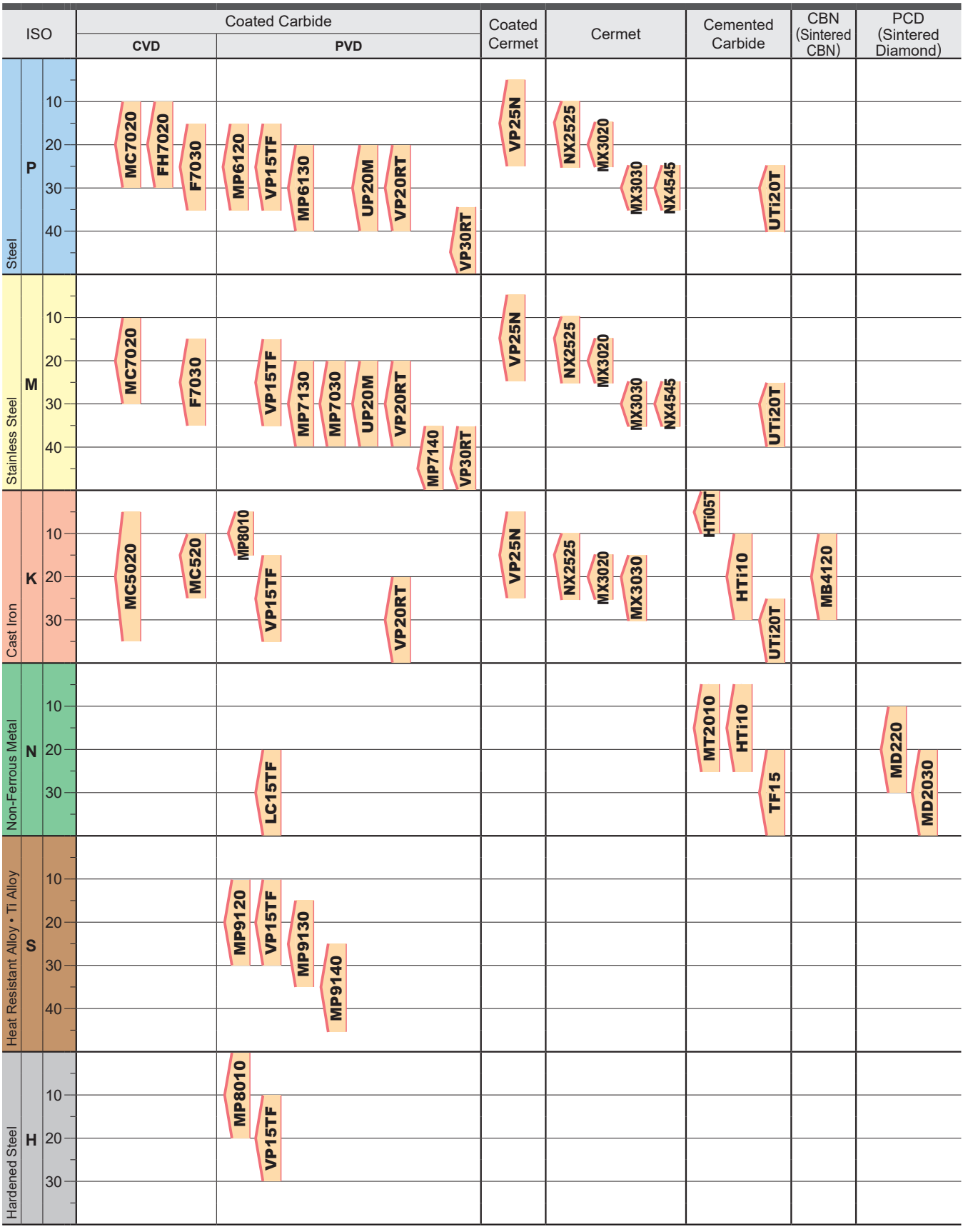
⑫ Chip Breaker

Symbol	Name
FT	FT Breaker
HS	HS Breaker
JH	JH Breaker
JM	JM Breaker
JP	JP Breaker
JS	JS Breaker
LS	LS Breaker
MM	MM Breaker
MS	MS Breaker

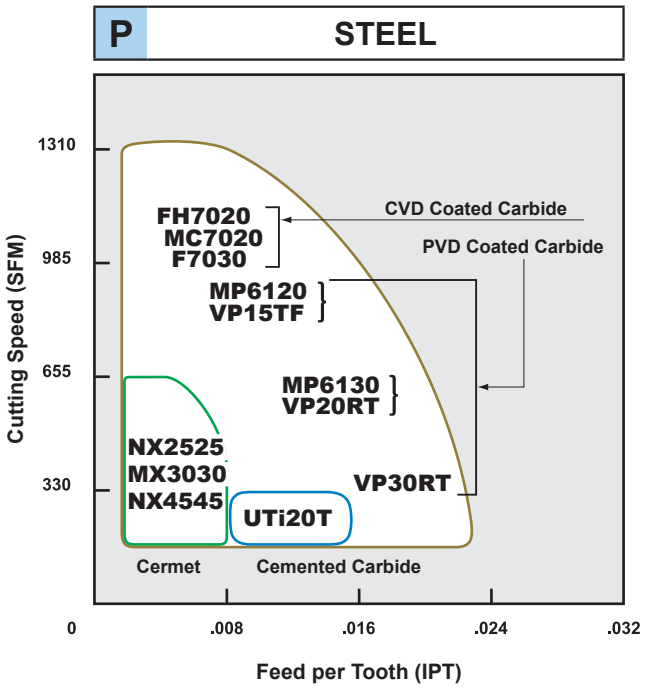
The above table shown as reference example.

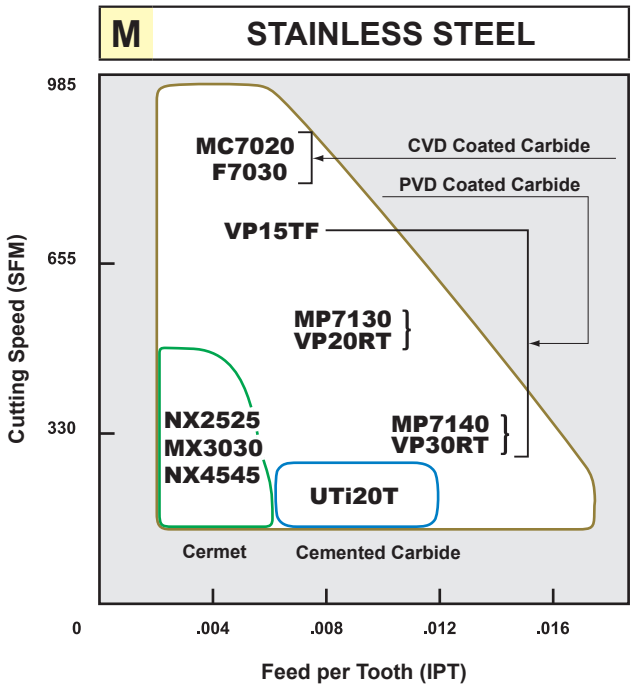
GRADES FOR MILLING

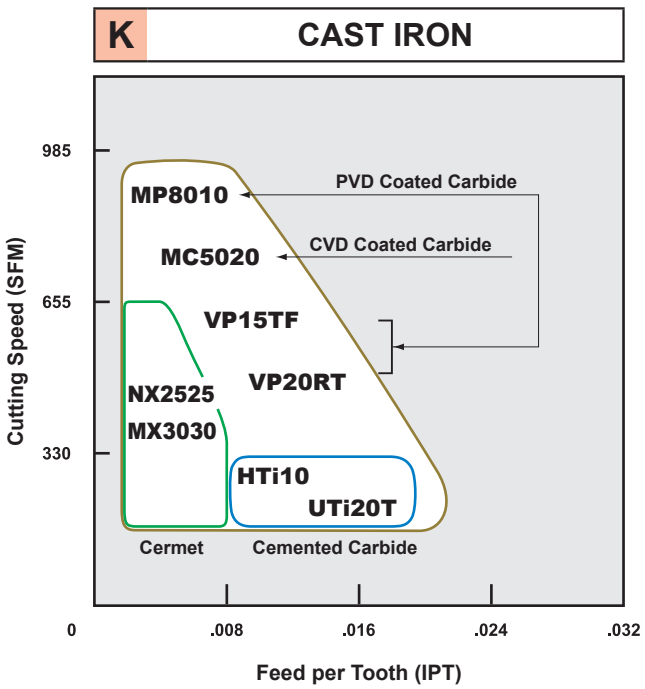
●INDEXABLE INSERT GRADES FOR MILLING

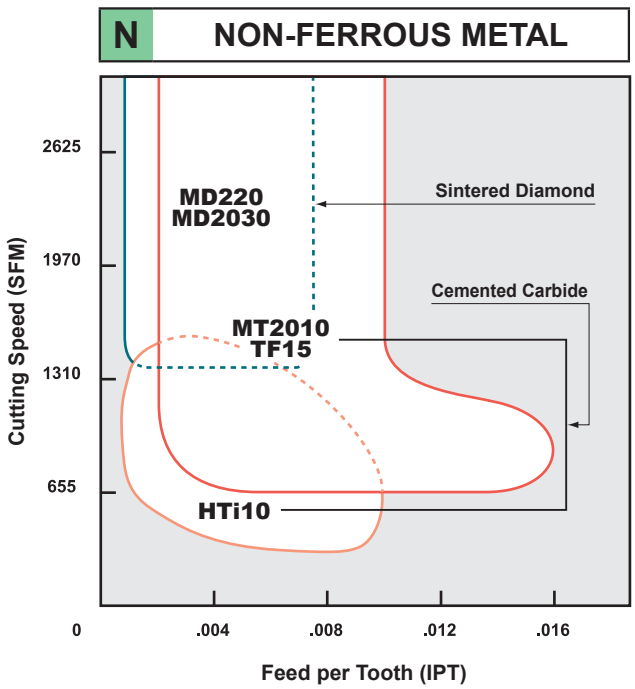


MILLING APPLICATION RANGE





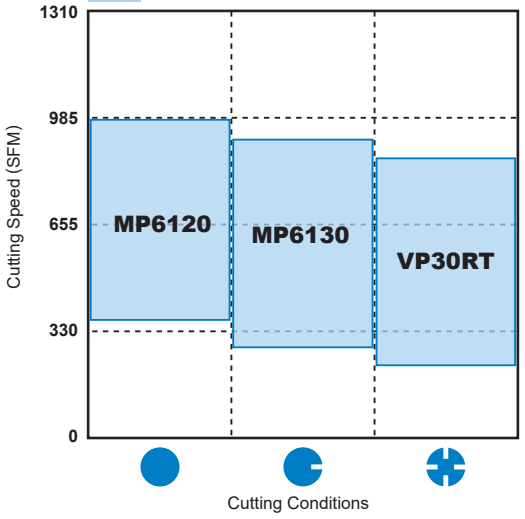




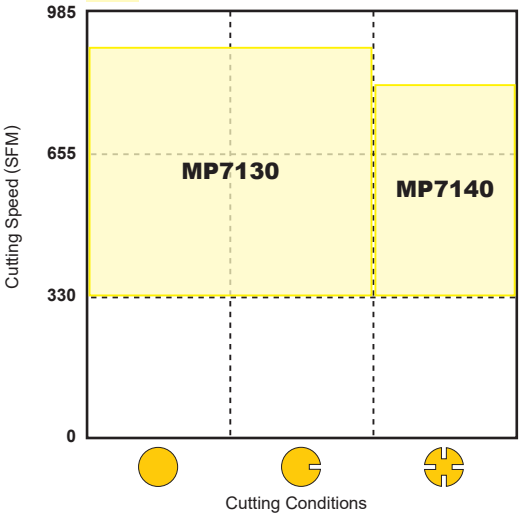
MILLING APPLICATION RANGE

●Recommendation of the main insert grade based on cutting speed and conditions for each workpiece.

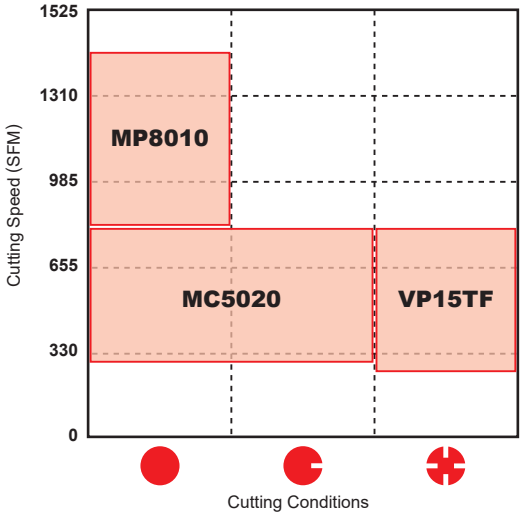
P STEEL (Medium-Rough Cutting)



M STAINLESS STEEL



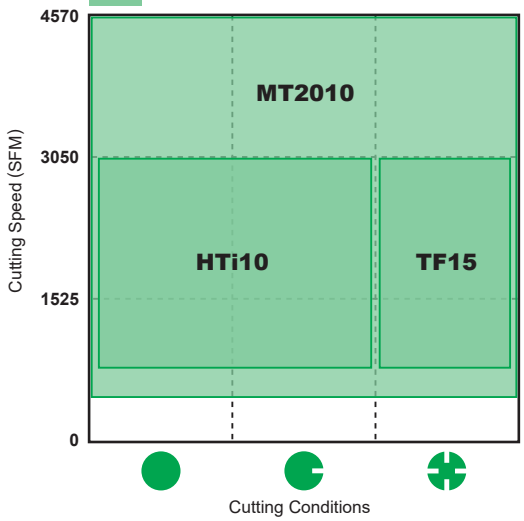
K CAST IRON



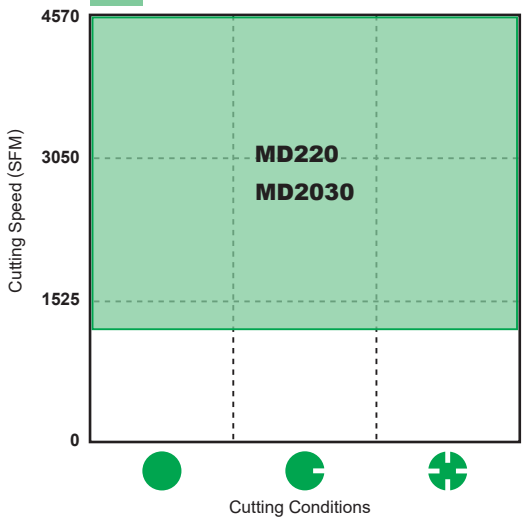
■CUTTING CONDITIONS

●	Stable Cutting	Continuous Cutting Constant Depth of Cut Pre-Machined Securely Clamped Component
◕	General Cutting	
✚	Unstable Cutting	Heavy Interrupted Cutting Irregular Depth of Cut Low Clamping Rigidity

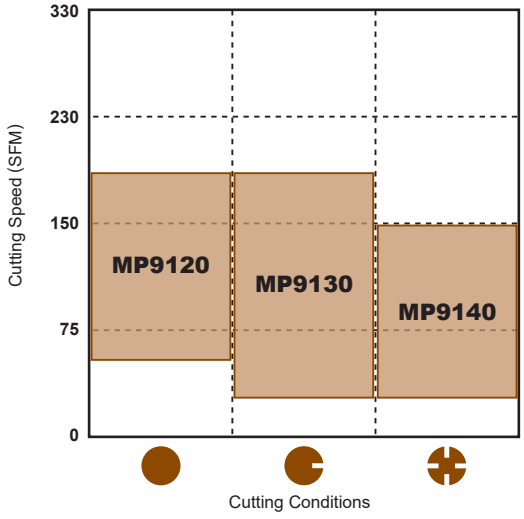
N NON-FERROUS METAL



N NON-FERROUS METAL (PCD)



S HEAT RESISTANT ALLOYS, TITANIUM ALLOYS



COATED CARBIDE (CVD&PVD)

<CVD>
- Special tough fibrous structure improves wear and fracture resistance.
- It covers a wide application range and reduces the number of tools required.

<PVD>
- PVD coating prolongs tool life when compared to cemented carbide under the same cutting conditions.
- Coating of tools with sharp edges is possible without softening or changing the quality of the substrate.

■SELECTION STANDARD

MILLING

	Workpiece Material	Recommended Grade	ISO	Application Range
P	Steel	F7030 MC7020 MP6120 MP6130 VP15TF	P	MC7020, FH7020, F7030, MP6120, VP15TF, MP6130, UP20M, VP20RT, VP30RT
M	Stainless Steel	F7030 MC7020 MP7030 MP7130 MP7140 VP15TF	M	MC7020, F7030, VP15TF, MP7130, MP7030, UP20M, VP20RT, MP7140, VP30RT
K	Cast Iron	MC5020 NEW MC520 VP15TF	K	MC5020, NEW MC520, MP8120, VP15TF, VP20RT
N	Aluminum Alloys	LC15TF	N	LC15TF
S	Heat Resistant Alloys Ti Alloys	MP9120 VP15TF MP9130 MP9140	S	MP9120, VP15TF, MP9130, MP9140
H	Hardened Steel	MP8010 VP15TF	H	MP8010, VP15TF

■GRADE CHARACTERISTICS

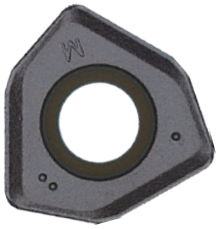
Grade	Substrate	Coating Layer	
	Hardness (HRA)	Composition	Thickness
MC5020	91.0	TiCN-Al_2O_3-Ti Compound	Thick
NEW **MC520**	91.0	TiCN-Al_2O_3-Ti Compound	Thick
MC7020	88.8	TiCN-Al_2O_3-Ti Compound	Thick
FH7020	89.0	TiCN-Al_2O_3-Ti Compound	Thick
F7030	88.8	TiCN-Al_2O_3-TiN	Thin
MP6120	91.5	(Al,Ti,Cr)N	Thin
MP6130	90.5	(Al,Ti,Cr)N	Thin
MP7030	90.5	(Al,Ti)N-Ti Compound	Thin
MP7130	90.5	(Al,Ti)N-Ti Compound	Thin
MP7140	88.8	(Al,Ti)N-Ti Compound	Thin

Grade	Substrate	Coating Layer	
	Hardness (HRA)	Composition	Thickness
MP8010	93.5	(Al,Ti,Si)N	Thin
MP9120	91.5	(Al,Ti,Cr)N	Thin
MP9130	90.5	(Al,Ti,Cr)N	Thin
MP9140	89.0	(Al,Ti)N	Thin
VP15TF	91.5	(Al,Ti)N	Thin
VP20RT	90.5	(Al,Ti)N	Thin
VP30RT	88.8	(Al,Ti)N	Thin
UP20M	90.5	TiN-TiCN-TiN	Thin

Note 1) The hardness values shown represent the typical values of the internal hardness.

For machining of steel and stainless steel

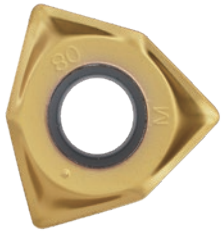
MC7020



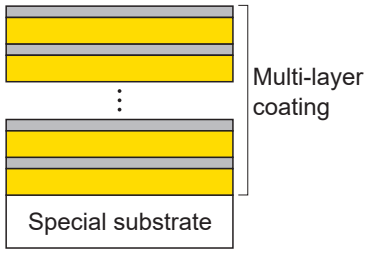
The micro-grain wear resistant Al_2O_3 and fibrous TiCN layers deliver excellent wear resistance in high-speed cutting. Use of a specially developed cemented carbide that provides superior resistance to fracture and thermal cracking prevents the cutting edge from sudden fracturing.

For machining of stainless steel

MP7130



MP7130 has a multi-layer coating based on a newly developed Ti-compound. It provides superior wear and fracture resistance in stainless steel machining. A special tough cemented carbide substrate gives excellent performance in machining of difficult-to-cut materials such as stainless steel.



Heat resistant Alloys, Cutting For Titanium Alloys

MP9130

An enhanced super fine cemented carbide substrate has increased toughness while maintaining hardness. The Al-Ti-Cr-N accumulative coating ensures optimum heat and wear resistance. The combination of these properties gives excellent fracture resistance and welding resistance because of low coefficient of friction when machining titanium alloys.

MP9140

The new technology Al-(Al, Ti)N coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.

CERMET

- NX2525 for high-speed milling.
- NX4545, MX3030 for general milling.

■SELECTION STANDARD

MILLING

Workpiece Material	Recommended Grade	ISO	Application Range
P Steel Stainless Steel M	NX2525 MX3030 NX4545	P 10 20 30 M	NX2525 MX3020 MX3030 NX4545
K Cast Iron	NX2525 MX3030	K 10 20	NX2525 MX3020 MX3030

Note 1) In case of wet cutting, please use coated carbide VP15TF for steel cutting and coated carbide MC5020 for cast iron cutting.

■GRADE CHARACTERISTICS

Grade	Hardness (HRA)
NX2525	92.2
MX3030	91.0
NX4545	90.0

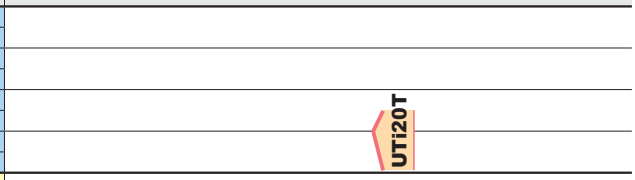
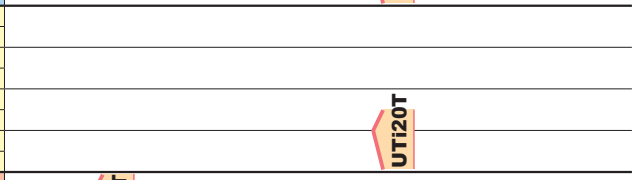
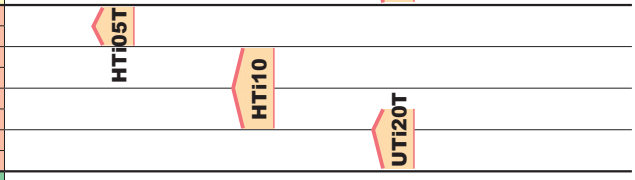
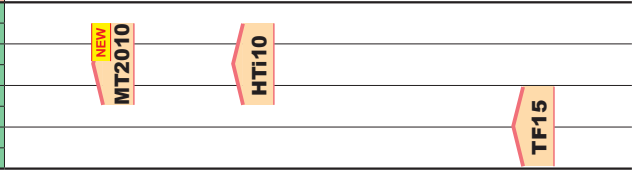
Note 1) The hardness values shown represent the typical values of the internal hardness.

CEMENTED CARBIDE

● **Available grade series are UTi20T for steel and cast iron, and HTi10 for cast iron, non-ferrous metal and non-metal.**

■SELECTION STANDARD

MILLING

Workpiece Material		Recommended Grade	ISO	Application Range
P	Steel	**UTi20T**	P	
M	Stainless Steel	**UTi20T**	M	
K	Cast Iron	**HTi05T**	K	
		HTi10		
		UTi20T		
N	Non-Ferrous Metal	**HTi10**	N	
		NEW **MT2010**		
		TF15		

■MAIN COMPONENT AND APPLICATION

ISO	Main Component	Characteristics	Workpiece Material
P M	WC-TiC-TaC-Co	Heat / Deformation resistance.	Carbon steel, Alloy steel, Stainless steel and Cast iron
K N	WC-Co	High rigidity and wear resistance.	Cast iron, Non-Ferrous metals and Non-metal

■GRADE CHARACTERISTICS

ISO	Grade	Hardness (HRA)
P M	**UTi20T**	90.5
K N	**HTi05T**	92.5
	HTi10	92.0
N	**MT2010**	91.8
	TF15	91.5

Note 1) The hardness values shown represent the typical values of the internal hardness.

CBN (SINTERED CBN)

- MB4120 high efficiency machining of cast iron.
- BC5030 high-speed machining of cast irons available.
- The combination of the BC5030 insert geometry and the AOX allows the use of up to 16 corners per insert, enabling cost effective, high efficiency machining.

■SELECTION STANDARD / RECOMMENDED CUTTING CONDITIONS

Recommended Cutter : FMAX

Workpiece Material		Structure	Cutting Speed (SFM) 820 1640 2460 3280 4100	Feed per Tooth (IPT)	Depth of Cut (inch)	Coolant
Grey Cast Iron	AISI No45B	Pearilitic	MB4120	—.006	—.020	Dry

Recommended Cutter : AOX445

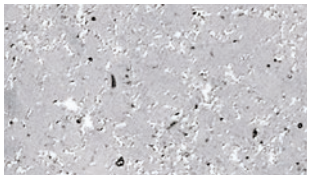
Workpiece Material		Structure	Cutting Speed (SFM) 820 1640 3280 4920 6560	Feed per Tooth (IPT)	Depth of Cut (inch)	Coolant
Grey Cast Iron	AISI No35B	Pearilitic	BC5030	—.006	—.118	Dry

■FEATURES AND BASE

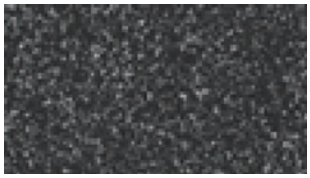
Grade	Application	Features	Main Component	Coating Layer
NEW MB4120	High Efficiency Machining High-Speed Cutting Interrupted Cutting	Fine CBN particles increase cutting edge toughness. The high fracture resistance allows stable performance even during interrupted machining. Optimized grade prevents fracture, edge chipping and thermal cracks under both dry cutting conditions and when cutting workpieces following the wet cutting process.	CBN Co Base Alloy	—
BC5030	High-speed machining at large depths of cut High-speed interrupted machining at large depths of cut	High CBN content and high thermal conductivity. The whole insert is composed of sintered CBN. This enables high-speed, high efficiency machining at larger depths of cut. The coated grade for easy recognition of used corners.	CBN AlN	TiN

PCD (SINTERED DIAMOND)

- **Suitable for cutting of non-ferrous metals such as aluminum alloys.**
- **Suitable for extremely high-speed finishing.**



Micro-Structure of **MD220**



Micro-Structure of **MD2030**

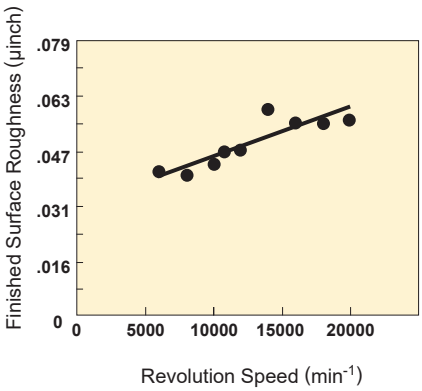
■GRADE FEATURES

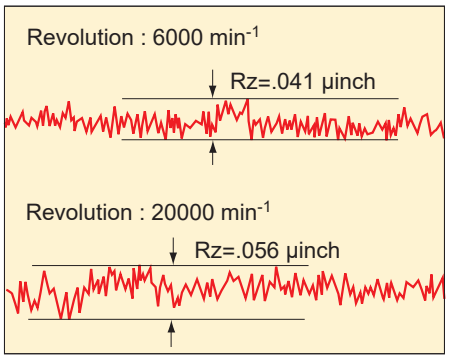
Grade	Features
MD220	Excellent in the balance between wear resistance and fracture resistance. For a wide range of tooling applications.
MD2030	Improved fracture resistance when used in unstable applications. The stability of the cutting edge can meet a wide variety of workpiece material and cutting conditions.

■RECOMMENDED CUTTING CONDITIONS

Workpiece Material	Cutting Speed (SFM)	Grade	Feed per Tooth (IPT)	Depth of Cut (inch)
Aluminum Alloy (Si ≤12%)	3280—19685	**MD220** **MD2030**	—.012	—.020
Aluminum Alloy (Si ≥13%)	655—2625			

■CUTTING PERFORMANCE





<Cutting Conditions>
Workpiece Material : Aluminum Alloy
Insert : NP-GDCW1240PDFR2
Grade : MD220
Tool : V10000R0406D
Feed per Tooth : .008 IPT
Depth of Cut : .020 inch
Width of Cut : 3.150 inch
Dry Cutting

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
AEMW150304ER	AEMW150304ER	**BAE500**	
AEMW150308ER	AEMW150308ER		K386
AEMW19T304ER	AEMW19T304ER	**BAE600**	
AEMW19T308ER	AEMW19T308ER		K386
AOGT123602PEFR-GM	AOGT123602PEFR-GM	**APX3000**	
AOGT123604PEFR-GM	AOGT123604PEFR-GM		K154
AOGT123608PEFR-GM	AOGT123608PEFR-GM		
AOMT123604PEER-H	AOMT123604PEER-H		
AOMT123608PEER-H	AOMT123608PEER-H		K154
AOMT123616PEER-H	AOMT123616PEER-H		
AOMT123602PEER-M	AOMT123602PEER-M		
AOMT123604PEER-M	AOMT123604PEER-M		
AOMT123608PEER-M	AOMT123608PEER-M		
AOMT123610PEER-M	AOMT123610PEER-M		
AOMT123612PEER-M	AOMT123612PEER-M		K154
AOMT123616PEER-M	AOMT123616PEER-M		
AOMT123620PEER-M	AOMT123620PEER-M		
AOMT123624PEER-M	AOMT123624PEER-M		
AOMT123630PEER-M	AOMT123630PEER-M		
AOMT123632PEER-M	AOMT123632PEER-M		
AOMT184804PEER-H	AOMT184804PEER-H	**APX4000**	
AOMT184808PEER-H	AOMT184808PEER-H		
AOMT184816PEER-H	AOMT184816PEER-H		
AOMT184832PEER-H	AOMT184832PEER-H		K168
AOMT184840PEER-H	AOMT184840PEER-H		
AOMT184850PEER-H	AOMT184850PEER-H		
AOMT184864PEER-H	AOMT184864PEER-H		
AOMT184804PEER-M	AOMT184804PEER-M		
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AOMT184810PEER-M	AOMT184810PEER-M		K168
AOMT184812PEER-M	AOMT184812PEER-M		
AOMT184816PEER-M	AOMT184816PEER-M		
AOMT184820PEER-M	AOMT184820PEER-M		
APMT1135PDER-H2	APMT1135PDER-H2	**SRM2** **SRM2 40/50**	
APMT1604PDER-H2	APMT1604PDER-H2		K362
APMT1135PDER-M2	APMT1135PDER-M2		K362
APMT1604PDER-M2	APMT1604PDER-M2		K386 K387

Order Number	(ISO) Number	Cutter Type	Page
APGT1135PDFR-G2	APGT1135PDFR-G2	**BAP300**	
			K386
APMT1135PDER-H1	APMT1135PDER-H1		
APMT1135PDER-H2	APMT1135PDER-H2		K386
APMT1135PDER-H6	APMT1135PDER-H6		
APMT1135PDER-M0	APMT1135PDER-M0		
APMT1135PDER-M1	APMT1135PDER-M1		K386
APMT1135PDER-M2	APMT1135PDER-M2		
APGT1604PDFR-G2	APGT1604PDFR-G2	**BAP400**	
			K386
APMT1604PDER-H1	APMT1604PDER-H1		
APMT1604PDER-H2	APMT1604PDER-H2		
APMT1604PDER-H4	APMT1604PDER-H4		K386
APMT1604PDER-H6	APMT1604PDER-H6		
APMT1604PDER-H8	APMT1604PDER-H8		
APMT1604PDER-M2	APMT1604PDER-M2		
			K387
CCMX083508ENA	CCMX083508EN-A	**LER**	
CCMX09T308ENA	CCMX09T308EN-A		K274
CCMX09T308ENB	CCMX09T308EN-B		K274
CPMT1205ZPEN-M2	CPMT1205ZPEN-M2	**PMR**	
CPMT1205ZPEN-M3	CPMT1205ZPEN-M3		K379

Order Number	(ISO) Number	Cutter Type	Page
GOER1404PXFR2	GOER1404PXFR2	**FMAX**	
GOER1408PXFR2	GOER1408PXFR2		K099
GOER1408PXFR2-8	GOER1408PXFR2-8		K099
GOER1401ZXFR2	GOER1401ZXFR2		K099
HNMX1206EN06-R	HNMX1206EN06-R	**BMR**	
			K380
HNMX1206ER12-R	HNMX1206ER12-R		K380
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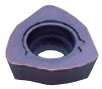
JOMW080320ZZSR-FT	JOMW080320ZZSR-FT		K286
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JDMW140520ZDSR-FT	JDMW140520ZDSR-FT		
JOMT06T216ZZER-JL	JOMT06T216ZZER-JL		K286
JOMT080322ZZER-JL	JOMT080322ZZER-JL		
JDMT09T323ZDER-JL	JDMT09T323ZDER-JL		
JDMT120423ZDER-JL	JDMT120423ZDER-JL		
JDMT140523ZDER-JL	JDMT140523ZDER-JL		
JOMT06T215ZZSR-JM	JOMT06T215ZZSR-JM		K286
JOMT080320ZZSR-JM	JOMT080320ZZSR-JM		
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JDMT120420ZDSR-JM	JDMT120420ZDSR-JM		
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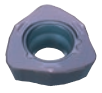
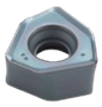
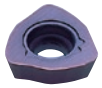
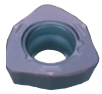
JDMT120420ZDSR-ST	JDMT120420ZDSR-ST		K286
JDMT140520ZDSR-ST	JDMT140520ZDSR-ST		
JOMU090512ZZER-L	JOMU090512ZZER-L	**WJX09**	
JOMU090512ZZER-M	JOMU090512ZZER-M	NEW	K308
JOMU090512ZZER-R	JOMU090512ZZER-R		
JOMU140715ZZER-L	JOMU140715ZZER-L	**WJX14**	
JOMU140715ZZER-M	JOMU140715ZZER-M		K318
JOMU140715ZZER-R	JOMU140715ZZER-R		

Order Number	(ISO) Number	Cutter Type	Page
JOMW080320ZZSR-FT	JOMW080320ZZSR-FT	**PMC**	
JDMW09T320ZDSR-FT	JDMW09T320ZDSR-FT		K376
JDMW120420ZDSR-FT	JDMW120420ZDSR-FT		
JDMT120420ZDSR-ST	JDMT120420ZDSR-ST		K376
JOMT080320ZZSR-JM	JOMT080320ZZSR-JM		K376
JDMT09T320ZDSR-JM	JDMT09T320ZDSR-JM		
JDMT120420ZDSR-JM	JDMT120420ZDSR-JM		
JPMT060204-E	JPMT060204-E		K393
JPGX1404080PPER-JM	JPGX1404080PPER-JM	**ASPX**	
JPGX1404120PPER-JM	JPGX1404120PPER-JM		
JPGX1404160PPER-JM	JPGX1404160PPER-JM	NEW	
JPGX1404240PPER-JM	JPGX1404240PPER-JM		K262
JPGX1404320PPER-JM	JPGX1404320PPER-JM		
JPGX1404400PPER-JM	JPGX1404400PPER-JM		
JPGX1404500PPER-JM	JPGX1404500PPER-JM		
JPGX1404635PPER-JM	JPGX1404635PPER-JM		
JPMX140412-JM	JPMX140412-JM	**SPX**	
JPMX190412-JM	JPMX190412-JM		K268
JPMX140412-WH	JPMX140412-WH		K268
JPMX190412-WH	JPMX190412-WH		

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
LNGU130804PNER-M	LNGU130804PNER-M	**VAS400 Side Cutter**	
LNGU130804PNEL-M	LNGU130804PNEL-M		
LNGU130808PNER-M	LNGU130808PNER-M		
LNGU130808PNEL-M	LNGU130808PNEL-M		
LNGU130812PNER-M	LNGU130812PNER-M		
LNGU130812PNEL-M	LNGU130812PNEL-M		
LNGU130816PNER-M	LNGU130816PNER-M		
LNGU130816PNEL-M	LNGU130816PNEL-M		
LNGU130820PNER-M	LNGU130820PNER-M		
LNGU130820PNEL-M	LNGU130820PNEL-M		
LNGU130824PNER-M	LNGU130824PNER-M		
LNGU130824PNEL-M	LNGU130824PNEL-M		
LNGU130830PNER-M	LNGU130830PNER-M		
LNGU130830PNEL-M	LNGU130830PNEL-M		
LNGU130840PNER-M	LNGU130840PNER-M		
LNGU130840PNEL-M	LNGU130840PNEL-M		
LNGU130850PNER-M	LNGU130850PNER-M		
LNGU130850PNEL-M	LNGU130850PNEL-M		K146
LNGU130804PNER-R	LNGU130804PNER-R		
LNGU130804PNEL-R	LNGU130804PNEL-R		
LNGU130808PNER-R	LNGU130808PNER-R		
LNGU130808PNEL-R	LNGU130808PNEL-R		
LNGU130812PNER-R	LNGU130812PNER-R		
LNGU130812PNEL-R	LNGU130812PNEL-R		
LNGU130816PNER-R	LNGU130816PNER-R		
LNGU130816PNEL-R	LNGU130816PNEL-R		
LNGU130820PNER-R	LNGU130820PNER-R		
LNGU130820PNEL-R	LNGU130820PNEL-R		
LNGU130824PNER-R	LNGU130824PNER-R		
LNGU130824PNEL-R	LNGU130824PNEL-R		
LNGU130830PNER-R	LNGU130830PNER-R		
LNGU130830PNEL-R	LNGU130830PNEL-R		
LNGU130840PNER-R	LNGU130840PNER-R		
LNGU130840PNEL-R	LNGU130840PNEL-R		
LNGU130850PNER-R	LNGU130850PNER-R		
LNGU130850PNEL-R	LNGU130850PNEL-R		

Order Number	(ISO) Number	Cutter Type	Page
LNGU171004PNER-R	LNGU171004PNER-R	**VAS500 Side Cutter**	
LNGU171004PNEL-R	LNGU171004PNEL-R		
LNGU171008PNER-R	LNGU171008PNER-R		
LNGU171008PNEL-R	LNGU171008PNEL-R		
LNGU171012PNER-R	LNGU171012PNER-R		
LNGU171012PNEL-R	LNGU171012PNEL-R		
LNGU171016PNER-R	LNGU171016PNER-R		
LNGU171016PNEL-R	LNGU171016PNEL-R		
LNGU171020PNER-R	LNGU171020PNER-R		
LNGU171020PNEL-R	LNGU171020PNEL-R		
LNGU171024PNER-R	LNGU171024PNER-R		K149
LNGU171024PNEL-R	LNGU171024PNEL-R		
LNGU171030PNER-R	LNGU171030PNER-R		
LNGU171030PNEL-R	LNGU171030PNEL-R		
LNGU171040PNER-R	LNGU171040PNER-R		
LNGU171040PNEL-R	LNGU171040PNEL-R		
LNGU171050PNER-R	LNGU171050PNER-R		
LNGU171050PNEL-R	LNGU171050PNEL-R		
LNGU171060PNER-R	LNGU171060PNER-R		
LNGU171060PNEL-R	LNGU171060PNEL-R		
LNGU171070PNER-R	LNGU171070PNER-R		
LNGU171070PNEL-R	LNGU171070PNEL-R		
LOGU0904020PNER-L	LOGU0904020PNER-L	**VPX200**	
LOGU0904040PNER-L	LOGU0904040PNER-L		
LOGU0904080PNER-L	LOGU0904080PNER-L		
LOGU0904100PNER-L	LOGU0904100PNER-L		
LOGU0904120PNER-L	LOGU0904120PNER-L		K188
LOGU0904160PNER-L	LOGU0904160PNER-L		
LOGU0904020PNFR-L	LOGU0904020PNFR-L		
LOGU0904040PNFR-L	LOGU0904040PNFR-L		
LOGU0904080PNFR-L	LOGU0904080PNFR-L		
LOGU0904100PNFR-L	LOGU0904100PNFR-L		
LOGU0904120PNFR-L	LOGU0904120PNFR-L		
LOGU0904160PNFR-L	LOGU0904160PNFR-L		
LOGU0904020PNER-M	LOGU0904020PNER-M		
LOGU0904040PNER-M	LOGU0904040PNER-M		
LOGU0904080PNER-M	LOGU0904080PNER-M		
LOGU0904100PNER-M	LOGU0904100PNER-M		
LOGU0904120PNER-M	LOGU0904120PNER-M		K188
LOGU0904160PNER-M	LOGU0904160PNER-M		
LOGU0904020PNFR-M	LOGU0904020PNFR-M		
LOGU0904040PNFR-M	LOGU0904040PNFR-M		
LOGU0904080PNFR-M	LOGU0904080PNFR-M		
LOGU0904100PNFR-M	LOGU0904100PNFR-M		
LOGU0904120PNFR-M	LOGU0904120PNFR-M		
LOGU0904160PNFR-M	LOGU0904160PNFR-M		

Order Number	(ISO) Number	Cutter Type	Page
LOGU1207020PNER-L	LOGU1207020PNER-L	**VPX300**	
LOGU1207040PNER-L	LOGU1207040PNER-L		
LOGU1207080PNER-L	LOGU1207080PNER-L		
LOGU1207100PNER-L	LOGU1207100PNER-L		
LOGU1207120PNER-L	LOGU1207120PNER-L		
LOGU1207160PNER-L	LOGU1207160PNER-L		
LOGU1207200PNER-L	LOGU1207200PNER-L		
LOGU1207240PNER-L	LOGU1207240PNER-L	NEW	
LOGU1207300PNER-L	LOGU1207300PNER-L		
LOGU1207320PNER-L	LOGU1207320PNER-L		K199
LOGU1207020PNFR-L	LOGU1207020PNFR-L		
LOGU1207040PNFR-L	LOGU1207040PNFR-L		
LOGU1207080PNFR-L	LOGU1207080PNFR-L		
LOGU1207100PNFR-L	LOGU1207100PNFR-L		
LOGU1207120PNFR-L	LOGU1207120PNFR-L		
LOGU1207160PNFR-L	LOGU1207160PNFR-L		
LOGU1207200PNFR-L	LOGU1207200PNFR-L		
LOGU1207240PNFR-L	LOGU1207240PNFR-L		
LOGU1207300PNFR-L	LOGU1207300PNFR-L		
LOGU1207320PNFR-L	LOGU1207320PNFR-L		
LOGU1207020PNER-M	LOGU1207020PNER-M		
LOGU1207040PNER-M	LOGU1207040PNER-M		
LOGU1207080PNER-M	LOGU1207080PNER-M		
LOGU1207100PNER-M	LOGU1207100PNER-M		
LOGU1207120PNER-M	LOGU1207120PNER-M		
LOGU1207160PNER-M	LOGU1207160PNER-M		
LOGU1207200PNER-M	LOGU1207200PNER-M		
LOGU1207240PNER-M	LOGU1207240PNER-M		
LOGU1207300PNER-M	LOGU1207300PNER-M		
LOGU1207320PNER-M	LOGU1207320PNER-M		K199
LOGU1207020PNFR-M	LOGU1207020PNFR-M		
LOGU1207040PNFR-M	LOGU1207040PNFR-M		
LOGU1207080PNFR-M	LOGU1207080PNFR-M		
LOGU1207100PNFR-M	LOGU1207100PNFR-M		
LOGU1207120PNFR-M	LOGU1207120PNFR-M		
LOGU1207160PNFR-M	LOGU1207160PNFR-M		
LOGU1207200PNFR-M	LOGU1207200PNFR-M		
LOGU1207240PNFR-M	LOGU1207240PNFR-M		
LOGU1207300PNFR-M	LOGU1207300PNFR-M		
LOGU1207320PNFR-M	LOGU1207320PNFR-M		
MPMX120412-JM	MPMX120412-JM	**SPX**	
			K268
MPMX120412-WH	MPMX120412-WH		
			K268

Order Number	(ISO) Number	Cutter Type	Page
NNMU130508ZER-L	NNMU130508ZER-L	**AHX440S**	
NNMU130508ZEN-M	NNMU130508ZEN-M		K064
NNMU130532ZEN-M	NNMU130532ZEN-M		K070
NNMU130532ZEN-R	NNMU130532ZEN-R		
NNMU200608ZEN-HK	NNMU200608ZEN-HK	**AHX640S AHX640W**	
			K074 K086
NNMU200608ZEN-MK	NNMU200608ZEN-MK		K074 K086
NNMU200708ZEN-M	NNMU200708ZEN-M	**AHX640S**	
			K074
NNMU200708ZEN-MP	NNMU200708ZEN-MP		K074
NNMU200712ZER-L	NNMU200712ZER-L		K074
NNMU200712ZER-MM	NNMU200712ZER-MM		K074
NP-GOEN1404PXSR05	NP-GOEN1404PXSR05	**FMAX**	
NP-GOEN1408PXSR05	NP-GOEN1408PXSR05	NEW	K099
NP-WEEW13T3AGFR3C	NP-WEEW13T3AGFR3C	**ASX445**	
			K056
OEMX12T3ETR1	OEMX12T3ETR1	**BOE**	
OEMX12T3ESR1	OEMX12T3ESR1		K387
OEMX1705ETR1	OEMX1705ETR1		
OEMX1705ESR1	OEMX1705ESR1		
OEMX12T3EER1-JS	OEMX12T3EER1-JS		K387
OEMX12T3ETR1-JS	OEMX12T3ETR1-JS		
OEMX1705EER1-JS	OEMX1705EER1-JS		
OEMX1705ETR1-JS	OEMX1705ETR1-JS		

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
QOGT0830R-G1	QOGT0830R-G1	AQX	
QOGT0934R-G1	QOGT0934R-G1		
QOGT1443R-G1	QOGT1443R-G1		K276
QOGT1651R-G1	QOGT1651R-G1		
QOGT1959R-G1	QOGT1959R-G1		
QOMT0830R-M2	QOMT0830R-M2		
QOMT0934R-M2	QOMT0934R-M2		
QOMT1443R-M2	QOMT1443R-M2		K276
QOMT1651R-M2	QOMT1651R-M2		
QOMT1959R-M2	QOMT1959R-M2		
QOGT0830R-G1	QOGT0830R-G1	AQX(METRIC)	
QOGT1035R-G1	QOGT1035R-G1		
QOGT1342R-G1	QOGT1342R-G1		
QOGT1651R-G1	QOGT1651R-G1		K276
QOGT1856R-G1	QOGT1856R-G1		
QOGT2062R-G1	QOGT2062R-G1		
QOGT2576R-G1	QOGT2576R-G1		
QOMT0830R-M2	QOMT0830R-M2		
QOMT1035R-M2	QOMT1035R-M2		
QOMT1342R-M2	QOMT1342R-M2		
QOMT1651R-M2	QOMT1651R-M2		K276
QOMT1856R-M2	QOMT1856R-M2		
QOMT2062R-M2	QOMT2062R-M2		
QOMT2576R-M2	QOMT2576R-M2		
RPHT1040M0E4-L	RPHT1040M0E4-L	ARP	
RPMT1040M0E4-L	RPMT1040M0E4-L		
NEW RPMT1040M0E8-L1	RPMT1040M0E8-L1		
NEW RPMT1040M0E4-L2	RPMT1040M0E4-L2		
RPHT1040M0E4-M	RPHT1040M0E4-M		
RPMT1040M0E4-M	RPMT1040M0E4-M		
NEW RPMT1040M0E8-M1	RPMT1040M0E8-M1		
NEW RPMT1040M0E4-M2	RPMT1040M0E4-M2		
RPHT1040M0E4-R	RPHT1040M0E4-R		
RPMT1040M0E4-R	RPMT1040M0E4-R		
NEW RPMT1040M0E8-R1	RPMT1040M0E8-R1		K328
RPHT1248M0E4-L	RPHT1248M0E4-L		
RPMT1248M0E4-L	RPMT1248M0E4-L		
NEW RPMT1248M0E8-L1	RPMT1248M0E8-L1		
NEW RPMT1248M0E4-L2	RPMT1248M0E4-L2		
RPHT1248M0E4-M	RPHT1248M0E4-M		
RPMT1248M0E4-M	RPMT1248M0E4-M		
NEW RPMT1248M0E8-M1	RPMT1248M0E8-M1		
NEW RPMT1248M0E4-M2	RPMT1248M0E4-M2		
RPHT1248M0E4-R	RPHT1248M0E4-R		
RPMT1248M0E4-R	RPMT1248M0E4-R		
NEW RPMT1248M0E8-R1	RPMT1248M0E8-R1		

Order Number	(ISO) Number	Cutter Type	Page
RDMW0517M0E	RDMW0517M0E	ARX(METRIC)	
RDMW0620M0E	RDMW0620M0E		K340
RDMW0724M0E	RDMW0724M0E		
REMX1705EN	REMX1705EN	BOE	
REMX1705SN	REMX1705SN		K387
REMX12T3EN-JS	REMX12T3EN-JS		
REMX1705EN-JS	REMX1705EN-JS		K387
RGEN2004EN	RGEN2004M0EN	SG20	
RGEN2004SN	RGEN2004M0SN		K391
RPMT07T200E-JS	RPMT07T200E-JS	BRP	
RPMT09T300E-JS	RPMT09T300E-JS		K344
RPMT120400E-JS	RPMT120400E-JS		
RPMT150600E-JS	RPMT150600E-JS		
RPMW120400E	RPMW120400E		
RPMW150600E	RPMW150600E		K344
SDEN42AEN	SDEN1203AEN	Corner Angle 45° 15° Positive	
			K393
SEEN42EFFR1	SEEN1203EFFR1	SE415	
SEEN42EFER1	SEEN1203EFER1		K389
SEEN42EFTR1	SEEN1203EFTR1		
SEEN42EFSR1	SEEN1203EFSR1		
SEER42EFER-JS	SEER1203EFER-JS		
			K389
SECN42AFTN1	SECN1203AFTN1	SE445	
SEEN42AFFN1	SEEN1203AFFN1		
SEEN42AFEN1	SEEN1203AFEN1		K390
SEEN42AFTN1	SEEN1203AFTN1		
SEEN42AFSN1	SEEN1203AFSN1		
SEEN42AFXN1	SEEN1203AFXN1		
SEER42AFEN-JS	SEER1203AFEN-JS		
SEER42AFXN-JS	SEER1203AFXN-JS		K390
SEEN53EFER1	SEEN1504EFER1	SE515	
			K390

Order Number	(ISO) Number	Cutter Type	Page
SEEN53AFEN1	SEEN1504AFEN1	**SE545**	K390
SEEN53AFTN1	SEEN1504AFTN1		
SEEN53AFSN1	SEEN1504AFSN1		
SEER53AFEN-JS	SEER1504AFEN-JS		K390
SEET13T3AGEN-JL	SEET13T3AGEN-JL	**ASX445**	K056
SEMT13T3AGSN-JM	SEMT13T3AGSN-JM		K056
SEMT13T3AGSN-JH	SEMT13T3AGSN-JH		K056
SEMT13T3AGSN-FT	SEMT13T3AGSN-FT		K056
SEGT13T3AGFN-JP	SEGT13T3AGFN-JP		K056
SEER43AFEN-JS	SEER1204AFEN-JS	**Corner Angle 45° 20° Positive**	K393
SFAN42ZFFR2	SFAN1203ZFFR2	**BF407**	K387
SFAN42ZFFL2	SFAN1203ZFFL2		
SFCN42ZFFR2	SFCN1203ZFFR2		
SFCN42ZFFR2	SFCN1203ZFFR2		K387
SL-ONEN120404ASN	SL-ONEN120404ASN	**AOX445**	K095
SNMN432	SNMN120408	**Negative**	K393
SNMN433	SNMN120412		

Order Number	(ISO) Number	Cutter Type	Page
SNMU1206C05ZNER-M	SNMU1206C05ZNER-M	**WSF406W** NEW	K103
WNGU1206ZNER5C-M	WNGU1206ZNER5C-M	NEW	K103
SNMU140812ANER-M	SNMU140812ANER-M	**WSX445**	K042
SNMU140812ANEL-M	SNMU140812ANEL-M		
SNMU140812ANER-R	SNMU140812ANER-R		
SNMU140812ANEL-R	SNMU140812ANEL-R		
SNMU140812ANER-H	SNMU140812ANER-H		
SNGU140812ANER-L	SNGU140812ANER-L		
SNGU140812ANEL-L	SNGU140812ANEL-L		
SNGU140812ANER-M	SNGU140812ANER-M		
SNGU140812ANEL-M	SNGU140812ANEL-M		
SNGU140812ANFR-L	SNGU140812ANFR-L		
SNGU140812ANFL-L	SNGU140812ANFL-L		
WNGU1406ANEN8C-M	WNGU1406ANEN8C-M		K042
SOET12T308PEER-JL	SOET12T308PEER-JL	**ASX400**	K138
SOMT12T308PEER-JM	SOMT12T308PEER-JM	**ASX400** ASX Side Cutter	K138 K152
SOMT12T308PEEL-JM	SOMT12T308PEEL-JM		
SOMT12T308PEER-JH	SOMT12T308PEER-JH	**ASX400**	K138
SOMT12T320PEER-FT	SOMT12T320PEER-FT		K138
SOGT12T308PEFR-JP	SOGT12T308PEFR-JP		K138
SONX1206PER	SONX1206PER	**VOX400** VOS Side Cutter	K106 K148
SONX1206PEL	SONX1206PEL		

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
SPEN42EEER1	SPEN1203EEER1	**FBP415**	K388
SPEN42EEEL1	SPEN1203EEEL1		
SPNN42EEER1	SPNN1203EEER1		
SPNN42EEEL1	SPNN1203EEEL1		
SPER42EEER-JS	SPER1203EEER-JS		K388
SPGX1204100PPER-JM	SPGX1204100PPER-JM	**ASPX** NEW	K262
SPMB1204APT	SPMB1204APT	**BSP**	K387
SPMM432A	SPMT120408-A	**TBE1**	K391
SPMN421	SPMN120304	**11° Positive**	K393
SPMN421T	SPMN120304T		
SPMN422	SPMN120308		
SPMN423	SPMN120312		
SPMN432	SPMN120408		
SPMN433	SPMN120412		
SPMN532	SPMN150408		
SPMW321	SPMW090304	**CFSP**	K388
SPMW322	SPMW090308		
SPMW421	SPMW120304		
SPMW422	SPMW120308		
SPMX120408-JM	SPMX120408-JM	**SPX**	K268
SPMX120408-WH	SPMX120408-WH		K268
SRFT0375	SRFT0375	**SRF**	K350
SRFT0500	SRFT0500		
SRFT0625	SRFT0625		
SRFT0750	SRFT0750		
SRFT1000	SRFT1000		
SRFT1250	SRFT1250		

Order Number	(ISO) Number	Cutter Type	Page
SRFT10	SRFT10	**SRF(METRIC)**	K350
SRFT12	SRFT12		
SRFT16	SRFT16		
SRFT20	SRFT20		
SRFT25	SRFT25		
SRFT30	SRFT30		
SRFT32	SRFT32		
SRG40C	SRG40C	**SRM2 40/50**	K374
SRG50C	SRG50C		
SRG40E	SRG40E		K374
SRG50E	SRG50E		
SRG16C	SRG16C	**SRM2(METRIC)**	K362
SRG20C	SRG20C		
SRG25C	SRG25C		
SRG30C	SRG30C		
SRG32C	SRG32C		
SRG16E	SRG16E		K362
SRG20E	SRG20E		
SRG25E	SRG25E		
SRG30E	SRG30E		
SRG32E	SRG32E		
SRM212C	SRM212C	**SRM2**	K362
SRM216C	SRM216C		
SRM220C	SRM220C		
SRM212E	SRM212E		K362
SRM216E	SRM216E		
SRM220E	SRM220E		
SRM210C-M	SRM210C-M		K362
SRM212C-M	SRM212C-M		
SRM216C-M	SRM216C-M		
SRM220C-M	SRM220C-M		
SRM210E-M	SRM210E-M		K362
SRM212E-M	SRM212E-M		
SRM216E-M	SRM216E-M		
SRM220E-M	SRM220E-M		

Order Number	(ISO) Number	Cutter Type	Page
SRM16C-M	SRM16C-M	**SRM2(METRIC)**	
SRM20C-M	SRM20C-M		
SRM25C-M	SRM25C-M		K362
SRM30C-M	SRM30C-M		
SRM32C-M	SRM32C-M		
SRM16E-M	SRM16E-M		
SRM20E-M	SRM20E-M		
SRM25E-M	SRM25E-M		K362
SRM30E-M	SRM30E-M		
SRM32E-M	SRM32E-M		
SUFT10R05	SUFT10R05	**SUF(METRIC)**	
SUFT10R10	SUFT10R10		
SUFT10R20	SUFT10R20		
SUFT12R05	SUFT12R05		
SUFT12R10	SUFT12R10		
SUFT12R20	SUFT12R20		
SUFT12R30	SUFT12R30		
SUFT16R05	SUFT16R05		
SUFT16R10	SUFT16R10		
SUFT16R15	SUFT16R15		
SUFT16R20	SUFT16R20		
SUFT16R30	SUFT16R30		
SUFT20R05	SUFT20R05		
SUFT20R10	SUFT20R10		K350
SUFT20R15	SUFT20R15		
SUFT20R20	SUFT20R20		
SUFT20R30	SUFT20R30		
SUFT25R05	SUFT25R05		
SUFT25R10	SUFT25R10		
SUFT25R20	SUFT25R20		
SUFT25R30	SUFT25R30		
SUFT30R05	SUFT30R05		
SUFT30R10	SUFT30R10		
SUFT30R20	SUFT30R20		
SUFT30R30	SUFT30R30		
SUFT32R05	SUFT32R05		
SUFT32R10	SUFT32R10		
SUFT32R20	SUFT32R20		
TECN32PEFR1W	TECN1603PEFR1W	**NSE300**	
TECN32PEER1W	TECN1603PEER1W		K388
TECN32PETR1W	TECN1603PETR1W		
TEEN32PEFR1	TEEN1603PEFR1		
TEEN32PEER1	TEEN1603PEER1		K389
TEEN32PETR1	TEEN1603PETR1		
TEEN32PESR1	TEEN1603PESR1		
TEER32PEER-JS	TEER1603PEER-JS		
			K389

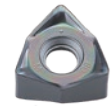
Order Number	(ISO) Number	Cutter Type	Page
TECN43PEFR1	TECN2204PEFR1	**NSE400 SE400**	
TECN43PEER1	TECN2204PEER1		
TECN43PETR1	TECN2204PETR1		
TEEN43PEFR1	TEEN2204PEFR1		K389
TEEN43PEER1	TEEN2204PEER1		
TEEN43PETR1	TEEN2204PETR1		
TEEN43PESR1	TEEN2204PESR1		
TEER43PEER-JS	TEER2204PEER-JS		
			K389
TPEW1303ZPER2	TPEW1303ZPER2	**PMF**	
			K378
TPMN321	TPMN160304	**11° Positive**	
TPMN322	TPMN160308		
TPMN323	TPMN160312		K393
TPMN431	TPMN220404		
TPMN432	TPMN220408		
TPMN433	TPMN220412		
WEC42EFER5C	WEC42EFER5C	**SE415**	
WEC42EFTR5C	WEC42EFTR5C		K390
WEC42AFTR5C	WEC42AFTR5C	**SE445**	
			K390
WEC53AFER5C	WEC53AFER5C	**SE545**	
WEC53AFTR5C	WEC53AFTR5C		K391
WEEW13T3AGER8C	WEEW13T3AGER8C	**ASX445**	
WEEW13T3AGTR8C	WEEW13T3AGTR8C		K056

CLASSIFICATION

Order Number	(ISO) Number	Cutter Type	Page
WNEU1305ZEN4C-M	WNEU1305ZEN4C-M	**AHX440S**	K064
WNEU2006ZEN7C-WK	WNEU2006ZEN7C-WK	**AHX640S AHX640W**	K074 K086
WNEU2007ZEN7C-M	WNEU2007ZEN7C-M	**AHX640S**	K074
WNEU2007ZEN7C-WP	WNEU2007ZEN7C-WP		
WOEW12T308PEER8C	WOEW12T308PEER8C	**ASX400**	K138
WOEW12T308PETR8C	WOEW12T308PETR8C		
WOEX1206PER5C	WOEX1206PER5C	**VOX400**	K106
WPC42EEER10C	WPC42EEER10C	**FBP415**	K388
WPC42EEEL10C	WPC42EEEL10C		
XDGT1550PDER-G04	XDGT1550PDER-G04	**BXD4000**	K258
XDGT1550PDER-G08	XDGT1550PDER-G08		
XDGT1550PDER-G12	XDGT1550PDER-G12		
XDGT1550PDER-G16	XDGT1550PDER-G16		
XDGT1550PDER-G20	XDGT1550PDER-G20		
XDGT1550PDER-G30	XDGT1550PDER-G30		
XDGT1550PDER-G32	XDGT1550PDER-G32		
XDGT1550PDER-G40	XDGT1550PDER-G40		
XDGT1550PDER-G50	XDGT1550PDER-G50		
XDGT1550PDFR-G04	XDGT1550PDFR-G04		K258
XDGT1550PDFR-G08	XDGT1550PDFR-G08		
XDGT1550PDFR-G12	XDGT1550PDFR-G12		
XDGT1550PDFR-G16	XDGT1550PDFR-G16		
XDGT1550PDFR-G20	XDGT1550PDFR-G20		
XDGT1550PDFR-G30	XDGT1550PDFR-G30		
XDGT1550PDFR-G32	XDGT1550PDFR-G32		
XDGT1550PDFR-G40	XDGT1550PDFR-G40		
XDGT1550PDFR-G50	XDGT1550PDFR-G50		
XDGT1550PDFR-GL04	XDGT1550PDFR-GL04		K258
XDGT1550PDFR-GL08	XDGT1550PDFR-GL08		

Order Number	(ISO) Number	Cutter Type	Page
XDGX175004PDFR-GL	XDGX175004PDFR-GL	**AXD4000 AXD4000A**	
XDGX175008PDFR-GL	XDGX175008PDFR-GL		
XDGX175012PDFR-GL	XDGX175012PDFR-GL		
XDGX175016PDFR-GL	XDGX175016PDFR-GL		
XDGX175020PDFR-GL	XDGX175020PDFR-GL		K226
XDGX175024PDFR-GL	XDGX175024PDFR-GL		K240
XDGX175030PDFR-GL	XDGX175030PDFR-GL		
XDGX175032PDFR-GL	XDGX175032PDFR-GL		
XDGX175040PDFR-GL	XDGX175040PDFR-GL		
XDGX175050PDFR-GL	XDGX175050PDFR-GL		
XDGX175004PDER-GM	XDGX175004PDER-GM		
XDGX175008PDER-GM	XDGX175008PDER-GM		
XDGX175012PDER-GM	XDGX175012PDER-GM		
XDGX175016PDER-GM	XDGX175016PDER-GM		
XDGX175020PDER-GM	XDGX175020PDER-GM		K226
XDGX175024PDER-GM	XDGX175024PDER-GM		K240
XDGX175030PDER-GM	XDGX175030PDER-GM		
XDGX175032PDER-GM	XDGX175032PDER-GM		
XDGX175040PDER-GM	XDGX175040PDER-GM		
XDGX175050PDER-GM	XDGX175050PDER-GM		
XDGX175004PDFR-GM	XDGX175004PDFR-GM		
XDGX175008PDFR-GM	XDGX175008PDFR-GM		
XDGX175012PDFR-GM	XDGX175012PDFR-GM		
XDGX175016PDFR-GM	XDGX175016PDFR-GM		
XDGX175020PDFR-GM	XDGX175020PDFR-GM		K226
XDGX175024PDFR-GM	XDGX175024PDFR-GM		K240
XDGX175030PDFR-GM	XDGX175030PDFR-GM		
XDGX175032PDFR-GM	XDGX175032PDFR-GM		
XDGX175040PDFR-GM	XDGX175040PDFR-GM		
XDGX175050PDFR-GM	XDGX175050PDFR-GM		
XDGX227008PDFR-GL	XDGX227008PDFR-GL	**AXD7000**	
XDGX227016PDFR-GL	XDGX227016PDFR-GL		
XDGX227020PDFR-GL	XDGX227020PDFR-GL		
XDGX227024PDFR-GL	XDGX227024PDFR-GL		
XDGX227030PDFR-GL	XDGX227030PDFR-GL		
XDGX227032PDFR-GL	XDGX227032PDFR-GL		
XDGX227040PDFR-GL	XDGX227040PDFR-GL		
XDGX227050PDFR-GL	XDGX227050PDFR-GL		
XDGX227008PDER-GLA	XDGX227008PDER-GLA		K246
XDGX227016PDER-GLA	XDGX227016PDER-GLA		
XDGX227020PDER-GLA	XDGX227020PDER-GLA		
XDGX227024PDER-GLA	XDGX227024PDER-GLA		
XDGX227030PDER-GLA	XDGX227030PDER-GLA		
XDGX227032PDER-GLA	XDGX227032PDER-GLA		
XDGX227040PDER-GLA	XDGX227040PDER-GLA		
XDGX227050PDER-GLA	XDGX227050PDER-GLA		

Order Number	(ISO) Number	Cutter Type	Page
XNMU160708R-MS	XNMU160708R-MS	**VFX5**	K392
XNMU160712R-MS	XNMU160712R-MS		
XNMU160716R-MS	XNMU160716R-MS		
XNMU160724R-MS	XNMU160724R-MS		
XNMU160732R-MS	XNMU160732R-MS		
XNMU160740R-MS	XNMU160740R-MS		
XNMU160708R-HS	XNMU160708R-HS		K392
XNMU160708R-LS	XNMU160708R-LS		K392
XNMU190912R-MS	XNMU190912R-MS	**VFX6**	K392
XNMU190916R-MS	XNMU190916R-MS		
XNMU190924R-MS	XNMU190924R-MS		
XNMU190932R-MS	XNMU190932R-MS		
XNMU190940R-MS	XNMU190940R-MS		
XNMU190950R-MS	XNMU190950R-MS		
XNMU190912R-HS	XNMU190912R-HS		K392
XNMU190912R-LS	XNMU190912R-LS		K392
ZCMX083508ERA	ZCMX083508ER-A	**LER**	K274
ZCMX09T308ERA	ZCMX09T308ER-A		
ZCMX09T308ERB	ZCMX09T308ER-B		K274
6NMU0906040PNER-M	6NMU0906040PNER-M	**WWX200**	K112
6NMU0906080PNER-M	6NMU0906080PNER-M	NEW	
6NMU0906080PNER-R	6NMU0906080PNER-R		

Order Number	(ISO) Number	Cutter Type	Page
6NGU1409040PNER-L	6NGU1409040PNER-L	**WWX400**	K125
6NGU1409080PNER-L	6NGU1409080PNER-L		
6NGU1409040PNFR-L	6NGU1409040PNFR-L		
6NGU1409080PNFR-L	6NGU1409080PNFR-L		
6NGU1409040PNER-M	6NGU1409040PNER-M	NEW 	
6NGU1409080PNER-M	6NGU1409080PNER-M		
6NMU1409040PNER-M	6NMU1409040PNER-M		
6NMU1409080PNER-M	6NMU1409080PNER-M		
6NMU1409160PNER-M	6NMU1409160PNER-M		
6NMU1409200PNER-M	6NMU1409200PNER-M		
6NMU1409080PNER-R	6NMU1409080PNER-R		
6NMU1409160PNER-R	6NMU1409160PNER-R		
6NMU1409200PNER-R	6NMU1409200PNER-R		
2NGU1406ZNER6C-M	2NGU1406ZNER6C-M	NEW	K125
TAWC12T301-45GM	TAWC12T301-45GM	**TAW**	K395

LIST OF CUTTING EDGE DIAMETER TOLERANCES

Cutter Type	Cutting Edge Diameter Tolerance
AJX	−.0039" (−0.1mm) −.0157" (−0.4mm)
APX3000 Arbor Type	−.0039" (−0.1mm) −.0157" (−0.4mm)
APX3000 Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)
APX3000 Long Cutting Edge Type	−.0039" (−0.1mm) −.0118" (−0.3mm)
APX4000 Arbor Type	−.0039" (−0.1mm) −.0157" (−0.4mm)
APX4000 Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)
APX4000 Long Cutting Edge Type	−.0039" (−0.1mm) −.0118" (−0.3mm)
AQX	−.0039" (−0.1mm) −.0118" (−0.3mm)
ARP Arbor Type	−.0039" (−0.1mm) −.0118" (−0.3mm)
ARP Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)
ARX	−.0020" (−0.05mm) −.0059" (−0.15mm)
ASPX	−.0039" (−0.1mm) −.0118" (−0.3mm)
ASX400	0" (0mm) −.0118" (−0.3mm)
AXD4000 Arbor Type	−.0039" (−0.1mm) −.0157" (−0.4mm)
AXD4000 Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)
AXD4000A	−.0079" (−0.2mm) −.0157" (−0.4mm)
AXD7000 Arbor Type	−.0039" (−0.1mm) −.0157" (−0.4mm)
AXD7000 Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)

Cutter Type	Cutting Edge Diameter Tolerance
BRP	−.0039" (−0.1mm) −.0118" (−0.3mm)
BXD4000 Arbor Type	−.0039" (−0.1mm) −.0157" (−0.4mm)
BXD4000 Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)
PMC	±.0020" (±0.05mm)
PMF	0" (0mm) −.0118" (−0.3mm)
PMR	0" (0mm) −.0118" (−0.3mm)
SPX	−.0039" (−0.1mm) −.0118" (−0.3mm)
SRF	0" (0mm) −.0011" (−0.027mm)
SRM	−.0020" (−0.05mm) −.0059" (−0.15mm)
SUF	0" (0mm) −.0008" (−0.02mm)
VOX400	−.0039" (−0.1mm) −.0157" (−0.4mm)
VPX200, VPX300 Arbor Type	−.0039" (−0.1mm) −.0118" (−0.3mm)
VPX200, VPX300 Shank Type	−.0039" (−0.1mm) −.0079" (−0.2mm)
VPX200,VPX300 Long Cutting Edge Type	−.0039" (−0.1mm) −.0118" (−0.3mm)
WJX	−.0039" (−0.1mm) −.0118" (−0.3mm)
WSF406	±.0039" (±0.1mm)
WWX200	−.0039" (−0.1mm) −.0118" (−0.3mm)
WWX400	−.0039" (−0.1mm) −.0118" (−0.3mm)

Note 1) Cutting edge diameter tolerance when the gauge insert is set.
Note 2) When setting the insert available, the insert tolerance is added to the above tolerance.
(Tolerance when setting the insert for SRF.)

MAXIMUM ALLOWABLE REVOLUTION FOR CUTTER

Diameter (inch)	WSX445		ASX445		AOX445		ASX400	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)
1.5"	19000	31	—	—	—	—	—	—
2.0"	17000	31	18000	31	13000	71	18000	31
2.5"	15000	31	16000	31	12000	71	16000	31
3.0"	14000	31	14000	31	11000	71	14000	31
4.0"	12000	31	13000	31	9300	71	13000	31
5.0"	11000	31	12000	31	8300	71	12000	31
6.0"	9500	31	10000	31	7200	71	10000	31
8.0"	8500	31	9000	31	6400	71	9000	31
10.0"	—	—	8000	31	—	—	8000	31

Diameter (inch)	FMAX		AHX640S		AHX640W		WJX14	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)
1.5"	30000	—	—	—	—	—	—	—
2.0"	30000	31	—	—	—	—	5000	44
2.5"	27000	31	11800	44.3	—	—	18100	44
3.0"	24500	31	10000	44.3	8900	53	16100	44
4.0"	22000	31	8600	44.3	7800	53	13300	44
5.0"	19600	31	7300	44.3	6600	53	11500	44
6.0"	—	—	6400	44.3	5300	53	9900	44
8.0"	—	—	5000	44.3	4100	53	—	—
10.0"	—	—	—	—	2900	53	—	—
12.0"	—	—	—	—	1700	53	—	—

Diameter (inch)	AXD4000		AXD7000		BXD4000		VPX200		VPX300		WJX09	
	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)	Max. Allowable Revolution (min^{-1})	Clamp Torque (lbf-in)
.625"	—	—	—	—	—	—	37900	8.9	—	—	—	—
.750"	15000	13.3	—	—	15000	35	33200	8.9	—	—	—	—
.875"	—	—	—	—	—	—	31400	8.9	—	—	—	—
1.0"	49000	13.3	—	—	38000	35	29000	8.9	24100	26.6	33000	17.7
1.125"	48500	13.3	—	—	—	—	27200	8.9	22500	26.6	29800	17.7
1.25"	48000	13.3	41000	31	33000	35	25100	8.9	20600	26.6	27500	17.7
1.375"	45000	13.3	—	—	31000	35	23800	8.9	19500	26.6	—	—
1.5"	41000	13.3	36000	31	29000	35	22000	8.9	17900	26.6	24000	17.7
2.0"	35000	13.3	30000	31	24000	35	19200	8.9	15500	26.6	19800	17.7
2.5"	30000	13.3	25000	31	21000	35	16700	8.9	13400	26.6	17200	17.7
3.0"	27000	13.3	23000	31	19000	35	—	—	11500	26.6	—	—
4.0"	23000	13.3	19000	31	16000	35	—	—	—	—	—	—
5.0"	20000	13.3	16000	31	14000	35	—	—	—	—	—	—
6.0"	—	—	—	—	—	—	—	—	—	—	—	—

Note 1) All values shown on this chart are based on the insert being properly seated in pocket and torqued to the recommended values.

FACE MILLING
<GENERAL CUTTING>

45° KAPR

F R

WSX445

P M K N S H

Fig.1

ø1.5"
ø2"
ø2.5"
ø3"

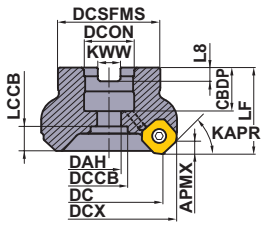
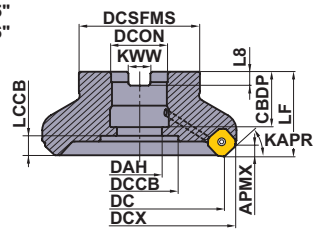


Fig.2

ø4"
ø5"
ø6"



Right hand tool holder only.

■ARBOR TYPE RIGHT HAND TOOL HOLDER

DC = inch size, DCON = Inch size (inch)

DC	Order Number	Stock	∗1 Coolant Thru	Number of Teeth	Pitch	DCX	LF	DCON	WT(lbs)	APMX	Fig.
1.500	**WSX445UR1503SA**	●	Y	3	Coarse	2.005	1.750	.500	.8	.197	1
1.500	**WSX445UR1504SA**	●	Y	4	Fine	2.005	1.750	.500	.7	.197	1
2.000	**WSX445UR0203AA**	●	Y	3	Coarse	2.506	1.750	.750	1.2	.197	1
2.000	**WSX445UR0204AA**	●	Y	4	Fine	2.506	1.750	.750	1.1	.197	1
2.000	**WSX445UR0205AA**	●	Y	5	Extra Fine	2.506	1.750	.750	1.1	.197	1
2.500	**WSX445UR2504CA**	●	Y	4	Coarse	3.006	2.000	1.000	2.0	.197	1
2.500	**WSX445UR2505CA**	●	Y	5	Fine	3.006	2.000	1.000	2.0	.197	1
2.500	**WSX445UR2506CA**	●	Y	6	Extra Fine	3.006	2.000	1.000	1.9	.197	1
3.000	**WSX445UR0304CA**	●	Y	4	Coarse	3.506	2.000	1.000	2.6	.197	1
3.000	**WSX445UR0306CA**	●	Y	6	Fine	3.506	2.000	1.000	2.5	.197	1
3.000	**WSX445UR0308CA**	●	Y	8	Extra Fine	3.506	2.000	1.000	2.4	.197	1
4.000	**WSX445UR0405EA**	●	Y	5	Coarse	4.506	2.500	1.500	5.9	.197	2
4.000	**WSX445UR0407EA**	●	Y	7	Fine	4.506	2.500	1.500	5.8	.197	2
4.000	**WSX445UR0410EA**	●	Y	10	Extra Fine	4.506	2.500	1.500	5.6	.197	2
5.000	**WSX445UR0506EA**	●	Y	6	Coarse	5.506	2.500	1.500	8.5	.197	2
5.000	**WSX445UR0508EA**	●	Y	8	Fine	5.506	2.500	1.500	8.3	.197	2
5.000	**WSX445UR0512EA**	●	Y	12	Extra Fine	5.506	2.500	1.500	8.0	.197	2
6.000	**WSX445UR0607EA**	●	Y	7	Coarse	6.506	2.500	1.500	10.6	.197	2
6.000	**WSX445UR0610EA**	●	Y	10	Fine	6.506	2.500	1.500	10.4	.197	2
6.000	**WSX445UR0616EA**	●	Y	16	Extra Fine	6.506	2.500	1.500	9.9	.197	2
8.000	**WSX445UR0808MN**	●	N	8	Coarse	8.506	2.500	2.500	19.1	.197	3
8.000	**WSX445UR0812MN**	●	N	12	Fine	8.506	2.500	2.500	18.8	.197	3
8.000	**WSX445UR0820MN**	●	N	20	Extra Fine	8.506	2.500	2.500	18.3	.197	3
NEW 10.000	**WSX445UR1010MN**	●	N	10	Coarse	10.493	2.500	2.500	28.5	.197	3
NEW 10.000	**WSX445UR1014MN**	●	N	14	Fine	10.493	2.500	2.500	29.2	.197	3
NEW 12.000	**WSX445UR1214MN**	●	N	14	Coarse	12.493	2.500	2.500	48.1	.197	4

∗1 Y=Yes, N=No
Note 1) The cutter body includes a set bolt for an arbor.

Fig.3

ø8"
ø10"

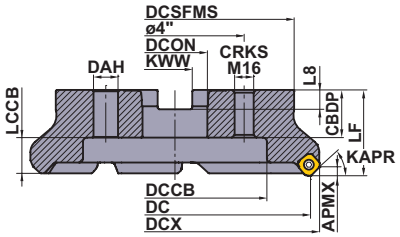
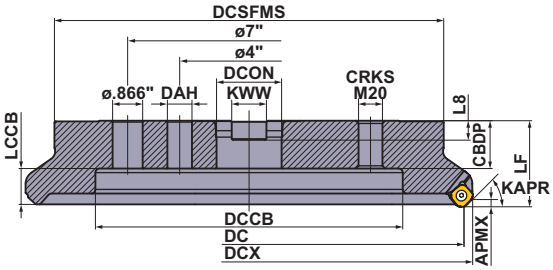


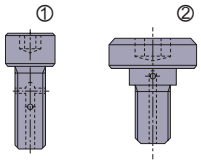
Fig.4

ø12"



Right hand tool holder only.

DC	Set Bolt	Geometry
1.500	HSCU25011H	①
2.000	HSCU37513H	
2.500	HSCU50014H	
3.000	HSCU50014H	
4.000	MBAU75016H	②
5.000	MBAU75016H	
6.000	MBAU75016H	
8.000	—	—
10.000	—	
12.000	—	



With Air / coolant through.

ARBOR TYPE MOUNTING DIMENSIONS

(inch)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
.500	1.500	**WSX445UR1503SA**	.630	.276	.433	.581	1.437	.250	.156	1
.500	1.500	**WSX445UR1504SA**	.630	.276	.433	.581	1.437	.250	.156	1
.750	2.000	**WSX445UR0203AA**	.748	.413	.630	.620	1.750	.313	.187	1
.750	2.000	**WSX445UR0204AA**	.748	.413	.630	.620	1.750	.313	.187	1
.750	2.000	**WSX445UR0205AA**	.748	.413	.630	.620	1.750	.313	.187	1
1.000	2.500	**WSX445UR2504CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	2.500	**WSX445UR2505CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	2.500	**WSX445UR2506CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	3.000	**WSX445UR0304CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	3.000	**WSX445UR0306CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.000	3.000	**WSX445UR0308CA**	.945	.539	.827	.671	2.190	.375	.219	1
1.500	4.000	**WSX445UR0405EA**	1.417	1.181	2.205	.778	3.500	.625	.375	2
1.500	4.000	**WSX445UR0407EA**	1.417	1.181	2.205	.778	3.500	.625	.375	2
1.500	4.000	**WSX445UR0410EA**	1.417	1.181	2.205	.778	3.500	.625	.375	2
1.500	5.000	**WSX445UR0506EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	5.000	**WSX445UR0508EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	5.000	**WSX445UR0512EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	6.000	**WSX445UR0607EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	6.000	**WSX445UR0610EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
1.500	6.000	**WSX445UR0616EA**	1.417	1.181	2.205	.778	3.813	.625	.375	2
2.500	8.000	**WSX445UR0808MN**	1.378	.709	5.512	1.053	6.890	1.000	.560	3
2.500	8.000	**WSX445UR0812MN**	1.378	.709	5.512	1.053	6.890	1.000	.560	3
2.500	8.000	**WSX445UR0820MN**	1.378	.709	5.512	1.053	6.890	1.000	.560	3
2.500	10.000	**WSX445UR1010MN**	1.378	.709	7.087	1.053	8.661	1.000	.560	3
2.500	10.000	**WSX445UR1014MN**	1.378	.709	7.087	1.053	8.661	1.000	.560	3
2.500	12.000	**WSX445UR1214MN**	1.575	.709	8.858	.856	11.220	1.000	.560	4

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Metric Standard

For inch arbors

Fig.1

ø80

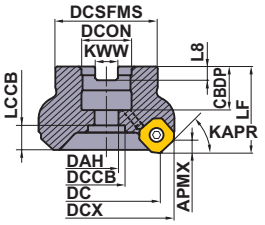
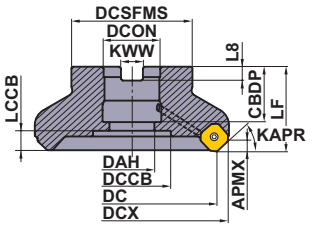


Fig.2

ø100
ø125
ø160



Right hand tool holder shown.

■ARBOR TYPE RIGHT HAND TOOL HOLDER

DC=mm size, DCON=Inch size (mm)

DC	Order Number	Stock	✶1 Coolant Thru	Number of Teeth	Pitch	DCX	LF	DCON	WT(kg)	APMX	Fig.
80	**WSX445R08004CA**	★	Y	4	Coarse	92.9	50	25.4 [1.00"]	1.3	5	1
80	**WSX445R08006CA**	★	Y	6	Fine	92.9	50	25.4 [1.00"]	1.2	5	1
80	**WSX445R08008CA**	★	Y	8	Extra Fine	92.9	50	25.4 [1.00"]	1.1	5	1
100	**WSX445R10005DA**	★	Y	5	Coarse	112.9	50	31.75 [1.25"]	1.8	5	2
100	**WSX445R10007DA**	★	Y	7	Fine	112.9	50	31.75 [1.25"]	1.7	5	2
100	**WSX445R10010DA**	★	Y	10	Extra Fine	112.9	50	31.75 [1.25"]	1.6	5	2
125	**WSX445R12506EA**	★	Y	6	Coarse	137.9	63	38.1 [1.50"]	3.2	5	2
125	**WSX445R12508EA**	★	Y	8	Fine	137.9	63	38.1 [1.50"]	3.1	5	2
125	**WSX445R12512EA**	★	Y	12	Extra Fine	137.9	63	38.1 [1.50"]	3.0	5	2
160	**WSX445R16007FA**	★	Y	7	Coarse	172.9	63	50.8 [2.00"]	4.9	5	2
160	**WSX445R16010FA**	★	Y	10	Fine	172.9	63	50.8 [2.00"]	4.8	5	2
160	**WSX445R16016FA**	★	Y	16	Extra Fine	172.8	63	50.8 [2.00"]	4.6	5	2
200	**WSX445R20008KN**	★	N	8	Coarse	212.9	63	47.625 [1.85"]	8.7	5	3
200	**WSX445R20012KN**	★	N	12	Fine	212.9	63	47.625 [1.85"]	8.6	5	3
200	**WSX445R20020KN**	★	N	20	Extra Fine	212.8	63	47.625 [1.85"]	8.4	5	3
NEW 250	**WSX445R25010KN**	★	N	10	Coarse	262.9	63	47.625 [1.85"]	13.1	5	3
NEW 250	**WSX445R25014KN**	★	N	14	Fine	262.9	63	47.625 [1.85"]	13.2	5	3
NEW 315	**WSX445R31514PN**	★	N	14	Coarse	327.9	63	47.625 [1.85"]	21.5	5	4

■ARBOR TYPE LEFT HAND TOOL HOLDER

DC=mm size, DCON=Inch size (mm)

DC	Order Number	Stock	✶1 Coolant Thru	Number of Teeth	Pitch	DCX	LF	DCON	WT(kg)	APMX	Fig.
80	**WSX445L08004CA**	★	Y	4	Coarse	92.9	50	25.4 [1.00"]	1.3	5	1
100	**WSX445L10005DA**	★	Y	5	Coarse	112.9	50	31.75 [1.25"]	1.8	5	2
125	**WSX445L12506EA**	★	Y	6	Coarse	137.9	63	38.1 [1.50"]	3.2	5	2
160	**WSX445L16007FA**	★	Y	7	Coarse	172.9	63	50.8 [2.00"]	4.9	5	2
200	**WSX445L20008KN**	★	N	8	Coarse	212.9	63	47.625 [1.85"]	8.7	5	3
NEW 250	**WSX445L25010KN**	★	N	10	Coarse	262.9	63	47.625 [1.85"]	13.1	5	3

✶1 Y=Yes, N=No
Note 1) Set bolt not included.

Fig.3

ø200
ø250

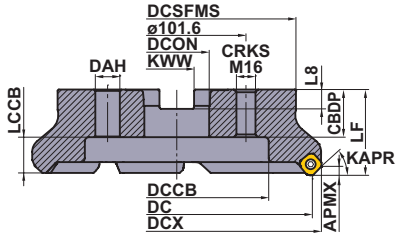
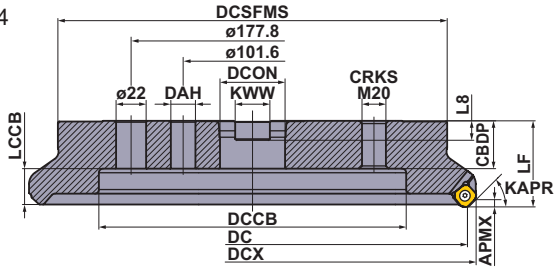


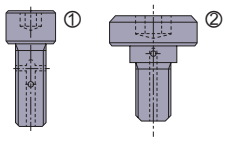
Fig.4

ø315



Right hand tool holder shown.

DC	Set Bolt	Geometry
ϕ80	HSC12035H	①
ϕ100	MBA16033H	②
ϕ125	MBA20040H	②
ϕ160	MBA24045H	②
ϕ200	—	—
ϕ250	—	—
ϕ315	—	—



With Air / coolant through.

ARBOR TYPE MOUNTING DIMENSIONS

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	**WSX445R08004CA**	26	13	20	34	56	9.5	6	1
25.4	80	**WSX445R08006CA**	26	13	20	34	56	9.5	6	1
25.4	80	**WSX445R08008CA**	26	13	20	34	56	9.5	6	1
31.75	100	**WSX445R10005DA**	32	26	45	37	70	12.7	8	2
31.75	100	**WSX445R10007DA**	32	26	45	37	70	12.7	8	2
31.75	100	**WSX445R10010DA**	32	26	45	37	70	12.7	8	2
38.1	125	**WSX445R12506EA**	36	30	56	42	80	15.9	10	2
38.1	125	**WSX445R12508EA**	36	30	56	42	80	15.9	10	2
38.1	125	**WSX445R12512EA**	36	30	56	42	80	15.9	10	2
50.8	160	**WSX445R16007FA**	38	40	72	45	100	19.1	11	2
50.8	160	**WSX445R16010FA**	38	40	72	45	100	19.1	11	2
50.8	160	**WSX445R16016FA**	38	40	72	45	100	19.1	11	2
47.625	200	**WSX445R20008KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	200	**WSX445R20012KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	200	**WSX445R20020KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	250	**WSX445R25010KN**	35	18	180	26.3	220	25.4	14.22	3
47.625	250	**WSX445R25014KN**	35	18	180	26.3	220	25.4	14.22	3
47.625	315	**WSX445R31514PN**	35	18	225	26.3	285	25.4	14.22	4

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	**WSX445L08004CA**	26	13	20	34	56	9.5	6	1
31.75	100	**WSX445L10005DA**	32	26	45	37	70	12.7	8	2
38.1	125	**WSX445L12506EA**	36	30	56	42	80	15.9	10	2
50.8	160	**WSX445L16007FA**	38	40	72	45	100	19.1	11	2
47.625	200	**WSX445L20008KN**	35	18	135	26.3	175	25.4	14.22	3
47.625	250	**WSX445L25010KN**	35	18	180	26.3	220	25.4	14.22	3

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Metric Standard

For metric arbors

Fig.1

ø40
ø50
ø63
ø80

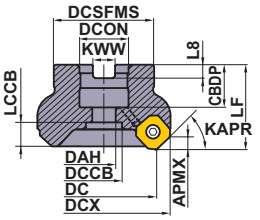
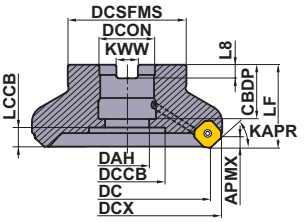


Fig.2

ø100
ø125



Right hand tool holder shown.

■ARBOR TYPE RIGHT HAND TOOL HOLDER

DC=mm size, DCON=mm size (mm)

DC	Order Number	Stock	★1 Coolant Thru	Number of Teeth	Pitch	DCX	LF	DCON	WT(kg)	APMX	Fig.
40	**WSX445-040A03AR**	★	Y	3	Coarse	52.8	40	16	0.3	5	1
40	**WSX445-040A04AR**	★	Y	4	Fine	52.8	40	16	0.3	5	1
50	**WSX445-050A03AR**	★	Y	3	Coarse	62.9	40	22	0.5	5	1
50	**WSX445-050A04AR**	★	Y	4	Fine	62.9	40	22	0.4	5	1
50	**WSX445-050A05AR**	★	Y	5	Extra Fine	62.9	40	22	0.4	5	1
63	**WSX445-063A04AR**	★	Y	4	Coarse	75.9	40	22	0.6	5	1
63	**WSX445-063A05AR**	★	Y	5	Fine	75.9	40	22	0.6	5	1
63	**WSX445-063A06AR**	★	Y	6	Extra Fine	75.9	40	22	0.6	5	1
80	**WSX445-080A04AR**	★	Y	4	Coarse	92.9	50	27	1.3	5	1
80	**WSX445-080A06AR**	★	Y	6	Fine	92.9	50	27	1.2	5	1
80	**WSX445-080A08AR**	★	Y	8	Extra Fine	92.9	50	27	1.1	5	1
100	**WSX445-100B05AR**	★	Y	5	Coarse	112.9	50	32	1.9	5	2
100	**WSX445-100B07AR**	★	Y	7	Fine	112.9	50	32	1.9	5	2
100	**WSX445-100B10AR**	★	Y	10	Extra Fine	112.9	50	32	1.8	5	2
125	**WSX445-125B06AR**	★	Y	6	Coarse	137.9	63	40	3.4	5	2
125	**WSX445-125B08AR**	★	Y	8	Fine	137.9	63	40	3.4	5	2
125	**WSX445-125B12AR**	★	Y	12	Extra Fine	137.9	63	40	3.2	5	2
160	**WSX445-160C07NR**	★	N	7	Coarse	172.9	63	40	4.9	5	3
160	**WSX445-160C10NR**	★	N	10	Fine	172.9	63	40	4.8	5	3
160	**WSX445-160C16NR**	★	N	16	Extra Fine	172.8	63	40	4.6	5	3
200	**WSX445-200C08NR**	★	N	8	Coarse	212.9	63	60	7.5	5	4
200	**WSX445-200C12NR**	★	N	12	Fine	212.9	63	60	7.4	5	4
200	**WSX445-200C20NR**	★	N	20	Extra Fine	212.8	63	60	7.2	5	4

■ARBOR TYPE LEFT HAND TOOL HOLDER

DC=mm size, DCON=mm size (mm)

DC	Order Number	Stock	★1 Coolant Thru	Number of Teeth	Pitch	DCX	LF	DCON	WT(kg)	APMX	Fig.
80	**WSX445-080A04AL**	★	Y	4	Coarse	92.9	50	27	1.3	5	1
100	**WSX445-100B05AL**	★	Y	5	Coarse	112.9	50	32	1.9	5	2
125	**WSX445-125B06AL**	★	Y	6	Coarse	137.9	63	40	3.4	5	2
160	**WSX445-160C07NL**	★	N	7	Coarse	172.9	63	40	4.9	5	3

★1 Y=Yes, N=No
Note 1) Set bolt not included.

Fig.3

ø160

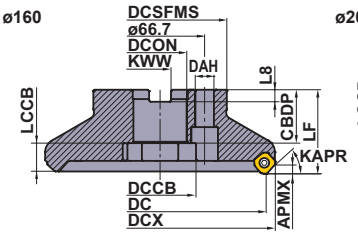
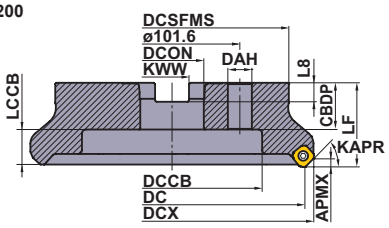
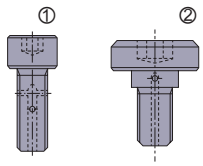


Fig.4

ø200



Right hand tool holder shown.

DC	Set Bolt	Geometry	
ϕ40	HSC08025H	①	① ② 
ϕ50	HSC10030H		
ϕ63	HSC10030H		
ϕ80	HSC12035H		
ϕ100	MBA16033H	②	
ϕ125	MBA20040H		
ϕ160	–	–	With Air / coolant through.
ϕ200	–		

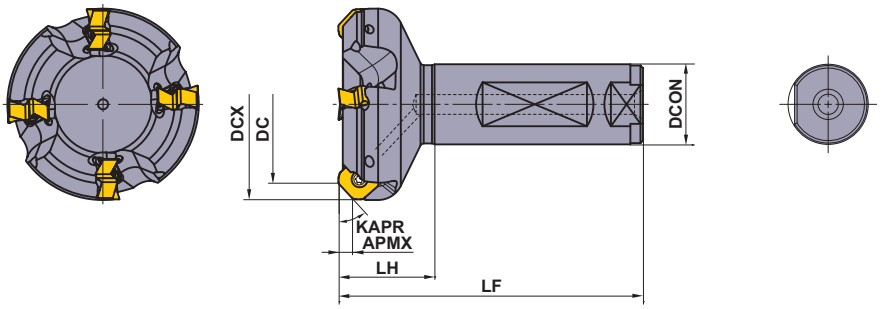
ARBOR TYPE MOUNTING DIMENSIONS

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
16	40	**WSX445-040A03AR**	18	9	14	25	37	8.4	5.6	1
16	40	**WSX445-040A04AR**	18	9	14	25	37	8.4	5.6	1
22	50	**WSX445-050A03AR**	20	11	17	27	47	10.4	6.3	1
22	50	**WSX445-050A04AR**	20	11	17	27	47	10.4	6.3	1
22	50	**WSX445-050A05AR**	20	11	17	27	47	10.4	6.3	1
22	63	**WSX445-063A04AR**	20	11	17	27	50	10.4	6.3	1
22	63	**WSX445-063A05AR**	20	11	17	27	50	10.4	6.3	1
22	63	**WSX445-063A06AR**	20	11	17	27	50	10.4	6.3	1
27	80	**WSX445-080A04AR**	23	13	20	34	56	12.4	7	1
27	80	**WSX445-080A06AR**	23	13	13	34	56	12.4	7	1
27	80	**WSX445-080A08AR**	23	13	20	34	56	12.4	7	1
32	100	**WSX445-100B05AR**	26	26	45	32	78	14.4	8	2
32	100	**WSX445-100B07AR**	26	26	45	32	78	14.4	8	2
32	100	**WSX445-100B10AR**	26	26	45	32	78	14.4	8	2
40	125	**WSX445-125B06AR**	28	30	56	40	89	16.4	9	2
40	125	**WSX445-125B08AR**	28	30	56	40	89	16.4	9	2
40	125	**WSX445-125B12AR**	28	30	56	40	89	16.4	9	2
40	160	**WSX445-160C07NR**	40	–	56	–	100	16.4	9	3
40	160	**WSX445-160C10NR**	40	–	56	–	100	16.4	9	3
40	160	**WSX445-160C16NR**	40	–	56	–	100	16.4	9	3
60	200	**WSX445-200C08NR**	32	–	135	–	160	25.7	14.22	4
60	200	**WSX445-200C12NR**	32	–	135	–	160	25.7	14.22	4
60	200	**WSX445-200C20NR**	32	–	135	–	160	25.7	14.22	4

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
27	80	**WSX445-080A04AL**	23	13	20	34	56	12.4	7	1
32	100	**WSX445-100B05AL**	26	26	45	32	78	14.4	8	2
40	125	**WSX445-125B06AL**	28	30	56	40	89	16.4	9	2
40	160	**WSX445-160C07NL**	40	–	56	–	100	16.4	9	3



Right hand tool holder only.

■SHANK TYPE

(inch)

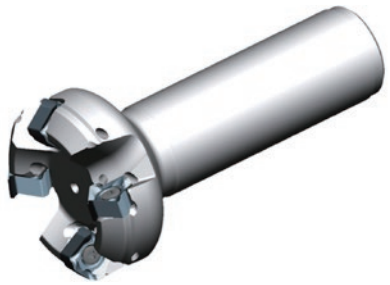
Type	Order Number	Stock R	∗1 Coolant Thru	Number of Teeth	DC	DCX	LF	DCON	LH	WT (lbs)	APMX
Coarse Pitch	**WSX445UR2403FA20M**	●	Y	3	1.500	2.005	4.750	1.250	1.500	1.698	.197
	WSX445UR3203FA20M	●	Y	3	2.000	2.506	4.750	1.250	1.500	2.050	.197
	WSX445UR4004FA20M	●	Y	4	2.500	3.006	4.750	1.250	1.500	2.469	.197
	WSX445UR4804FA20M	●	Y	4	3.000	3.506	4.750	1.250	1.500	2.976	.197
Fine Pitch	**WSX445UR2404FA20M**	●	Y	4	1.500	2.005	4.750	1.250	1.500	1.631	.197
	WSX445UR3204FA20M	●	Y	4	2.000	2.506	4.750	1.250	1.500	1.984	.197
	WSX445UR4005FA20M	●	Y	5	2.500	3.006	4.750	1.250	1.500	2.381	.197
	WSX445UR4806FA20M	●	Y	6	3.000	3.506	4.750	1.250	1.500	2.844	.197

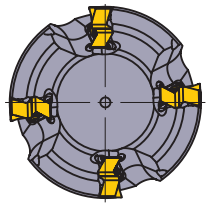
∗1 Y=Yes, N=No

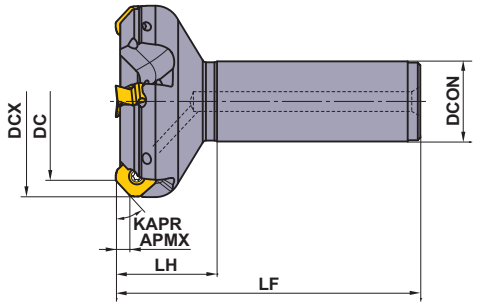
SPARE PARTS

Arbor Type	∗ Clamp Screw	Wrench (Insert)
WSX445	TPS4R	TIP15W

∗ Clamp Torque (lbf-in) : TPS4R=31







Right hand tool holder only.

Metric Standard

■STRAIGHT SHANK TYPE

(mm)

Type	Order Number	Stock R	✶1 Coolant Thru	Number of Teeth	DC	DCX	LF	DCON	LH	WT (kg)	APMX
Coarse Pitch	**WSX445R4003SA32M**	★	Y	3	40	52.8	125	32	40	0.84	5
	WSX445R5003SA32M	★	Y	3	50	62.9	125	32	40	0.98	5
	WSX445R6304SA32M	★	Y	4	63	75.9	125	32	40	1.18	5
	WSX445R8004SA32M	★	Y	4	80	92.9	125	32	40	1.51	5
Fine Pitch	**WSX445R4004SA32M**	★	Y	4	40	52.8	125	32	40	0.81	5
	WSX445R5004SA32M	★	Y	4	50	62.9	125	32	40	0.95	5
	WSX445R6305SA32M	★	Y	5	63	75.9	125	32	40	1.15	5
	WSX445R8006SA32M	★	Y	6	80	92.9	125	32	40	1.45	5

✶1 Y=Yes, N=No

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

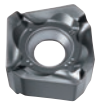
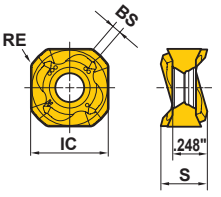
INSERTS WITH BREAKER

(inch)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting
✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Hand	Edge Preparation	Coated									Cermet	Carbide		IC	S	BS	RE	Geometry
					MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP20RT	MX3030	TF15						
	**SNGU140812ANFR-L**	G	R	F											●		.551	.331	.059	.047	
	SNGU140812ANER-L	G	R	E	●	●	●	●	●	●	●	●	●	●			.551	.331	.059	.047	
	SNGU140812ANER-M	G	R	E	●	●	●	●	●	●	●	●	●	●			.551	.331	.059	.047	
	SNMU140812ANER-M	M	R	E	●	●	●	●	●	●	●	●	●	●			.551	.331	.059	.047	
	SNMU140812ANER-R	M	R	E	●	●	●					●	●				.551	.331	.059	.047	
	SNMU140812ANER-H	M	R	E	●	●	●					●	●				.551	.331	.059	.047	
	SNGU140812ANFL-L	G	L	F											●		.551	.331	.059	.047	
	SNGU140812ANEL-L	G	L	E	●	●	●					●		●			.551	.331	.059	.047	
	SNGU140812ANEL-M	G	L	E	●	●	●					●		●			.551	.331	.059	.047	
	SNMU140812ANEL-M	M	L	E	●	●	●					●		●			.551	.331	.059	.047	
	SNMU140812ANEL-R	M	L	E	●	●	●					●					.551	.331	.059	.047	

Right hand insert shown.

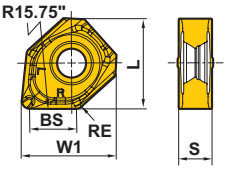
WIPER INSERTS

(inch)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting
✣ : Unstable Cutting

Edge Preparation : **E :** Round

Shape	Order Number	Class	Edge Preparation	Coated			Cermet	L	W1	S	BS	RE	Geometry
				MC5020	MP6120	VP15TF	MX3020						
	WNGU1406ANEN8C-M	G	E	●	●	●	●	.664	.664	.236	.315	.039	

■ Instructions for Use of Wiper Inserts

Fig.1

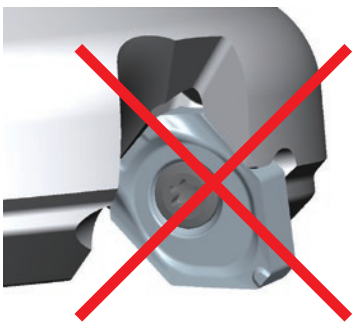


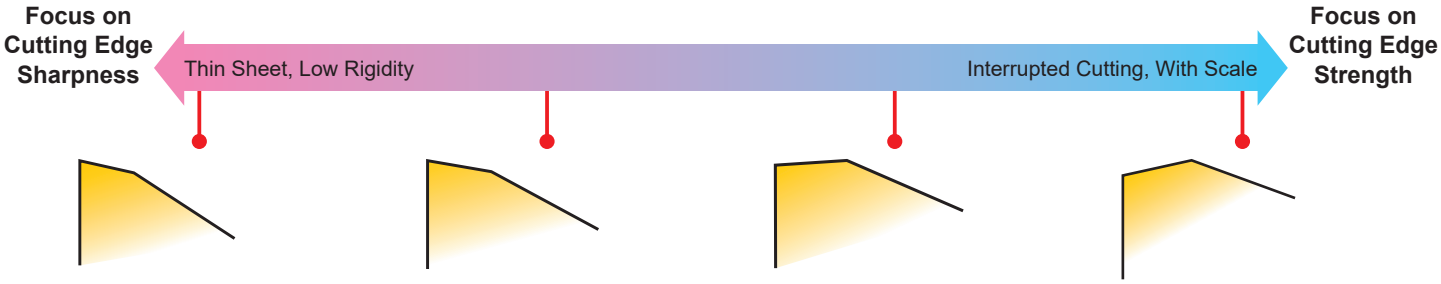
Fig.2

Wiper inserts for WSX445 are two-cornered. Please set as shown in Fig.1.
Excellent surface finish can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than .315 IPR.

● : **USA Stock**
<10 inserts in one case>

Breaker System

Breaker Series for Varied Cutting Conditions



L Breaker

Focus on cutting edge sharpness
Low resistance type

- For machining difficult-to-cut materials
- For when the machine or the workpiece rigidity is low

M Breaker

1st Recommendation
All-around

- For general cutting

R Breaker

For unstable applications
Reinforced edge type

- For interrupted cutting

H Breaker

For demanding applications
Reinforced edge type

- For heavy interrupted cutting

Workpiece Material	Cutting Conditions		
	Light Cutting	General Cutting	Heavy Cutting
P	L	M	R, H
M	L	M	
K	L	M	R, H
N	L		
S	L	M	
H		M	R, H

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting Condition

Workpiece Material		Hardness	1st Recommendation	2nd Recommendation	**vc** (SFM)	Finish Cutting	
						fz (IPT)	**ap**
P						L Breaker	
	Mild Steel	≤180HB	MP6120	VP15TF	820 (655—985)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	785 (620—950)	.006 (.004—.008)	≤.039
			MX3030	—	590 (425—755)	.006 (.004—.008)	≤.039
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	720 (560—885)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	655 (490—820)	.006 (.004—.008)	≤.039
			MX3030	—	490 (395—590)	.006 (.004—.008)	≤.039
	Alloy Tool Steel	≤ 350HB (Annealing)	MP6120	VP15TF	720 (560—885)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	655 (490—820)	.006 (.004—.008)	≤.039
			MX3030	—	490 (395—590)	.006 (.004—.008)	≤.039
	Pre-Hardened Steel	35—45HRC	MP6120	VP15TF	460 (330—590)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	395 (295—490)	.006 (.004—.008)	≤.039
M						L Breaker	
	Austenitic Stainless Steel	≤200HB	MP7130	VP15TF	655 (490—820)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	655 (490—820)	.006 (.004—.008)	≤.039
			MX3030	—	425 (330—590)	.006 (.004—.008)	≤.039
	Austenitic Stainless Steel	>200HB	MP7130	VP15TF	560 (395—720)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	560 (395—720)	.006 (.004—.008)	≤.039
	Duplex Stainless Steel	≤ 280HB	MP7130	VP15TF	525 (360—690)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	525 (360—690)	.006 (.004—.008)	≤.039
	Precipitation Hardening Stainless Steel	< 450HB	MP7130	VP15TF	490 (330—655)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	490 (330—655)	.006 (.004—.008)	≤.039
K						L Breaker	
	Gray Cast Iron	≤350MPa	MC5020	—	720 (655—885)	.006 (.004—.008)	≤.039
			VP15TF	—	590 (425—820)	.006 (.004—.008)	≤.039
			VP20RT	—	560 (395—785)	.006 (.004—.008)	≤.039
			MX3030	—	490 (395—590)	.006 (.004—.008)	≤.039
	Ductile Cast Iron	≤450MPa	MC5020	—	655 (590—820)	.006 (.004—.008)	≤.039
			VP15TF	VP20RT	525 (360—785)	.006 (.004—.008)	≤.039
	Ductile Cast Iron	≤800MPa	MC5020	—	655 (590—820)	.006 (.004—.008)	≤.039
			VP15TF	—	525 (360—785)	.006 (.004—.008)	≤.039
			VP20RT	—	490 (330—655)	.006 (.004—.008)	≤.039
H						M Breaker	
	Hardened Steel	40—55HRC	VP15TF	—	165 (100—230)	.002 (.002—.004)	≤.039
	Hardened Steel	55—62HRC	VP15TF	—	130 (65—165)	.002 (.002—.004)	≤.039

Note 1) Refer to the table above and set the cutting conditions to match the application.
Note 2) Wet cutting is recommended, when focusing on the surface finish. (Life is lower than dry cutting.)

(inch)

	Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
	fz (IPT)	**ap**	**fz** (IPT)	**ap**	**fz** (IPT)	**ap**	**fz** (IPT)	**ap**
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	L,M Breaker		M Breaker					
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	—	—	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	M,R Breaker		R,H Breaker					
	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting Condition

	Workpiece Material	Hardness	1st Recommendation	2nd Recommendation	vc (SFM)	Finish Cutting fz (IPT)	Finish Cutting ap
P						L Breaker	
	Mild Steel	≤ 180HB	MP6120	VP15TF	490 (330—655)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	490 (330—655)	.006 (.004—.008)	≤.039
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	395 (260—525)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	395 (260—525)	.006 (.004—.008)	≤.039
	Alloy Tool Steel	≤ 350HB (Annealing)	MP6120	VP15TF	395 (260—525)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	395 (260—525)	.006 (.004—.008)	≤.039
	Pre-Hardened Steel	35—45HRC	MP6120	VP15TF	330 (260—395)	.006 (.004—.008)	≤.039
			MP6130	VP20RT	330 (260—395)	.006 (.004—.008)	≤.039
M						L Breaker	
	Austenitic Stainless Steel	≤ 200HB	MP7130	VP15TF	425 (260—590)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	425 (260—590)	.006 (.004—.008)	≤.039
	Austenitic Stainless Steel	> 200HB	MP7130	VP15TF	330 (260—490)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	330 (260—490)	.006 (.004—.008)	≤.039
	Duplex Stainless Steel	≤ 280HB	MP7130	VP15TF	330 (260—490)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	330 (260—490)	.006 (.004—.008)	≤.039
	Precipitation Hardening Stainless Steel	< 450HB	MP7130	VP15TF	295 (165—460)	.006 (.004—.008)	≤.039
			MP7140	VP20RT	295 (165—460)	.006 (.004—.008)	≤.039
K						L Breaker	
	Gray Cast Iron	≤350MPa	MC5020	—	590 (525—655)	.006 (.004—.008)	≤.039
			VP15TF	VP20RT	425 (330—525)	.006 (.004—.008)	≤.039
	Ductile Cast Iron	≤450MPa	MC5020	—	590 (525—655)	.006 (.004—.008)	≤.039
			VP15TF	VP20RT	425 (330—525)	.006 (.004—.008)	≤.039
	Ductile Cast Iron	≤ 800MPa	MC5020	—	590 (525—655)	.006 (.004—.008)	≤.039
			VP15TF	VP20RT	360 (260—460)	.006 (.004—.008)	≤.039
N						L Breaker	
	Aluminum Alloys	—	TF15	—	1640 (655—3280)	.006 (.004—.008)	≤.039
S						L Breaker	
	Titanium Alloys	—	MP9120	VP15TF	165 (130—195)	.002 (.002—.004)	≤.039
			MP9130	VP20RT	165 (130—195)	.002 (.002—.004)	≤.039
	Heat Resistant Alloys	—	MP9120	VP15TF	130 (65—165)	.002 (.002—.004)	≤.039
			MP9130	VP20RT	130 (65—165)	.002 (.002—.004)	≤.039

Note 1) Refer to the table above and set the cutting conditions to match the application.
Note 2) Wet cutting is recommended, when focusing on the surface finish. (Life is lower than dry cutting.)

(inch)

	Light Cutting		Medium Cutting		Rough Cutting		Heavy Cutting	
	fz (IPT)	**ap**	**fz** (IPT)	**ap**	**fz** (IPT)	**ap**	**fz** (IPT)	**ap**
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	L,M Breaker		M Breaker					
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	—	—	—	—
	L,M Breaker		M Breaker		M,R Breaker		R,H Breaker	
	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	.006 (.004—.008)	≤.079	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	L Breaker		L Breaker		L Breaker		L Breaker	
	.006 (.004—.008)	≤.079	.008 (.006—.010)	≤.118	.008 (.006—.010)	≤.157	.010 (.008—.012)	≤.197
	L,M Breaker		M Breaker					
	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—
	.002 (.002—.004)	≤.059	.004 (.002—.006)	≤.079	—	—	—	—

FACE MILLING
<GENERAL CUTTING>

45° KAPR

ASX445

P M K N S H

Fig.1
ø2"
ø2.5"

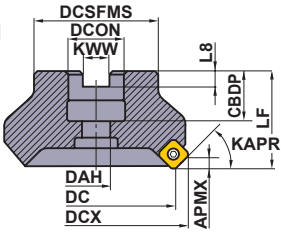


Fig.2
ø3"
ø4"
ø5"
ø6"

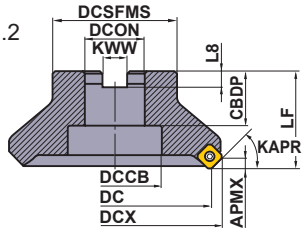
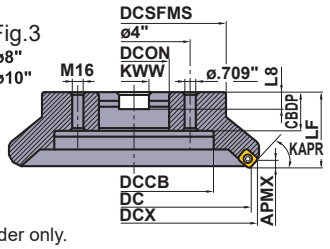


Fig.3
ø8"
ø10"

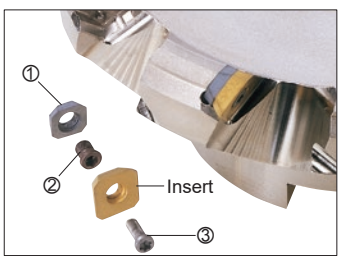


Right hand tool holder only.

■ ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	APMX (inch)	WT (lbs)	Fig.
Coarse Pitch	ASX445R2504	●	4	2.500	3.009	1.575	.750	.748	.415	—	1.969	.313	.187	.236	1.5	1
	ASX445R0304C	●	4	3.000	3.520	1.969	1.000	1.024	—	1.496	2.205	.375	.219	.236	2.4	2
	ASX445R0405E	●	5	4.000	4.518	1.969	1.500	1.378	—	2.362	3.150	.625	.375	.236	4.0	2
	ASX445R0506E	●	6	5.000	5.513	2.480	1.500	1.378	—	2.362	3.150	.625	.375	.236	6.6	2
	ASX445R0607E	●	7	6.000	6.511	2.480	1.500	1.378	—	2.362	3.937	.625	.375	.236	10.4	2
	ASX445R0808M	●	8	8.000	8.509	2.480	2.500	1.378	—	5.512	6.890	1.000	.560	.236	17.4	3
	ASX445R1010M	●	10	10.000	10.508	2.480	2.500	1.378	—	7.087	8.661	1.000	.560	.236	28.6	3
Fine Pitch	ASX445R0204	●	4	2.000	2.513	1.575	.750	.748	.415	—	1.772	.313	.187	.236	.9	1
	ASX445R2505	●	5	2.500	3.009	1.575	.750	.748	.415	—	1.969	.313	.187	.236	1.5	1
	ASX445R0306C	●	6	3.000	3.520	1.969	1.000	1.024	—	1.496	2.205	.375	.219	.236	2.2	2
	ASX445R0407E	●	7	4.000	4.518	1.969	1.500	1.378	—	2.362	3.150	.625	.375	.236	3.7	2
	ASX445R0508E	●	8	5.000	5.513	2.480	1.500	1.378	—	2.362	3.150	.625	.375	.236	6.2	2
	ASX445R0610E	●	10	6.000	6.511	2.480	1.500	1.378	—	2.362	3.937	.625	.375	.236	10.1	2
	ASX445R0812M	●	12	8.000	8.509	2.480	2.500	1.378	—	5.512	6.890	1.000	.560	.236	17.0	3
	ASX445R1014M	●	14	10.000	10.508	2.480	2.500	1.378	—	7.087	8.661	1.000	.560	.236	28.2	3
Extra Fine Pitch	ASX445R0205	●	5	2.000	2.513	1.575	.750	.748	.415	—	1.772	.313	.187	.236	.9	1
	ASX445R0308C	●	8	3.000	3.520	1.969	1.000	1.024	—	1.496	2.205	.375	.219	.236	2.2	2
	ASX445R0410E	●	10	4.000	4.518	1.969	1.500	1.378	—	2.362	3.150	.625	.375	.236	3.8	2
	ASX445R0512E	●	12	5.000	5.513	2.480	1.500	1.378	—	2.362	3.150	.625	.375	.236	6.4	2
	ASX445R0616E	●	16	6.000	6.511	2.480	1.500	1.378	—	2.362	3.937	.625	.375	.236	10.3	2
	ASX445R0820M	●	20	8.000	8.509	2.480	2.500	1.378	—	5.512	6.890	1.000	.560	.236	17.2	3
	ASX445R1024M	●	24	10.000	10.508	2.480	2.500	1.378	—	7.087	8.661	1.000	.560	.236	28.4	3

Note 1) Set bolt not included.



SPARE PARTS

Tool Holder Number	① Shim	② Shim Screw *	③ Insert Screw *	Wrench (Insert)	Wrench (Shim)
ASX445 Type	STASX445N	WCS503507H	TPS35	TIP15T	HKY35R

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

Metric Standard

For inch arbors

Fig.1

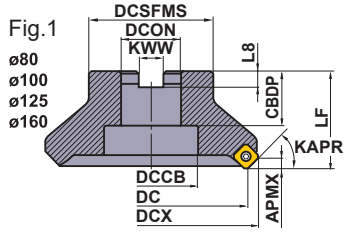


Fig.2

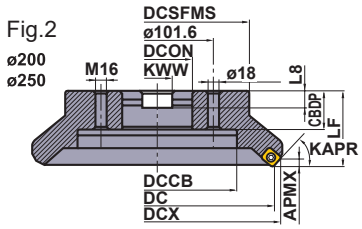
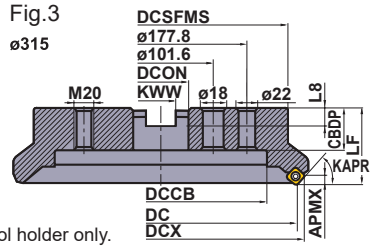


Fig.3



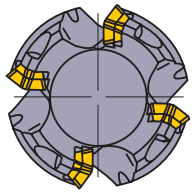
Right hand tool holder only.

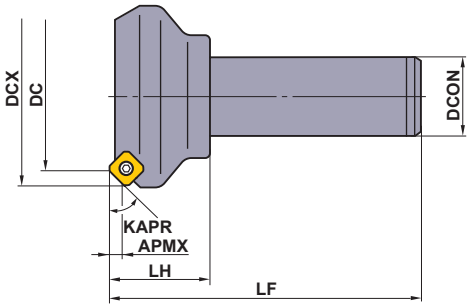
■ ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	DC	DCX	LF	DCON	CBDP	DCCB	DCSFMS	KWW	L8	APMX (mm)	WT (kg)	Fig.
				Dimensions (mm) [inch]											
Coarse Pitch	ASX445R08004C	★	4	80	93.2	50	25.4 [1.0"]	26	38	56	9.5	6	6	1.1	1
	ASX445R10005D	★	5	100	113.2	50	31.75 [1.25"]	32	45	70	12.7	8	6	1.8	1
	ASX445R12506E	★	6	125	138.0	63	38.1 [1.5"]	35	60	80	15.9	10	6	2.9	1
	ASX445R16007F	★	7	160	173.0	63	50.8 [2.0"]	38	80	100	19.1	11	6	4.7	1
	ASX445R20008K	★	8	200	212.9	63	47.625 [1.875"]	35	140	175	25.4	14.22	6	7.9	2
	ASX445R25010K	★	10	250	262.9	63	47.625 [1.875"]	35	180	220	25.4	14.22	6	12.9	2
	ASX445R31514P	★	14	315	327.9	63	47.625 [1.875"]	40	245	285	25.4	14.22	6	22.4	3
Fine Pitch	ASX445R08006C	★	6	80	93.2	50	25.4 [1.0"]	26	38	56	9.5	6	6	1.0	1
	ASX445R10007D	★	7	100	113.2	50	31.75 [1.25"]	32	45	70	12.7	8	6	1.7	1
	ASX445R12508E	★	8	125	138.0	63	38.1 [1.5"]	35	60	80	15.9	10	6	2.8	1
	ASX445R16010F	★	10	160	173.0	63	50.8 [2.0"]	38	80	100	19.1	11	6	4.6	1
	ASX445R20012K	★	12	200	212.9	63	47.625 [1.875"]	35	140	175	25.4	14.22	6	7.8	2
	ASX445R25014K	★	14	250	262.9	63	47.625 [1.875"]	35	180	220	25.4	14.22	6	12.8	2
	ASX445R31518P	★	18	315	327.9	63	47.625 [1.875"]	40	245	285	25.4	14.22	6	22.2	3
Extra Fine Pitch	ASX445R08008C	★	8	80	93.2	50	25.4 [1.0"]	26	38	56	9.5	6	6	1.1	1
	ASX445R10010D	★	10	100	113.2	50	31.75 [1.25"]	32	45	70	12.7	8	6	1.8	1
	ASX445R12512E	★	12	125	138.0	63	38.1 [1.5"]	35	60	80	15.9	10	6	2.9	1
	ASX445R16016F	★	16	160	173.0	63	50.8 [2.0"]	38	80	100	19.1	11	6	4.7	1
	ASX445R20020K	★	20	200	212.9	63	47.625 [1.875"]	35	140	175	25.4	14.22	6	7.8	2
	ASX445R25024K	★	24	250	262.9	63	47.625 [1.875"]	35	180	220	25.4	14.22	6	12.8	2
	ASX445R31528P	★	28	315	327.9	63	47.625 [1.875"]	40	245	285	25.4	14.22	6	21.8	3

Note 1) Set bolt not included.

Metric Standard





Right hand tool holder only.

■ SHANK TYPE

Order Number	Stock R	Number of Teeth	DC	DCX	LF	DCON	LH	APMX (mm)
			Dimensions (mm)					
ASX445R503S32	★	3	50	63.0	125	32	40	6
ASX445R634S32	★	4	63	75.9	125	32	40	6
ASX445R804S32	★	4	80	93.2	125	32	40	6

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Metric Standard

For metric arbors

ø50, ø63

Over ø80

Fig.1
ø50
ø63

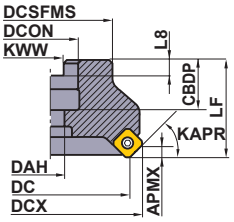


Fig.2
ø80
ø100

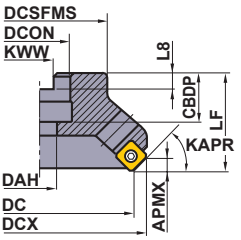


Fig.3
ø125

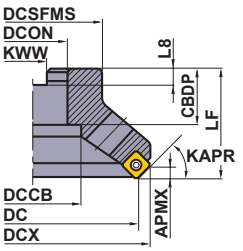


Fig.4
ø160

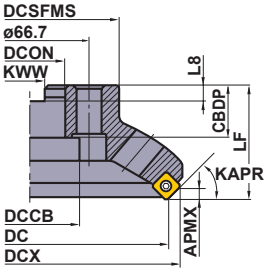
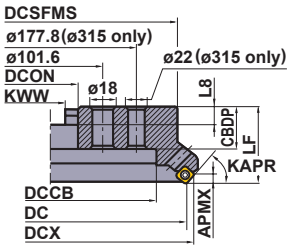


Fig.5
ø200
ø250
ø315



Right hand tool holder only.

■ ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	APMX (mm)	WT (kg)	Fig.
Coarse Pitch	**ASX445-050A03R**	★	3	50	63.0	40	22	20	11	17	45	10.4	6.3	6	0.5	1
	ASX445-063A04R	★	4	63	75.9	40	22	20	11	17	50	10.4	6.3	6	0.7	1
	ASX445-080A04R	★	4	80	93.2	50	27	23	13	37.84	56	12.4	7	6	1.0	2
	ASX445-100A05R	★	5	100	113.2	50	32	26	17	56.92	70	14.4	8	6	1.6	2
	ASX445-125B06R	★	6	125	138.0	63	40	32	–	56	80	16.4	9	6	2.4	3
	ASX445-160C07R	★	7	160	173.0	63	40	29	–	56	100	16.4	9	6	3.9	4
	ASX445-200C08R	★	8	200	212.9	63	60	32	–	135	155	25.7	14.22	6	6.7	5
	ASX445-250C10R	★	10	250	262.9	63	60	32	–	174	200	25.7	14.22	6	10.5	5
	ASX445-315C14R	★	14	315	327.9	80	60	57	–	256.8	285	25.7	14.22	6	22.4	5
Fine Pitch	**ASX445-050A04R**	★	4	50	63.0	40	22	20	11	17	45	10.4	6.3	6	0.4	1
	ASX445-063A05R	★	5	63	75.9	40	22	20	11	17	50	10.4	6.3	6	0.6	1
	ASX445-080A06R	★	6	80	93.2	50	27	23	13	37.84	56	12.4	7	6	0.9	2
	ASX445-100A07R	★	7	100	113.2	50	32	26	17	56.92	70	14.4	8	6	1.5	2
	ASX445-125B08R	★	8	125	138.0	63	40	32	–	56	80	16.4	9	6	2.3	3
	ASX445-160C10R	★	10	160	173.0	63	40	29	–	56	100	16.4	9	6	3.6	4
	ASX445-200C12R	★	12	200	212.9	63	60	32	–	135	155	25.7	14.22	6	5.8	5
	ASX445-250C14R	★	14	250	262.9	63	60	32	–	174	200	25.7	14.22	6	10.6	5
	ASX445-315C18R	★	18	315	327.9	80	60	57	–	256.8	285	25.7	14.22	6	22.2	5
Extra Fine Pitch	**ASX445-050A05R**	★	5	50	63.0	40	22	20	11	17	45	10.4	6.3	6	0.4	1
	ASX445-063A06R	★	6	63	75.9	40	22	20	11	17	50	10.4	6.3	6	0.6	1
	ASX445-080A08R	★	8	80	93.2	50	27	23	13	37.84	56	12.4	7	6	0.9	2
	ASX445-100A10R	★	10	100	113.2	50	32	26	17	56.92	70	14.4	8	6	1.5	2
	ASX445-125B12R	★	12	125	138.0	63	40	32	–	56	80	16.4	9	6	2.3	3
	ASX445-160C16R	★	16	160	173.0	63	40	29	–	56	100	16.4	9	6	3.6	4
	ASX445-200C20R	★	20	200	212.9	63	60	32	–	135	155	25.7	14.22	6	6.5	5
	ASX445-250C24R	★	24	250	262.9	63	60	32	–	174	200	25.7	14.22	6	10.3	5
	ASX445-315C28R	★	28	315	327.9	80	60	57	–	256.8	285	25.7	14.22	6	21.8	5

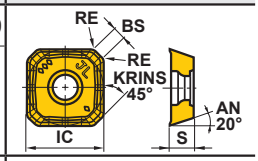
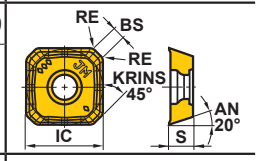
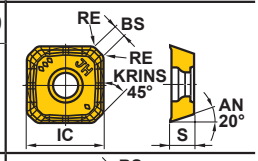
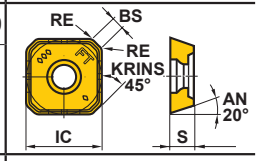
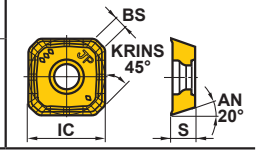
Note 1) Set bolt not included.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

INSERTS WITH BREAKER

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloys, Titanium Alloys	
H	Hardened Steel	

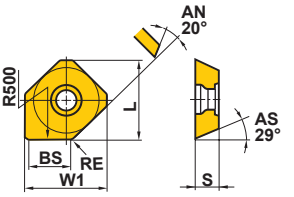
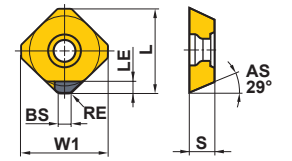
Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting
✠ : Unstable Cutting
Edge Preparation :
E : Round **F :** Sharp
S : Chamfer + Hone

Application	Shape	Order Number	Class	Edge Preparation	Coated											Cermet		Carbide		Dimensions (inch)				Geometry
					F7010	F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545		HTi10		IC	S	BS	RE	
Finish–Light Cutting	**JL** Breaker	**SEET13T3AGEN-JL**	E	E		●		●	●	●	●	●	●	●	●	●				.528	.156	.075	.059	
Light–Rough Cutting	**JM** Breaker	**SEMT13T3AGSN-JM**	M	S	●	●	●	●	●	●	●	●	●	●	●	●				.528	.156	.075	.059	
Medium–Heavy Cutting	**JH** Breaker	**SEMT13T3AGSN-JH**	M	S		●	●	●	●	●	●	●	●	●	●					.528	.156	.075	.059	
Roughing For Cast Iron	**FT** Breaker	**SEMT13T3AGSN-FT**	M	S			●													.528	.156	.075	.059	
For Aluminum Alloys	**JP** Breaker	**SEGT13T3AGFN-JP**	G	F														●		.528	.156	.087	—	

■ Instructions for using JP breaker handling

Note 1) The JP breaker has sharp cutting edge. Please wear gloves when installing to prevent.
Note 2) During machining of aluminum alloy, chip welding can occur that can cause fracturing of the insert.
Note 3) Wet cutting is recommended.

WIPER INSERTS

Workpiece Material			Coated		Cermet		Coated Cermet		Carbide		PCD		Dimensions(inch)						Geometry
Shape	Order Number	Class	Edge Preparation	MC5020	VP15TF	NX2525		VP25N		HTI05T		MD220	L	LE	W1	S	BS	RE	
	WEEW13T3AGER8C	E	E	●	●					●			.654	–	.649	.156	.295	.059	
	WEEW13T3AGTR8C	E	T			●		●					.654	–	.649	.156	.295	.059	
	NP-WEEW13T3AGFR3C	E	F									●	.654	.071	.649	.156	.118	.059	

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✠ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp
T : Chamfer

*Wiper inserts are single-cornered.
*PCD grade MD220 is for aluminum alloy.

■Instructions for use of wiper inserts

Fig.1

Fig.2

Note 1) These wiper inserts are single-cornered.
Note 2) Install the insert so that the cutting edge is located as shown in Fig. 1.
Do not install the wiper insert as shown in Fig. 2. (The insert may be damaged by a too heavy cutting load.)
Note 3) Recommended depth of cutting is ap=.008"-.020". (Be aware of the cutting load if the depth of cut is over the recommendation.)
Note 4) The major cutting edge of a wiper insert is set more inside than a general tooth.
This is to prevent heavy loads on the wiper insert. (To prevent fracture set the feed under .008 inch/t.)
Note 5) Excellent finished surface can be obtained with one wiper insert.
Note 6) When the feed per revolution is larger than the width of the wiper edge, install 2 or more wiper inserts equally inside the cutting body.

RECOMMENDED CUTTING CONDITIONS WHEN USING A WIPER INSERT

Workpiece Material	Grade	Recommended Cutting Speed (SFM)
P	VP25N	655 (260–820)
	VP15TF	590 (260–820)
M	VP15TF	390–885
K	MC5020	425–820
	VP15TF	
S	VP15TF	65–165
H	VP15TF	130–260
N	MD220	2130 (985–3280)

●Recommended depth of cut (ap) is .008"-.020" and feed per tooth (fz) is up to .008 inch/t.

● : USA Stock
<PCD wiper inserts are available in 1 piece in one case>

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (SFM)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (IPT)	Breaker	Feed per Tooth (IPT)	Breaker	Feed per Tooth (IPT)	Breaker
P	Mild Steel	≤180HB	**F7030**	920 (690—1150)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6120 VP15TF	820 (655—985)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6130	800 (620—950)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP30RT	755 (590—920)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			NX4545	590 (425—755)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	820 (655—985)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6120 VP15TF	720 (560—885)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6130	600 (480—740)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP30RT	490 (395—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			NX4545	490 (390—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
		280—350HB	**F7030**	590 (425—755)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6120 VP15TF	460 (330—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP6130	400 (300—490)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			VP30RT	330 (260—395)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			NX4545	330 (260—390)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	720 (560—885)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			MP7140 VP30RT	655 (490—820)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
			NX4545	490 (395—590)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	655 (400—820)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH FT**
			VP15TF NX4545	590 (425—826)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH**
		Tensile Strength ≥450MPa	**MC5020**	360 (260—490)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	.012 (.008—.016)	**JH FT**
N	Aluminum Alloys	—	**HTi10**	2130 (1000—3300)	.006 (.004—.008)	**JP**	.008 (.004—.012)	**JP**	.012 (.008—.016)	**JP**
S	Titanium Alloys	—	**MP9120 VP15TF**	165 (130—195)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			MP9130	140 (100—180)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
	Heat Resistant Alloys	—	**MP9120 VP15TF**	130 (65—165)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
			MP9130	110 (55—140)	.006 (.004—.008)	**JL**	.008 (.004—.012)	**JM**	—	—
H	Hardened Steel	40—55HRC	**VP15TF**	260 (195—330)	.004 (.002—.006)	**JL**	.006 (.004—.008)	**JM**	.008 (.004—.012)	**JH**

FACE MILLING
<GENERAL CUTTING>

AHX440S/475S/640S

Selection Reference Table (Cutting Edge Count and Cutting Conditions)

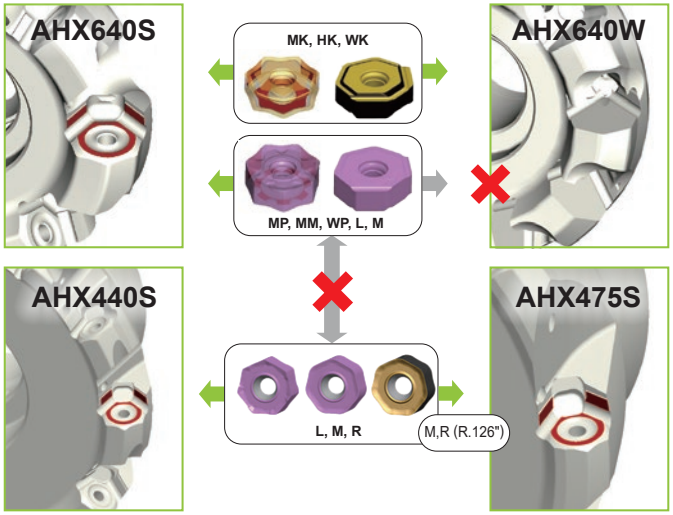
(inch)

DC	Type	Number of Teeth	AHX440S General Cutting			AHX475S High Feed Machining			AHX640S General Cutting		
			Stock	fr (IPR)	APMX	Stock	fr (IPR)	APMX	Stock	fr (IPR)	APMX
1.500" 40 mm	Fine Pitch	3	●	.024 — .047	.118						
	Extra Fine Pitch	4	●	.031 — .063	.118						
2.000" 50 mm"	Fine Pitch	4	●	.031 — .063	.118	●	.094 — .157	.063			
	Extra Fine Pitch	5	●	.039 — .079	.118	●	.118 — .197	.063			
	Super Extra Fine Pitch	6	●	.047 — .094	.118						
2.500" 63 mm	Coarse Pitch	4							●	.031 — .063	.236
	Fine Pitch	5	●	.039 — .079	.118	●	.118 — .197	.063	●	.039 — .079	.236
	Extra Fine Pitch	6	●	.047 — .094	.118	●	.142 — .236	.063			
	Super Extra Fine Pitch	8	●	.063 — .126	.118						
3.000" 80 mm"	Coarse Pitch	4							●	.031 — .063	.236
	Fine Pitch	6	●	.047 — .094	.118	●	.142 — .236	.063	●	.047 — .094	.236
	Extra Fine Pitch	8	●	.063 — .126	.118	●	.189 — .315	.063			
	Super Extra Fine Pitch	10	●	.079 — .157	.118						
4.000" 100 mm"	Coarse Pitch	5							●	.039 — .079	.236
	Fine Pitch	7	●	.055 — .110	.118	●	.165 — .276	.063	●	.055 — .110	.236
	Extra Fine Pitch	9				●	.213 — .354	.063			
		10	●	.079 — .157	.118						
	Super Extra Fine Pitch	12	●	.094 — .189	.118						
5.000" 125 mm	Coarse Pitch	6							●	.047 — .094	.236
	Fine Pitch	8	●	.063 — .126	.118	●	.189 — .315	.063	●	.063 — .126	.236
	Extra Fine Pitch	10				●	.236 — .394	.063			
		12	●	.094 — .189	.118						
	Super Extra Fine Pitch	14	●	.110 — .220	.118						
6.000" 160 mm	Coarse Pitch	7							●	.055 — .110	.236
	Fine Pitch	10	●	.079 — .157	.118	●	.236 — .394	.063	●	.079 — .157	.236
	Extra Fine Pitch	12				●	.283 — .472	.063			
		14	●	.110 — .220	.118						
	Super Extra Fine Pitch	16	●	.126 — .252	.118						
8.000" 200 mm	Coarse Pitch	8							●	.063 — .126	.236
	Fine Pitch	12							●	.094 — .189	.236

Note 1) fr: Feed rate per revolution (AHX475S: the feed rate per cutter (fz) will be limited by the cutting width ae. Please refer to page K073 for details.)
Note 2) APMX: Maximum depths of cut (AHX440S: the maximum depths of cut will vary depending on the breaker)
Note 3) The depths of cut and feed rate are identical to the recommended conditions for carbon steel and alloy steel.

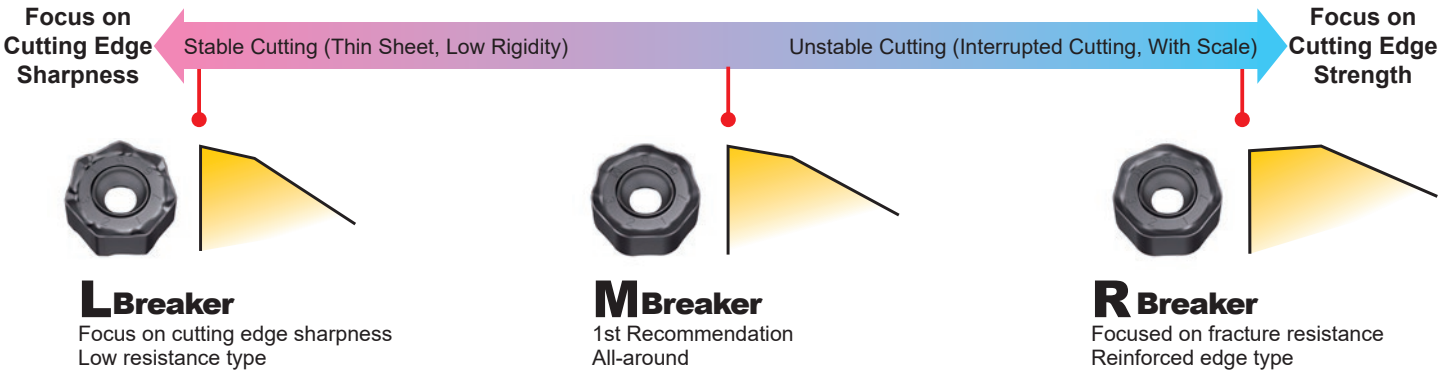
Compatibility with Inserts for AHX Series

The RE = .126 inch insert for use with AHX440S can be mounted on AHX475S.
All inserts for use with AHX640 can be mounted on AHX640S (note, however, that the set height will differ).
The inserts for mounting on AHX640W are the MK, HK, and WK breakers for casting.



Breaker System

Breaker Series for Varied Cutting Conditions



L Breaker
Focus on cutting edge sharpness
Low resistance type

M Breaker
1st Recommendation
All-around

R Breaker
Focused on fracture resistance
Reinforced edge type

Workpiece Material	Cutting Conditions		
	Stable Cutting	General Cutting	Unstable Cutting
P	AHX440S: L (With Wiper); M (R.031") (With Wiper); M (R.126") (Not with Wiper, Shared with AHX475); R (Not with Wiper, Shared with AHX475)		
	AHX640S: M; MP		
M	AHX440S: L (With Wiper); M (R.031") (With Wiper); M (R.126") (Not with Wiper); R (Not with Wiper)		
	AHX640S: MM		
K	AHX440S: L (With Wiper); M (R.031") (With Wiper); M (R.126") (Not with Wiper, Shared with AHX475); R (Not with Wiper, Shared with AHX475)		
	AHX640S: MK; HK		

Wiper Insert of AHX640S

Based on the number of inserts and the cutting conditions, use of wiper inserts can improve overall surface finishes.

P

WP + combination with **MP**
Right-hand 2 corners, left-hand 2 corners.

K

WK + combination with **MK**
Right-hand 2 corners, left-hand 2 corners.

FACE MILLING
<GENERAL CUTTING>

50° KAPR

AHX440S

P M K N S H

Fig. 1
ø1.500"
ø2.000"
ø2.500"
ø3.000"

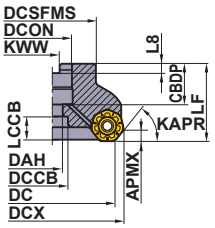
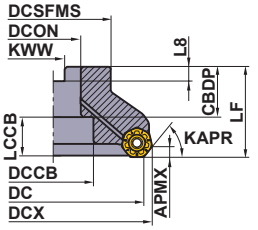
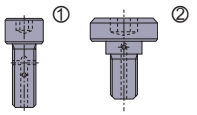


Fig. 2
ø4.000"
ø5.000"
ø6.000"



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ1.500	HSCU25011H	①
ϕ2.000	HSCU37513H	
ϕ2.500	HSCU50014H	
ϕ3.000		
ϕ4.000	MBAU75016H	②
ϕ5.000		
ϕ6.000		



With Air / coolant through.

DC=Inch size, DCON=Inch size (inch)

DC	Order Number	Stock	*1 Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(lbs)	*2 APMX
1.500	**AHX440SUR1503SA**	●	Y	3	1.750	1.829	.500	1	.7	.118, .138
	AHX440SUR1504SA	●	Y	4	1.750	1.829	.500	1	.6	.118, .138
2.000	**AHX440SUR0204AA**	●	Y	4	1.750	2.329	.750	1	1.0	.118, .138
	AHX440SUR0205AA	●	Y	5	1.750	2.329	.750	1	1.0	.118, .138
	AHX440SUR0206AA	●	Y	6	1.750	2.329	.750	1	.9	.118, .138
2.500	**AHX440SUR2505CA**	●	Y	5	2.000	2.829	1.000	1	1.8	.118, .138
	AHX440SUR2506CA	●	Y	6	2.000	2.829	1.000	1	1.7	.118, .138
	AHX440SUR2508CA	●	Y	8	2.000	2.829	1.000	1	1.6	.118, .138
3.000	**AHX440SUR0306CA**	●	Y	6	2.000	3.329	1.000	1	2.3	.118, .138
	AHX440SUR0308CA	●	Y	8	2.000	3.329	1.000	1	2.2	.118, .138
	AHX440SUR0310CA	●	Y	10	2.000	3.328	1.000	1	2.1	.118, .138
4.000	**AHX440SUR0407EA**	●	Y	7	2.500	4.329	1.500	2	5.1	.118, .138
	AHX440SUR0410EA	●	Y	10	2.500	4.329	1.500	2	5.0	.118, .138
	AHX440SUR0412EA	●	Y	12	2.500	4.329	1.500	2	4.9	.118, .138
5.000	**AHX440SUR0508EA**	●	Y	8	2.500	5.329	1.500	2	8.1	.118, .138
	AHX440SUR0512EA	●	Y	12	2.500	5.329	1.500	2	7.9	.118, .138
	AHX440SUR0514EA	●	Y	14	2.500	5.329	1.500	2	7.8	.118, .138
6.000	**AHX440SUR0610EA**	●	Y	10	2.500	6.329	1.500	2	10.3	.118, .138
	AHX440SUR0614EA	●	Y	14	2.500	6.329	1.500	2	10.1	.118, .138
	AHX440SUR0616EA	●	Y	16	2.500	6.329	1.500	2	10.1	.118, .138

*1 Y=Yes
*2 For NNMU130508ZER-L, APMX max = .118, for NNMU130508ZEN-M, NNMU130532ZEN-M & NNMU130532ZEN-R, APMX max = .138
Note 1) The above "APMX" will vary depending on the insert chip breaker.
Note 2) The cutter body includes a set bolt for an arbor.

Metric Standard

For inch arbors

Fig. 1
ø80

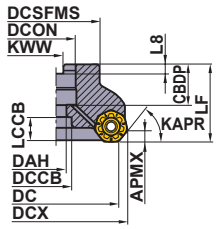
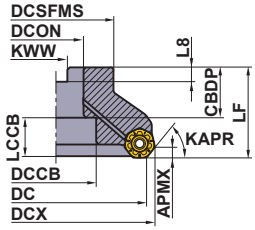


Fig. 2
ø100
ø125
ø160



Right hand tool holder only.

DC=mm size, DCON=Inch size (mm)

DC	Order Number	Stock	∗1 Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(kg)	∗2 APMX
80	**AHX440SR08006CA**	★	Y	6	50	88.4	25.4 [1.0"]	1	1.1	3.0, 3.5
	AHX440SR08008CA	★	Y	8	50	88.4	25.4 [1.0"]	1	1.1	3.0, 3.5
	AHX440SR08010CA	★	Y	10	50	88.4	25.4 [1.0"]	1	1.1	3.0, 3.5
100	**AHX440SR10007DA**	★	Y	7	50	108.4	31.75 [1.25"]	2	1.6	3.0, 3.5
	AHX440SR10010DA	★	Y	10	50	108.4	31.75 [1.25"]	2	1.6	3.0, 3.5
	AHX440SR10012DA	★	Y	12	50	108.3	31.75 [1.25"]	2	1.6	3.0, 3.5
125	**AHX440SR12508EA**	★	Y	8	63	133.4	38.1 [1.50"]	2	3.0	3.0, 3.5
	AHX440SR12512EA	★	Y	12	63	133.4	38.1 [1.50"]	2	3.0	3.0, 3.5
	AHX440SR12514EA	★	Y	14	63	133.3	38.1 [1.50"]	2	2.9	3.0, 3.5
160	**AHX440SR16010FA**	★	Y	10	63	168.4	50.8 [2.0"]	2	4.8	3.0, 3.5
	AHX440SR16014FA	★	Y	14	63	168.4	50.8 [2.0"]	2	4.6	3.0, 3.5
	AHX440SR16016FA	★	Y	16	63	168.4	50.8 [2.0"]	2	4.7	3.0, 3.5

∗1 Y=Yes
∗2 For NNMU130508ZER-L, APMX max = 3.0, for NNMU130508ZEN-M, NNMU130532ZEN-M & NNMU130532ZEN-R, APMX max = 3.5
Note 1) Set bolt not included.
Note 2) The above "APMX" will vary depending on the insert chip breaker.

SPARE PARTS

Tool Holder Number	∗	
	Clamp Screw	Wrench (Insert)
AHX440S	TS35R	TKY15T

∗ Clamp Torque (lbf-in) : TS35R=31

ISO13399	**➢ K003**
MOUNTING DIMENSION	**➢ K082, K084**
SPARE PARTS	**➢ M001**
TECHNICAL DATA	**➢ N001**

Metric Standard

For metric arbors

Fig. 1
ø40
ø50
ø63
ø80

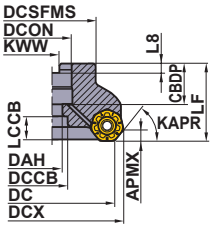


Fig. 2
ø100
ø125

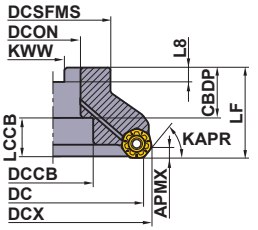
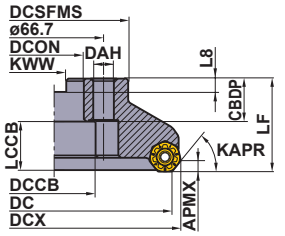


Fig. 3
ø160



Right hand tool holder only.

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	∗1 Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(kg)	∗2 APMX
40	**AHX440S-040A03AR**	★	Y	3	40	48.4	16	1	0.3	3.0, 3.5
	AHX440S-040A04AR	★	Y	4	40	48.4	16	1	0.2	3.0, 3.5
50	**AHX440S-050A04AR**	★	Y	4	40	58.4	22	1	0.4	3.0, 3.5
	AHX440S-050A05AR	★	Y	5	40	58.4	22	1	0.4	3.0, 3.5
	AHX440S-050A06AR	★	Y	6	40	58.4	22	1	0.4	3.0, 3.5
63	**AHX440S-063A05AR**	★	Y	5	40	71.4	22	1	0.6	3.0, 3.5
	AHX440S-063A06AR	★	Y	6	40	71.4	22	1	0.6	3.0, 3.5
	AHX440S-063A08AR	★	Y	8	40	71.4	22	1	0.5	3.0, 3.5
80	**AHX440S-080A06AR**	★	Y	6	50	88.4	27	1	1.1	3.0, 3.5
	AHX440S-080A08AR	★	Y	8	50	88.4	27	1	1.1	3.0, 3.5
	AHX440S-080A10AR	★	Y	10	50	88.4	27	1	1.1	3.0, 3.5
100	**AHX440S-100B07AR**	★	Y	7	50	108.4	32	2	1.6	3.0, 3.5
	AHX440S-100B10AR	★	Y	10	50	108.4	32	2	1.6	3.0, 3.5
	AHX440S-100B12AR	★	Y	12	50	108.3	32	2	1.6	3.0, 3.5
125	**AHX440S-125B08AR**	★	Y	8	63	133.4	40	2	3.0	3.0, 3.5
	AHX440S-125B12AR	★	Y	12	63	133.4	40	2	3.0	3.0, 3.5
	AHX440S-125B14AR	★	Y	14	63	133.3	40	2	2.9	3.0, 3.5
160	**AHX440S-160C10NR**	★	N	10	63	168.4	40	3	4.8	3.0, 3.5
	AHX440S-160C14NR	★	N	14	63	168.4	40	3	4.6	3.0, 3.5
	AHX440S-160C16NR	★	N	16	63	168.4	40	3	4.7	3.0, 3.5

∗1 Y=Yes N=No

∗2 For NNMU130508ZER-L, APMX max = 3.0, for NNMU130508ZEN-M, NNMU130532ZEN-M & NNMU130532ZEN-R, APMX max = 3.5

Note 1) Set bolt not included.

Note 2) The above "APMX" will vary depending on the insert chip breaker.

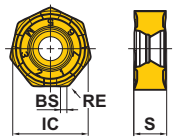
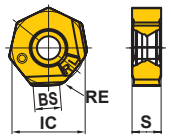
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

MOUNTING DIMENSION ➢ K084

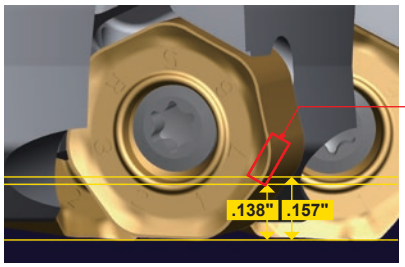
INSERTS

Workpiece Material			MP6120	MP6130	MP7130	MP7140	MC5020	VP15TF
	P	Steel	●	✱				●
	M	Stainless Steel			●	✱		●
	K	Cast Iron					●	●
	H	Hardened Steel						●

Cutting Conditions (Guide) :
● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting
Edge Preparation :
E : Round

Application	Shape	Order Number	Class	Edge Preparation	MP6120	MP6130	MP7130	MP7140	MC5020	VP15TF	IC	RE	BS	S	APMX	Geometry
Stable Cutting		**NNMU130508ZER-L**	M	E	●	●	●	●	●	★	.528	.031	.039	.227	.118	
General Cutting		**NNMU130508ZEN-M**	M	E	●	●	●	●	●	★	.528	.031	.039	.219	✱.138	
		NNMU130532ZEN-M	M	E	●	●	●	●	●	★	.528	.126	—	.219	✱.138	
Unstable Cutting		**NNMU130532ZEN-R**	M	E	●	●	●	●	●	★	.528	.126	—	.215	✱.157	
Finish Cutting	Wiper	**WNEU1305ZEN4C-M**	E	E	●				●	●	.528	.106	.157	.201	.020	

✱ When not using the Wiper, APMX = .138 inch



Corner R on Opposite Side

If using corner R on the opposite side, APMX = .157 inch
If not using the opposite corner, APMX = .138 inch

■Instructions for Use of Wiper Inserts

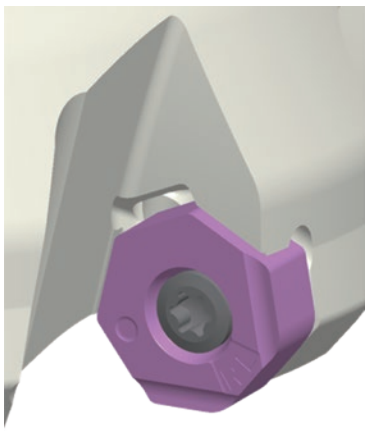


Fig.1

Fig.2

Note 1) The specifications for these wipers are right hand body 2 corners and left hand body 2 corners. Refer to Figure 1.
Note 2) Satisfactory finish surface can be achieved with one wiper insert.
However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

Dry Cutting

(inch)

	Workpiece Material	Hardness	Grade	vc (SFM)	fz (IPT)	ap
P	Mild Steel	≤180HB	**MP6120,VP15TF**	820 (655—985)	.012 (.008—.016)	≤.118
			MP6130	785 (620—950)	.012 (.008—.016)	≤.118
	Carbon Steel,Alloy Steel	180—280HB	**MP6120,VP15TF**	720 (560—885)	.012 (.008—.016)	≤.118
			MP6130	655 (490—820)	.012 (.008—.016)	≤.118
	Carbon Steel,Alloy Steel	280—350HB	**MP6120,VP15TF**	460 (330—590)	.012 (.008—.016)	≤.118
			MP6130	395 (295—490)	.012 (.008—.016)	≤.118
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120,VP15TF**	460 (330—590)	.006 (.004—.008)	≤.039
			MP6130	395 (295—490)	.006 (.004—.008)	≤.039
	Pre-hardened Steel	35—45HRC	**MP6120,VP15TF**	460 (330—590)	.006 (.004—.008)	≤.039
			MP6130	395 (295—490)	.006 (.004—.008)	≤.039
M	Austenitic Stainless Steel	≤200HB	**MP7130,VP15TF**	655 (490—820)	.008 (.004—.012)	≤.118
			MP7140	590 (395—755)	.008 (.004—.012)	≤.118
		> 200HB	**MP7130,VP15TF**	490 (330—655)	.008 (.004—.012)	≤.118
			MP7140	425 (260—590)	.008 (.004—.012)	≤.118
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7130,VP15TF**	655 (490—820)	.008 (.004—.012)	≤.118
			MP7140	590 (395—755)	.008 (.004—.012)	≤.118
		> 200HB	**MP7130,VP15TF**	490 (330—655)	.008 (.004—.012)	≤.118
			MP7140	425 (260—590)	.008 (.004—.012)	≤.118
	Two-phase Stainless Steel	≤280HB	**MP7130,VP15TF**	460 (330—590)	.006 (.002—.010)	≤.118
			MP7140	395 (260—525)	.006 (.002—.010)	≤.118
	Precipitation Hardening Stainless Steel	< 450HB	**MP7130,VP15TF**	425 (330—525)	.006 (.002—.010)	≤.118
			MP7140	360 (260—460)	.006 (.002—.010)	≤.118
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	720 (490—985)	.012 (.008—.016)	≤.118
			VP15TF	590 (425—755)	.012 (.008—.016)	≤.118
	Ductile Cast Ilon	Tensile Strength ≤450MPa	**MC5020**	655 (490—820)	.008 (.004—.012)	≤.118
			VP15TF	560 (395—720)	.008 (.004—.012)	≤.118
	Ductile Cast Ilon	Tensile Strength ≤800MPa	**MC5020**	560 (490—655)	.008 (.004—.012)	≤.118
			VP15TF	460 (330—590)	.008 (.004—.012)	≤.118
H	Hardened Steel	40—55HRC	**VP15TF**	260 (195—330)	.006 (.004—.008)	≤.039

Wet Cutting

(inch)

	Workpiece Material	Hardness	Grade	vc (SFM)	fz (IPT)	ap
M	Austenitic Stainless Steel	≤200HB	**MP7130,VP15TF**	410 (330—490)	.006 (.004—.008)	≤.118
			MP7140	330 (260—460)	.045 (.004—.008)	≤.118
		> 200HB	**MP7130,VP15TF**	330 (245—410)	.006 (.004—.008)	≤.118
			MP7140	260 (180—345)	.006 (.004—.008)	≤.118
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7130,VP15TF**	410 (330—490)	.006 (.004—.008)	≤.118
			MP7140	330 (260—460)	.006 (.004—.008)	≤.118
		> 200HB	**MP7130,VP15TF**	330 (245—410)	.006 (.004—.008)	≤.118
			MP7140	260 (180—345)	.006 (.004—.008)	≤.118
	Two-phase Stainless Steel	≤280HB	**MP7130,VP15TF**	260 (195—330)	.004 (.002—.006)	≤.118
			MP7140	195 (130—260)	.004 (.002—.006)	≤.118
	Precipitation Hardening Stainless Steel	< 450HB	**MP7130,VP15TF**	230 (165—295)	.004 (.002—.006)	≤.118
			MP7140	165 (100—230)	.004 (.002—.006)	≤.118

Note 1) Refer to the above table and set up cutting conditions according to cutting applications.
Note 2) When placing emphasis on surface finish quality, wet cutting is recommended. (tool life is lowered as compared to dry cutting)
Note 3) The recommended depth of cut differs according to insert geometry.
Note 4) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.
Note 5) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)

Cutting Conditions with Wiper Insert

(inch)

	Workpiece Material	Hardness	Grade	vc (SFM)	fz (IPT)	ap
P	Mild Steel	≤180HB	**MP6120,VP15TF**	820 (655—985)	.012 (.008—.016)	≤.020
	Carbon Steel,Alloy Steel	180—280HB	**MP6120,VP15TF**	720 (560—885)	.012 (.008—.016)	≤.020
		280—350HB	**MP6120,VP15TF**	460 (330—590)	.012 (.008—.016)	≤.020
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120,VP15TF**	460 (330—590)	.006 (.004—.008)	≤.020
	Pre-hardened Steel	35—45HRC	**MP6120,VP15TF**	460 (330—590)	.006 (.004—.008)	≤.020
M	Austenitic Stainless Steel	≤200HB	**VP15TF**	410 (330—490)	.006 (.004—.008)	≤.020
		> 200HB	**VP15TF**	330 (245—410)	.006 (.004—.008)	≤.020
	Ferritic and Maltensitic Stainless Steel	≤200HB	**VP15TF**	410 (330—490)	.006 (.004—.008)	≤.020
		> 200HB	**VP15TF**	330 (245—410)	.006 (.004—.008)	≤.020
	Two-phase Stainless Steel	≤280HB	**VP15TF**	260 (195—330)	.004 (.002—.006)	≤.020
	Precipitation Hardening Stainless Steel	< 450HB	**VP15TF**	230 (165—295)	.004 (.002—.006)	≤.020
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	1050 (820—1310)	.012 (.008—.016)	≤.020
			VP15TF	720 (490—985)	.012 (.008—.016)	≤.020
	Ductile Cast Ilon	Tensile Strength ≤450MPa	**MC5020**	820 (655—985)	.008 (.004—.012)	≤.020
			VP15TF	655 (490—820)	.008 (.004—.012)	≤.020
		Tensile Strength ≤800MPa	**MC5020**	720 (655—820)	.008 (.004—.012)	≤.020
			VP15TF	560 (490—655)	.008 (.004—.012)	≤.020
H	Hardened Steel	40—55HRC	**VP15TF**	260 (195—330)	.006 (.004—.008)	≤.020

Note 1) Refer to the above table and set up cutting conditions according to cutting applications.
Note 2) When placing emphasis on surface finish quality, wet cutting is recommended. (tool life is lowered as compared to dry cutting)
Note 3) The recommended depth of cut differs according to insert geometry.
Note 4) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.
Note 5) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)

OPTIONAL PARTS

(inch)

Tool Holder Number	Set Bolt		Fig.	a	b	c	d	e	f	g	Geometry
	With Coolant Hole	Without Coolant Hole									
	Order Number	Order Number									
AHX440S-040A○○AR	HSC08025H	HSC08025	1	.512	M8×1.25	1.299	.315	.197	–	–	
AHX440S-050A○○AR	HSC10030H	HSC10030	1	.630	M10×1.5	1.575	.394	.236	–	–	
AHX440S-063A○○AR	HSC10030H	HSC10030	1	.630	M10×1.5	1.575	.394	.236	–	–	
AHX440S-080A○○AR	HSC12035H	HSC12035	1	.709	M12×1.75	1.850	.472	.394	–	–	
AHX440S-100B○○AR	MBA16033H	–	2	1.575	M16×2	1.693	.394	.551	.236	.906	
AHX440S-125B○○AR	MBA20040H	–	2	1.969	M20×2.5	2.126	.551	.669	.236	1.063	
AHX440S-160C○○NR	MBA20040H	–	2	1.969	M20×2.5	2.126	.551	.669	.236	1.063	
AHX440SR080○○CA	HSC12035H	HSC12035	1	.709	M12×1.75	1.850	.472	.394	–	–	
AHX440SR100○○DA	MBA16033H	–	2	1.575	M16×2	1.693	.394	.551	.236	.906	
AHX440SR125○○EA	MBA20040H	–	2	1.969	M20×2.5	2.126	.551	.669	.236	1.063	
AHX440SR160○○FA	MBA24045H	–	2	2.559	M24×3	2.323	.551	.669	.394	1.457	

Fig.1

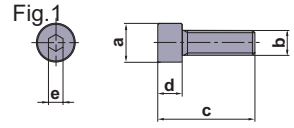
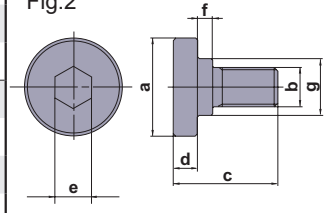


Fig.2



Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

FACE MILLING

<HIGH FEED CUTTING FOR CAST IRON>

15° KAPR

F

AHX475S

P | M | K | N | S | H

Fig.1

ø2.000"
ø2.500"
ø3.000"
ø4.000"

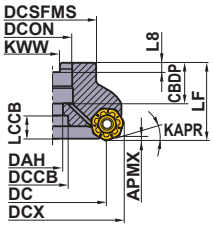
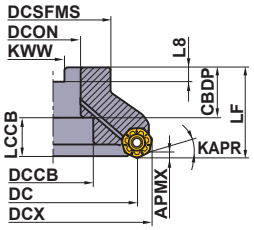


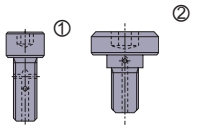
Fig.2

ø5.000"
ø6.000"



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.000	HSCU37513H	①
ϕ2.500	HSCU50014H	①
ϕ3.000	HSCU50014H	①
ϕ4.000	MBAU75016H	②
ϕ5.000	MBAU75016H	②
ϕ6.000	MBAU75016H	②



With Air / coolant through.

DC = inch size, DCON = Inch size

(inch)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(lbs)	APMX
2.000	**AHX475SUR0204AA**	●	Y	4	2.000	2.616	.750	1	1.5	.063
	AHX475SUR0205AA	●	Y	5	2.000	2.616	.750	1	1.4	.063
2.500	**AHX475SUR2505CA**	●	Y	5	2.000	3.116	1.000	1	2.2	.063
	AHX475SUR2506CA	●	Y	6	2.000	3.116	1.000	1	2.2	.063
3.000	**AHX475SUR0306CA**	●	Y	6	2.000	3.614	1.000	1	3.2	.063
	AHX475SUR0308CA	●	Y	8	2.000	3.614	1.000	1	3.1	.063
	AHX475SUR0306DA	●	Y	6	2.500	3.614	1.250	1	4.1	.063
	AHX475SUR0308DA	●	Y	8	2.500	3.614	1.250	1	4.0	.063
4.000	**AHX475SUR0407EA**	●	Y	7	2.500	4.616	1.500	1	7.0	.063
	AHX475SUR0409EA	●	Y	9	2.500	4.616	1.500	1	6.9	.063
5.000	**AHX475SUR0508EA**	●	Y	8	2.500	5.616	1.500	2	8.8	.063
	AHX475SUR0510EA	●	Y	10	2.500	5.616	1.500	2	8.8	.063
6.000	**AHX475SUR0610FA**	●	Y	10	2.500	6.616	2.000	2	12.4	.063
	AHX475SUR0612FA	●	Y	12	2.500	6.616	2.000	2	12.5	.063

* Y=Yes

Note 1) The cutter body includes a set bolt for an arbor.

Fig.1

ø50
ø63
ø80
ø100

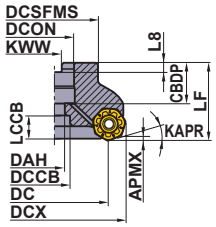
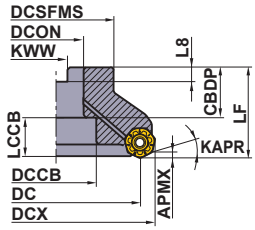


Fig.2

ø125
ø160



Right hand tool holder only.

Metric Standard

For inch arbors

DC = mm size, DCON = Inch size

(mm)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(kg)	APMX
80	**AHX475SR08006DA**	★	Y	6	63	95.6	31.75 [1.25"]	1	2.0	1.6
	AHX475SR08008DA	★	Y	8	63	95.6	31.75 [1.25"]	1	2.0	1.6
100	**AHX475SR10007DA**	★	Y	7	63	115.6	31.75 [1.25"]	1	3.2	1.6
	AHX475SR10009DA	★	Y	9	63	115.6	31.75 [1.25"]	1	3.2	1.6
125	**AHX475SR12508EA**	★	Y	8	63	140.6	38.1 [1.50"]	2	4.0	1.6
	AHX475SR12510EA	★	Y	10	63	140.6	38.1 [1.50"]	2	4.0	1.6
160	**AHX475SR16010FA**	★	Y	10	63	175.6	50.8 [2.0"]	2	5.5	1.6
	AHX475SR16012FA	★	Y	12	63	175.6	50.8 [2.0"]	2	5.5	1.6

* Y=Yes

Note 1) Set bolt not included.

Metric Standard

For metric arbors

DC = mm size, DCON = mm size

(mm)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(kg)	APMX
50	**AHX475S-050A04AR**	★	Y	4	50	65.7	22	1	0.6	1.6
	AHX475S-050A05AR	★	Y	5	50	65.7	22	1	0.6	1.6
63	**AHX475S-063A05AR**	★	Y	5	50	78.7	22	1	1.0	1.6
	AHX475S-063A06AR	★	Y	6	50	78.7	22	1	1.0	1.6
80	**AHX475S-080A06AR**	★	Y	6	50	95.6	27	1	1.6	1.6
	AHX475S-080A08AR	★	Y	8	50	95.6	27	1	1.6	1.6
100	**AHX475S-100A07AR**	★	Y	7	63	115.6	32	1	3.3	1.6
	AHX475S-100A09AR	★	Y	9	63	115.6	32	1	3.3	1.6
125	**AHX475S-125B08AR**	★	Y	8	63	140.6	40	2	4.0	1.6
	AHX475S-125B10AR	★	Y	10	63	140.6	40	2	4.0	1.6
160	**AHX475S-160B10AR**	★	Y	10	63	175.6	40	2	6.0	1.6
	AHX475S-160B12AR	★	Y	12	63	175.6	40	2	6.0	1.6

* Y=Yes

Note 1) Set bolt not included.

ISO13399	➢ K003
MOUNTING DIMENSION	➢ K082, K084
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

SPARE PARTS

Tool Holder Number	* Clamp Screw	Wrench (Insert)
AHX475S	TS35R	TKY15T

* Clamp Torque (lbf-in) : TS35R=31

OPTIONAL PARTS

(inch)

Tool Holder Number	Set Bolt		Fig.	Reference Dimensions							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
AHX475S-050A○○AR	HSC10030H	HSC10030	1	.630	M10×1.5	1.575	.394	.236	–	–	Fig.1
AHX475S-063A○○AR	HSC10030H	HSC10030	1	.630	M10×1.5	1.575	.394	.236	–	–	
AHX475S-080A○○AR	HSC12035H	HSC12035	1	.709	M12×1.75	2.244	.472	.394	–	–	
AHX475S-100B○○AR	HSC16040H	–	1	.945	M16×2	2.205	.630	.551	–	–	
AHX475S-125B○○AR	MBA20040H	–	2	1.969	M20×2.5	2.126	.551	.669	.236	1.063	Fig.2
AHX475S-160B○○AR	MBA20040H	–	2	1.969	M20×2.5	2.126	.551	.669	.236	1.063	
AHX475SR080○○DA	HSC16040H	–	1	.945	M16×2	2.205	.630	.551	–	–	
AHX475SR100○○DA	HSC16040H	–	1	.945	M16×2	2.205	.630	.551	–	–	
AHX475SR125○○EA	MBA20040H	–	2	1.969	M20×2.5	2.126	.551	.669	.236	1.063	
AHX475SR160○○FA	MBA24045H	–	2	2.559	M24×3	2.323	.551	.669	.394	1.457	

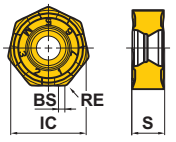
Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions.
The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.
Note 2) Internal coolant is necessary with the set bolt.

INSERTS

(mm)

Workpiece Material			P	K	M	S	H
	P	Steel	◐	✣		◐	
	K	Cast Iron			◐	◐	
	H	Hardened Steel				◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
Edge Preparation : E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated						Dimensions (mm)					Geometry
					MP6120	MP6130	MC5020	VP15TF			IC	RE	BS	S	APMX	
General Cutting		**NNMU130532ZEN-M**	M	E	●	●	●	★			.528	.126	–	.219	.063	
Unstable Cutting		**NNMU130532ZEN-R**	M	E	●	●	●	★			.528	.126	–	.215	.063	

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

Dry Cutting

(inch)

	Workpiece Material	Hardness	Grade	Breaker	vc (SFM)	fz (IPT)	ap	ae
P	Mild Steel	≤180HB	**MP6120**	**R**	490 (330—655)	.024	≤.063	≤0.5DC
			MP6120	**R**	490 (330—655)	.031	≤.063	0.5—0.8DC
			MP6120	**M**	490 (330—655)	.039	≤.063	0.8—1DC
			MP6130	**R**	425 (260—590)	.024	≤.063	≤0.5DC
			MP6130	**R**	425 (260—590)	.031	≤.063	0.5—0.8DC
			MP6130	**M**	425 (260—590)	.039	≤.063	0.8—1DC
	Carbon Steel,Alloy Steel	180—280HB	**MP6120**	**R**	425 (260—590)	.024	≤.063	≤0.5DC
			MP6120	**R**	425 (260—590)	.031	≤.063	0.5—0.8DC
			MP6120	**M**	425 (260—590)	.039	≤.063	0.8—1DC
			MP6130	**R**	360 (195—525)	.024	≤.063	≤0.5DC
			MP6130	**R**	360 (195—525)	.031	≤.063	0.5—0.8DC
			MP6130	**M**	360 (195—525)	.039	≤.063	0.8—1DC
	Carbon Steel,Alloy Steel	280—350HB	**MP6120**	**R**	330 (165—490)	.020	≤.063	≤0.5DC
			MP6120	**R**	330 (165—490)	.024	≤.063	0.5—0.8DC
			MP6120	**R**	330 (165—490)	.028	≤.063	0.8—1DC
			MP6130	**R**	260 (100—425)	.020	≤.063	≤0.5DC
			MP6130	**R**	260 (100—425)	.024	≤.063	0.5—0.8DC
			MP6130	**R**	260 (100—425)	.028	≤.063	0.8—1DC
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120**	**R**	330 (165—490)	.020	≤.063	≤0.5DC
			MP6120	**R**	330 (165—490)	.024	≤.063	0.5—0.8DC
			MP6120	**R**	330 (165—490)	.028	≤.063	0.8—1DC
			MP6130	**R**	260 (100—395)	.020	≤.063	≤0.5DC
			MP6130	**R**	260 (100—395)	.024	≤.063	0.5—0.8DC
			MP6130	**R**	260 (100—395)	.028	≤.063	0.8—1DC
	Pre-hardened Steel	35—45HRC	**MP6120**	**R**	330 (230—425)	.020	≤.063	≤0.5DC
			MP6120	**R**	330 (230—425)	.024	≤.063	0.5—0.8DC
			MP6120	**R**	330 (230—425)	.028	≤.063	0.8—1DC
			MP6130	**R**	260 (165—360)	.020	≤.063	≤0.5DC
			MP6130	**R**	260 (165—360)	.024	≤.063	0.5—0.8DC
			MP6130	**R**	260 (165—360)	.028	≤.063	0.8—1DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**R**	490 (330—655)	.024	≤.063	≤0.5DC
			MC5020	**R**	490 (330—655)	.031	≤.063	0.5—0.8DC
			MC5020	**M**	490 (330—655)	.039	≤.063	0.8—1DC
			VP15TF	**M**	395 (260—525)	.024	≤.063	≤0.5DC
			VP15TF	**M**	395 (260—525)	.031	≤.063	0.5—0.8DC
			VP15TF	**M**	395 (260—525)	.039	≤.063	0.8—1DC
	Ductile Cast Ilon	Tensile Strength ≤450MPa	**MC5020**	**R**	490 (330—655)	.024	≤.063	≤0.5DC
			MC5020	**R**	490 (330—655)	.031	≤.063	0.5—0.8DC
			MC5020	**M**	490 (330—655)	.039	≤.063	0.8—1DC
			VP15TF	**R**	395 (260—525)	.024	≤.063	≤0.5DC
			VP15TF	**R**	395 (260—525)	.031	≤.063	0.5—0.8DC
			VP15TF	**M**	395 (260—525)	.039	≤.063	0.8—1DC
	Ductile Cast Ilon	Tensile Strength ≤800MPa	**MC5020**	**R**	490 (330—655)	.020	≤.063	≤0.5DC
			MC5020	**R**	490 (330—655)	.024	≤.063	0.5—0.8DC
			MC5020	**R**	490 (330—655)	.028	≤.063	0.8—1DC
			VP15TF	**R**	395 (260—525)	.020	≤.063	≤0.5DC
			VP15TF	**R**	395 (260—525)	.024	≤.063	0.5—0.8DC
			VP15TF	**R**	395 (260—525)	.028	≤.063	0.8—1DC
H	Hardened Steel	40—55HRC	**VP15TF**	**R**	230 (165—295)	.016	≤.063	≤0.5DC
			VP15TF	**R**	230 (165—295)	.020	≤.063	0.5—0.8DC
			VP15TF	**R**	230 (165—295)	.024	≤.063	0.8—1DC

Note 1) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

FACE MILLING
<GENERAL CUTTING>

50° KAPR

AHX640S

P M K N S H

Fig. 1
ø2.500"
ø3.000"

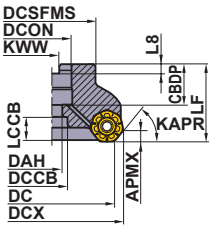


Fig. 2
ø4.000"
ø5.000"
ø6.000"

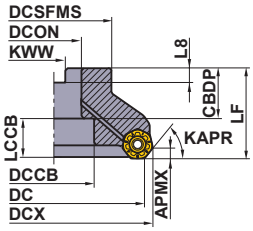
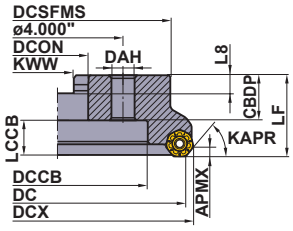
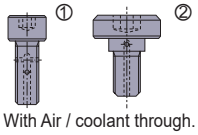


Fig. 3
ø8.000"



Right hand tool holder shown.

DC	Set Bolt	Geometry	
ϕ2.500	HSCU37513H	①	
ϕ3.000	HSCU62516H		
ϕ4.000	HSCU75016H		
ϕ5.000	MBAU75016H	②	
ϕ6.000	MBAU100016H		
ϕ8.000	—	—	

With Air / coolant through.

DC=Inch size, DCON=Inch size

(inch)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	Type	LF	DCX	DCON	Fig.	WT(lbs)	APMX
2.500	**AHX640SUR2504AA**	●	Y	4	R	2.000	2.994	.750	1	2.0	.236
	AHX640SUL2504AA	□	Y	4	L	2.000	2.994	.750	1	2.0	.236
	AHX640SUR2505AA	●	Y	5	R	2.000	2.994	.750	1	1.8	.236
	AHX640SUL2505AA	□	Y	5	L	2.000	2.994	.750	1	1.8	.236
3.000	**AHX640SUR0304DA**	●	Y	4	R	2.500	3.494	1.250	1	3.7	.236
	AHX640SUL0304DA	□	Y	4	L	2.500	3.494	1.250	1	3.7	.236
	AHX640SUR0306DA	●	Y	6	R	2.500	3.494	1.250	1	3.5	.236
	AHX640SUL0306DA	□	Y	6	L	2.500	3.494	1.250	1	3.5	.236
4.000	**AHX640SUR0405EA**	●	Y	5	R	2.500	4.494	1.500	2	6.4	.236
	AHX640SUL0405EA	□	Y	5	L	2.500	4.494	1.500	2	6.4	.236
	AHX640SUR0407EA	●	Y	7	R	2.500	4.494	1.500	2	6.4	.236
	AHX640SUL0407EA	□	Y	7	L	2.500	4.494	1.500	2	6.4	.236

* Y=Yes

Note 1) The cutter body includes a set bolt for an arbor.

Note 2) The above "APMX" will vary depending on the breaker insert.

Fig. 1
ø2.500"
ø3.000"

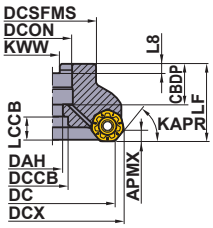


Fig. 2
ø4.000"
ø5.000"
ø6.000"

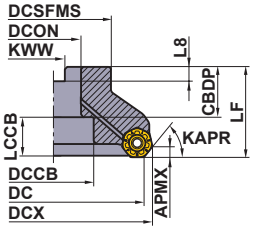
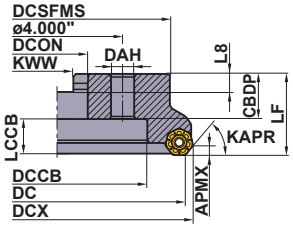
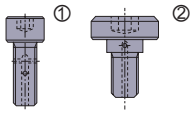


Fig. 3
ø8.000"



Right hand tool holder shown.

DC	Set Bolt	Geometry
ϕ2.500	HSCU37513H	①
ϕ3.000	HSCU62516H	
ϕ4.000	HSCU75016H	
ϕ5.000	MBAU75016H	②
ϕ6.000	MBAU100016H	
ϕ8.000	—	—



With Air / coolant through.

DC=Inch size, DCON=Inch size

(inch)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	Type	LF	DCX	DCON	Fig.	WT(lbs)	APMX
5.000	**AHX640SUR0506EA**	●	Y	6	R	2.500	5.494	1.500	2	8.2	.236
	AHX640SUL0506EA	□	Y	6	L	2.500	5.494	1.500	2	8.2	.236
	AHX640SUR0508EA	●	Y	8	R	2.500	5.494	1.500	2	7.9	.236
	AHX640SUL0508EA	□	Y	8	L	2.500	5.494	1.500	2	7.9	.236
6.000	**AHX640SUR0607FA**	●	Y	7	R	2.500	6.494	2.000	2	11.7	.236
	AHX640SUL0607FA	□	Y	7	L	2.500	6.494	2.000	2	11.7	.236
	AHX640SUR0610FA	●	Y	10	R	2.500	6.494	2.000	2	11.2	.236
	AHX640SUL0610FA	□	Y	10	L	2.500	6.494	2.000	2	11.2	.236
8.000	**AHX640SUR0808MN**	●	N	8	R	2.500	8.494	2.500	3	18.5	.236
	AHX640SUL0808MN	□	N	8	L	2.500	8.494	2.500	3	18.5	.236
	AHX640SUR0812MN	●	N	12	R	2.500	8.494	2.500	3	18.3	.236
	AHX640SUL0812MN	□	N	12	L	2.500	8.494	2.500	3	18.3	.236

* Y=Yes, N=No

Note 1) The cutter body includes a set bolt for an arbor.

SPARE PARTS

Tool Holder Number	*	
	Clamp Screw	Wrench (Insert)
AHX640S	CS5015060T	TKY20T

* Clamp Torque (lbf-in) : CS5015060T=44

ISO13399	➢ K003
MOUNTING DIMENSION	➢ K082
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

Metric Standard

For inch arbors

Fig. 1
ø63
ø80

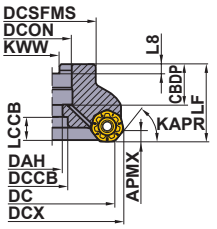


Fig. 2
ø100
ø125
ø160

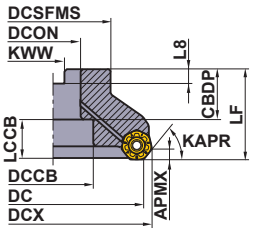
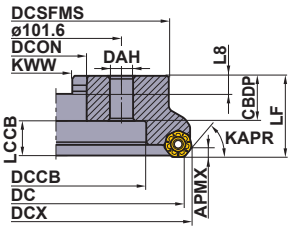
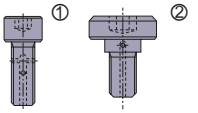


Fig. 3
ø200



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	HSC12035H	
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	MBA24045H	
ϕ200	—	—



With Air / coolant through.

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(kg)	APMX
80	**AHX640SR08004CA**	★	Y	4	50	92.55	25.4 [1.0"]	1	1.1	6
	AHX640SR08006CA	★	Y	6	50	92.55	25.4 [1.0"]	1	1.0	6
100	**AHX640SR10005DA**	★	Y	5	50	112.55	31.75 [1.25"]	2	1.7	6
	AHX640SR10007DA	★	Y	7	50	112.55	31.75 [1.25"]	2	1.5	6
125	**AHX640SR12506EA**	★	Y	6	63	137.55	38.1 [1.50"]	2	3.0	6
	AHX640SR12508EA	★	Y	8	63	137.55	38.1 [1.50"]	2	2.9	6
160	**AHX640SR16007FA**	★	Y	7	63	172.55	50.8 [2.0"]	2	4.9	6
	AHX640SR16010FA	★	Y	10	63	172.55	50.8 [2.0"]	2	4.7	6
200	**AHX640SR20008KN**	★	N	8	63	212.55	47.625 [1.875"]	3	8.2	6
	AHX640SR20012KN	★	N	12	63	212.55	47.625 [1.875"]	3	7.9	6

* Y=Yes, N=No

Note 1) Set bolt not included.

SPARE PARTS

Tool Holder Number	*	
	Clamp Screw	Wrench (Insert)
AHX640S	CS5015060T	TKY20T

* Clamp Torque (lbf-in) : CS5015060T=44

Metric Standard

For metric arbors

Fig. 1
ø63
ø80

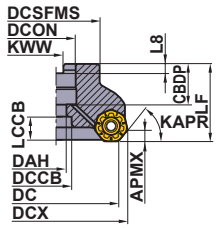


Fig. 2
ø100
ø125

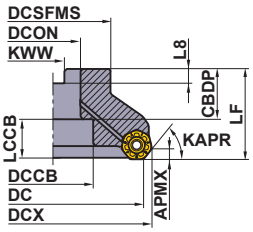


Fig. 3
ø160

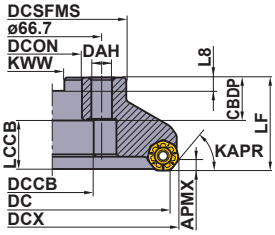
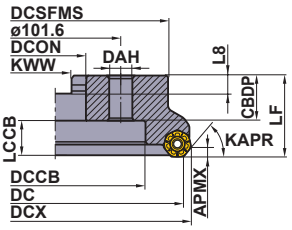
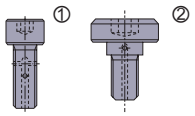


Fig. 4
ø200



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63	HSC10030H	①
ϕ80	HSC12035H	
ϕ100	MBA16033H	②
ϕ125	MBA20040H	
ϕ160	—	—
ϕ200	—	—



With Air / coolant through.

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	LF	DCX	DCON	Fig.	WT(kg)	APMX
63	**AHX640S-063A04AR**	★	Y	4	50	75.55	22	1	0.7	6
	AHX640S-063A05AR	★	Y	5	50	75.55	22	1	0.6	6
80	**AHX640S-080A04AR**	★	Y	4	50	92.55	27	1	1.1	6
	AHX640S-080A06AR	★	Y	6	50	92.55	27	1	1.0	6
100	**AHX640S-100B05AR**	★	Y	5	50	112.55	32	2	1.7	6
	AHX640S-100B07AR	★	Y	7	50	112.55	32	2	1.6	6
125	**AHX640S-125B06AR**	★	Y	6	63	137.55	40	2	3.1	6
	AHX640S-125B08AR	★	Y	8	63	137.55	40	2	3.0	6
160	**AHX640S-160C07NR**	★	N	7	63	172.55	40	3	5.4	6
	AHX640S-160C10NR	★	N	10	63	172.55	40	3	5.2	6
200	**AHX640S-200C08NR**	★	N	8	63	212.55	60	4	7.8	6
	AHX640S-200C12NR	★	N	12	63	212.55	60	4	7.5	6

* Y=Yes, N=No

Note 1) Set bolt not included.

SPARE PARTS

Tool Holder Number	* Clamp Screw	Wrench (Insert)
AHX640S	CS5015060T	TKY20T

* Clamp Torque (lbf-in) : CS5015060T=44

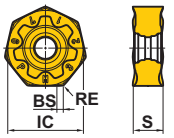
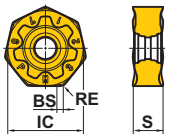
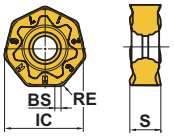
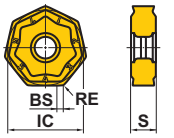
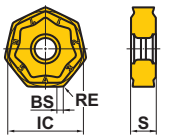
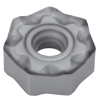
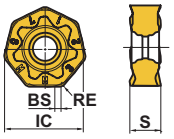
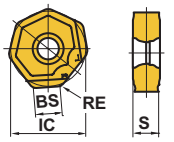
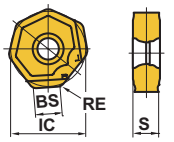
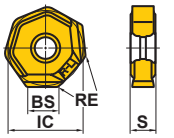
ISO13399	➢ K003
MOUNTING DIMENSION	➢ K084
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
N	Non-ferrous Metal	
S	Heat resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round

Application	Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (inch)					Geometry
					MP6120	MP6130	MP7030	MP9120	MP9130	MC5020	VP15TF	VP20RT	IC	RE	BS	S	APMX	
For Steel General Cutting		**NNMU200708ZEN-M**	M	E	●	●							.787	.031	.039	.315	.236	
For Steel General Cutting		**NNMU200708ZEN-MP**	M	E							●		.787	.031	.039	.315	.236	
For Stainless Steel		**NNMU200712ZER-MM**	M	E			●						.787	.047	.039	.315	.236	
For Cast Iron General Cutting		**NNMU200608ZEN-MK**	M	E						●	●	●	.787	.031	.039	.258	.236	
For Cast Iron Strong Cutting Edge Type		**NNMU200608ZEN-HK**	M	E						●	●	●	.787	.031	.039	.258	.236	
For Titanium Alloys and Heat Resistant Alloys		**NNMU200712ZER-L**	M	E				●	●				.787	.047	.039	.315	.236	
For Steel	Wiper	**WNEU2007ZEN7C-M**	E	E	●								.787	.031	.283	.272	.020	
General Cutting	Wiper	**WNEU2007ZEN7C-WP**	E	E							●		.787	.031	.280	.272	.020	
For Cast Iron	Wiper	**WNEU2006ZEN7C-WK**	E	E						●			.787	.031	.291	.258	.020	

Note 1) The height of cutter when setting MK, HK inserts are different from when setting MP, MM inserts.

● : USA Stock
<10 inserts in one case>

■ Instructions for use of wiper inserts

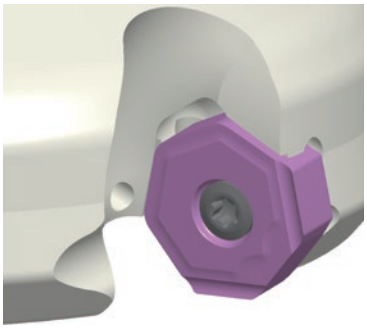


Fig.1

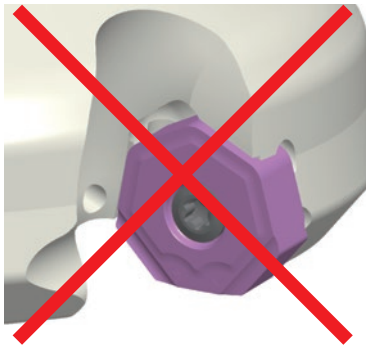


Fig.2

Note 1) The specifications for these wipers are right hand body 2 corners and left hand body 2 corners. Refer to Figure 1.
Note 2) A satisfactory finish surface can be achieved with one wiper insert.
However, if the feed rate per revolution will be equal to or greater than the width of the wiper edge, it is recommended to install the second and further wiper inserts spaced evenly within the cutting body.

RECOMMENDED CUTTING CONDITIONS

Dry Cutting

(inch)

	Workpiece Material	Hardness	Grade	Breaker	vc (SFM)	fz (IPT)	ap	ae
P	Mild Steel	≤180HB	**MP6120**	**M**	820 (655—985)	.012 (.008—.016)	≤.197	≤0.8DC
			VP15TF	**MP**	820 (655—985)	.012 (.008—.016)	≤.197	≤0.8DC
			MP6130	**M**	720 (560—885)	.016 (.012—.020)	≤.197	≤0.8DC
	Carbon Steel,Alloy Steel	180—280HB	**MP6120**	**M**	720 (560—885)	.012 (.008—.016)	≤.197	≤0.8DC
			VP15TF	**MP**	720 (560—885)	.012 (.008—.016)	≤.197	≤0.8DC
			MP6130	**M**	620 (460—785)	.016 (.012—.020)	≤.197	≤0.8DC
	Carbon Steel,Alloy Steel	280—350HB	**MP6120**	**M**	460 (330—590)	.012 (.008—.016)	≤.197	≤0.8DC
			VP15TF	**MP**	460 (330—590)	.012 (.008—.016)	≤.197	≤0.8DC
			MP6130	**M**	360 (230—490)	.016 (.012—.020)	≤.197	≤0.8DC
	Alloy Tool Steel	≤350HB (Annealing)	**MP6120**	**M**	460 (330—590)	.006 (.004—.008)	≤.118	≤0.8DC
			VP15TF	**MP**	460 (330—590)	.006 (.004—.008)	≤.118	≤0.8DC
			MP6130	**M**	360 (230—490)	.010 (.008—.012)	≤.118	≤0.8DC
	Pre-hardened Steel	35—45HRC	**MP6120**	**M**	460 (330—590)	.006 (.004—.008)	≤.118	≤0.8DC
			VP15TF	**MP**	460 (330—590)	.006 (.004—.008)	≤.197	≤0.8DC
			MP6130	**M**	360 (230—490)	.010 (.008—.012)	≤.118	≤0.8DC
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	655 (490—820)	.008 (.004—.012)	≤.197	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	490 (330—655)	.008 (.004—.012)	≤.197	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	460 (330—590)	.006 (.002—.010)	≤.197	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7030**	**MM**	655 (490—820)	.008 (.004—.012)	≤.197	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	> 200HB	**MP7030**	**MM**	490 (330—655)	.008 (.004—.012)	≤.197	≤0.8DC
	Precipitation Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	425 (330—525)	.006 (.002—.010)	≤.197	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	720 (490—985)	.012 (.008—.016)	≤.197	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	590 (425—755)	.012 (.008—.016)	≤.197	≤0.8DC
			VP15TF	**MP**	590 (425—755)	.012 (.008—.016)	≤.197	≤0.8DC
	Ductile Cast Ilon	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	655 (490—820)	.008 (.004—.012)	≤.197	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	560 (395—720)	.008 (.004—.012)	≤.197	≤0.8DC
			VP15TF	**MP**	560 (395—720)	.008 (.004—.012)	≤.197	≤0.8DC
	Ductile Cast Ilon	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	560 (490—655)	.008 (.004—.012)	≤.197	≤0.8DC
			VP15TF,VP20RT	**MK,HK**	460 (330—590)	.008 (.004—.012)	≤.197	≤0.8DC
			VP15TF	**MP**	460 (330—590)	.008 (.004—.012)	≤.197	≤0.8DC
H	Hardened Steel	40—55HRC	**VP15TF**	**MP**	260 (195—330)	.006 (.004—.008)	≤.118	≤0.8DC

Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)
Note2) We recommend wet cutting with internal coolant for titanium alloy and heat resistant alloy,
Note3) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

Wet Cutting

(inch)

	Workpiece Material	Hardness	Breaker	Grade	vc (SFM)	fz (IPT)	ap	ae
M	Austenitic Stainless Steel	≤200HB	**MP7030**	**MM**	410 (330—490)	.006 (.004—.008)	≤.197	≤0.8DC
	Austenitic Stainless Steel	> 200HB	**MP7030**	**MM**	330 (245—410)	.006 (.004—.008)	≤.197	≤0.8DC
	Two-phase Stainless Steel	≤280HB	**MP7030**	**MM**	260 (195—330)	.004 (.002—.006)	≤.197	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	≤200HB	**MP7030**	**MM**	410 (330—490)	.006 (.004—.008)	≤.197	≤0.8DC
	Ferritic and Maltensitic Stainless Steel	> 200HB	**MP7030**	**MM**	330 (245—410)	.006 (.004—.008)	≤.197	≤0.8DC
	Precipitation Hardening Stainless Steel	< 450HB	**MP7030**	**MM**	230 (165—295)	.004 (.002—.006)	≤.197	≤0.8DC
S	Titanium Alloys	—	**MP7030**	**MM**	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC
		—	**MP9120**	**L**	195 (165—230)	.004 (.002—.006)	≤.118	≤0.6DC
		—	**MP9130**	**L**	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC
	Heat Resistant Alloys	—	**MP7030**	**MM**	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC
		—	**MP9120**	**L**	195 (165—230)	.004 (.002—.006)	≤.118	≤0.6DC
		—	**MP9130**	**L**	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC

Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)
Note2) We recommend wet cutting with internal coolant for titanium alloy and heat resistant alloy.
Note3) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

Cutting Conditions with Wiper Insert

(inch)

	Workpiece Material	Hardness	Main Insert	Grade	Wiper Insert	Grade	vc (SFM)	fz (IPT)	ap	ae
P	Mild Steel	≤180HB	**VP15TF**	**MP**	**VP15TF**	**WP**	820 (655—985)	.012 (.008—.016)	≤.0197	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	820 (655—985)	.012 (.008—.016)	≤.0197	≤0.8DC
	Carbon Steel,Alloy Steel	180—280HB	**VP15TF**	**MP**	**VP15TF**	**WP**	720 (560—885)	.012 (.008—.016)	≤.0197	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	720 (560—885)	.012 (.008—.016)	≤.0197	≤0.8DC
	Carbon Steel,Alloy Steel	280—350HB	**VP15TF**	**MP**	**VP15TF**	**WP**	460 (330—590)	.012 (.008—.016)	≤.0197	≤0.8DC
			MP6120	**M**	**MP6120**	**M**	460 (330—590)	.012 (.008—.016)	≤.0197	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	1050 (820—1310)	.012 (.008—.016)	≤.0197	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	720 (490—985)	.012 (.008—.016)	≤.0197	≤0.8DC
	Ductile Cast Ilon	Tensile Strength ≤450MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	820 (655—985)	.008 (.004—.012)	≤.0197	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	655 (490—820)	.008 (.004—.012)	≤.0197	≤0.8DC
	Ductile Cast Ilon	Tensile Strength ≤800MPa	**MC5020**	**MK,HK**	**MC5020**	**WK**	720 (655—820)	.008 (.004—.012)	≤.0197	≤0.8DC
			VP15TF	**MP**	**VP15TF**	**WP**	560 (490—655)	.008 (.004—.012)	≤.0197	≤0.8DC
S	Heat Resistant Alloys	—	**VP15TF**	**MP**	**VP15TF**	**WP**	130 (65—165)	.006 (.004—.008)	≤.0197	≤0.8DC
H	Hardened Steel	40—55HRC	**VP15TF**	**MP**	**VP15TF**	**WP**	260 (195—330)	.006 (.004—.008)	≤.0197	≤0.8DC

Note 1) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.
Note 2) Please use WP geometry insert in combination with MP or M geometry inserts, and use WK geometry insert in combination with MK or HK geometry inserts

AHX440S, AHX475S, AHX640S Mounting Dimension

Fig. 1

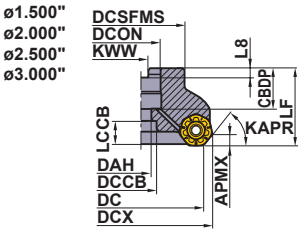


Fig. 2

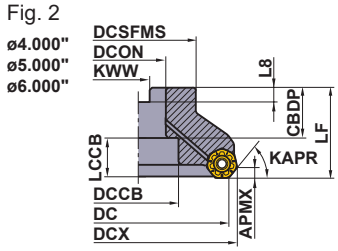
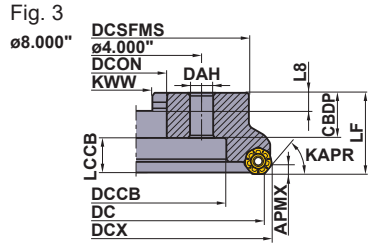


Fig. 3



Right hand tool holder shown.

(inch)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
.500	1.500	**AHX440SUR1503SA**	.630	.276	.433	.602	1.44	.250	.156	1
.500	1.500	**AHX440SUR1504SA**	.630	.276	.433	.602	1.44	.250	.156	1
.750	2.000	**AHX440SUR0204AA**	.748	.413	.630	.642	1.75	.313	.187	1
.750	2.000	**AHX440SUR0205AA**	.748	.413	.630	.642	1.75	.313	.187	1
.750	2.000	**AHX440SUR0206AA**	.748	.413	.630	.642	1.75	.313	.187	1
.750	2.000	**AHX475SUR0204AA**	.748	.413	.630	.609	1.88	.313	.187	4
.750	2.000	**AHX475SUR0205AA**	.748	.413	.630	.609	1.88	.313	.187	4
.750	2.500	**AHX640SUL2504AA**	.748	.413	.630	.591	1.75	.313	.187	1
.750	2.500	**AHX640SUL2505AA**	.748	.413	.630	.591	1.75	.313	.187	1
.750	2.500	**AHX640SUR2504AA**	.748	.413	.630	.591	1.75	.313	.187	1
.750	2.500	**AHX640SUR2505AA**	.748	.413	.630	.591	1.75	.313	.187	1
1.000	2.500	**AHX440SUR2505CA**	.945	.539	.787	.695	2.19	.375	.219	1
1.000	2.500	**AHX440SUR2506CA**	.945	.539	.787	.695	2.19	.375	.219	1
1.000	2.500	**AHX440SUR2508CA**	.945	.539	.787	.695	2.19	.375	.219	1
1.000	2.500	**AHX475SUR2505CA**	.945	.539	.787	.688	2.38	.375	.219	4
1.000	2.500	**AHX475SUR2506CA**	.945	.539	.787	.688	2.38	.375	.219	4
1.000	3.000	**AHX440SUR0306CA**	.945	.539	.787	.695	2.19	.375	.219	1
1.000	3.000	**AHX440SUR0308CA**	.945	.539	.787	.695	2.19	.375	.219	1
1.000	3.000	**AHX440SUR0310CA**	.945	.539	.787	.695	2.19	.375	.219	1
1.000	3.000	**AHX475SUR0306CA**	.945	.539	.787	.688	2.75	.375	.219	4
1.000	3.000	**AHX475SUR0308CA**	.945	.539	.787	.688	2.75	.375	.219	4
1.250	3.000	**AHX475SUR0306DA**	1.260	.669	1.024	.794	2.88	.500	.281	4
1.250	3.000	**AHX475SUR0308DA**	1.260	.669	1.024	.794	2.88	.500	.281	4
1.250	3.000	**AHX640SUL0304DA**	1.260	.669	1.024	.776	2.88	.500	.281	1
1.250	3.000	**AHX640SUL0306DA**	1.260	.669	1.024	.776	2.88	.500	.281	1
1.250	3.000	**AHX640SUR0304DA**	1.260	.669	1.024	.776	2.88	.500	.281	1
1.250	3.000	**AHX640SUR0306DA**	1.260	.669	1.024	.776	2.88	.500	.281	1
1.500	4.000	**AHX440SUR0407EA**	1.417	—	1.500	.801	3.50	.625	.375	2
1.500	4.000	**AHX440SUR0410EA**	1.417	—	1.500	.801	3.50	.625	.375	2

Fig.4

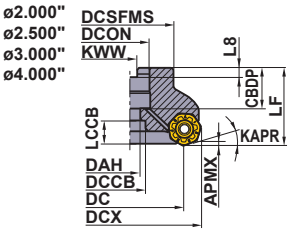
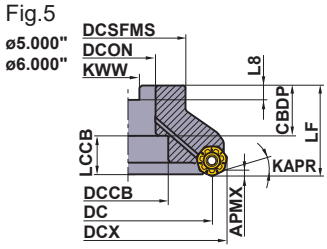


Fig.5



Right hand tool holder only.

(inch)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.500	4.000	**AHX440SUR0412EA**	1.417	—	1.500	.801	3.50	.625	.375	2
1.500	4.000	**AHX475SUR0407EA**	1.181	.787	1.181	.952	3.75	.625	.375	4
1.500	4.000	**AHX475SUR0409EA**	1.181	.787	1.181	.952	3.75	.625	.375	4
1.500	4.000	**AHX640SUL0405EA**	1.181	—	.787	.933	3.81	.625	.375	2
1.500	4.000	**AHX640SUL0407EA**	1.181	—	.787	.933	3.81	.625	.375	2
1.500	4.000	**AHX640SUR0405EA**	1.181	—	.787	.933	3.81	.625	.375	2
1.500	4.000	**AHX640SUR0407EA**	1.181	—	.787	.933	3.81	.625	.375	2
1.500	5.000	**AHX440SUR0508EA**	1.417	—	1.500	.801	3.81	.625	.375	2
1.500	5.000	**AHX440SUR0512EA**	1.417	—	1.500	.801	3.81	.625	.375	2
1.500	5.000	**AHX440SUR0514EA**	1.417	—	1.500	.801	3.81	.625	.375	2
1.500	5.000	**AHX475SUR0508EA**	1.417	—	1.500	.794	3.81	.625	.375	5
1.500	5.000	**AHX475SUR0510EA**	1.417	—	1.500	.794	3.81	.625	.375	5
1.500	5.000	**AHX640SUL0506EA**	1.575	—	2.205	.855	3.81	.625	.375	2
1.500	5.000	**AHX640SUL0508EA**	1.575	—	2.205	.855	3.81	.625	.375	2
1.500	5.000	**AHX640SUR0506EA**	1.575	—	2.205	.855	3.81	.625	.375	2
1.500	5.000	**AHX640SUR0508EA**	1.575	—	2.205	.855	3.81	.625	.375	2
1.500	6.000	**AHX440SUR0610EA**	1.417	—	1.500	.801	3.81	.625	.375	2
1.500	6.000	**AHX440SUR0614EA**	1.417	—	1.500	.801	3.81	.625	.375	2
1.500	6.000	**AHX440SUR0616EA**	1.417	—	1.500	.801	3.81	.625	.375	2
2.000	6.000	**AHX475SUR0610FA**	1.417	—	3.228	.755	4.88	.750	.437	5
2.000	6.000	**AHX475SUR0612FA**	1.417	—	3.228	.755	4.88	.750	.437	5
2.000	6.000	**AHX640SUL0607FA**	1.693	—	3.228	.737	4.88	.750	.437	2
2.000	6.000	**AHX640SUL0610FA**	1.693	—	3.228	.737	4.88	.750	.437	2
2.000	6.000	**AHX640SUR0607FA**	1.693	—	3.228	.737	4.88	.750	.437	2
2.000	6.000	**AHX640SUR0610FA**	1.693	—	3.228	.737	4.88	.750	.437	2
2.500	8.000	**AHX640SUL0808MN**	1.378	—	5.512	1.052	6.89	1.000	.560	3
2.500	8.000	**AHX640SUL0812MN**	1.378	—	5.512	1.052	6.89	1.000	.560	3
2.500	8.000	**AHX640SUR0808MN**	1.378	—	5.512	1.052	6.89	1.000	.560	3
2.500	8.000	**AHX640SUR0812MN**	1.378	—	5.512	1.052	6.89	1.000	.560	3

AHX440S, AHX475S, AHX640S Mounting Dimension

Fig. 1

ø40
ø50
ø63
ø80

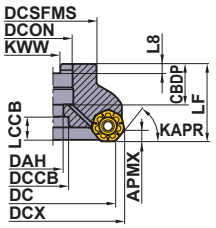


Fig. 2

ø100
ø125
ø160

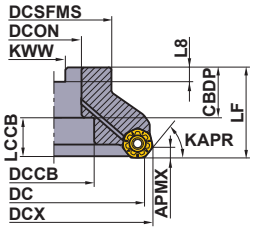
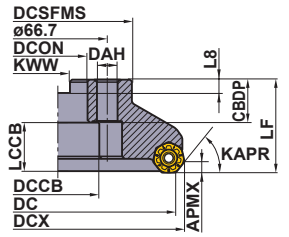


Fig. 3

ø160



Right hand tool holder only.

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
16	40	**AHX440S-040A03AR**	18	9	14	13.9	37	8.4	5.6	1
16	40	**AHX440S-040A04AR**	18	9	14	13.9	37	8.4	5.6	1
22	50	**AHX440S-050A04AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX440S-050A05AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX440S-050A06AR**	20	11	17	11.9	47	10.4	6.3	1
22	50	**AHX475S-050A04AR**	20	11	17	16.7	47	10.4	6.3	5
22	50	**AHX475S-050A05AR**	20	11	17	16.7	47	10.4	6.3	5
22	63	**AHX440S-063A05AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX440S-063A06AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX440S-063A08AR**	20	11	17	11.9	50	10.4	6.3	1
22	63	**AHX475S-063A05AR**	20	11	17	16.7	60	10.4	6.3	5
22	63	**AHX475S-063A06AR**	20	11	17	16.7	60	10.4	6.3	5
22	63	**AHX640S-063A04AR**	20	11	17	16.2	50	10.4	6.3	1
22	63	**AHX640S-063A05AR**	20	11	17	16.2	50	10.4	6.3	1
25.4	80	**AHX440SR08006CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX440SR08008CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX440SR08010CA**	26	13	20	14.9	56	9.5	6	1
25.4	80	**AHX640SR08004CA**	26	13	20	14.2	56	9.5	6	1
25.4	80	**AHX640SR08006CA**	26	13	20	14.2	56	9.5	6	1
27	80	**AHX440S-080A06AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX440S-080A08AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX440S-080A10AR**	23	13	20	14.9	56	12.4	7	1
27	80	**AHX475S-080A06AR**	23	13	20	14.7	76	12.4	7	5
27	80	**AHX475S-080A08AR**	23	13	20	14.7	76	12.4	7	5
27	80	**AHX640S-080A04AR**	23	13	20	15.2	56	12.4	7	1
27	80	**AHX640S-080A06AR**	23	13	20	15.2	56	12.4	7	1
31.75	80	**AHX475SR08006DA**	32	17	26	19.7	76	12.7	8	5
31.75	80	**AHX475SR08008DA**	32	17	26	19.7	76	12.7	8	5
31.75	100	**AHX440SR10007DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX440SR10010DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX440SR10012DA**	37	—	45	11.9	70	12.7	8	2
31.75	100	**AHX475SR10007DA**	32	17	26	19.7	96	12.7	8	5
31.75	100	**AHX475SR10009DA**	32	17	26	19.7	96	12.7	8	5
31.75	100	**AHX640SR10005DA**	35	—	45	13.2	70	12.7	8	2
31.75	100	**AHX640SR10007DA**	35	—	45	13.2	70	12.7	8	2
32	100	**AHX440S-100B07AR**	32	—	45	16.9	78	14.4	8	2
32	100	**AHX440S-100B10AR**	32	—	45	16.9	78	14.4	8	2
32	100	**AHX440S-100B12AR**	32	—	45	16.9	78	14.4	8	2

Fig. 4
ø200

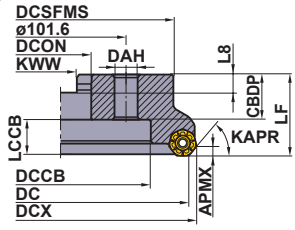


Fig.5
ø50
ø63
ø80
ø100

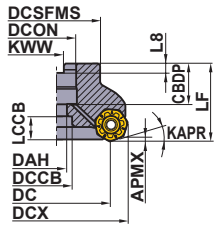
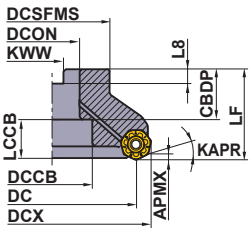


Fig.6
ø125
ø160



Right hand tool holder only.

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
32	100	**AHX475S-100A07AR**	26	17	26	25.7	96	14.4	8	5
32	100	**AHX475S-100A09AR**	26	17	26	25.7	96	14.4	8	5
32	100	**AHX640S-100B05AR**	32	—	45	16.2	78	14.4	8	2
32	100	**AHX640S-100B07AR**	32	—	45	16.2	78	14.4	8	2
38.1	125	**AHX440SR12508EA**	42	—	56	19.9	80	15.9	10	2
38.1	125	**AHX440SR12512EA**	42	—	56	19.9	80	15.9	10	2
38.1	125	**AHX440SR12514EA**	42	—	56	19.9	80	15.9	10	2
38.1	125	**AHX475SR12508EA**	42	—	56	19.7	100	15.9	10	6
38.1	125	**AHX475SR12510EA**	42	—	56	19.7	100	15.9	10	6
38.1	125	**AHX640SR12506EA**	42	—	56	19.2	80	15.9	10	2
38.1	125	**AHX640SR12508EA**	42	—	56	19.2	80	15.9	10	2
40	125	**AHX440S-125B08AR**	40	—	56	21.9	89	16.4	9	2
40	125	**AHX440S-125B12AR**	40	—	56	21.9	89	16.4	9	2
40	125	**AHX440S-125B14AR**	40	—	56	21.9	89	16.4	9	2
40	125	**AHX475S-125B08AR**	40	—	56	21.7	100	16.4	9	6
40	125	**AHX475S-125B10AR**	40	—	56	21.7	100	16.4	9	6
40	125	**AHX640S-125B06AR**	42	—	56	19.2	89	16.4	9	2
40	125	**AHX640S-125B08AR**	42	—	56	19.2	89	16.4	9	2
40	160	**AHX440S-160C10NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX440S-160C14NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX440S-160C16NR**	40	14	56	21.9	100	16.4	9	3
40	160	**AHX475S-160B10AR**	40	—	56	21.7	100	16.4	9	6
40	160	**AHX475S-160B12AR**	40	—	56	21.7	100	16.4	9	6
40	160	**AHX640S-160C07NR**	29	14	56	32.2	120	16.4	9	3
40	160	**AHX640S-160C10NR**	29	14	56	32.2	120	16.4	9	3
47.625	200	**AHX640SR20008KN**	35	18	140	26.2	175	25.4	14.22	4
47.625	200	**AHX640SR20012KN**	35	18	140	26.2	175	25.4	14.22	4
50.8	160	**AHX440SR16010FA**	45	—	72	16.9	100	19.1	11	2
50.8	160	**AHX440SR16014FA**	45	—	72	16.9	100	19.1	11	2
50.8	160	**AHX440SR16016FA**	45	—	72	16.9	100	19.1	11	2
50.8	160	**AHX475SR16010FA**	45	—	72	16.7	100	19.1	11	6
50.8	160	**AHX475SR16012FA**	45	—	72	16.7	100	19.1	11	6
50.8	160	**AHX640SR16007FA**	43	—	72	18.2	100	19.1	11	2
50.8	160	**AHX640SR16010FA**	43	—	72	18.2	100	19.1	11	2
60	200	**AHX640S-200C08NR**	32	18	140	29.2	175	25.7	14.22	4
60	200	**AHX640S-200C12NR**	32	18	140	29.2	175	25.7	14.22	4

FACE MILLING

<HIGH FEED CUTTING FOR CAST IRON>

50° KAPR

AHX640W

P M K N S H

Fig.1
ø3.000"
ø4.000"

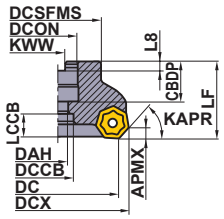


Fig.2
ø5.000"
ø6.000"

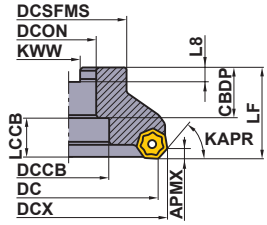


Fig.3
ø8.000"
ø10.000"

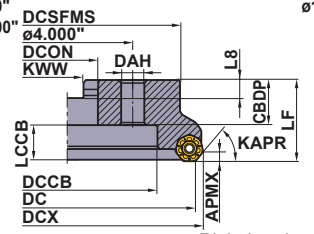
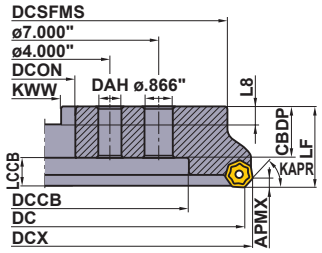


Fig.4
ø12.000"



Right hand tool holder shown.

DC=Inch size, DCON=Inch size

(inch)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	Type	LF	DCX	DCON	Fig.	WT(lbs)	APMX
3.000	**AHX640WR0308D**	●	N	8	R	2.500	3.494	1.250	1	4.2	.236
	AHX640WL0308D	□	N	8	L	2.500	3.494	1.250	1	4.2	.236
	AHX640WR0310D	●	N	10	R	2.500	3.494	1.250	1	4.2	.236
	AHX640WL0310D	□	N	10	L	2.500	3.494	1.250	1	4.2	.236
4.000	**AHX640WR0410E**	●	N	10	R	2.500	4.494	1.500	1	7.3	.236
	AHX640WL0410E	□	N	10	L	2.500	4.494	1.500	1	7.3	.236
	AHX640WR0414E	●	N	14	R	2.500	4.494	1.500	1	7.3	.236
	AHX640WL0414E	□	N	14	L	2.500	4.494	1.500	1	7.3	.236
5.000	**AHX640WR0512E**	●	N	12	R	2.500	5.494	1.500	2	8.8	.236
	AHX640WL0512E	□	N	12	L	2.500	5.494	1.500	2	8.8	.236
	AHX640WR0518E	●	N	18	R	2.500	5.494	1.500	2	8.8	.236
	AHX640WL0518E	□	N	18	L	2.500	5.494	1.500	2	8.8	.236
6.000	**AHX640WR0614F**	●	N	14	R	2.500	6.494	2.000	2	12.6	.236
	AHX640WL0614F	□	N	14	L	2.500	6.494	2.000	2	12.6	.236
	AHX640WR0620F	●	N	20	R	2.500	6.494	2.000	2	12.6	.236
	AHX640WL0620F	□	N	20	L	2.500	6.494	2.000	2	12.6	.236

* N=No

Note 1) Set bolt not included.

Fig.1
ø3.000"
ø4.000"

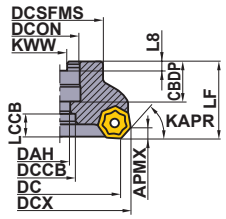


Fig.2
ø5.000"
ø6.000"

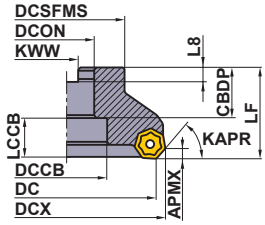


Fig.3
ø8.000"
ø10.000"

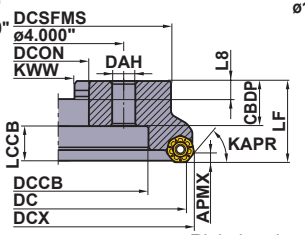
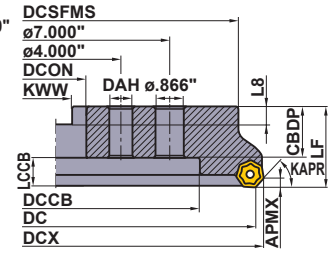


Fig.4
ø12.000"



Right hand tool holder shown.

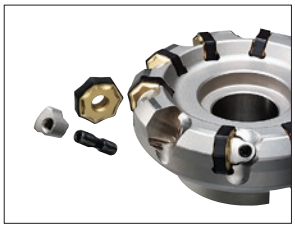
DC=Inch size, DCON=Inch size

(inch)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	Type	LF	DCX	DCON	Fig.	WT(lbs)	APMX
8.000	**AHX640WR0820M**	●	N	20	R	2.500	8.494	2.500	3	19.6	.236
	AHX640WL0820M	□	N	20	L	2.500	8.494	2.500	3	19.6	.236
	AHX640WR0828M	●	N	28	R	2.500	8.494	2.500	3	19.6	.236
	AHX640WL0828M	□	N	28	L	2.500	8.494	2.500	3	19.6	.236
10.000	**AHX640WR1024M**	●	N	24	R	2.500	10.494	2.500	3	32.0	.236
	AHX640WL1024M	□	N	24	L	2.500	10.494	2.500	3	32.0	.236
	AHX640WR1036M	●	N	36	R	2.500	10.494	2.500	3	32.0	.236
	AHX640WL1036M	□	N	36	L	2.500	10.494	2.500	3	32.0	.236
12.000	**AHX640WR1228M**	●	N	28	R	2.500	12.494	2.500	4	49.2	.236
	AHX640WL1228M	□	N	28	L	2.500	12.494	2.500	4	49.2	.236
	AHX640WR1242M	●	N	42	R	2.500	12.494	2.500	4	49.2	.236
	AHX640WL1242M	□	N	42	L	2.500	12.494	2.500	4	49.2	.236

* N=No

Note 1) Set bolt not included.



SPARE PARTS

Tool Holder Number	Wedge	* Clamp Screw	Wrench
AHX640W Type	CWAHX640WN	LS0622T	TKY15T

* Clamp Torque (lbf-in) : LS0622T=53

ISO13399	➤ K003
MOUNTING DIMENSION	➤ K092
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

Metric Standard

For inch arbors

Fig.1
ø80

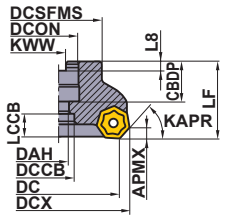


Fig.2
ø100
ø125
ø160

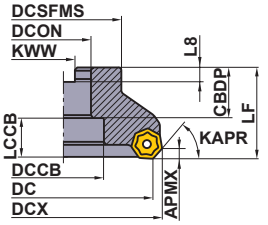


Fig.3
ø200
ø250

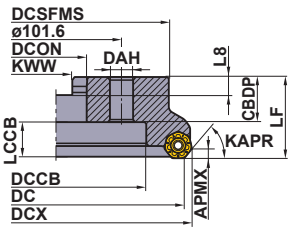
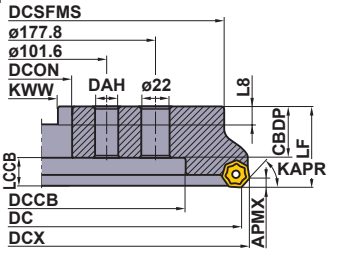


Fig.4
ø315



Right hand tool holder shown.

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	Type	LF	DCX	DCON	Fig.	WT(kg)	APMX
80	**AHX640WR08008C**	★	N	8	R	50	92.6	25.4 [1.0"]	1	1.5	6
	AHX640WL08008C	★	N	8	L	50	92.6	25.4 [1.0"]	1	1.5	6
	AHX640WR08010C	★	N	10	R	50	92.6	25.4 [1.0"]	1	1.5	6
	AHX640WL08010C	★	N	10	L	50	92.6	25.4 [1.0"]	1	1.5	6
100	**AHX640WR10010D**	★	N	10	R	50	112.6	31.75 [1.25"]	2	2.1	6
	AHX640WL10010D	★	N	10	L	50	112.6	31.75 [1.25"]	2	2.1	6
	AHX640WR10014D	★	N	14	R	50	112.6	31.75 [1.25"]	2	2.1	6
	AHX640WL10014D	★	N	14	L	50	112.6	31.75 [1.25"]	2	2.1	6
125	**AHX640WR12512E**	★	N	12	R	63	137.6	38.1 [1.50"]	2	3.5	6
	AHX640WL12512E	★	N	12	L	63	137.6	38.1 [1.50"]	2	3.5	6
	AHX640WR12518E	★	N	18	R	63	137.6	38.1 [1.50"]	2	3.5	6
	AHX640WL12518E	★	N	18	L	63	137.6	38.1 [1.50"]	2	3.5	6
160	**AHX640WR16016F**	★	N	16	R	63	172.6	50.8 [2.0"]	2	5.6	6
	AHX640WL16016F	★	N	16	L	63	172.6	50.8 [2.0"]	2	5.6	6
	AHX640WR16022F	★	N	22	R	63	172.6	50.8 [2.0"]	2	5.6	6
	AHX640WL16022F	★	N	22	L	63	172.6	50.8 [2.0"]	2	5.6	6
200	**AHX640WR20020K**	★	N	20	R	63	212.6	47.625 [1.875"]	3	9.0	6
	AHX640WL20020K	★	N	20	L	63	212.6	47.625 [1.875"]	3	9.0	6
	AHX640WR20028K	★	N	28	R	63	212.6	47.625 [1.875"]	3	9.0	6
	AHX640WL20028K	★	N	28	L	63	212.6	47.625 [1.875"]	3	9.0	6
250	**AHX640WR25024K**	★	N	24	R	63	262.6	47.625 [1.875"]	3	14.4	6
	AHX640WL25024K	★	N	24	L	63	262.6	47.625 [1.875"]	3	14.4	6
	AHX640WR25036K	★	N	36	R	63	262.6	47.625 [1.875"]	3	14.4	6
	AHX640WL25036K	★	N	36	L	63	262.6	47.625 [1.875"]	3	14.4	6
315	**AHX640WR31528P**	★	N	28	R	63	327.6	47.625 [1.875"]	4	23.8	6
	AHX640WL31528P	★	N	28	L	63	327.6	47.625 [1.875"]	4	23.8	6
	AHX640WR31544P	★	N	44	R	63	327.6	47.625 [1.875"]	4	23.8	6
	AHX640WL31544P	★	N	44	L	63	327.6	47.625 [1.875"]	4	23.8	6

★ N=No

Note 1) Set bolt not included.

Metric Standard

For metric arbors

Fig.1
ø80

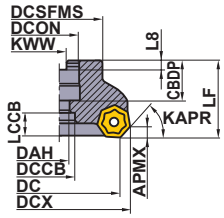


Fig.2
ø100
ø125

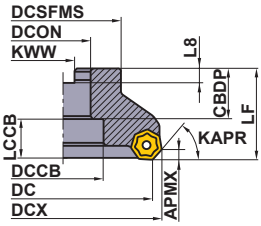


Fig.3
ø160

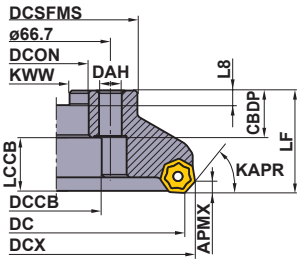


Fig.4
ø200
ø250

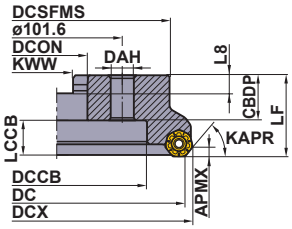
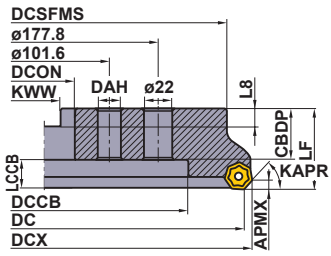


Fig.5
ø315



Right hand tool holder shown.

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	* Coolant Thru	Number of Teeth	Type	LF	DCX	DCON	Fig.	WT(kg)	APMX
80	**AHX640W-080A08R**	★	N	8	R	50	92.6	27	1	1.5	6
	AHX640W-080A08L	★	N	8	L	50	92.6	27	1	1.5	6
	AHX640W-080A10R	★	N	10	R	50	92.6	27	1	1.5	6
	AHX640W-080A10L	★	N	10	L	50	92.6	27	1	1.5	6
100	**AHX640W-100B10R**	★	N	10	R	50	112.6	32	2	2.1	6
	AHX640W-100B10L	★	N	10	L	50	112.6	32	2	2.1	6
	AHX640W-100B14R	★	N	14	R	50	112.6	32	2	2.1	6
	AHX640W-100B14L	★	N	14	L	50	112.6	32	2	2.1	6
125	**AHX640W-125B12R**	★	N	12	R	63	137.6	40	2	3.1	6
	AHX640W-125B12L	★	N	12	L	63	137.6	40	2	3.1	6
	AHX640W-125B18R	★	N	18	R	63	137.6	40	2	3.1	6
	AHX640W-125B18L	★	N	18	L	63	137.6	40	2	3.1	6
160	**AHX640W-160C16R**	★	N	16	R	63	172.6	40	3	5.6	6
	AHX640W-160C16L	★	N	16	L	63	172.6	40	3	5.6	6
	AHX640W-160C22R	★	N	22	R	63	172.6	40	3	5.6	6
	AHX640W-160C22L	★	N	22	L	63	172.6	40	3	5.6	6
200	**AHX640W-200C20R**	★	N	20	R	63	212.6	60	4	8.0	6
	AHX640W-200C20L	★	N	20	L	63	212.6	60	4	8.0	6
	AHX640W-200C28R	★	N	28	R	63	212.6	60	4	8.0	6
	AHX640W-200C28L	★	N	28	L	63	212.6	60	4	8.0	6
250	**AHX640W-250C24R**	★	N	24	R	63	262.6	60	4	12.6	6
	AHX640W-250C24L	★	N	24	L	63	262.6	60	4	12.6	6
	AHX640W-250C36R	★	N	36	R	63	262.6	60	4	12.6	6
	AHX640W-250C36L	★	N	36	L	63	262.6	60	4	12.6	6
315	**AHX640W-315C28R**	★	N	28	R	80	327.6	60	5	31.5	6
	AHX640W-315C28L	★	N	28	L	80	327.6	60	5	31.5	6
	AHX640W-315C44R	★	N	44	R	80	327.6	60	5	31.5	6
	AHX640W-315C44L	★	N	44	L	80	327.6	60	5	31.5	6

* N=No

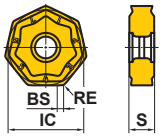
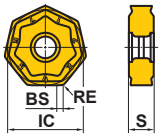
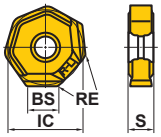
Note 1) Set bolt not included.

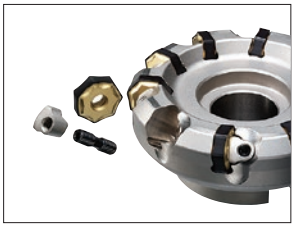
ISO13399	➤ K003
MOUNTING DIMENSION	➤ K093
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

INSERTS

Workpiece Material	K	Cast Iron

Cutting Conditions (Guide) : ● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting
Edge Preparation : E : Round

Shape	Order Number	Class	Edge Preparation	Coated			Dimensions(inch)					Geometry
				MC5020	VP15TF	VP20RT	IC	RE	BS	S	APMX	
General Cutting	**NNMU200608ZEN-MK**	M	E	●	●	●	.787	.031	.039	.258	.236	
Strong Cutting Edge Type	**NNMU200608ZEN-HK**	M	E	●	●	●	.787	.031	.039	.258	.236	
Wiper	**WNEU2006ZEN7C-WK**	E	E	●			.787	.031	.291	.258	.020	



SPARE PARTS

Tool Holder Number	Wedge	* Clamp Screw	Wrench
AHX640W	CWAHX640WN	LS0622T	TKY15T

* Clamp Torque (lbf-in) : LS0622T=53

● : USA Stock
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

■ Dry·Wet Cutting

(inch)

Workpiece Material		Tensile Strength	Grade	vc (SFM)	fz (IPT)
K	Gray Cast Iron	≤350MPa	MC5020	720 (490—985)	.012 (.008—.016)
			VP15TF VP20RT	590 (425—755)	.012 (.008—.016)
	Ductile Cast Iron	≤450MPa	MC5020	655 (490—820)	.008 (.004—.012)
			VP15TF VP20RT	560 (395—720)	.008 (.004—.012)
		≤800MPa	MC5020	560 (490—655)	.008 (.004—.012)
			VP15TF VP20RT	460 (330—590)	.008 (.004—.012)

■ Finishing (Use of Wiper Inserts)

(inch)

Workpiece Material		Grade	ap	vc (SFM)	fz (IPT)
K	Gray Cast Iron	MC5020	<.0197	1050 (820—1310)	.008 (.004—.012)
			.0197—.118	855 (655—1150)	
	Ductile Cast Iron		<.0197	855 (655—1150)	
			.0197—.118	720 (655—820)	

*In the case of IPR > .236 IPR, it is possible to use 2 or 3 wiper inserts for finish machining.

Note 1) With reference to the above examples, adjust the cutting conditions according to the use environment.
Note 2) Tool life when wet cutting is short compared to dry cutting.

AHX640W Mounting Dimension

Fig.1

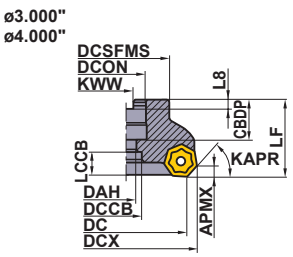


Fig.2

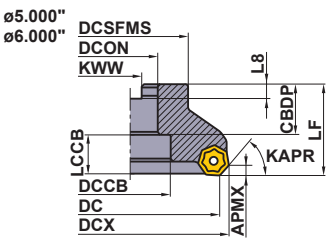


Fig.3

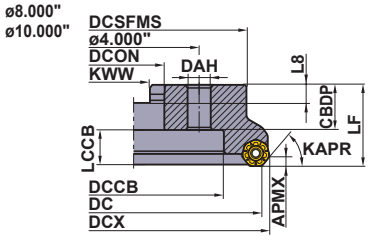
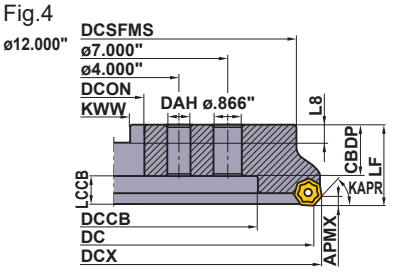


Fig.4



Right hand tool holder shown.

(inch)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.250	3.000	**AHX640WL0308D**	1.260	.669	1.024	.800	2.87	.500	.281	1
1.250	3.000	**AHX640WL0310D**	1.260	.669	1.024	.800	2.87	.500	.281	1
1.250	3.000	**AHX640WR0308D**	1.260	.669	1.024	.800	2.87	.500	.281	1
1.250	3.000	**AHX640WR0310D**	1.260	.669	1.024	.800	2.87	.500	.281	1
1.500	4.000	**AHX640WL0410E**	1.181	.787	1.181	.879	3.80	.625	.375	1
1.500	4.000	**AHX640WL0414E**	1.181	.787	1.181	.879	3.80	.625	.375	1
1.500	4.000	**AHX640WR0410E**	1.181	.787	1.181	.879	3.80	.625	.375	1
1.500	4.000	**AHX640WR0414E**	1.181	.787	1.181	.879	3.80	.625	.375	1
1.500	5.000	**AHX640WL0512E**	1.378	—	2.362	1.076	3.80	.625	.375	2
1.500	5.000	**AHX640WL0518E**	1.378	—	2.362	1.076	3.80	.625	.375	2
1.500	5.000	**AHX640WR0512E**	1.378	—	2.362	1.076	3.80	.625	.375	2
1.500	5.000	**AHX640WR0518E**	1.378	—	2.362	1.076	3.80	.625	.375	2
2.000	6.000	**AHX640WL0614F**	1.496	—	3.150	.958	4.72	.750	.437	2
2.000	6.000	**AHX640WL0620F**	1.496	—	3.150	.958	4.72	.750	.437	2
2.000	6.000	**AHX640WR0614F**	1.496	—	3.150	.958	4.72	.750	.437	2
2.000	6.000	**AHX640WR0620F**	1.496	—	3.150	.958	4.72	.750	.437	2
2.500	8.000	**AHX640WL0820M**	1.378	—	5.512	1.076	6.89	1.000	.560	3
2.500	8.000	**AHX640WL0828M**	1.378	—	5.512	1.076	6.89	1.000	.560	3
2.500	8.000	**AHX640WR0820M**	1.378	—	5.512	1.076	6.89	1.000	.560	3
2.500	8.000	**AHX640WR0828M**	1.378	—	5.512	1.076	6.89	1.000	.560	3
2.500	10.000	**AHX640WL1024M**	1.378	—	7.087	1.076	8.66	1.000	.560	3
2.500	10.000	**AHX640WL1036M**	1.378	—	7.087	1.076	8.66	1.000	.560	3
2.500	10.000	**AHX640WR1024M**	1.378	—	7.087	1.076	8.66	1.000	.560	3
2.500	10.000	**AHX640WR1036M**	1.378	—	7.087	1.076	8.66	1.000	.560	3
2.500	12.000	**AHX640WL1228M**	1.575	—	9.646	.879	11.22	1.000	.560	4
2.500	12.000	**AHX640WL1242M**	1.575	—	9.646	.879	11.22	1.000	.560	4
2.500	12.000	**AHX640WR1228M**	1.575	—	9.646	.879	11.22	1.000	.560	4
2.500	12.000	**AHX640WR1242M**	1.575	—	9.646	.879	11.22	1.000	.560	4

AHX640W Mounting Dimension

Fig.1

ø80

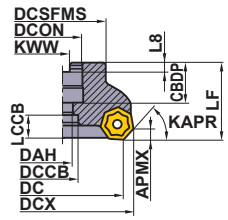


Fig.2

ø100
ø125
ø160

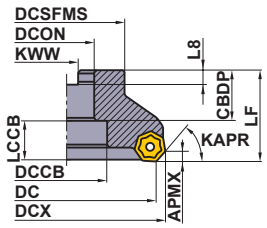


Fig.3

ø160

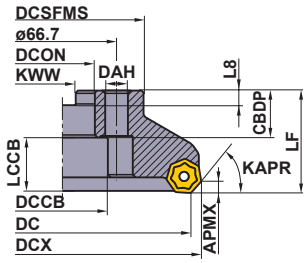


Fig.4

ø200
ø250

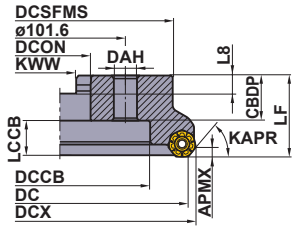
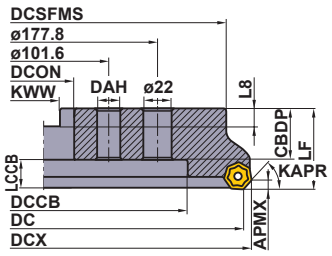


Fig.5

ø315



Right hand tool holder shown.

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
25.4	80	**AHX640WL08008C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WL08010C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WR08008C**	26	13	20	14.8	56	9.5	6	1
25.4	80	**AHX640WR08010C**	26	13	20	14.8	56	9.5	6	1
27	80	**AHX640W-080A08L**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A08R**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A10L**	23	13	20	14.8	56	12.4	7	1
27	80	**AHX640W-080A10R**	23	13	20	14.8	56	12.4	7	1
31.75	100	**AHX640WL10010D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WL10014D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WR10010D**	32	—	45	16.8	70	12.7	8	2
31.75	100	**AHX640WR10014D**	32	—	45	16.8	70	12.7	8	2
32	100	**AHX640W-100B10L**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B10R**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B14L**	32	—	45	16.8	70	14.4	8	2
32	100	**AHX640W-100B14R**	32	—	45	16.8	70	14.4	8	2
38.1	125	**AHX640WL12512E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WL12518E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WR12512E**	35	—	56	26.8	80	15.9	10	2
38.1	125	**AHX640WR12518E**	35	—	56	26.8	80	15.9	10	2
40	125	**AHX640W-125B12L**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B12R**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B18L**	32	—	56	29.8	80	16.4	9	2
40	125	**AHX640W-125B18R**	32	—	56	29.8	80	16.4	9	2
40	160	**AHX640W-160C16L**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C16R**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C22L**	29	14	56	32.8	100	16.4	9	3
40	160	**AHX640W-160C22R**	29	14	56	32.8	100	16.4	9	3

AHX640W Mounting Dimension

Fig.1

ø80

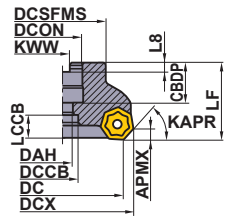


Fig.2

ø100
ø125
ø160

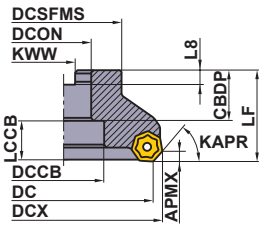


Fig.3

ø160

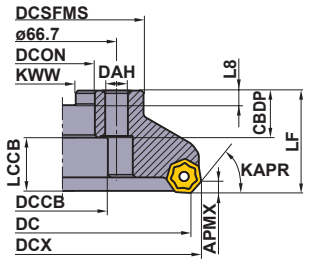


Fig.4

ø200
ø250

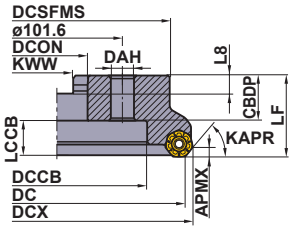
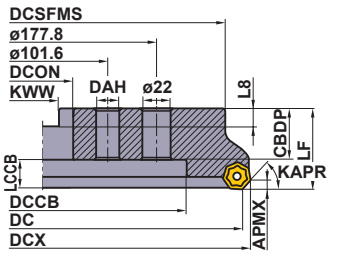


Fig.5

ø315



Right hand tool holder shown.

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
47.625	200	**AHX640WL20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WL20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20020K**	35	18	140	26.8	175	25.4	14.22	4
47.625	200	**AHX640WR20028K**	35	18	140	26.8	175	25.4	14.22	4
47.625	250	**AHX640WL25024K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WL25036K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WR25024K**	35	18	180	26.8	220	25.4	14.22	4
47.625	250	**AHX640WR25036K**	35	18	180	26.8	220	25.4	14.22	4
47.625	315	**AHX640WL31528P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WL31544P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WR31528P**	40	18	225	21.8	285	25.4	14.22	5
47.625	315	**AHX640WR31544P**	40	18	225	21.8	285	25.4	14.22	5
50.8	160	**AHX640WL16016F**	38	—	72	23.8	100	19.1	11	2
50.8	160	**AHX640WL16022F**	38	—	72	23.8	100	19.1	11	2
50.8	160	**AHX640WR16016F**	38	—	72	23.8	100	19.1	11	2
50.8	160	**AHX640WR16022F**	38	—	72	23.8	100	19.1	11	2
60	200	**AHX640W-200C20L**	32	18	135	29.8	155	25.7	14	4
60	200	**AHX640W-200C20R**	32	18	135	29.8	155	25.7	14	4
60	200	**AHX640W-200C28L**	32	18	135	29.8	155	25.7	14	4
60	200	**AHX640W-200C28R**	32	18	135	29.8	155	25.7	14	4
60	250	**AHX640W-250C24L**	32	18	180	29.8	200	25.7	14	4
60	250	**AHX640W-250C24R**	32	18	180	29.8	200	25.7	14	4
60	250	**AHX640W-250C36L**	32	18	180	29.8	200	25.7	14	4
60	250	**AHX640W-250C36R**	32	18	180	29.8	200	25.7	14	4
60	315	**AHX640W-315C28L**	57	18	225	21.8	285	25.7	14	5
60	315	**AHX640W-315C28R**	57	18	225	21.8	285	25.7	14	5
60	315	**AHX640W-315C44L**	57	18	225	21.8	285	25.7	14	5
60	315	**AHX640W-315C44R**	57	18	225	21.8	285	25.7	14	5

FACE MILLING
<HIGH EFFICIENCY CUTTING FOR CAST IRON>

45° KAPR

AOX445

P M **K** N S H

Fig.1
ø63

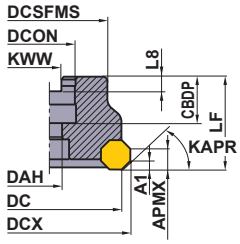
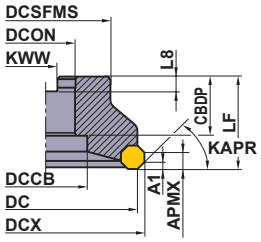


Fig.2
ø80
ø100
ø125
ø160



Metric Standard

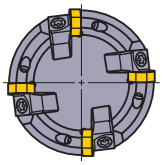
■ ARBOR TYPE

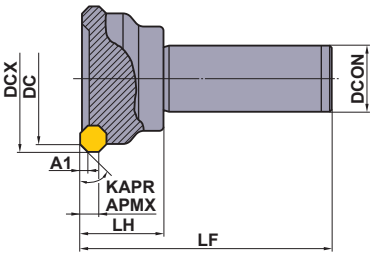
Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	DCX	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (kg)	Max. Depth of Cut (mm) A1	APMX	Max. Spindle Speed (min^{-1})	Fig.
Coarse Pitch	AOX445-063A04R	★	4	63	70.75	40	22	20	11	—	50	10.4	6.3	0.6	3	8	12000	1
	AOX445R08006C	★	6	80	87.73	50	25.4 [1.0"]	26	—	38	60	9.5	6	1.2	3	8	11000	2
	AOX445R10008D	★	8	100	107.73	50	31.75 [1.25"]	32	—	45	70	12.7	8	1.8	3	8	9300	2
	AOX445R12510E	★	10	125	132.71	63	38.1 [1.5"]	35	—	60	80	15.9	10	3.0	3	8	8300	2
	AOX445R16012F	★	12	160	167.71	63	50.8 [2.0"]	38	—	80	100	19.1	11	4.9	3	8	7200	2

Note 1) When machining with a depth of cut of over 3 mm, 16 corners cannot be used.

Metric Standard



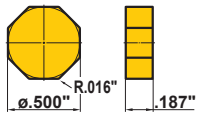


■ SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCX	LF	DCON	LH	WT (kg)	Max. Depth of Cut (mm) A1	APMX	Max. Spindle Speed (min^{-1})
Coarse Pitch	AOX445R503S32	★	3	50	57.75	125	32	40	1.1	3	8	13000
	AOX445R634S32	★	4	63	70.75	125	32	40	1.4	3	8	12000

INSERTS

Order Number	Class	CBN BC5030	Geometry
SL-ONEN120404ASN	E	★	

SPARE PARTS

Tool Holder Number	Wedge	Clamp Screw *	Wrench
AOX445	CWAOX445N	LS15T	TKY25T

* Clamp Torque (lbf-in) : LS15T=71

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Tensile Strength	Grade	Cutting Speed (SFM)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	BC5030	3280 (2625—4920)	.004 (.002—.006)
		250—350 MPa			

★ : Stocked in Japan
<1 insert in one case for CBN>

FACE MILLING
<HIGH FEED FINISHING>

90° KAPR F

FMAX

P M K N S H

Fig.1
ø3.000"
ø4.000"

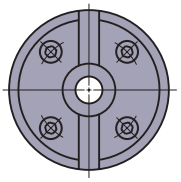
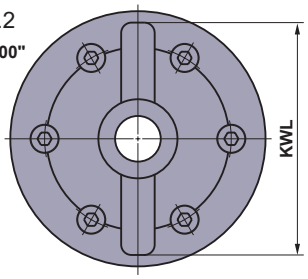
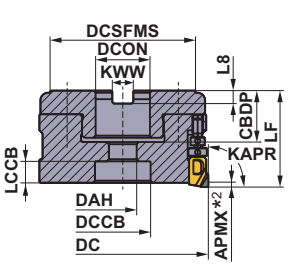
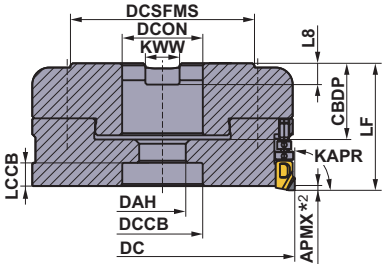


Fig.2
ø5.000"







■ ARBOR TYPE

DC=inch size, DCON=Inch size

Right hand tool holder only.

(inch)

DC	Order Number	Stock	*1 Coolant Thru	Number of Teeth	LF	DCON	WT (lbs)	RPMX (min-1)	Fig.
3.000	**FMAXUR0310C**	●	Y	10	1.772	1.000	2.2	24500	1
3.000	**FMAXUR0314C**	●	Y	14	1.772	1.000	2.1	24500	1
4.000	**FMAXUR0412D**	●	Y	12	1.969	1.250	4.2	22000	1
4.000	**FMAXUR0418D**	●	Y	18	1.969	1.250	4.1	22000	1
5.000	**FMAXUR0516E**	●	Y	16	2.362	1.500	7.6	19600	2
5.000	**FMAXUR0524E**	●	Y	24	2.362	1.500	7.5	19600	2

*1 Y=Yes

*2 For the maximum depth of cut (**APMX**), please refer to recommended cutting conditions (**ap**).

Note 1) The maximum depth of cut for should be .079 inch or less for ultra high efficiency machining with table feed (**vf** ≥ 787 IPM).

MOUNTING DIMENSIONS

(inch)

DCON	DC	Tool Holder Type	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
1.000	3.000	**FMAXUR03**	.945	.539	1.024	.433	2.677	.375	.219	—	1
1.250	4.000	**FMAXUR04**	1.260	.669	1.260	.394	3.465	.500	.281	—	1
1.500	5.000	**FMAXUR05**	1.417	.787	1.496	.472	3.465	.625	.375	4.409	2

SPARE PARTS

(inch)

DC	Tool Holder Type	Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø.098"
3.000	**FMAXUR03**	TSS04505S	KSN3	KSS2	HSCXU50012H	TKY10T	RKY25S
4.000	**FMAXUR04**	TSS04505S	KSN3	KSS2	HSCXU62514H	TKY10T	RKY25S
5.000	**FMAXUR05**	TSS04505S	KSN3	KSS2	HSCXU75017H	TKY10T	RKY25S

* Clamp Torque (lbf-in) : TSS04505S=31

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Note 2) The cutter body includes a set bolt for an arbor.

FMAX

For Compact and Smaller Machining Centers

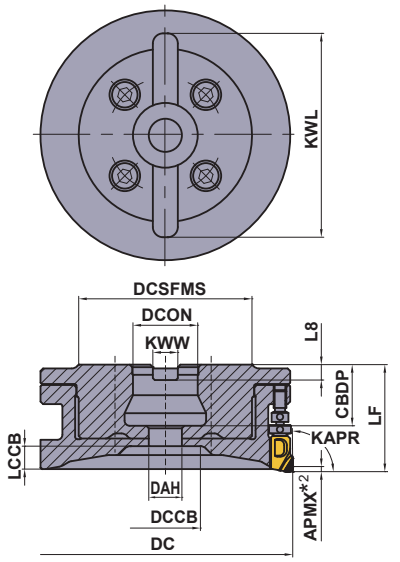
P | M | **K** | **N** | S | H

Metric Standard

For Inch Arbors

Fig.1

ø100
ø125



Right hand tool holder only.

■ARBOR TYPE

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	∗1 Coolant Thru	Number of Teeth	LF	DCON	WT (kg)	RPMX (min-1)	Fig.
100	**FMAXR10010CLW**	★	Y	10	42	25.4	1.06	22000	1
100	**FMAXR10016CLW**	★	Y	16	42	25.4	1.11	22000	1
125	**FMAXR12514CLW**	★	Y	14	42	25.4	1.44	19600	1
125	**FMAXR12520CLW**	★	Y	20	42	25.4	1.48	19600	1

∗1 Y=Yes

∗2 For the maximum depth of cut (**APMX**), please refer to recommended cutting conditions (**ap**).

Note 1) The maximum depth of cut for should be 2 mm or less for ultra high efficiency machining with table feed (**vf** ≥ 20000 mm/min).

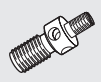
MOUNTING DIMENSIONS

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4	100	**FMAXR10010CLW**	24	13	27	9	68	9.5	6	80	1
25.4	100	**FMAXR10016CLW**	24	13	27	9	68	9.5	6	80	1
25.4	125	**FMAXR12514CLW**	24	13	52	9	68	9.5	6	80	1
25.4	125	**FMAXR12520CLW**	24	13	52	9	68	9.5	6	80	1

SPARE PARTS

(mm)

Insert Clamp Screw *	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
					
TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S

∗ Clamp Torque (lbf-in) : TSS04505S = 31

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Note 2) The cutter body includes a set bolt for an arbor.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

FMAX-40/50/63

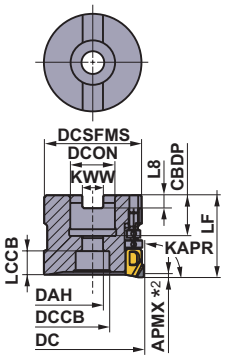
P M **K** **N** S H

Metric Standard

For Metric Arbors

Fig.1

ø40
ø50
ø63



Right hand tool holder only.

■ARBOR TYPE

DC=mm size, DCON=mm size

(mm)

DC	Order Number	Stock	∗1 Coolant Thru	Number of Teeth	LF	DCON	WT (kg)	RPMX (min^{-1})	Fig.
40	**FMAX-040A04R**	★	Y	4	40	16	0.24	30000	1
40	**FMAX-040A06R**	★	Y	6	40	16	0.23	30000	1
50	**FMAX-050A08R**	★	Y	8	40	22	0.37	30000	1
50	**FMAX-050A10R**	★	Y	10	40	22	0.35	30000	1
63	**FMAX-063A10R**	★	Y	10	40	22	0.67	27000	1
63	**FMAX-063A12R**	★	Y	12	40	22	0.66	27000	1

∗1 Y=Yes

∗2 For the maximum depth of cut (**APMX**), please refer to recommended cutting conditions (**ap**).

Note 1) The maximum depth of cut for should be 2 mm or less for ultra high efficiency machining with table feed (**vf** ≥ 20000 mm/min).

MOUNTING DIMENSIONS

(mm)

DCON	DC	Tool Holder Type	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
16	40	**FMAX-040**	18	9	14	10	37	8.4	5.6	—	1
22	50	**FMAX-050**	20	11	17	12	47	10.4	6.3	—	1
22	63	**FMAX-063**	20	11	17	12	60	10.4	6.3	—	1

SPARE PARTS

(mm)

DC	Tool Holder Type	Insert Clamp Screw ∗	Micro Adjustment Nut	Cutter Set Bolt	Wrench T10	Wrench ø2.5
40	**FMAX-040**	TSS04505S	KSN3	HSC08030H	TKY10T	RKY25S
50	**FMAX-050**	TSS04505S	KSN3	HSC10030H	TKY10T	RKY25S
63	**FMAX-063**	TSS04505S	KSN3	HSC10030H	TKY10T	RKY25S

∗ Clamp Torque (lbf-in) : TSS04505S = 31

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Note 2) The cutter body includes a set bolt for an arbor.

FMAX

P M **K** **N** S H

Metric Standard

For Inch Arbors

Fig.1
ø80

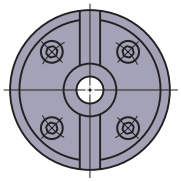
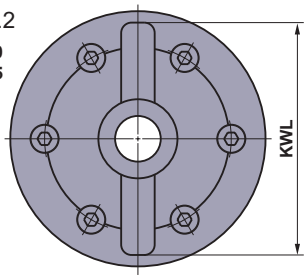
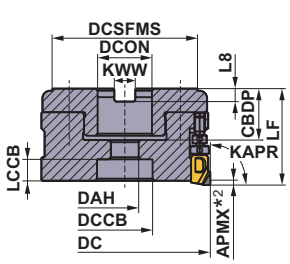
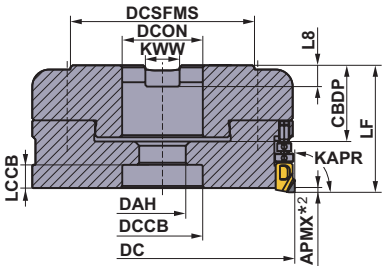


Fig.2
ø100
ø125







Right hand tool holder only.

■ARBOR TYPE

DC=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock	*1 Coolant Thru	Number of Teeth	LF	DCON	WT (kg)	RPMX (min^{-1})	Fig.
80	**FMAXR08010C**	★	Y	10	45	25.4 [1.00"]	1.11	24500	1
80	**FMAXR08014C**	★	Y	14	45	25.4 [1.00"]	1.09	24500	1
100	**FMAXR10012D**	★	Y	12	50	31.75 [1.25"]	1.85	22000	2
100	**FMAXR10018D**	★	Y	18	50	31.75 [1.25"]	1.81	22000	2
125	**FMAXR12516E**	★	Y	16	60	38.1 [1.50"]	3.33	19600	2
125	**FMAXR12524E**	★	Y	24	60	38.1 [1.50"]	3.27	19600	2
NEW 160	**FMAXR16016D**	★	Y	16	63	31.75	3.30	10000	1
NEW 160	**FMAXR16024D**	★	Y	24	63	31.75	3.39	10000	1

*1 Y=Yes

*2 For the maximum depth of cut (**APMX**), please refer to recommended cutting conditions (**ap**).

Note 1) The maximum depth of cut for should be 2mm or less for ultra high efficiency machining with table feed (**vf** ≥ 20000mm/min).

MOUNTING DIMENSIONS

(mm)

DCON	DC	Order Number	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	KWL	Fig.
25.4	80	**FMAXR08010C**	24	13	26	11	68	9.5	6	—	1
25.4	80	**FMAXR08014C**	24	13	26	11	68	9.5	6	—	1
31.75	100	**FMAXR10012D**	32	17	32	10	79	12.7	8	90	2
31.75	100	**FMAXR10018D**	32	17	32	10	79	12.7	8	90	2
38.1	125	**FMAXR12516E**	36	22	38	12	88	15.9	10	112	2
38.1	125	**FMAXR12524E**	36	22	38	12	88	15.9	10	112	2
31.75	160	**FMAXR16016D**	38	17	53	10	75	12.7	8	—	1
31.75	160	**FMAXR16024D**	38	17	53	10	75	12.7	8	—	1

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

SPARE PARTS

(mm)

DC	Tool Holder Type	Insert Clamp* Screw	Micro Adjustment Nut	Large Adjustment Screw	Cutter Set Bolt	Wrench T10	Wrench ø2.5
80	**FMAXR080**	TSS04505S	KSN3	KSS2	HSCX12030H	TKY10T	RKY25S
100	**FMAXR100**	TSS04505S	KSN3	KSS2	HSCX16035H	TKY10T	RKY25S
125	**FMAXR125**	TSS04505S	KSN3	KSS2	HSCX20035H	TKY10T	RKY25S
160	**FMAXR160**	TSS04505S	KSN3	KSS2	HSCX16045H	TKY10T	RKY25S

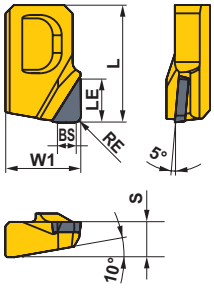
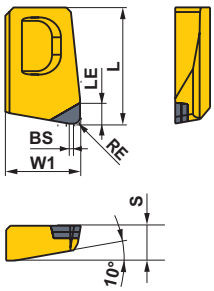
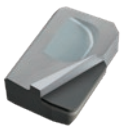
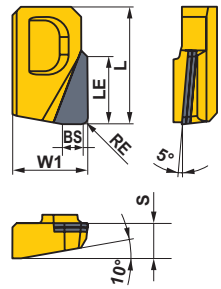
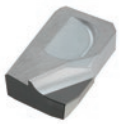
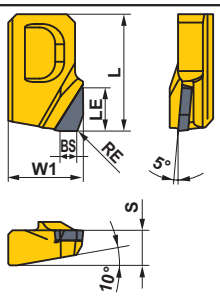
* Clamp Torque (lbf-in) : TSS04505S = 31

Note 1) Please refer to the instruction manual included in the cutter body for how to locate the insert and adjust the run-out and the balance.

Note 2) The cutter body includes a set bolt for an arbor.

INSERTS

(inch)

Workpiece Material			MD220	MD2030	MB4120	Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting						
	K	Cast Iron	◐	◐	◐							
	N	Non-ferrous Metal										
Shape	Order Number					L	LE	W1	S	BS	RE	Geometry
For Aluminum Alloys General Purpose	**GOER1404PXFR2**		●	●		.551	.197	.354	.165	.079	.016	
	GOER1408PXFR2		●	●		.551	.197	.354	.165	.079	.031	
For Gray Cast Iron NEW General Purpose	**NP-GOEN1404PXSR05**				●	.551	.098	.354	.165	.020	.016	
	NP-GOEN1408PXSR05				●	.551	.098	.354	.165	.020	.031	
For Aluminum Alloys  Long Edge	**GOER1408PXFR2-8**		●			.551	.315	.354	.165	.079	.031	
For Aluminum Alloys  Burr Prevention	**GOER1401ZXFR2**		●			.551	.197"	.354	.165	.079	.004	

For Aluminum Alloys : Sharp Edge
For Gray Cast Iron : Chamfered and Rounded (0.13mmx15°+R0.01)

Note 1) If general purpose inserts (RE = .016", .031"), burr prevention inserts and long edge inserts are used together, they will not be able to sufficiently display their full performance. Inserts of the same shape should be used according to the application.
Note 2) The cutting diameter will change depending on the shape.
Be particularly careful when cutting near vertical walls, since there is a possibility of interference with the holder.
Note 3) The long edge inserts corresponds to the gate remainder and can not be used for constant depth cutting.

● : USA Stock
<PCD inserts are available with 1 piece in one case.>

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

(inch)

Workpiece Material		Properties	Grade	Cutting Speed **vc** (SFM)	Depth of Cut		Feed per Tooth **fz** (IPT)	Cutting Mode
					ae	**ap**		
K	Gray Cast Iron	Tensile Strength ≤350MPa	**MB4120**	3280 (2295—4265)	≤ 0.8 DC	≤ .020	.003 (.002—.006)	Dry
N	Aluminum Alloys	Content Si < 5%	**MD2030 MD220**	8200 (6560—9840)	≤ 0.2 DC	≤ .118 (.020—.118)	.003 (.002—.008)	Wet
					≤ 0.5 DC	≤ .098 (.020—.098)		
					≤ 0.8 DC	≤ .079 (.020—.079)		
		Content 5% ≤ Si ≤ 10%	**MD2030 MD220**	8200 (6560—9840)	≤ 0.2 DC	≤ .118 (.020—.118)	.003 (.002—.008)	Wet
					≤ 0.5 DC	≤ .098 (.020—.098)		
					≤ 0.8 DC	≤ .079 (.020—.079)		
		Content 10% < Si < 15%	**MD220 MD2030**	1970 (1310—2625)	≤ 0.2 DC	≤ .118 (.020—.118)	.003 (.002—.008)	Wet
					≤ 0.5 DC	≤ .098 (.020—.098)		
					≤ 0.8 DC	≤ .079 (.020—.079)		
		Content Si ≥ 15%	**MD220 MD2030**	1970 (1310—2625)	≤ 0.2 DC	≤ .118 (.020—.118)	.003 (.002—.008)	Wet
					≤ 0.5 DC	≤ .098 (.020—.098)		
					≤ 0.8 DC	≤ .079 (.020—.079)		

Note 1) Please adjust the depth of cut **ap** depending on the width of cut **ae**.

Note 2) When using the long edge insert, please select the conditions depending on depths of cut (**ap**) excluding the length of the gate.

FACE MILLING

<HIGH EFFICIENCY CUTTING FOR CAST IRON>

84° KAPR

F R

WSF406W NEW

P M K N S H

Metric Standard

Fig.1

ø80

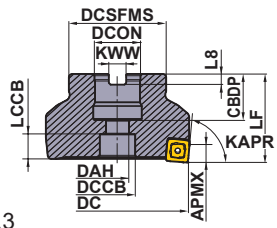


Fig.2

ø100
ø125
ø160

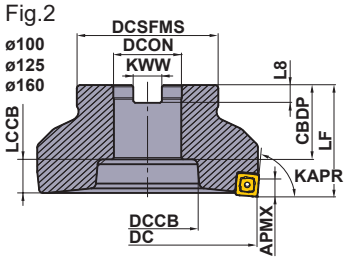
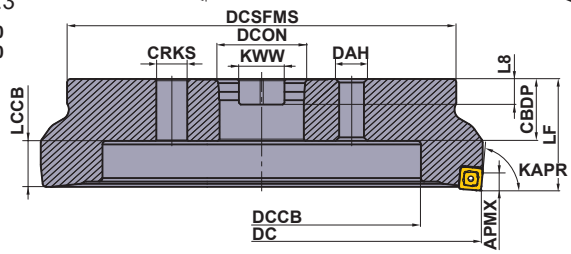


Fig.3

ø200
ø250



Right hand tool holder only.

■ARBOR TYPE

DCON=inch size

(mm)

DC	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.
80	**WSF406WR08006CN**	★	6	50	25.4	1.2	7.0	7,800	1
80	**WSF406WR08009CN**	★	9	50	25.4	1.2	7.0	7,800	1
100	**WSF406WR10008DN**	★	8	50	31.75	1.7	7.0	7,000	2
100	**WSF406WR10012DN**	★	12	50	31.75	1.7	7.0	7,000	2
125	**WSF406WR12510EN**	★	10	63	38.1	3.3	7.0	6,250	2
125	**WSF406WR12516EN**	★	16	63	38.1	3.2	7.0	6,250	2
160	**WSF406WR16014FN**	★	14	63	50.8	5	7.0	5,500	2
160	**WSF406WR16020FN**	★	20	63	50.8	4.9	7.0	5,500	2
200	**WSF406WR20016KN**	★	16	63	47.625	8.6	7.0	4,900	3
200	**WSF406WR20024KN**	★	24	63	47.625	8.5	7.0	4,900	3
250	**WSF406WR25022KN**	★	22	63	47.625	14	7.0	4,400	3
250	**WSF406WR25032KN**	★	32	63	47.625	13.9	7.0	4,400	3

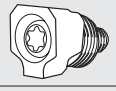
Note1) A set bolt for the arbor is not supplied with the body. Please refer to page K104 to find the correct type of set bolt to order.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	CRKS	LCCB	DCSFMS	KWW	L8	Fig.
80	**WSF406WR080**	25.4	34	13	20	—	14	55	9.5	6	1
100	**WSF406WR100**	31.75	32	—	46	—	16	70	12.7	8	2
125	**WSF406WR125**	38.1	42	—	56	—	19	80	15.9	10	2
160	**WSF406WR160**	50.8	45	—	80	—	16	100	19.1	11	2
200	**WSF406WR200**	47.625	35	18	140	M16	26	175	25.4	14.22	3
250	**WSF406WR250**	47.625	35	18	180	M16	26	220	25.4	14.22	3

SPARE PARTS

Tool Holder Type		*		
	Wedge	Clamp Screw	Wrench	Adjustable Run-Out System
WSF406W	CWSF406N	LS0622T	TKY15T	ADW04

* Clamp Torque (lbf-in) : LS0622T = 53

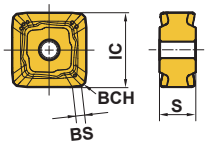
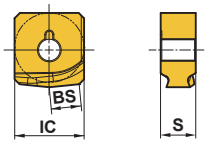
ISO13399	➤ K003
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

INSERTS

(inch)

Workpiece Material	K	Cast Iron

Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
Edge Preparation : E : Round

Shape	Order Number	Class	Edge Preparation	Coated MC520	IC	S	BS	BCH	Geometry
	SNMU1206C05ZNER-M	M	E	★	.500	.244	.063	.020	
Wiper	**WNGU1206ZNER5C-M**	G	E	★	.484	.244	.205	–	

How to Use Wiper Insert for Best Results

- The WSF406W can obtain a good surface finish when using a standard insert due to the adjustable run-out system, but by using a wiper insert an excellent surface finish can be achieved without having to set a high accuracy face run-out. When a wiper insert is mounted, aim to set the standard insert run-out accuracy to within .0016 inch.
- Just one wiper insert is enough to achieve excellent finished surfaces.
  However, if the feed per revolution is greater than .197 IPR, attach two or more wiper inserts so that they are evenly spaced in the cutter body and set the run-out accuracy between multiple wiper inserts to within .0001 inch before use.

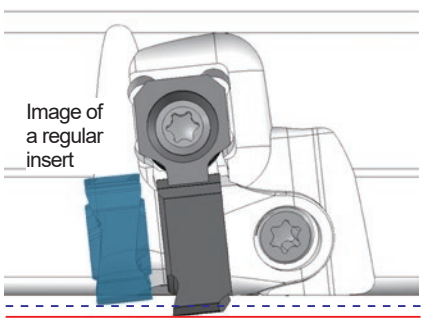


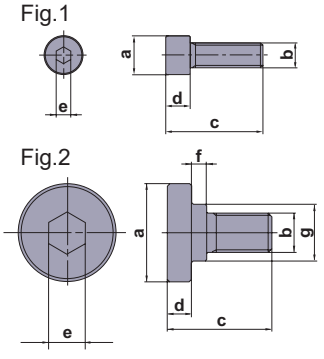
Image diagram

Regular insert cutting edge
Wiper insert cutting edge
Overhand amount should be within .0028 inch

OPTIONAL PARTS

(mm)

Tool Holder Type	Set Bolt Order Number	Fig.	a	b	c	d	e	f	g	Geometry
WSF406WR080	HSC12035	1	18	M12×1.75	47	12	10	–	–	Fig.1
WSF406WR100	–	2	40	M16×2	43	10	14	6	23	
WSF406WR125	–	2	50	M20×2.5	54	14	17	6	27	
WSF406WR160	–	2	65	M24×3	59	14	17	10	37	
WSF406WR200	–	1	24	M16×2	61-	16	14	–	–	Fig.2
WSF406WR250	–	1	24	M16×2	61-	16	14	–	–	



Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions. The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials

★ : Stocked in Japan
<10 inserts in one case>

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✠ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

(inch)

	Workpiece Material	Properties	Cutting Conditions	Depth of Cut **ap**	Cutting Speed **vc** (SFM)	Feed per Tooth **fz** (IPT)	Width of Cut **ae**
K	Gray Cast Iron	Tensile Strength ≤350MPa	●	ap≤.020	985(820—1150)	.005(.003—.008)	≤.8DC
				ap≤.079	820(690—985)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	720(620—850)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	655(590—755)	.004(.003—.006)	≤.8DC
			◕	ap≤.020	820(690—985)	.005(.003—.008)	≤.8DC
				ap≤.079	720(620—850)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	655(590—755)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	590(525—690)	.004(.003—.006)	≤.8DC
			✠	ap≤.020	720(620—850)	.005(.003—.008)	≤.8DC
				ap≤.079	655(590—755)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	590(525—690)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	490(330—590)	.004(.003—.006)	≤.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	●	ap≤.020	755(655—820)	.005(.003—.008)	≤.8DC
				ap≤.079	655(560—755)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	590(490—690)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	525(425—620)	.004(.003—.006)	≤.8DC
			◕	ap≤.020	655(560—755)	.005(.003—.008)	≤.8DC
				ap≤.079	590(490—690)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	525(425—620)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	460(360—560)	.004(.003—.006)	≤.8DC
			✠	ap≤.020	590(490—655)	.005(.003—.008)	≤.8DC
				ap≤.079	525(425—620)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	460(360—560)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	395(295—490)	.004(.003—.006)	≤.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	●	ap≤.020	755(655—820)	.005(.003—.008)	≤.8DC
				ap≤.079	655(560—755)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	590(490—690)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	525(425—620)	.004(.003—.006)	≤.8DC
			◕	ap≤.020	655(560—755)	.005(.003—.008)	≤.8DC
				ap≤.079	590(490—690)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	525(425—620)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	460(360—560)	.004(.003—.006)	≤.8DC
			✠	ap≤.020	590(490—690)	.005(.003—.008)	≤.8DC
				ap≤.079	525(425—620)	.006(.004—.010)	≤.8DC
				.079 <ap≤.157	460(360—560)	.005(.004—.008)	≤.8DC
				.157 <ap≤.298	395(295—490)	.004(.003—.006)	≤.8DC

Note 1) Set the cutting conditions according to the usage written on the table above.
Note 2) When using a wiper insert, the cutting conditions for the finishing area are ap≤.020 inch.

SHOULDER MILLING
<STRONG EDGE TYPE FOR CAST IRON>

90° KAPR

VOX400

P M **K** N S H

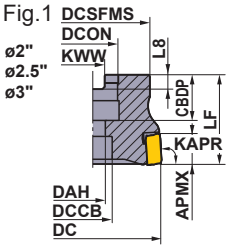
Fig.1


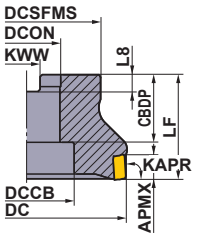
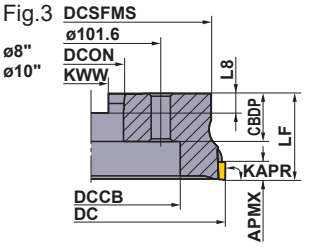
Fig.2


Fig.3


■ ARBOR TYPE

Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	WT (lbs)	APMX (inch)	Fig.
Coarse Pitch	**VOX400UR0203C**	●	3	2.000	2.000	1.000	1.339	.539	.787	1.93	.375	.219	.8	.394	1
	VOX400UR2504C	●	4	2.500	2.000	1.000	1.339	.539	.787	2.19	.375	.219	1.7	.394	1
	VOX400UR0304C	●	4	3.000	2.000	1.000	1.339	.539	.787	2.19	.375	.219	2.2	.394	1
	VOX400UR0406E	●	6	4.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	4.3	.394	2
	VOX400UR0508E	●	8	5.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	6.0	.394	2
	VOX400UR0610F	●	10	6.000	2.500	2.000	1.024	—	3.228	4.88	.750	.437	10.2	.394	2
	VOX400UR0812M	●	12	8.000	2.500	2.500	1.378	—	5.512	6.89	1.000	.560	17.6	.394	3
	VOX400UR1016M	●	16	10.000	2.500	2.500	1.378	—	7.078	8.66	1.000	.560	29.4	.394	3
Fine Pitch	**VOX400UR0205C**	●	5	2.000	2.000	1.000	1.339	.539	.787	1.93	.375	.219	.8	.394	1
	VOX400UR2506C	●	6	2.500	2.000	1.000	1.339	.539	.787	2.19	.375	.219	1.7	.394	1
	VOX400UR0308C	●	8	3.000	2.000	1.000	1.339	.539	.787	2.19	.375	.219	2.2	.394	1
	VOX400UR0410E	●	10	4.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	4.3	.394	2
	VOX400UR0512E	●	12	5.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	6.0	.394	2
	VOX400UR0616F	●	16	6.000	2.500	2.000	1.024	—	3.228	4.88	.750	.437	10.2	.394	2
	VOX400UR0820M	●	20	8.000	2.500	2.500	1.378	—	5.512	6.89	1.000	.560	17.6	.394	3
	VOX400UR1024M	●	24	10.000	2.500	2.500	1.378	—	7.078	8.66	1.000	.560	29.4	.394	3
Extra Fine Pitch	**VOX400UR2508C**	●	8	2.500	2.000	1.000	1.024	.539	.787	2.19	.375	.219	1.5	.394	1
	VOX400UR0310C	●	10	3.000	2.000	1.000	1.024	.539	.787	2.19	.375	.219	2.0	.394	1
	VOX400UR0412E	●	12	4.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	4.1	.394	2
	VOX400UR0516E	●	16	5.000	2.000	1.500	1.024	—	2.205	3.81	.625	.375	5.6	.394	2
	VOX400UR0620F	●	20	6.000	2.500	2.000	1.024	—	3.228	4.88	.750	.437	9.8	.394	2
	VOX400UR0826M	●	26	8.000	2.500	2.500	1.378	—	5.512	6.89	1.000	.560	17.1	.394	3
	VOX400UR1034M	●	34	10.000	2.500	2.500	1.378	—	7.087	8.66	1.000	.560	28.7	.394	3

Note 1) Set bolt not included.

● : USA Stock ★ : Stocked in Japan

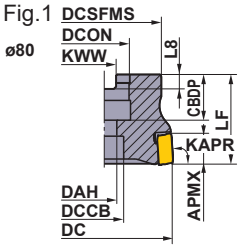
Fig.1


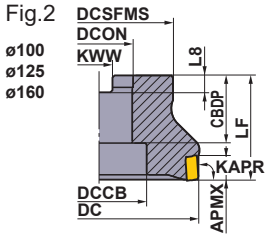
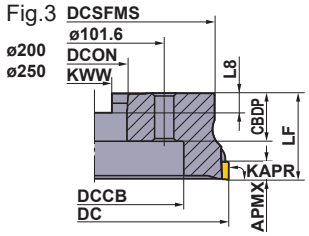
Fig.2


Fig.3


Right hand tool holder only.

Metric Standard

For inch arbors

■ ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]										WT (kg)	APMX (mm)	Fig.
		R		DC	LF	DCON		CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	**VOX400R08004C**	★	4	80	50	25.4	[1.0"]	26	13	20	55	9.5	6	1.0	10	1
	VOX400R10006D	★	6	100	50	31.75	[1.25"]	32	—	45	70	12.7	8	1.5	10	2
	VOX400R12508E	★	8	125	63	38.1	[1.5"]	40	—	60	80	15.9	10	2.7	10	2
	VOX400R16010F	★	10	160	63	50.8	[2.0"]	43	—	80	120	19.1	11	5.3	10	2
	VOX400R20012K	★	12	200	63	47.625	[1.875"]	35	—	130	175	25.4	14.22	8.5	10	3
	VOX400R25016K	★	16	250	63	47.625	[1.875"]	35	—	180	220	25.4	14.22	13.3	10	3
Fine Pitch	**VOX400R08008C**	★	8	80	50	25.4	[1.0"]	26	13	20	55	9.5	6	1.0	10	1
	VOX400R10010D	★	10	100	50	31.75	[1.25"]	32	—	45	70	12.7	8	1.5	10	2
	VOX400R12512E	★	12	125	63	38.1	[1.5"]	40	—	60	80	15.9	10	2.7	10	2
	VOX400R16016F	★	16	160	63	50.8	[2.0"]	43	—	80	120	19.1	11	5.3	10	2
	VOX400R20020K	★	20	200	63	47.625	[1.875"]	35	—	130	175	25.4	14.22	8.5	10	3
	VOX400R25024K	★	24	250	63	47.625	[1.875"]	35	—	180	220	25.4	14.22	13.3	10	3
Extra Fine Pitch	**VOX400R08010C**	★	10	80	50	25.4	[1.0"]	26	13	20	55	9.5	6	1.0	10	1
	VOX400R10012D	★	12	100	50	31.75	[1.25"]	32	—	45	70	12.7	8	1.4	10	2
	VOX400R12516E	★	16	125	63	38.1	[1.5"]	40	—	60	80	15.9	10	2.6	10	2
	VOX400R16020F	★	20	160	63	50.8	[2.0"]	43	—	80	120	19.1	11	5.1	10	2
	VOX400R20026K	★	26	200	63	47.625	[1.875"]	35	—	130	175	25.4	14.22	8.2	10	3
	VOX400R25034K	★	34	250	63	47.625	[1.875"]	35	—	180	220	25.4	14.22	13.0	10	3

Note 1) Set bolt not included.

SPARE PARTS

Tool Holder Number	*	
	Clamp Screw	Wrench
VOX400	CS401160T	TKY15T

* Clamp Torque (lbf-in) : CS401160T=31

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Metric Standard

For metric arbors

Fig.1

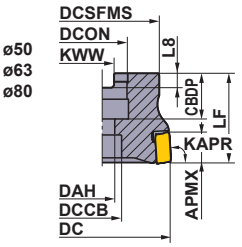
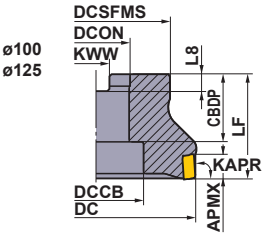
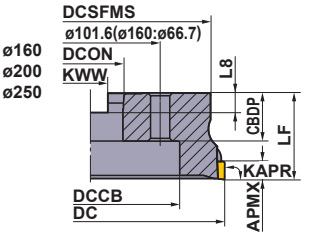


Fig.2



Right hand tool holder only.

Fig.3



■ ARBOR TYPE

Type	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT (kg)	APMX (mm)	Fig.
		R		DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8			
Coarse Pitch	**VOX400-050A03R**	★	3	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	VOX400-063A04R	★	4	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	VOX400-080A04R	★	4	80	50	27	23	13	20	56	12.4	7	1	10	1
	VOX400-100B06R	★	6	100	50	32	32	—	45	78	14.4	8	1.7	10	2
	VOX400-125B08R	★	8	125	63	40	32	—	56	89	16.4	9	3	10	2
	VOX400-160C10R	★	10	160	63	40	29	—	56	120	16.4	9	5.4	10	3
	VOX400-200C12R	★	12	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3
	VOX400-250C16R	★	16	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3
Fine Pitch	**VOX400-050A05R**	★	5	50	40	22	20	11	17	41	10.4	6.3	0.3	10	1
	VOX400-063A06R	★	6	63	40	22	20	11	17	50	10.4	6.3	0.6	10	1
	VOX400-080A08R	★	8	80	50	27	23	13	20	56	12.4	7	1	10	1
	VOX400-100B10R	★	10	100	50	32	32	—	45	78	14.4	8	1.7	10	2
	VOX400-125B12R	★	12	125	63	40	32	—	56	89	16.4	9	3	10	2
	VOX400-160C16R	★	16	160	63	40	29	—	56	120	16.4	9	5.4	10	3
	VOX400-200C20R	★	20	200	63	60	32	—	130	175	25.7	14.22	8.1	10	3
	VOX400-250C24R	★	24	250	63	60	32	—	180	210	25.7	14.22	11.8	10	3
Extra Fine Pitch	**VOX400-063A08R**	★	8	63	40	22	20	11	17	50	10.4	6.3	0.5	10	1
	VOX400-080A10R	★	10	80	50	27	23	13	20	56	12.4	7	1.0	10	1
	VOX400-100B12R	★	12	100	50	32	32	—	45	78	14.4	8	1.6	10	2
	VOX400-125B16R	★	16	125	63	40	32	—	56	89	16.4	9	2.8	10	2
	VOX400-160C20R	★	20	160	63	40	29	—	56	120	16.4	9	5.2	10	3
	VOX400-200C26R	★	26	200	63	60	32	—	130	175	25.7	14.22	7.9	10	3
	VOX400-250C34R	★	34	250	63	60	32	—	180	210	25.7	14.22	11.5	10	3

Note 1) Set bolt not included.

SPARE PARTS

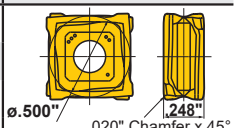
Tool Holder Number	*	
	Clamp Screw	Wrench
VOX400	CS401160T	TKY15T

* Clamp Torque (lbf-in) : CS401160T=31

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

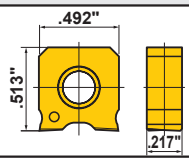
INSERTS

Workpiece Material	K	Cast Iron			Cutting Conditions (Guide) : ●: Stable Cutting ◔: General Cutting ✣: Unstable Cutting

Shape	Order Number	Class	Edge Preparation	Coated MC5020	Coated VP15TF	Geometry
	SONX1206PER	N	E	●	●	 ø.500" .248" .020" Chamfer x 45° Right hand insert shown.
	SONX1206PEL	N	E		★	

WIPER INSERTS

Workpiece Material	K	Cast Iron			Cutting Conditions (Guide) : ●: Stable Cutting ◔: General Cutting ✣: Unstable Cutting

Shape	Order Number	Class	Edge Preparation	Coated VP15TF	Geometry
	WOEX1206PER5C	E	E	●	 .492" .513" .217"

Note 1) Left hand insert used for special products. (Ex. Side cutter, Left hand cutter)
Note 2) SONX12 features 8 usable corners with high strength cutting edge.

RECOMMENDED CUTTING CONDITIONS

■ VOX400 (Standard pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2"–ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤DC	≤.394	.008(.004－.012)

■ VOX400 (Fine pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2.5"			ϕ3"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤0.8DC	≤.394	.012(.008－.016)	≤0.6DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.8DC	≤.394	.012(.008－.016)	≤0.6DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤0.8DC	≤.394	.008(.004－.012)	≤0.6DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.8DC	≤.394	.008(.004－.012)	≤0.6DC	≤.394	.008(.004－.012)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ4"			ϕ5"		
					Radial depth of cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤0.5DC	≤.394	.012(.008－.016)	≤0.4DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.5DC	≤.394	.012(.008－.016)	≤0.4DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤0.5DC	≤.394	.008(.004－.012)	≤0.4DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.5DC	≤.394	.008(.004－.012)	≤0.4DC	≤.394	.008(.004－.012)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤0.3DC	≤.394	.012(.008－.016)	≤0.2DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.3DC	≤.394	.012(.008－.016)	≤0.2DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤0.3DC	≤.394	.008(.004－.012)	≤0.2DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.3DC	≤.394	.008(.004－.012)	≤0.2DC	≤.394	.008(.004－.012)

Note 1) DC is cutter diameter.
Note 2) When using wiper insert, please reduce the feed per tooth to half the normal rate.

■ VOX400 (Extra fine pitch)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ2.5"			ϕ3"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤0.6DC	≤.394	.012(.008－.016)	≤0.5DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.6DC	≤.394	.012(.008－.016)	≤0.5DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤0.6DC	≤.394	.008(.004－.012)	≤0.5DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.6DC	≤.394	.008(.004－.012)	≤0.5DC	≤.394	.008(.004－.012)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ4"			ϕ5"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤0.4DC	≤.394	.012(.008－.016)	≤0.3DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.4DC	≤.394	.012(.008－.016)	≤0.3DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤0.4DC	≤.394	.008(.004－.012)	≤0.3DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.4DC	≤.394	.008(.004－.012)	≤0.3DC	≤.394	.008(.004－.012)

Workpiece Material		Tensile Strength	Insert Grade	Cutting Speed (SFM)	ϕ6"			ϕ8", ϕ10"		
					Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)	Radial Depth of Cut ae (mm)	Depth of Cut ap (inch)	Feed per Tooth (IPT)
K	Gray Cast Iron	≤200MPa	**MC5020**	985(820－1150)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
			VP15TF	820(655－985)	≤DC	≤.394	.016(.012－.020)	≤DC	≤.394	.016(.012－.020)
		≤350MPa	**MC5020**	720(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
			VP15TF	655(490－985)	≤DC	≤.394	.012(.008－.016)	≤DC	≤.394	.012(.008－.016)
	Ductile Cast Iron	≤450MPa	**MC5020**	655(490－820)	≤0.25DC	≤.394	.012(.008－.016)	≤0.15DC	≤.394	.012(.008－.016)
			VP15TF	555(490－655)	≤0.25DC	≤.394	.012(.008－.016)	≤0.15DC	≤.394	.012(.008－.016)
		≤800MPa	**MC5020**	555(490－655)	≤0.25DC	≤.394	.008(.004－.012)	≤0.15DC	≤.394	.008(.004－.012)
			VP15TF	490(330－655)	≤0.25DC	≤.394	.008(.004－.012)	≤0.15DC	≤.394	.008(.004－.012)

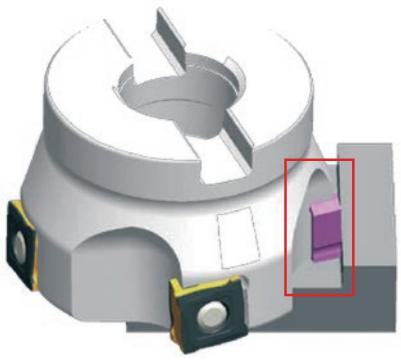
Note 1) DC is cutter diameter.

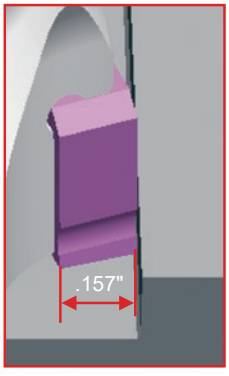
Note 2) When using wiper insert, please reduce the feed per tooth to half the normal rate.

■ Usable cutting edge width of wiper inserts

The width of the wiper insert itself is .217 inch, however the actual functioning cutting edge width after installation to the body is .177 inch, as shown in the diagram.

With one wiper insert, it is possible to machine up to fr=.157 inch feed per revolution. When exceeding fr=.157 inch, use two or more wiper inserts. Note that there is a possibility to exceed fr=.157 inch when using a holder with more than 24 inserts.





SHOULDER MILLING
<GENERAL CUTTING>

90° KAPR

WWX200 NEW

P M K N S H

Fig.1
ø1.500"
ø2.000"

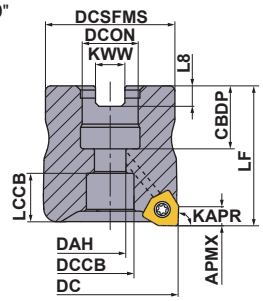
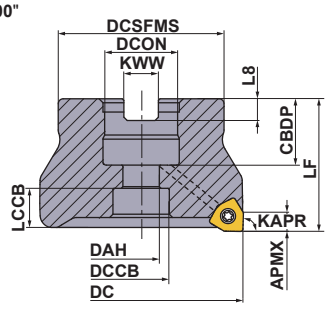


Fig.2
ø2.500"
ø3.000"



Right hand tool holder only.

■ARBOR TYPE

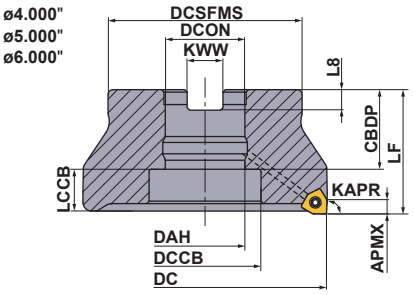
DCON = inch size (inch)

DC	Order Number	Stock R	* Coolant Thru	Number of Teeth	Pitch	LF	DCON	WT (lbs)	APMX	RPMX (min^{-1})	Fig.
1.500	**WWX200UR1.5003SA**	●	Y	3	Coarse	1.750	.500	.6	.197	21600	1
1.500	**WWX200UR1.5004SA**	●	Y	4	Fine	1.750	.500	.5	.197	21600	1
2.000	**WWX200UR2.0004AA**	●	Y	4	Coarse	1.750	.750	.9	.197	18600	1
2.000	**WWX200UR2.0005AA**	●	Y	5	Fine	1.750	.750	.9	.197	18600	1
2.000	**WWX200UR2.0006AA**	●	Y	6	Extra Fine	1.750	.750	.9	.197	18600	1
2.500	**WWX200UR2.5005CA**	●	Y	5	Coarse	2.000	1.000	1.7	.197	16000	2
2.500	**WWX200UR2.5006CA**	●	Y	6	Fine	2.000	1.000	1.6	.197	16000	2
2.500	**WWX200UR2.5007CA**	●	Y	7	Extra Fine	2.000	1.000	1.6	.197	16000	2
3.000	**WWX200UR3.0005CA**	●	Y	5	Coarse	2.000	1.000	2.2	.197	13600	2
3.000	**WWX200UR3.0007CA**	●	Y	7	Fine	2.000	1.000	2.2	.197	13600	2
3.000	**WWX200UR3.0009CA**	●	Y	9	Extra Fine	2.000	1.000	2.1	.197	13600	2
4.000	**WWX200UR4.0006EA**	●	Y	6	Coarse	2.500	1.500	5.1	.197	11700	3
4.000	**WWX200UR4.0008EA**	●	Y	8	Fine	2.500	1.500	5.0	.197	11700	3
4.000	**WWX200UR4.0011EA**	●	Y	11	Extra Fine	2.500	1.500	4.9	.197	11700	3
5.000	**WWX200UR5.0007EA**	●	Y	7	Coarse	2.500	1.500	7.8	.197	10100	3
5.000	**WWX200UR5.0011EA**	●	Y	11	Fine	2.500	1.500	7.6	.197	10100	3
5.000	**WWX200UR5.0014EA**	●	Y	14	Extra Fine	2.500	1.500	7.6	.197	10100	3
6.000	**WWX200UR6.0009EA**	●	N	9	Coarse	2.500	1.500	10.0	.197	8600	3
6.000	**WWX200UR6.0012EA**	●	N	12	Fine	2.500	1.500	9.8	.197	8600	3
6.000	**WWX200UR6.0016EA**	●	N	16	Extra Fine	2.500	1.500	9.8	.197	8600	3

* Y=Yes, N=No

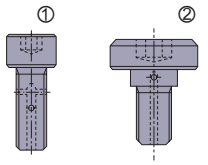
● : USA Stock

Fig.3



Right hand tool holder only.

DC	Set Bolt	Geometry
1.500	HSCU25011H	①
2.000	HSCU37513H	
2.500	HSCU50014H	
3.000	HSCU50014H	
4.000	MBAU75016H	②
5.000	MBAU75016H	
6.000	MBAU75016H	



With Air / coolant through.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.500	**WWX200UR1.5003SA**	.500	.630	.276	.433	.680	1.438	.250	.156	1
1.500	**WWX200UR1.5004SA**	.500	.630	.276	.433	.680	1.438	.250	.156	1
2.000	**WWX200UR2.0004AA**	.750	.748	.413	.630	.561	1.750	.313	.187	1
2.000	**WWX200UR2.0005AA**	.750	.748	.413	.630	.561	1.750	.313	.187	1
2.000	**WWX200UR2.0006AA**	.750	.748	.413	.630	.561	1.750	.313	.187	1
2.500	**WWX200UR2.5005CA**	1.000	.945	.539	.787	.680	2.188	.375	.219	2
2.500	**WWX200UR2.5006CA**	1.000	.945	.539	.787	.680	2.188	.375	.219	2
2.500	**WWX200UR2.5007CA**	1.000	.945	.539	.787	.680	2.188	.375	.219	2
3.000	**WWX200UR3.0005CA**	1.000	.945	.539	.787	.693	2.188	.375	.219	2
3.000	**WWX200UR3.0007CA**	1.000	.945	.539	.787	.693	2.188	.375	.219	2
3.000	**WWX200UR3.0009CA**	1.000	.945	.539	.787	.693	2.188	.375	.219	2
4.000	**WWX200UR4.0006EA**	1.500	1.654	1.500	2.205	.800	3.500	.625	.375	3
4.000	**WWX200UR4.0008EA**	1.500	1.654	1.500	2.205	.800	3.500	.625	.375	3
4.000	**WWX200UR4.0011EA**	1.500	1.654	1.500	2.205	.800	3.500	.625	.375	3
5.000	**WWX200UR5.0007EA**	1.500	1.654	1.500	2.205	.800	3.813	.625	.375	3
5.000	**WWX200UR5.0011EA**	1.500	1.654	1.500	2.205	.800	3.813	.625	.375	3
5.000	**WWX200UR5.0014EA**	1.500	1.654	1.500	2.205	.800	3.813	.625	.375	3
6.000	**WWX200UR6.0009EA**	1.500	1.654	1.500	2.205	.800	3.813	.625	.375	3
6.000	**WWX200UR6.0012EA**	1.500	1.654	1.500	2.205	.800	3.813	.625	.375	3
6.000	**WWX200UR6.0016EA**	1.500	1.654	1.500	2.205	.800	3.813	.625	.375	3

SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TPS3R	TIP10D	MK1KS

* Clamp Torque (lbf-in) : TPS3R = 17.7

ISO13399 ➤ K003
CUTTING CONDITIONS ➤ K130
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1

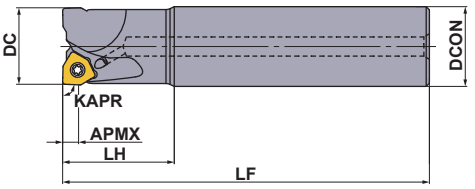


Fig.3

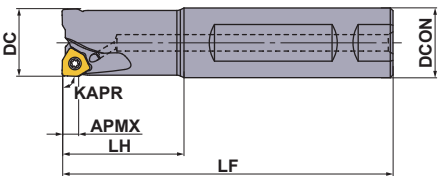


Fig.2

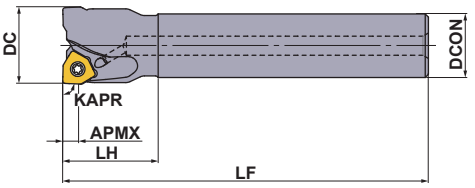
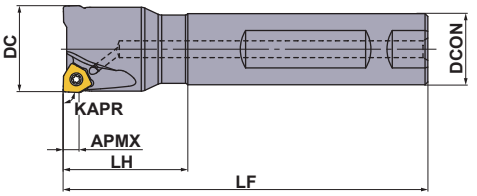


Fig.4



Right hand tool holder only.

■SHANK TYPE

With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Pitch	LF	DCON	LH	WT (lbs)	APMX	RPMX (min^{-1})	Fig.
1.000	**WWX200UR1602FA16S**	●	2	Coarse	4.750	1.000	1.750	.9	.197	29600	3
1.000	**WWX200UR1602SA16L**	●	2	Coarse	8.500	1.000	2.500	1.7	.197	29600	1
1.125	**WWX200UR1802SA16L**	●	2	Coarse	8.500	1.000	1.750	1.8	.197	27400	2
1.250	**WWX200UR2002FA16S**	●	2	Coarse	5.125	1.000	1.750	1.1	.197	25100	4
1.250	**WWX200UR2003FA16S**	●	3	Fine	5.125	1.000	1.750	1.1	.197	25100	4
1.250	**WWX200UR2003SA16L**	●	3	Coarse	9.000	1.000	1.750	1.9	.197	25100	2
1.250	**WWX200UR2002FA20S**	●	2	Coarse	5.125	1.250	2.000	1.5	.197	25100	3
1.250	**WWX200UR2003FA20S**	●	3	Fine	5.125	1.250	2.000	1.5	.197	25100	3
1.250	**WWX200UR2003SA20L**	●	3	Coarse	9.000	1.250	3.000	2.8	.197	25100	1
1.500	**WWX200UR2403FA20S**	●	3	Coarse	5.125	1.250	2.000	1.7	.197	21600	4
1.500	**WWX200UR2404FA20S**	●	4	Fine	5.125	1.250	2.000	1.7	.197	21600	4
1.500	**WWX200UR2404SA20L**	●	4	Fine	9.000	1.250	2.000	3.0	.197	21600	2

SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TPS3R	TIP10D	MK1KS

* Clamp Torque (lbf-in) : TPS3R = 17.7

● : USA Stock ★ : Stocked in Japan

Fig.1

ø40
ø50

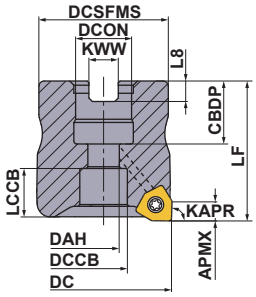
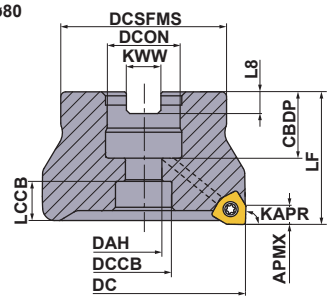


Fig.2

ø63
ø80



Right hand tool holder only.

Metric Standard

■ARBOR TYPE

DCON = inch size

(mm)

DC	Order Number	Stock R	* Coolant Thru	Number of Teeth	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.
80	**WWX200R08005CA**	★	Y	5	50	25.4	1.1	5.0	13600	2
80	**WWX200R08007CA**	★	Y	7	50	25.4	1.1	5.0	13600	2
80	**WWX200R08009CA**	★	Y	9	50	25.4	1.0	5.0	13600	2
100	**WWX200R10006DA**	★	Y	6	50	31.75	1.6	5.0	11700	3
100	**WWX200R10008DA**	★	Y	8	50	31.75	1.5	5.0	11700	3
100	**WWX200R10011DA**	★	Y	11	50	31.75	1.5	5.0	11700	3
125	**WWX200R12507EA**	★	Y	7	63	38.1	2.8	5.0	10100	3
125	**WWX200R12511EA**	★	Y	11	63	38.1	2.8	5.0	10100	3
125	**WWX200R12514EA**	★	Y	14	63	38.1	2.8	5.0	10100	3
160	**WWX200R16009FA**	★	Y	9	63	50.8	4.6	5.0	8600	3
160	**WWX200R16012FA**	★	Y	12	63	50.8	4.5	5.0	8600	3
160	**WWX200R16016FA**	★	Y	16	63	50.8	4.5	5.0	8600	3

* Y=Yes, N=No

Note1) A set bolt to the arbor is not supplied with the body. Please refer to page K117, when ordering.

Note2) Please use a set bolt of the FMA type on the cutter body from 80 to 160 in diameter(DC).

ISO13399 ➤ K003
MOUNTING DIMENSION ➤ K117
CUTTING CONDITIONS ➤ K130
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.3
ø100
ø125
ø160

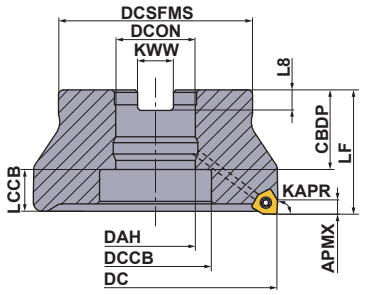
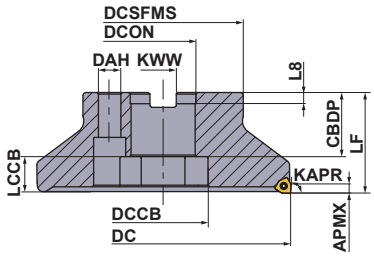


Fig.4
ø160



Right hand tool holder only.

Metric Standard

■ARBOR TYPE

DCON=mm size

(mm)

DC	Order Number	Stock R	Coolant Thru *	Number of Teeth	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.
40	**WWX200-040A03AR**	★	Y	3	40	16	0.2	5.0	21600	1
40	**WWX200-040A04AR**	★	Y	4	40	16	0.2	5.0	21600	1
50	**WWX200-050A04AR**	★	Y	4	40	22	0.4	5.0	18600	1
50	**WWX200-050A05AR**	★	Y	5	40	22	0.4	5.0	18600	1
50	**WWX200-050A06AR**	★	Y	6	40	22	0.3	5.0	18600	1
63	**WWX200-063A05AR**	★	Y	5	40	22	0.5	5.0	16000	2
63	**WWX200-063A06AR**	★	Y	6	40	22	0.5	5.0	16000	2
63	**WWX200-063A07AR**	★	Y	7	40	22	0.5	5.0	16000	2
80	**WWX200-080A05AR**	★	Y	5	50	27	1.1	5.0	13600	2
80	**WWX200-080A07AR**	★	Y	7	50	27	1.0	5.0	13600	2
80	**WWX200-080A09AR**	★	Y	9	50	27	1.0	5.0	13600	2
100	**WWX200-100B06AR**	★	Y	6	50	32	1.7	5.0	11700	3
100	**WWX200-100B08AR**	★	Y	8	50	32	1.7	5.0	11700	3
100	**WWX200-100B11AR**	★	Y	11	50	32	1.7	5.0	11700	3
125	**WWX200-125B07AR**	★	Y	7	63	40	3.1	5.0	10100	3
125	**WWX200-125B11AR**	★	Y	11	63	40	3.0	5.0	10100	3
125	**WWX200-125B14AR**	★	Y	14	63	40	3.0	5.0	10100	3
160	**WWX200-160C09NR**	★	N	9	63	40	4.6	5.0	8600	4
160	**WWX200-160C12NR**	★	N	12	63	40	4.6	5.0	8600	4
160	**WWX200-160C16NR**	★	N	16	63	40	4.6	5.0	8600	4

* Y=Yes, N=No

Note1) A set bolt to the arbor is not supplied with the body. Please refer to page K117, when ordering.

Note2) Please use a set bolt of the FMC type on the cutter body from 40 to 100 in diameter(DC).

Note3) Please use a set bolt of the FMA type on the cutter body from 125 to 160 in diameter(DC).

SPARE PARTS

(mm)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX200	TPS3R	TIP10D	MK1KS

* Clamp Torque (lbf-in) : TPS3R = 17.7

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
40	**WWX200-040A03AR**	16	18	9	13.6	13.8	37	8.4	5.6	1
40	**WWX200-040A04AR**	16	18	9	13.6	13.8	37	8.4	5.6	1
50	**WWX200-050A04AR**	22	20	11	17	11.8	47	10.4	6.3	1
50	**WWX200-050A05AR**	22	20	11	17	11.8	47	10.4	6.3	1
50	**WWX200-050A06AR**	22	20	11	17	11.8	47	10.4	6.3	1
63	**WWX200-063A05AR**	22	20	11	17	11.8	50	10.4	6.3	2
63	**WWX200-063A06AR**	22	20	11	17	11.8	50	10.4	6.3	2
63	**WWX200-063A07AR**	22	20	11	17	11.8	50	10.4	6.3	2
80	**WWX200R08005CA**	25.4	26	13	20	11.8	56	9.5	6	2
80	**WWX200R08007CA**	25.4	26	13	20	11.8	56	9.5	6	2
80	**WWX200R08009CA**	25.4	26	13	20	11.8	56	9.5	6	2
80	**WWX200-080A05AR**	27	23	13	20	11.8	56	12.4	7	2
80	**WWX200-080A07AR**	27	23	13	20	11.8	56	12.4	7	2
80	**WWX200-080A09AR**	27	23	13	20	11.8	56	12.4	7	2
100	**WWX200R10006DA**	31.75	37	31.75	45	16.8	70	12.7	8	3
100	**WWX200R10008DA**	31.75	37	31.75	45	16.8	70	12.7	8	3
100	**WWX200R10011DA**	31.75	37	31.75	45	16.8	70	12.7	8	3
100	**WWX200-100B06AR**	32	26	32	45	16.8	78	14.4	8	3
100	**WWX200-100B08AR**	32	26	32	45	16.8	78	14.4	8	3
100	**WWX200-100B11AR**	32	26	32	45	16.8	78	14.4	8	3
125	**WWX200R12507EA**	38.1	42	38.1	56	21.8	80	15.9	10	3
125	**WWX200R12511EA**	38.1	42	38.1	56	21.8	80	15.9	10	3
125	**WWX200R12514EA**	38.1	42	38.1	56	21.8	80	15.9	10	3
125	**WWX200-125B07AR**	40	35	42	56	21.8	89	16.4	9	3
125	**WWX200-125B11AR**	40	35	42	56	21.8	89	16.4	9	3
125	**WWX200-125B14AR**	40	35	42	56	21.8	89	16.4	9	3
160	**WWX200-160C09NR**	40	40	–	56	21.8	100	16.4	9	4
160	**WWX200-160C12NR**	40	40	–	56	21.8	100	16.4	9	4
160	**WWX200-160C16NR**	40	40	–	56	21.8	100	16.4	9	4
160	**WWX200R16009FA**	50.8	45	50.8	72	21.8	100	19.1	11	3
160	**WWX200R16012FA**	50.8	45	50.8	72	21.8	100	19.1	11	3
160	**WWX200R16016FA**	50.8	45	50.8	72	21.8	100	19.1	11	3

OPTIONAL PARTS

(mm)

Tool Holder Type	Set Bolt		Fig.	Reference Dimensions							Geometry
	With Coolant Hole	Without Coolant Hole		a	b	c	d	e	f	g	
	Order Number	Order Number									
WWX200R080○○CA	HSC12035H	HSC12035	1	18	M12x1.75	47	12	10	–	–	Fig.1
WWX200R100○○DA	MBA16033H	–	2	40	M16x2	43	10	14	6	23	
WWX200R125○○EA	MBA20040H	–	2	50	M20x2.5	54	14	17	6	27	
WWX200R160○○FA	MBA24045H	–	2	65	M24x3	59	14	17	10	37	
WWX200-040A○○AR	HSC08025H	–	1	13	M8x1.25	33	8	5	–	–	Fig.2
WWX200-050A○○AR	HSC10030H	HSC10035	1	16	M10x1.5	40(45)	10	6	–	–	
WWX200-063A○○AR	HSC10030H	HSC10035	1	16	M10x1.5	40(45)	10	6	–	–	
WWX200-080A○○AR	HSC12035H	HSC12035	1	18	M12x1.75	47	12	10	–	–	
WWX200-100B○○AR	MBA16033H	–	2	40	M16x2	43	10	14	6	23	
WWX200-125B○○AR	MBA20040H	–	2	50	M20x2.5	54	14	17	6	27	
WWX200-160C○○NR	No Coolant Hole	–	2	50	M20x2.5	54	14	17	6	27	

Note 1) Please purchase the appropriate set bolt after confirming the reference dimensions. The items with an order number listed under the Set Bolt columns are also sold by Mitsubishi Materials.

Note 2) Internal coolant is necessary with the set bolt.

ISO13399	➤ K003	SPARE PARTS	➤ M001
CUTTING CONDITIONS	➤ K130	TECHNICAL DATA	➤ N001

Fig.1

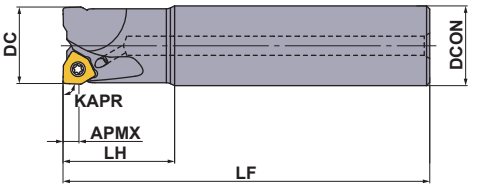
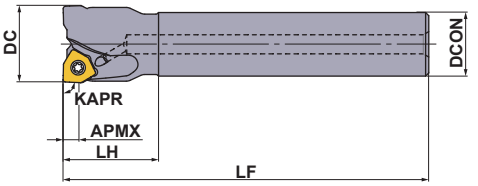


Fig.2



Right hand tool holder only.

Metric Standard

■SHANK TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	LF	DCON	LH	WT (kg)	APMX	RPMX (min^{-1})	Fig.
25	**WWX200R2502SA20S**	★	2	115	20	30	0.3	5	29600	2
25	**WWX200R2502SA25S**	★	2	115	25	35	0.4	5	29600	1
25	**WWX200R2502SA25L**	★	2	170	25	70	0.6	5	29600	1
28	**WWX200R2802SA25S**	★	2	115	25	35	0.4	5	27400	2
28	**WWX200R2802SA25L**	★	2	170	25	35	0.6	5	27400	2
30	**WWX200R3002SA25S**	★	2	125	25	35	0.5	5	26200	2
32	**WWX200R3202SA32S**	★	2	125	32	45	0.7	5	26200	1
32	**WWX200R3203SA32S**	★	3	125	32	45	0.7	5	26200	1
32	**WWX200R3203SA32L**	★	3	190	32	90	1.0	5	26200	1
35	**WWX200R3503SA32L**	★	3	190	32	45	1.1	5	25100	2
40	**WWX200R4003SA32S**	★	3	125	32	45	0.8	5	21600	2
40	**WWX200R4004SA32S**	★	4	125	32	45	0.8	5	21600	2
50	**WWX200R5004SA32S**	★	4	125	32	45	0.9	5	18600	2
50	**WWX200R5005SA32S**	★	5	125	32	45	0.9	5	18600	2
50	**WWX200R5006SA32S**	★	6	125	32	45	0.9	5	18600	2

SPARE PARTS

(mm)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX200	TPS3R	TIP10D	MK1KS

* Clamp Torque (lbf-in) : TPS3R = 17.7

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

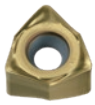
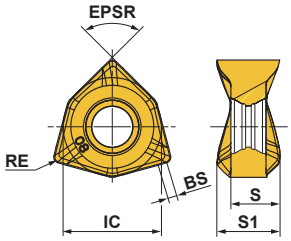
INSERTS

(inch)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp Edge

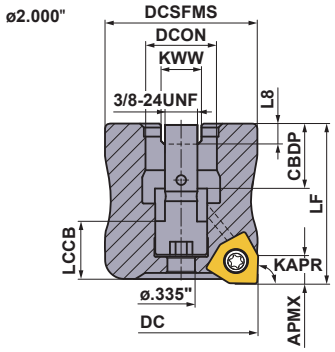
Shape	Order Number	Class	Edge Preparation	Coated								IC	S	S1	BS	RE	Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF							
	**6NMU0906040PNER-M**	M	E	●	●	●	●	●	●	●		.354	.209	.240	.063	.016	
	6NMU0906080PNER-M	M	E	●	●	●	●	●	●	●		.354	.209	.240	.047	.031	
	6NMU0906080PNER-R	M	E	●	●	●		●	●	●		.354	.209	.240	.047	.031	

SHOULDER MILLING
<GENERAL CUTTING>

90° KAPR

WWX400 2.000" NEW

P M K N S H



Right hand tool holder only.
The set bolt is built in.
Allen wrench (1/4 inch Hex Key size) is used to tighten the set bolt.

■ARBOR TYPE

DCON = inch size, With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Pitch	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})
2.000	**WWX400UR2.0003AA**	●	3	Coarse	2.125	.750	1.1	.323	.4°	5000
2.000	**WWX400UR2.0004AA**	●	4	Fine	2.125	.750	1.1	.323	.4°	5000

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) The milling cutter has a built-in set bolt. The set bolt cannot be replaced.
Therefore, absolutely do not disassemble the milling cutter.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	LCCB	DCSFMS	KWW	L8
2.000	**WWX400UR2.0003AA**	.750	.858	.787	1.750	.313	.187
2.000	**WWX400UR2.0004AA**	.750	.858	.787	1.750	.313	.187

SPARE PARTS

(inch)

Tool Holder Type	Clamp Screw *	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

● : USA Stock

WWX400 NEW

P M K N S H

Fig.1

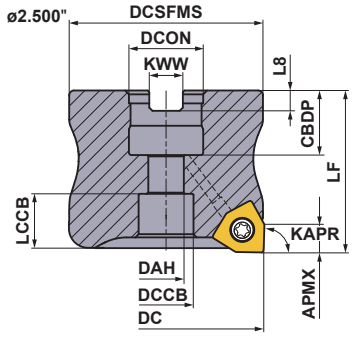
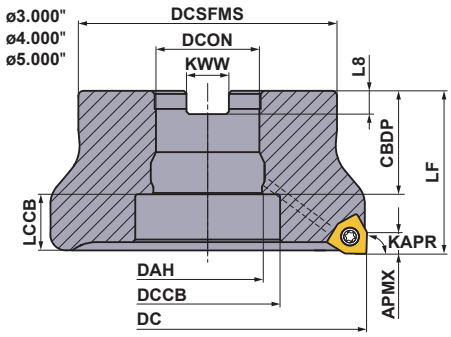


Fig.2



Right hand tool holder only.

■ARBOR TYPE

DCON = inch size (inch)

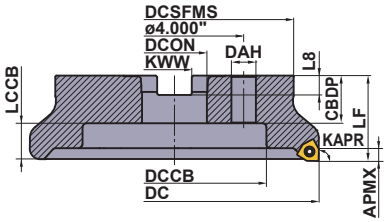
DC	Order Number	Stock R	Coolant Thru *	Number of Teeth	Pitch	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})	Fig.
2.500	**WWX400UR2.5003CA**	●	Y	3	Coarse	2.000	1.000	1.6	.323	.26°	14000	1
2.500	**WWX400UR2.5004CA**	●	Y	4	Fine	2.000	1.000	1.5	.323	.26°	14000	1
2.500	**WWX400UR2.5005CA**	●	Y	5	Extra Fine	2.000	1.000	1.5	.323	.26°	14000	1
3.000	**WWX400UR3.0004CA**	●	Y	4	Coarse	2.000	1.000	2.1	.323	.16°	12600	2
3.000	**WWX400UR3.0005CA**	●	Y	5	Fine	2.000	1.000	2.1	.323	.16°	12600	2
3.000	**WWX400UR3.0007CA**	●	Y	7	Extra Fine	2.000	1.000	1.9	.323	.16°	12600	2
4.000	**WWX400UR4.0005EA**	●	Y	5	Coarse	2.500	1.500	4.9	.323	—	10700	2
4.000	**WWX400UR4.0007EA**	●	Y	7	Fine	2.500	1.500	4.8	.323	—	10700	2
4.000	**WWX400UR4.0009EA**	●	Y	9	Extra Fine	2.500	1.500	4.7	.323	—	10700	2
5.000	**WWX400UR5.0006EA**	●	Y	6	Coarse	2.500	1.500	7.6	.323	—	9400	2
5.000	**WWX400UR5.0008EA**	●	Y	8	Fine	2.500	1.500	7.5	.323	—	9400	2
5.000	**WWX400UR5.0012EA**	●	Y	12	Extra Fine	2.500	1.500	7.3	.323	—	9400	2
6.000	**WWX400UR6.0008EA**	●	Y	8	Coarse	2.500	1.500	9.9	.323	—	8500	2
6.000	**WWX400UR6.0010EA**	●	Y	10	Fine	2.500	1.500	9.8	.323	—	8500	2
6.000	**WWX400UR6.0014EA**	●	Y	14	Extra Fine	2.500	1.500	9.7	.323	—	8500	2
8.000	**WWX400UR8.0010MN**	●	N	10	Coarse	2.500	2.500	17.3	.323	—	7200	3
8.000	**WWX400UR8.0012MN**	●	N	12	Fine	2.500	2.500	17.2	.323	—	7200	3
8.000	**WWX400UR8.0016MN**	●	N	16	Extra Fine	2.500	2.500	17	.323	—	7200	3
10.000	**WWX400UR10.0012MN**	●	N	12	Coarse	2.500	2.500	29.3	.323	—	6400	3
10.000	**WWX400UR10.0014MN**	●	N	14	Fine	2.500	2.500	29.3	.323	—	6400	3
10.000	**WWX400UR10.0018MN**	●	N	18	Extra Fine	2.500	2.500	29	.323	—	6400	3

* Y=Yes, N=No

ISO13399 ➤ K003
MOUNTING DIMENSION ➤ K122
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

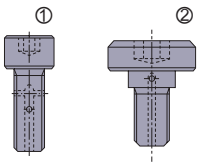
Fig.3

ø8.000"
ø10.000"



Right hand tool holder only.

DC	Set Bolt	Geometry
2.500	HSCU50014H	①
3.000	HSCU50014H	
4.000	MBAU75016H	②
5.000	MBAU75016H	
6.000	MBAU75016H	
8.000	—	—
10.000	—	



With Air / coolant through.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
2.500	**WWX400UR2.5003CA**	1.000	.945	.539	.787	.670	2.190	.375	.219	1
2.500	**WWX400UR2.5004CA**	1.000	.945	.539	.787	.670	2.190	.375	.219	1
2.500	**WWX400UR2.5005CA**	1.000	.945	.539	.787	.670	2.190	.375	.219	1
3.000	**WWX400UR3.0004CA**	1.000	.945	.539	.787	.670	2.190	.375	.219	2
3.000	**WWX400UR3.0005CA**	1.000	.945	.539	.787	.670	2.190	.375	.219	2
3.000	**WWX400UR3.0007CA**	1.000	.945	.539	.787	.670	2.190	.375	.219	2
4.000	**WWX400UR4.0005EA**	1.500	1.654	1.500	2.205	.776	3.500	.625	.375	2
4.000	**WWX400UR4.0007EA**	1.500	1.654	1.500	2.205	.776	3.500	.625	.375	2
4.000	**WWX400UR4.0009EA**	1.500	1.654	1.500	2.205	.776	3.500	.625	.375	2
5.000	**WWX400UR5.0006EA**	1.500	1.654	1.500	2.205	.776	3.813	.625	.375	2
5.000	**WWX400UR5.0008EA**	1.500	1.654	1.500	2.205	.776	3.813	.625	.375	2
5.000	**WWX400UR5.0012EA**	1.500	1.654	1.500	2.205	.776	3.813	.625	.375	2
6.000	**WWX400UR6.0008EA**	1.500	1.654	1.500	2.205	.776	3.813	.625	.375	2
6.000	**WWX400UR6.0010EA**	1.500	1.654	1.500	2.205	.776	3.813	.625	.375	2
6.000	**WWX400UR6.0014EA**	1.500	1.654	1.500	2.205	.776	3.813	.625	.375	2
8.000	**WWX400UR8.0010MN**	2.500	1.378	.709	5.512	1.052	6.890	1.000	.560	3
8.000	**WWX400UR8.0012MN**	2.500	1.378	.709	5.512	1.052	6.890	1.000	.560	3
8.000	**WWX400UR8.0016MN**	2.500	1.378	.709	5.512	1.052	6.890	1.000	.560	3
10.000	**WWX400UR10.0012MN**	2.500	1.378	.709	7.087	1.052	8.661	1.000	.560	3
10.000	**WWX400UR10.0014MN**	2.500	1.378	.709	7.087	1.052	8.661	1.000	.560	3
10.000	**WWX400UR10.0018MN**	2.500	1.378	.709	7.087	1.052	8.661	1.000	.560	3

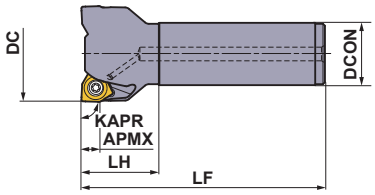
SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

● : **USA Stock**



Right hand tool holder only.

■SHANK TYPE

With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Pitch	LF	DCON	LH	WT (lbs)	APMX	RMPX	RPMX (min^{-1})
2.000	**WWX400UR3203FA20M**	●	3	Coarse	4.750	1.250	1.500	1.7	.323	.4°	15800
2.000	**WWX400UR3204FA20M**	●	4	Fine	4.750	1.250	1.500	1.7	.323	.4°	15800
2.500	**WWX400UR4003FA20M**	●	3	Coarse	4.750	1.250	1.500	2.1	.323	.26°	14000
2.500	**WWX400UR4004FA20M**	●	4	Fine	4.750	1.250	1.500	2	.323	.26°	14000
2.500	**WWX400UR4005FA20M**	●	5	Extra Fine	4.750	1.250	1.500	2	.323	.26°	14000
3.000	**WWX400UR4804FA20M**	●	4	Coarse	4.750	1.250	1.500	2.5	.323	.16°	12600
3.000	**WWX400UR4805FA20M**	●	5	Fine	4.750	1.250	1.500	2.4	.323	.16°	12600
3.000	**WWX400UR4807FA20M**	●	7	Extra Fine	4.750	1.250	1.500	2.3	.323	.16°	12600

SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

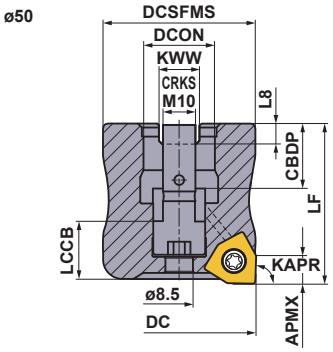
* Clamp Torque (lbf-in) : TS5R = 44

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

WWX400 50 NEW

P M K N S H

Metric Standard



Right hand tool holder only.
The set bolt is built in.
Allen wrench (7 mm Hex Key size) is used to tighten the set bolt.

■ARBOR TYPE

DCON=mm size, With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Pitch	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})
50	**WWX400-050A03AR**	★	3	Coarse	55	22	0.5	8.2	0.4°	5000
50	**WWX400-050A04AR**	★	4	Fine	55	22	0.5	8.2	0.4°	5000

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) The milling cutter has a built-in set bolt. The set bolt cannot be replaced.
Therefore, absolutely do not disassemble the milling cutter.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	LCCB	DCSFMS	KWW	L8
50	**WWX400-050A03AR**	22	20	12.2	47	10.4	6.3
50	**WWX400-050A04AR**	22	20	12.2	47	10.4	6.3

SPARE PARTS

(mm)

Tool Holder Type	* Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

★ : **Stocked in Japan**

WWX400 NEW

P M K N S H

Fig.1

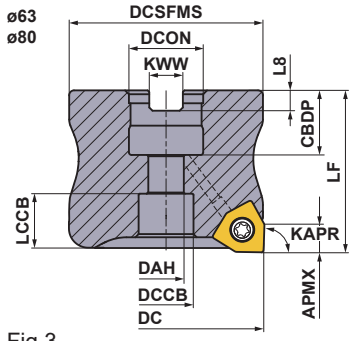


Fig.2

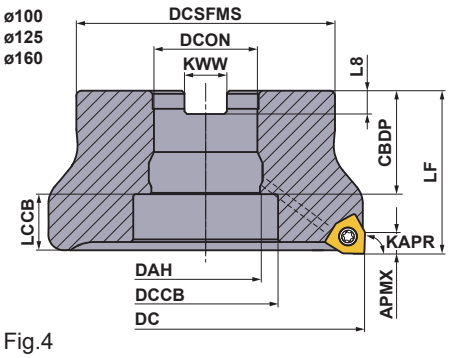


Fig.3

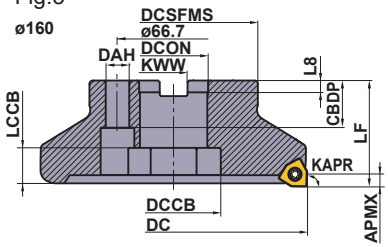
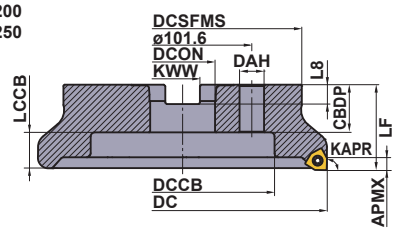


Fig.4



Metric Standard

■ARBOR TYPE

DCON=inch size

Right hand tool holder only.

(mm)

DC	Order Number	Stock R	Coolant Thru *	Number of Teeth	Pitch	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Fig.
80	**WWX400R08004CA**	★	Y	4	Coarse	50	25.4	1.0	8.2	0.16°	12200	1
80	**WWX400R08005CA**	★	Y	5	Fine	50	25.4	1.0	8.2	0.16°	12200	1
80	**WWX400R08007CA**	★	Y	7	Extra Fine	50	25.4	0.9	8.2	0.16°	12200	1
100	**WWX400R10005DA**	★	Y	5	Coarse	50	31.75	1.4	8.2	—	10700	2
100	**WWX400R10007DA**	★	Y	7	Fine	50	31.75	1.4	8.2	—	10700	2
100	**WWX400R10009DA**	★	Y	9	Extra Fine	50	31.75	1.3	8.2	—	10700	2
125	**WWX400R12506EA**	★	Y	6	Coarse	63	38.1	2.8	8.2	—	9500	2
125	**WWX400R12508EA**	★	Y	8	Fine	63	38.1	2.8	8.2	—	9500	2
125	**WWX400R12512EA**	★	Y	12	Extra Fine	63	38.1	2.7	8.2	—	9500	2
160	**WWX400R16008FA**	★	Y	8	Coarse	63	50.8	4.5	8.2	—	8300	2
160	**WWX400R16010FA**	★	Y	10	Fine	63	50.8	4.4	8.2	—	8300	2
160	**WWX400R16014FA**	★	Y	14	Extra Fine	63	50.8	4.3	8.2	—	8300	2
200	**WWX400R20010KN**	★	N	10	Coarse	63	47.625	8.1	8.2	—	7300	4
200	**WWX400R20012KN**	★	N	12	Fine	63	47.625	8.1	8.2	—	7300	4
200	**WWX400R20016KN**	★	N	16	Extra Fine	63	47.625	8.0	8.2	—	7300	4
250	**WWX400R25012KN**	★	N	12	Coarse	63	47.625	12.1	8.2	—	6400	4
250	**WWX400R25014KN**	★	N	14	Fine	63	47.625	12.1	8.2	—	6400	4
250	**WWX400R25018KN**	★	N	18	Extra Fine	63	47.625	12.0	8.2	—	6400	4

* Y=Yes, N=No

Note1) A set bolt to the arbor is not supplied with the body. Please refer to page K126, when ordering.

Note2) Please use a set bolt of the FMA type on the cutter body from 80 to 250 in diameter(DC).

SPARE PARTS

(mm)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

ISO13399	➤ K003	SPARE PARTS	➤ M001
MOUNTING DIMENSION	➤ K127	TECHNICAL DATA	➤ N001

Metric Standard

■ARBOR TYPE

DCON=mm size (mm)

DC	Order Number	Stock R	Coolant Thru *	Number of Teeth	Pitch	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Fig.
63	**WWX400-063A03AR**	★	Y	3	Coarse	40	22	0.5	8.2	0.26°	14100	1
63	**WWX400-063A04AR**	★	Y	4	Fine	40	22	0.5	8.2	0.26°	14100	1
63	**WWX400-063A05AR**	★	Y	5	Extra Fine	40	22	0.5	8.2	0.26°	14100	1
80	**WWX400-080A04AR**	★	Y	4	Coarse	50	27	1.0	8.2	0.16°	12200	1
80	**WWX400-080A05AR**	★	Y	5	Fine	50	27	1.0	8.2	0.16°	12200	1
80	**WWX400-080A07AR**	★	Y	7	Extra Fine	50	27	0.9	8.2	0.16°	12200	1
100	**WWX400-100B05AR**	★	Y	5	Coarse	50	32	1.6	8.2	—	10700	2
100	**WWX400-100B07AR**	★	Y	7	Fine	50	32	1.5	8.2	—	10700	2
100	**WWX400-100B09AR**	★	Y	9	Extra Fine	50	32	1.5	8.2	—	10700	2
125	**WWX400-125B06AR**	★	Y	6	Coarse	63	40	3.0	8.2	—	9500	2
125	**WWX400-125B08AR**	★	Y	8	Fine	63	40	3.0	8.2	—	9500	2
125	**WWX400-125B12AR**	★	Y	12	Extra Fine	63	40	2.9	8.2	—	9500	2
160	**WWX400-160C08NR**	★	N	8	Coarse	63	40	4.5	8.2	—	8300	3
160	**WWX400-160C10NR**	★	N	10	Fine	63	40	4.4	8.2	—	8300	3
160	**WWX400-160C14NR**	★	N	14	Extra Fine	63	40	4.4	8.2	—	8300	3
200	**WWX400-200C10NR**	★	N	10	Coarse	63	60	6.7	8.2	—	7300	4
200	**WWX400-200C12NR**	★	N	12	Fine	63	60	6.7	8.2	—	7300	4
200	**WWX400-200C16NR**	★	N	16	Extra Fine	63	60	6.6	8.2	—	7300	4
250	**WWX400-250C12NR**	★	N	12	Coarse	63	60	11.5	8.2	—	6400	4
250	**WWX400-250C14NR**	★	N	14	Fine	63	60	11.5	8.2	—	6400	4
250	**WWX400-250C18NR**	★	N	18	Extra Fine	63	60	11.4	8.2	—	6400	4

* Y=Yes, N=No

Note1) A set bolt to the arbor is not supplied with the body. Please refer to page K126, when ordering.

Note2) Please use a set bolt of the FMC type on the cutter body from 63 to 100 in diameter(DC).

Note3) Please use a set bolt of the FMA type on the cutter body from 125 to 250 in diameter(DC).

OPTIONAL PARTS

(mm)

Tool Holder Type	Set Bolt: With Coolant Hole Order Number	Set Bolt: Without Coolant Hole Order Number	Fig.	Reference Dimensions a	b	c	d	e	f	g	Geometry
WWX400R080○○CA	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	Fig.1
WWX400R100○○DA	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
WWX400R125○○EA	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400R160○○FA	MBA24045H	–	2	65	M24×3	59	14	17	10	37	
WWX400R200○○KN	–	–	1	24	M16×2	61-	16	14	–	–	
WWX400R250○○KN	–	–	1	24	M16×2	61-	16	14	–	–	
WWX400-063A○○AR	HSC10030H	HSC10035	1	16	M10×1.5	40	10	6	–	–	Fig.2
WWX400-080A○○AR	HSC12035H	HSC12035	1	18	M12×1.75	47	12	10	–	–	
WWX400-100B○○AR	MBA16033H	–	2	40	M16×2	43	10	14	6	23	
WWX400-125B○○AR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400-160C○○NR	MBA20040H	–	2	50	M20×2.5	54	14	17	6	27	
WWX400-200C○○NR	–	–	1	24	M16×2	61-	16	14	–	–	
WWX400-250C○○NR	–	–	1	24	M16×2	61-	16	14	–	–	

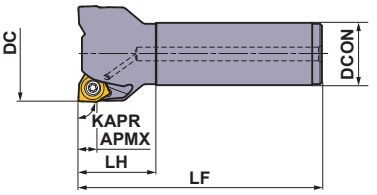
Note 1) Internal coolant is necessary with the set bolt.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
63	**WWX400-063A03AR**	22	20	11	17	11.2	50	10.4	6.3	1
63	**WWX400-063A04AR**	22	20	11	17	11.2	50	10.4	6.3	1
63	**WWX400-063A05AR**	22	20	11	17	11.2	50	10.4	6.3	1
80	**WWX400R08004CA**	25.4	26	13	20	14.2	56	9.5	6	1
80	**WWX400R08005CA**	25.4	26	13	20	14.2	56	9.5	6	1
80	**WWX400R08007CA**	25.4	26	13	20	14.2	56	9.5	6	1
80	**WWX400-080A04AR**	27	23	13	20	14.2	56	12.4	7	1
80	**WWX400-080A05AR**	27	23	13	20	14.2	56	12.4	7	1
80	**WWX400-080A07AR**	27	23	13	20	14.2	56	12.4	7	1
100	**WWX400R10005DA**	31.75	37	31.75	45	11.2	70	12.7	8	2
100	**WWX400R10007DA**	31.75	37	31.75	45	11.2	70	12.7	8	2
100	**WWX400R10009DA**	31.75	37	31.75	45	11.2	70	12.7	8	2
100	**WWX400-100B05AR**	32	32	32	45	16.2	78	14.4	8	2
100	**WWX400-100B07AR**	32	32	32	45	16.2	78	14.4	8	2
100	**WWX400-100B09AR**	32	32	32	45	16.2	78	14.4	8	2
125	**WWX400R12506EA**	38.1	42	38.1	56	19.2	80	15.9	10	2
125	**WWX400R12508EA**	38.1	42	38.1	56	19.2	80	15.9	10	2
125	**WWX400R12512EA**	38.1	42	38.1	56	19.2	80	15.9	10	2
125	**WWX400-125B06AR**	40	40	40	56	21.2	89	16.4	9	2
125	**WWX400-125B08AR**	40	40	40	56	21.2	89	16.4	9	2
125	**WWX400-125B12AR**	40	40	40	56	21.2	89	16.4	9	2
160	**WWX400-160C08NR**	40	40	14	56	21.2	100	16.4	9	3
160	**WWX400-160C10NR**	40	40	14	56	21.2	100	16.4	9	3
160	**WWX400-160C14NR**	40	40	14	56	21.2	100	16.4	9	3
160	**WWX400R16008FA**	50.8	45	50.8	72	16.2	100	19.1	11	2
160	**WWX400R16010FA**	50.8	45	50.8	72	16.2	100	19.1	11	2
160	**WWX400R16014FA**	50.8	45	50.8	72	16.2	100	19.1	11	2
200	**WWX400R20010KN**	47.625	35	18	135	26.2	175	25.4	14.22	4
200	**WWX400R20012KN**	47.625	35	18	135	26.2	175	25.4	14.22	4
200	**WWX400R20016KN**	47.625	35	18	135	26.2	175	25.4	14.22	4
200	**WWX400-200C10NR**	60	32	18	135	29.2	160	25.7	14.22	4
200	**WWX400-200C12NR**	60	32	18	135	29.2	160	25.7	14.22	4
200	**WWX400-200C16NR**	60	32	18	135	29.2	160	25.7	14.22	4
250	**WWX400R25012KN**	47.625	35	18	180	26.2	210	25.4	14.22	4
250	**WWX400R25014KN**	47.625	35	18	180	26.2	210	25.4	14.22	4
250	**WWX400R25018KN**	47.625	35	18	180	26.2	210	25.4	14.22	4
250	**WWX400-250C12NR**	60	32	18	180	29.2	210	25.7	14.22	4
250	**WWX400-250C14NR**	60	32	18	180	29.2	210	25.7	14.22	4
250	**WWX400-250C18NR**	60	32	18	180	29.2	210	25.7	14.22	4

ISO13399 ➢ K003
SPARE PARTS ➢ M001
TECHNICAL DATA ➢ N001



Right hand tool holder only.

Metric Standard

■SHANK TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Pitch	LF	DCON	LH	WT (kg)	APMX	RMPX	RPMX (min^{-1})
50	**WWX400R5003SA32M**	★	3	Coarse	125	32	40	0.8	8.2	0.4°	16000
50	**WWX400R5004SA32M**	★	4	Fine	125	32	40	0.8	8.2	0.4°	16000
63	**WWX400R6303SA32M**	★	3	Coarse	125	32	40	1.0	8.2	0.26°	14100
63	**WWX400R6304SA32M**	★	4	Fine	125	32	40	1.0	8.2	0.26°	14100
63	**WWX400R6305SA32M**	★	5	Extra Fine	125	32	40	1.0	8.2	0.26°	14100
80	**WWX400R8004SA32M**	★	4	Coarse	125	32	40	1.3	8.2	0.16°	12200
80	**WWX400R8005SA32M**	★	5	Fine	125	32	40	1.3	8.2	0.16°	12200
80	**WWX400R8007SA32M**	★	7	Extra Fine	125	32	40	1.2	8.2	0.16°	12200

SPARE PARTS

(mm)

Tool Holder Type	* Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WWX400	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

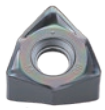
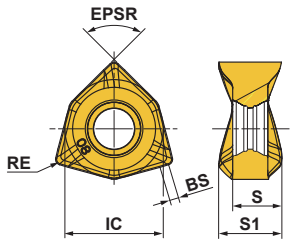
INSERTS

(inch)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated							Carbide		IC	S	S1	BS	RE	Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF		TF15						
	6NGU1409040PNER-L	G	E	●	●	●	●	●	●	●			.551	.276	.354	.067	.016	
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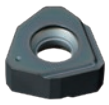
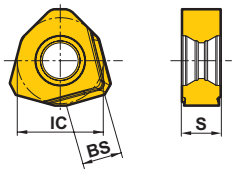
	6NGU1409080PNFR-L	G	F									●	.551	.276	.354	.051	.031	
	6NGU1409040PNER-M	G	E	★	●	★	●	●	★	★			.551	.276	.354	.067	.016	
	6NGU1409080PNER-M	G	E	★	●	●	●	●	★	★			.551	.276	.354	.051	.031	
	6NMU1409040PNER-M	M	E	●	●	●	●	●	●	●			.551	.276	.354	.067	.016	
	6NMU1409080PNER-M	M	E	●	●	●	●	●	●	●			.551	.276	.354	.051	.031	
	6NMU1409160PNER-M	M	E	●	●	●	●	●	●	●			.551	.276	.354	.002	.063	
	6NMU1409200PNER-M	M	E	●	●	●	●	●	●	●			.551	.276	.354	.002	.079	
	6NMU1409080PNER-R	M	E	●	●	●		●	●	●			.551	.276	.354	.051	.031	
	6NMU1409160PNER-R	M	E	★	★	★		★	●	●			.551	.276	.354	.002	.063	
	6NMU1409200PNER-R	M	E	★	★	★		★	●	●			.551	.276	.354	.002	.079	
 Wiper	2NGU1406ZNER6C-M	G	E	●	●					●			.551	.248	—	.256	—	

■ Instructions for Use of Wiper Inserts

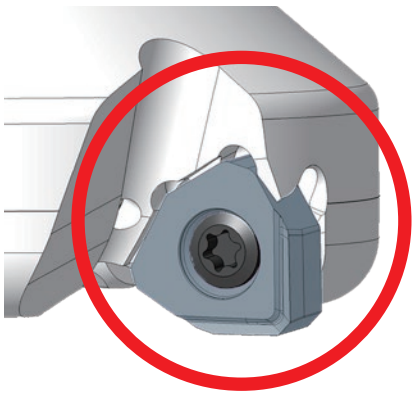


Fig.1

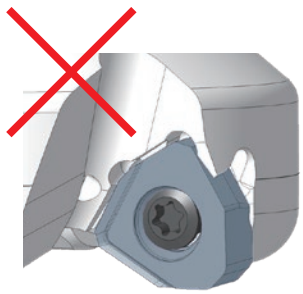


Fig.2

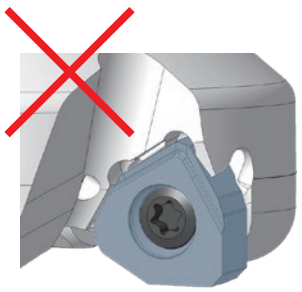


Fig.3

Wiper inserts for WWX400 are two-cornered. Please set as shown in Fig.1.
Excellent surface finish can be achieved with one wiper.
Set more than 2 wiper inserts, equally spaced, when the feed per revolution is larger than .256 IPR.
When choosing a wiper insert select a general grade that is similar to the ideal cutting conditions.

ISO13399	➢ K003
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

WWX200/400

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥	Width of Cut **ae** .8DC≥	Width of Cut **ae** DC(Slot)
					Cutting Speed **vc** (SFM)		
P	Mild Steel	Hardness ≤180HB	●	MP6120	785(655–920)	720(590–850)	655(525–785)
			◐	MP6130	755(620–885)	690(560–820)	620(490–755)
			✲	MP6130,VP15TF	690(560–820)	620(490–755)	560(425–690)
	Carbon Steel Alloy Steel	Hardness 180–280HB	●	MP6120	690(560–820)	620(490–755)	560(425–690)
			◐	MP6130	655(525–785)	590(460–720)	525(395–655)
			✲	MP6130,VP15TF	590(460–720)	525(395–655)	460(330–590)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280–350HB ≤350HB (Annealing)	●	MP6120	655(525–785)	590(460–720)	525(395–655)
			◐	MP6130	620(490–755)	560(425–690)	490(360–620)
			✲	MP6130,VP15TF	560(425–690)	490(360–620)	425(295–560)
	Pre-hardened Steel	Hardness 35–45HRC	●	MP6120	460(395–525)	–	–
			◐	MP6130	395(330–460)	–	–
			✲	MP6130,VP15TF	360(295–425)	–	–
M	Austenitic Stainless Steel	Hardness ≤200HB	●	MP7130	590(525–655)	525(460–590)	–
			◐	MP7130,VP15TF	560(490–620)	490(425–560)	–
			✲	MP7130,VP15TF	490(425–560)	425(360–490)	–
	Austenitic Stainless Steel	Hardness >200HB	●	MP7130	560(490–620)	490(425–560)	–
			◐	MP7130,VP15TF	525(460–590)	460(395–525)	–
			✲	MP7130,VP15TF	460(395–525)	395(330–460)	–
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	●	MP7130	590(525–655)	525(460–590)	–
			◐	MP7130,VP15TF	560(490–620)	490(425–560)	–
			✲	MP7130,VP15TF	490(425–560)	425(360–490)	–
	Duplex Stainless Steel	Hardness ≤280HB	●	MP7130	525(460–590)	460(395–525)	–
			◐	MP7130,VP15TF	490(425–560)	425(360–490)	–
			✲	MP7130,VP15TF	425(360–490)	360(295–425)	–
	Precipitation Hardening Stainless Steel	Hardness <450HB	●	MP7130	460(395–525)	–	–
			◐	MP7130,VP15TF	425(360–490)	–	–
			✲	MP7130,VP15TF	360(295–425)	–	–
K	Gray Cast Iron	Tensile Strength ≤350MPa	●	MC5020	820(690–950)	755(620–885)	690(560–820)
			◐	MC5020	785(655–920)	720(590–850)	655(525–785)
			◐	VP15TF	785(655–920)	720(590–850)	–
			✲	MC5020,VP15TF	720(590–850)	655(525–785)	590(460–720)
	Ductile Cast Iron	Tensile Strength ≤450MPa	●	MC5020	720(590–525)	655(525–785)	590(460–720)
			◐	MC5020	690(560–820)	620(490–755)	560(425–690)
			◐	VP15TF	690(560–820)	620(490–755)	–
			✲	MC5020,VP15TF	620(490–755)	560(425–690)	490(360–620)
	Ductile Cast Iron	Tensile Strength ≤800MPa	●	MC5020	590(460–720)	525(395–655)	460(330–590)
			◐	MC5020	560(425–690)	490(360–620)	425(295–560)
			◐	VP15TF	560(425–690)	490(360–620)	–
			✲	MC5020,VP15TF	490(360–620)	425(295–560)	360(230–490)
H	Hardened Steel	Hardness 40–55HRC	● ◐	VP15TF	165(100–230)	–	–
			◐	MP6120	130(100–230)	–	–

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.
Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

■ Wet Cutting
Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥	Width of Cut **ae** .8DC≥	Width of Cut **ae** DC(Slot)
					Cutting Speed **vc** (SFM)		
P	Mild Steel	Hardness ≤180HB	●	MP6120	490(460—525)	425(395—460)	395(360—425)
			◔	MP6130	460(425—490)	395(360—425)	360(330—395)
			✣	MP6130,VP15TF	395(360—425)	330(295—360)	295(260—330)
	Carbon Steel Alloy Steel	Hardness 180—280HB	●	MP6120	490(460—525)	425(395—460)	395(360—425)
			◔	MP6130	460(425—490)	395(360—425)	360(330—395)
			✣	MP6130,VP15TF	395(360—425)	330(295—360)	295(260—330)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	460(425—490)	395(360—425)	360(330—395)
			◔	MP6130	425(395—460)	360(330—395)	330(295—360)
			✣	MP6130,VP15TF	360(330—395)	295(260—330)	260(230—295)
	Pre-hardened Steel	Hardness 35—45HRC	●	MP6120	360(330—395)	—	—
			◔	MP6130	330(295—360)	—	—
			✣	MP6130,VP15TF	260(230—295)	—	—
M	Austenitic Stainless Steel	Hardness ≤200HB	●	MP7130	425(395—460)	360(330—395)	—
			◔	MP7130,VP15TF	395(360—425)	330(295—360)	—
			✣	MP7130,VP15TF	330(295—360)	260(230—295)	—
	Austenitic Stainless Steel	Hardness >200HB	●	MP7130	425(395—460)	360(330—395)	—
			◔	MP7130,VP15TF	395(360—425)	330(295—360)	—
			✣	MP7130,VP15TF	330(295—360)	260(230—295)	—
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	●	MP7130	425(395—460)	360(330—395)	—
			◔	MP7130,VP15TF	395(360—425)	330(295—360)	—
			✣	MP7130,VP15TF	330(295—360)	260(230—295)	—
	Duplex Stainless Steel	Hardness ≤280HB	●	MP7130	395(360—425)	330(295—360)	—
			◔	MP7130,VP15TF	360(330—395)	295(260—330)	—
			✣	MP7130,VP15TF	295(260—330)	230(195—260)	—
	Precipitation Hardening Stainless Steel	Hardness <450HB	●	MP7130	395(360—425)	—	—
			◔	MP7130,VP15TF	360(330—395)	—	—
			✣	MP7130,VP15TF	295(260—330)	—	—
K	Gray Cast Iron	Tensile Strength ≤350MPa	●	MC5020	560(490—620)	490(425—560)	425(360—490)
			◔	MC5020	525(460—590)	460(395—525)	395(330—460)
			◔	VP15TF	525(460—590)	460(395—525)	—
			✣	MC5020,VP15TF	460(395—525)	395(330—460)	330(260—395)
	Ductile Cast Iron	Tensile Strength ≤450MPa	●	MC5020	560(490—620)	490(425—560)	425(360—490)
			◔	MC5020	525(460—590)	460(395—525)	395(330—460)
			◔	VP15TF	525(460—590)	460(395—525)	—
			✣	MC5020,VP15TF	460(395—525)	395(330—460)	330(260—395)
	Ductile Cast Iron	Tensile Strength ≤800MPa	●	MC5020	525(490—560)	460(425—490)	395(360—425)
			◔	MC5020	490(460—525)	425(395—460)	360(330—395)
			◔	VP15TF	490(460—525)	425(395—460)	—
			✣	MC5020,VP15TF	425(395—460)	360(330—395)	295(260—330)
N	Aluminum Alloys	Content Si<5%	●	TF15	1640(985—2950)	1640(985—2950)	1640(985—2950)
			◔	TF15	1640(985—2950)	1640(985—2950)	1640(985—2950)
			✣	TF15	1310(655—2625)	1310(655—2625)	1310(655—2625)
S	Titanium Alloys	—	●	MP9120	260(195—330)	—	—
			◔	MP9120	230(165—295)	—	—
			✣	MP9130	195(130—260)	—	—
	Heat Resistant Alloys	—	●	MP9120	195(165—230)	—	—
			◔	MP9120	165(100—195)	—	—
			✣	MP9130	130(65—130)	—	—
H	Hardened Steel	Hardness 40—55HRC	●	VP15TF	165(100—230)	—	—
			◔	MP6120	130(100—230)	—	—

Note 1) To dischage chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.
Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

WWX200

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥ Breaker	**ap**	**fz** (IPT)
P	Mild Steel	Hardness ≤180HB	●	MP6120	M	≤.118	.005(.004–.006)
			◐	MP6130	M	≤.118	.005(.004–.006)
			◐		R	≤.118	.006(.004–.008)
			✣	MP6130,VP15TF	R	≤.118	.005(.004–.006)
	Carbon Steel Alloy Steel	Hardness 180–280HB	●	MP6120	M	≤.118	.005(.004–.006)
			◐	MP6130	M	≤.118	.005(.004–.006)
			◐		R	≤.118	.006(.004–.008)
			✣	MP6130,VP15TF	R	≤.118	.005(.004–.006)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280–350HB ≤350HB (Annealing)	●	MP6120	M	≤.118	.005(.004–.006)
			◐	MP6130	M	≤.118	.005(.004–.006)
			◐		R	≤.118	.006(.004–.008)
			✣	MP6130,VP15TF	R	≤.118	.005(.004–.006)
	Pre-hardened Steel	Hardness 35–45HRC	●	MP6120	M	≤.078	.005(.004–.006)
			◐	MP6130	M	≤.078	.005(.004–.006)
			◐		R	≤.078	.006(.004–.008)
			✣	MP6130,VP15TF	R	≤.078	.005(.004–.006)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◐	MP7130	M	≤.118	.005(.004–.006)
			◐	VP15TF	M	≤.118	.006(.004–.008)
			✣	MP7130,VP15TF	M	≤.118	.005(.004–.006)
	Austenitic Stainless Steel	Hardness >200HB	●	MP7130	M	≤.078	.005(.004–.006)
			●		M	≤.118	.005(.004–.006)
			◐		M	≤.078	.005(.004–.006)
			◐		M	≤.118	.005(.004–.006)
			◐	VP15TF	M	≤.078	.006(.004–.008)
			◐		M	≤.118	.006(.004–.008)
			✣	MP7130,VP15TF	M	≤.078	.005(.004–.006)
			✣		M	≤.118	.005(.004–.006)
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	● ◐	MP7130	M	≤.118	.005(.004–.006)
			◐	VP15TF	M	≤.118	.006(.004–.008)
			✣	MP7130,VP15TF	M	≤.118	.005(.004–.006)
	Duplex Stainless Steel	Hardness ≤280HB	● ◐	MP7130	M	≤.078	.005(.004–.006)
			● ◐		M	≤.118	.005(.004–.006)
			◐	VP15TF	M	≤.078	.006(.004–.008)
			◐		M	≤.118	.006(.004–.008)
			✣	MP7130,VP15TF	M	≤.078	.005(.004–.006)
			✣		M	≤.118	.005(.004–.006)
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ◐	MP7130	M	≤.078	.005(.004–.006)
			◐	VP15TF	M	≤.078	.006(.004–.008)
			✣	MP7130,VP15TF	M	≤.078	.005(.004–.006)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◐	MC5020	M	≤.118	.005(.004–.006)
			◐	VP15TF	R	≤.118	.006(.004–.008)
			✣	MC5020,VP15TF	R	≤.118	.005(.004–.006)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◐	MC5020	M	≤.118	.005(.004–.006)
			◐	VP15TF	R	≤.118	.006(.004–.008)
			✣	MC5020,VP15TF	R	≤.118	.005(.004–.006)
S	Titanium Alloys	–	● ◐	MP9120	M	≤.078	.004(.002–.005)
			✣	MP9130	M	≤.078	.004(.002–.005)
	Heat Resistant Alloys	–	● ◐	MP9120	M	≤.078	.004(.002–.005)
			✣	MP9130	M	≤.078	.004(.002–.005)
H	Hardened Steel	Hardness 40–55HRC	●	VP15TF	M	≤.078	.002(.002–.004)
			◐	VP15TF,MP6120	R	≤.078	.002(.002–.004)

Note 1) To dischage chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.
Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

(inch)

Width of Cut **ae**						Cutting Mode
.8DC≥			DC(Slot)			
Breaker	**ap**	**fz** (IPT)	Breaker	**ap**	**fz** (IPT)	
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
R	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
R	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
R	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry
M	≤.118	.005(.004–.006)	–	–	–	Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry
M	≤.118	.005(.004–.006)	–	–	–	Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry
M	≤.118	.006(.004–.008)	–	–	–	Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry
M	≤.118	.005(.004–.006)	–	–	–	Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry
M	≤.118	.005(.004–.006)	–	–	–	Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry
M	≤.118	.006(.004–.008)	–	–	–	Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry
M	≤.118	.005(.004–.006)	–	–	–	Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
R	≤.118	.005(.004–.006)	R	≤.078	.005(.004–.006)	Dry, Wet
M	≤.118	.005(.004–.006)	M	≤.078	.005(.004–.006)	Dry, Wet
R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
R	≤.118	.005(.004–.006)	R	≤.078	.005(.004–.006)	Dry, Wet
	–	–	–	–	–	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet

WWX400

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥ Breaker	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	●	MP6120	L,M	≤.157	.005(.004–.006)
			●	MP6130	L,M	≤.157	.005(.004–.006)
			●		M,R	≤.157	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.157	.005(.004–.006)
	Carbon Steel Alloy Steel	Hardness 180–280HB	●	MP6120	L,M	≤.157	.005(.004–.006)
			●	MP6130	L,M	≤.157	.005(.004–.006)
			●		M,R	≤.157	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.157	.005(.004–.006)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280–350HB ≤350HB (Annealing)	●	MP6120	L,M	≤.118	.005(.004–.006)
			●	MP6130	L,M	≤.118	.005(.004–.006)
			●		M,R	≤.118	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.118	.005(.004–.006)
	Pre-hardened Steel	Hardness 35–45HRC	●	MP6120	L,M	≤.079	.005(.004–.006)
			●	MP6130	L,M	≤.079	.005(.004–.006)
			●		M,R	≤.079	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.079	.005(.004–.006)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ●	MP7130	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M	≤.157	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.157	.005(.004–.006)
	Austenitic Stainless Steel	Hardness >200HB	●	MP7130	L,M	≤.157	.005(.004–.006)
			●	MP7130	L,M	≤.118	.005(.004–.006)
			●	VP15TF	M	≤.118	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.118	.005(.004–.006)
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	● ●	MP7130	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M	≤.157	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.118	.005(.004–.006)
	Duplex Stainless Steel	Hardness ≤280HB	● ●	MP7130	L,M	≤.118	.005(.004–.006)
			● ●	MP7130	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M	≤.118	.006(.004–.008)
			●	VP15TF	M	≤.157	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.118	.005(.004–.006)
			✱	MP7130,VP15TF	M	≤.157	.005(.004–.006)
	Precipitation Hardening Stainless Steel	Hardness <450HB	●	MP7130	L,M	≤.079	.005(.004–.006)
			●	MP7130	L,M	≤.079	.005(.004–.006)
			●	VP15TF	M	≤.079	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.079	.005(.004–.006)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ●	MC5020	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M,R	≤.157	.006(.004–.008)
			✱	MC5020,VP15TF	M,R	≤.157	.005(.004–.006)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ●	MC5020	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M,R	≤.157	.006(.004–.008)
			✱	MC5020,VP15TF	M,R	≤.157	.005(.004–.006)
N	Aluminum Alloys	Content Si<5%	● ● ✱	TF15	L	≤.157	.005(.004–.006)
S	Titanium Alloys	–	● ●	MP9120	L,M	≤.079	.004(.002–.005)
			✱	MP9130	L,M	≤.079	.004(.002–.005)
	Heat Resistant Alloys	–	● ●	MP9120	L,M	≤.079	.004(.002–.005)
			✱	MP9130	L,M	≤.079	.004(.002–.005)
H	Hardened Steel	Hardness 40–55HRC	●	VP15TF	M	≤.079	.002(.002–.004)
			●	VP15TF	M,R	≤.079	.002(.002–.004)

Note 1) Refer to the above table and set up cutting conditions according to cutting applications.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

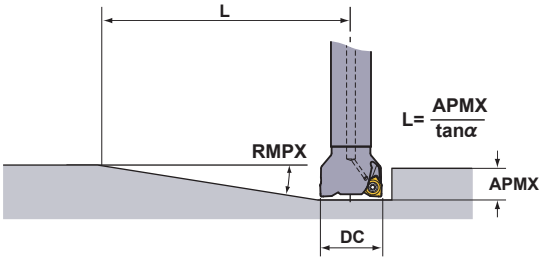
(inch)

Width of Cut **ae**						Cutting Mode
.8DC≥			DC(Slot)			
Breaker	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Breaker	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
M,R	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M,R	≤.118	.005(.004—.006)	M	≤.079	.005(.004—.006)	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
M,R	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M,R	≤.118	.005(.004—.006)	M	≤.079	.005(.004—.006)	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.118	.005(.004—.006)	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
M,R	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M,R	≤.118	.005(.004—.006)	M	≤.079	.005(.004—.006)	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
L,M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
M	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
L,M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
L,M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
M	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
L,M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
M	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M	≤.118	.005(.004—.006)	—	—	—	Dry, Wet
L,M	≤.118	.005(.004—.006)	—	—	—	Dry
L,M	≤.118	.005(.004—.006)	—	—	—	Wet
M	≤.118	.006(.004—.008)	—	—	—	Dry
M	≤.118	.006(.004—.008)	—	—	—	Wet
M	≤.118	.006(.004—.008)	—	—	—	Dry
M	≤.118	.005(.004—.006)	—	—	—	Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
M,R	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M,R	≤.118	.005(.004—.006)	M,R	≤.079	.005(.004—.006)	Dry, Wet
L,M	≤.118	.005(.004—.006)	L,M	≤.079	.005(.004—.006)	Dry, Wet
M,R	≤.118	.006(.004—.008)	—	—	—	Dry, Wet
M,R	≤.118	.005(.004—.006)	M,R	≤.079	.005(.004—.006)	Dry, Wet
L	≤.118	.005(.004—.006)	L	≤.079	.005(.004—.006)	Wet
—	—	—	—	—	—	Wet
—	—	—	—	—	—	Wet
—	—	—	—	—	—	Wet
—	—	—	—	—	—	Wet
—	—	—	—	—	—	Dry, Wet
—	—	—	—	—	—	Dry, Wet

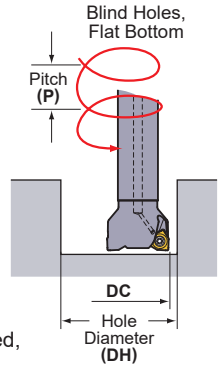
WWX400

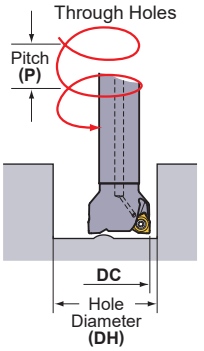
Ramping / Helical Milling

● **Ramping**



● **Helical Milling**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(inch)

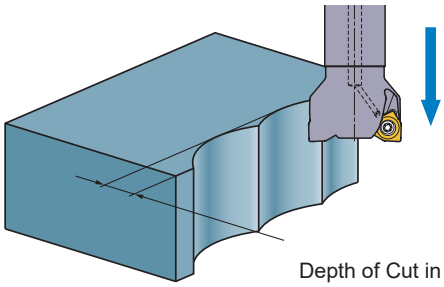
DC		RE	APMX	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
inch	mm			Maximum Ramping Angle **RMPX**	Minimum * Distance **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
1.969	50	.016	.315	.40°	46.260	3.878	.042	3.748	.039	3.248	.028
1.969	50	.031	.315	.40°	46.260	3.846	.041	3.748	.039	3.248	.028
2.000	—	.016	.315	.40°	46.260	3.929	.042	3.811	.040	3.295	.028
2.000	—	.031	.315	.40°	46.260	3.898	.042	3.811	.040	3.295	.028
2.480	63	.016	.315	.26°	71.142	4.902	.035	4.772	.033	4.276	.024
2.480	63	.031	.315	.26°	71.142	4.870	.034	4.772	.033	4.276	.024
2.500	—	.016	.315	.26°	71.142	4.929	.035	4.811	.033	4.299	.026
2.500	—	.031	.315	.26°	71.142	4.898	.034	4.811	.033	4.299	.026
3.000	—	.016	.315	.16°	115.591	5.929	.026	5.811	.025	5.299	.020
3.000	—	.031	.315	.16°	115.591	5.898	.026	5.811	.025	5.299	.020
3.150	80	.016	.315	.16°	115.591	6.240	.027	6.110	.026	5.614	.020
3.150	80	.031	.315	.16°	115.591	6.209	.027	6.114	.026	5.614	.020

*Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan α).
Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping and helical milling, long continuous chips may be scattered so please be careful.
Note 3) WWX200 cannot be used for ramping or helical machining.

<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove "the uncut part" in the center of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn't exceed the maximum depth of cut (**APMX**).

WWX400/200

● **Plunging**



Depth of Cut in the Radius Direction : **ae** = WWX200 .197 inch
WWX400 .315 inch

SHOULDER MILLING
<GENERAL CUTTING>

90° KAPR

ASX400

P M K N S H

Fig.1
ø2"
ø2.5"

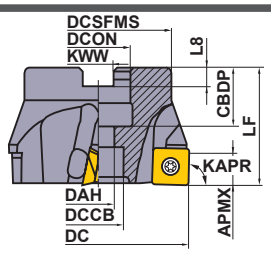


Fig.2
ø3"
ø4"
ø5"
ø6"

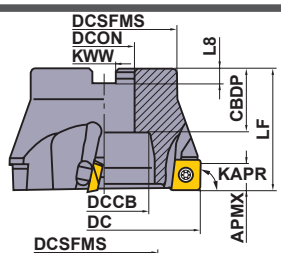
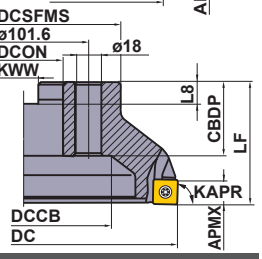


Fig.3
ø8"
ø10"



Right hand tool holder only.

■ ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	CBDP	DAH	DCCB	KWW	L8	APMX (inch)	WT (lbs)	Fig.
Coarse Pitch	**ASX400R0203**	●	3	2.000	1.575	.750	.748	.415	—	.313	.187	.394	.8	1
	ASX400R2504	●	4	2.500	1.575	.750	.748	.415	—	.313	.187	.394	1.1	1
	ASX400R0304C	●	4	3.000	1.969	1.000	1.024	—	1.496	.375	.219	.394	2.2	2
	ASX400R0405E	●	5	4.000	1.969	1.500	1.378	—	2.362	.625	.375	.394	3.3	2
	ASX400R0506E	●	6	5.000	2.480	1.500	1.378	—	2.362	.625	.375	.394	5.5	2
	ASX400R0608E	●	8	6.000	2.480	1.500	1.378	—	2.362	.625	.375	.394	8.8	2
	ASX400R0810M	●	10	8.000	2.480	2.500	1.378	—	5.315	1.000	.560	.394	15.0	3
	ASX400R1012M	●	12	10.000	2.480	2.500	1.378	—	7.087	1.000	.560	.394	26.0	3
Fine Pitch	**ASX400R0204**	●	4	2.000	1.575	.750	.748	.415	—	.313	.187	.394	.8	1
	ASX400R2505	●	5	2.500	1.575	.750	.748	.415	—	.313	.187	.394	1.1	1
	ASX400R0306C	●	6	3.000	1.969	1.000	1.024	—	1.496	.375	.219	.394	2.2	2
	ASX400R0407E	●	7	4.000	1.969	1.500	1.378	—	2.362	.625	.375	.394	3.3	2
	ASX400R0508E	●	8	5.000	2.480	1.500	1.378	—	2.362	.625	.375	.394	5.5	2
	ASX400R0612E	●	12	6.000	2.480	1.500	1.378	—	2.362	.625	.375	.394	8.8	2
	ASX400R0816M	●	16	8.000	2.480	2.500	1.378	—	5.315	1.000	.560	.394	15.0	3
	ASX400R1018M	●	18	10.000	2.480	2.500	1.378	—	7.087	1.000	.560	.394	26.0	3
Extra Fine Pitch	**ASX400R0205**	●	5	2.000	1.575	.750	.748	.415	—	.313	.187	.394	.8	1
	ASX400R2506	●	6	2.500	1.575	.750	.748	.415	—	.313	.187	.394	1.1	1
	ASX400R0308C	●	8	3.000	1.969	1.000	1.024	—	1.496	.375	.219	.394	2.2	2
	ASX400R0410E	●	10	4.000	1.969	1.500	1.378	—	2.362	.625	.375	.394	3.3	2
	ASX400R0512E	●	12	5.000	2.480	1.500	1.378	—	2.362	.625	.375	.394	5.5	2
	ASX400R0615E	●	15	6.000	2.480	1.500	1.378	—	2.362	.625	.375	.394	8.8	2
	ASX400R0819M	●	19	8.000	2.480	2.500	1.378	—	5.315	1.000	.560	.394	15.0	3
	ASX400R1022M	●	22	10.000	2.480	2.500	1.378	—	7.087	1.000	.560	.394	26.0	3

Note 1) Set bolt not included.

● : USA Stock ★ : Stocked in Japan

Metric Standard

For inch arbors

Fig.1
ø80
ø100
ø125
ø160

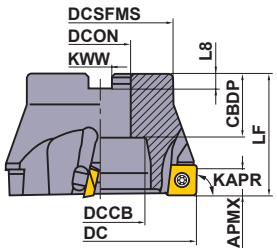
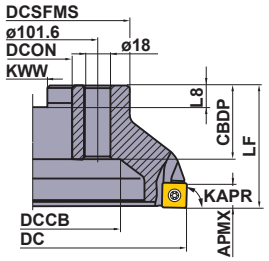


Fig.2
ø200
ø250

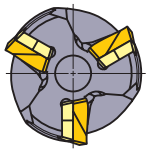


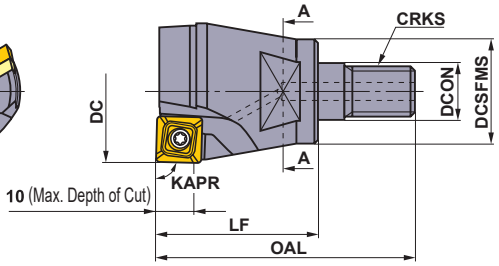
Right hand tool holder only.

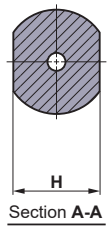
■ ARBOR TYPE

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) [inch] DC	LF	DCON	CBDP	DCCB	DCSFMS	KWW	L8	APMX (mm)	WT (kg)	Fig.
Coarse Pitch	**ASX400R08004C**	★	4	80	50	25.4 [1.0"]	26	38	60	9.5	6	10	1.0	1
	ASX400R10005D	★	5	100	50	31.75 [1.25"]	32	45	70	12.7	8	10	1.5	1
	ASX400R12506E	★	6	125	63	38.1 [1.5"]	35	60	80	15.9	10	10	2.5	1
	ASX400R16008F	★	8	160	63	50.8 [2.0"]	38	90	100	19.1	11	10	4.0	1
	ASX400R20010K	★	10	200	63	47.625 [1.875"]	35	135	160	25.4	14.22	10	7.0	2
	ASX400R25012K	★	12	250	63	47.625 [1.875"]	35	180	210	25.4	14.22	10	12.0	2
Fine Pitch	**ASX400R08006C**	★	6	80	50	25.4 [1.0"]	26	38	60	9.5	6	10	1.0	1
	ASX400R10007D	★	7	100	50	31.75 [1.25"]	32	45	70	12.7	8	10	1.5	1
	ASX400R12508E	★	8	125	63	38.1 [1.5"]	35	60	80	15.9	10	10	2.5	1
	ASX400R16012F	★	12	160	63	50.8 [2.0"]	38	90	100	19.1	11	10	4.0	1
	ASX400R20016K	★	16	200	63	47.625 [1.875"]	35	135	160	25.4	14.22	10	7.0	2
	ASX400R25018K	★	18	250	63	47.625 [1.875"]	35	180	210	25.4	14.22	10	12.0	2

Note 1) Set bolt not included.







Metric Standard

■ SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock R	Coolant Thru *3	Number of Teeth	Dimensions (mm) DC	DCON	DCSFMS	OAL	LF	H	CRKS *2	WT (kg)	Shim	Shim Screw *1	Insert Screw *1	Wrench (Insert)	Wrench (Shim)
ASX400R322AM1640	★	Y	2	32	17	29	63	40	24	M16	0.3	—	WCS503507H	TPS35	TIP15T	HKY35R
ASX400R403AM1645	★	Y	3	40	17	29	68	45	24	M16	0.3	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R

*1 Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31
*2 Clamp Torque of the Head (lbf-ft) : M16=66.7
*3 Y=Yes

ISO13399	➤ K003
SCREW-IN HOLDERS	➤ K382
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

Metric Standard

For metric arbors

Fig.1 ø50 ø63

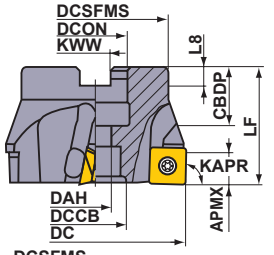


Fig.2 ø80 ø100 ø125

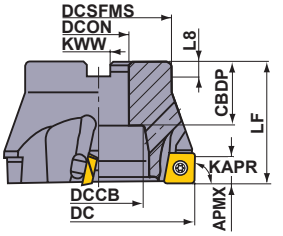


Fig.3 ø160

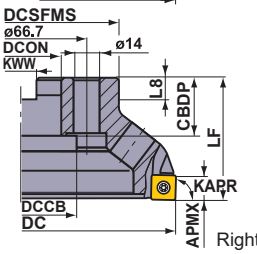
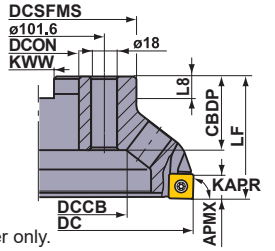


Fig.4 ø200 ø250



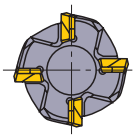
■ ARBOR TYPE

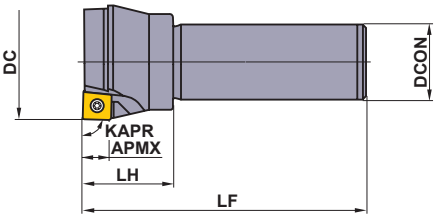
Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCCB	DCSFMS	KWW	L8	APMX (mm)	WT (kg)	Fig.
Coarse Pitch	ASX400-050A03R	★	3	50	40	22	20	11	—	41	10.4	6.3	10	0.3	1
	ASX400-063A04R	★	4	63	40	22	20	11	—	50	10.4	6.3	10	0.5	1
	ASX400-080B04R	★	4	80	50	27	29	—	38	60	12.4	7	10	0.9	2
	ASX400-100B05R	★	5	100	50	32	32	—	45	70	14.4	8	10	1.4	2
	ASX400-125B06R	★	6	125	63	40	32	—	60	80	16.4	9	10	2.3	2
	ASX400-160C08R	★	8	160	63	40	29	—	56	100	16.4	9	10	3.6	3
	ASX400-200C10R	★	10	200	63	60	32	—	135	160	25.7	14.22	10	6.3	4
	ASX400-250C12R	★	12	250	63	60	32	—	180	210	25.7	14.22	10	10.8	4
Fine Pitch	ASX400-050A04R	★	4	50	40	22	20	11	—	41	10.4	6.3	10	0.3	1
	ASX400-063A05R	★	5	63	40	22	20	11	—	50	10.4	6.3	10	0.5	1
	ASX400-080B06R	★	6	80	50	27	29	—	38	60	12.4	7	10	0.9	2
	ASX400-100B07R	★	7	100	50	32	32	—	45	70	14.4	8	10	1.4	2
	ASX400-125B08R	★	8	125	63	40	32	—	60	80	16.4	9	10	2.2	2
	ASX400-160C12R	★	12	160	63	40	29	—	56	100	16.4	9	10	3.5	3
	ASX400-200C16R	★	16	200	63	60	32	—	135	160	25.7	14.22	10	6.2	4
	ASX400-250C18R	★	18	250	63	60	32	—	180	210	25.7	14.22	10	10.7	4
Extra Fine Pitch	ASX400-050A05R	★	5	50	40	22	20	11	—	41	10.4	6.3	10	0.3	1
	ASX400-063A06R	★	6	63	40	22	20	11	—	50	10.4	6.3	10	0.5	1
	ASX400-080B08R	★	8	80	50	27	29	—	38	60	12.4	7	10	0.9	2
	ASX400-100B10R	★	10	100	50	32	32	—	45	70	14.4	8	10	1.4	2
	ASX400-125B12R	★	12	125	63	40	32	—	60	80	16.4	9	10	2.1	2
	ASX400-160C15R	★	15	160	63	40	29	—	56	100	16.4	9	10	3.4	3
	ASX400-200C19R	★	19	200	63	60	32	—	135	160	25.7	14.22	10	6.2	4
	ASX400-250C22R	★	22	250	63	60	32	—	180	210	25.7	14.22	10	10.5	4

Note 1) Set bolt not included.

Metric Standard





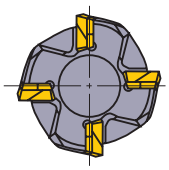
■ SHANK TYPE

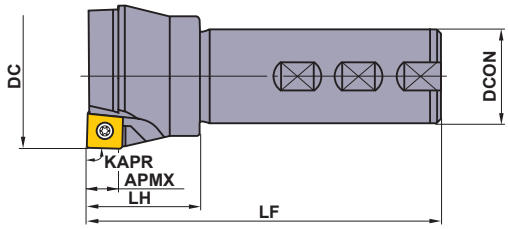
Right hand tool holder only.

Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	LH	APMX	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
Coarse Pitch	ASX400R403S32	★	3	40	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
	ASX400R503S32	★	3	50	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	ASX400R634S32	★	4	63	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	ASX400R804S32	★	4	80	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
Fine Pitch	ASX400R504S32	★	4	50	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
	ASX400R635S32	★	5	63	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
	ASX400R806S32	★	6	80	125	32	40	10	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

● : USA Stock ★ : Stocked in Japan





Right hand tool holder only.

■ WELDON SHANK TYPE

Order Number	Stock	Number of Teeth	Dimensions (inch)					Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
	R		DC	LF	DCON	LH	APMX	Shim	Shim Screw	Insert Screw	Wrench (Insert)	Wrench (Shim)	Insert
ASX400R202W20	●	2	1.250	4.750	1.250	1.500	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□
ASX400R243W20	●	3	1.500	4.750	1.250	1.500	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	
ASX400R324W20	●	4	2.000	4.750	1.250	1.575	.394	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

SPARE PARTS

Tool Holder Number	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Insert
ASX400R Type	STASX400N	WCS503507H	TPS35	TIP15T	HKY35R	SO□T12T3□□ PE□R-□□

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

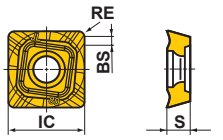
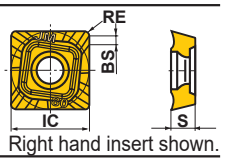
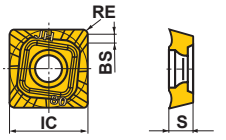
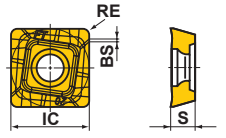
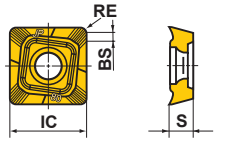
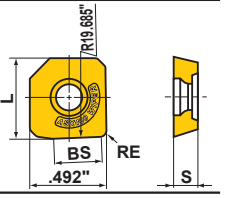
ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting
✣ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **T** : Chamfer

Application	Shape	Order Number	Class	Edge Preparation	Coated											Cermet		Carbide		Dimensions (inch)					Geometry
					F7010	F7030	MC5020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT	NX4545	NX2525	HTi10	HTi05T	L	IC	S	BS	RE	
Finish–Light Cutting	**JL** Breaker	**SOET12T308PEER-JL**	E	E		●		●	●	●	●	●	●	●	●	●				–	.500	.156	.055	.031	
Light–Rough Cutting	**JM** Breaker	**SOMT12T308PEER-JM**	M	E	●	●	●	●	●	●	●	●	●	●	●	●				–	.500	.156	.055	.031	
		SOMT12T308PEEL-JM	M	E										★						–	.500	.156	.055	.031	Right hand insert shown.
Medium–Heavy Cutting	**JH** Breaker	**SOMT12T308PEER-JH**	M	E		●	●	●	●	●	●	●	●	●	●					–	.500	.156	.055	.031	
Heavy Interrupted Cutting	**FT** Breaker	**SOMT12T320PEER-FT**	M	E			●	●				●	●	●						–	.500	.156	.020	.079	
For Aluminum Alloys	**JP** Breaker	**SOGT12T308PEFR-JP**	G	F														●		–	.500	.156	.055	.031	
Wiper		**WOEW12T308PEER8C**	E	E															●	.520	–	.156	.315	.031	
		WOEW12T308PETR8C	E	T													●			.520	–	.156	.315	.031	

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Hardness	Grade	Cutting Speed (SFM)	Finish—Light Cutting		Light—Rough Cutting		Medium—Heavy Cutting	
					Feed per Tooth (inch/tooth)	Breaker	Feed per Tooth (inch/tooth)	Breaker	Feed per Tooth (inch/tooth)	Breaker
P	Mild Steel	≤180HB	**F7030**	920 (690—1150)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.008—.014)	**JH**
			MP6120 VP15TF	820 (655—985)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
			MP6130	780 (652—950)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
			VP30RT	755 (590—920)	.007 (.003—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
			NX4545	590 (425—755)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	—	—
	Carbon Steel Alloy Steel	180—280HB	**F7030**	820 (655—985)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			MP6120 VP15TF	720 (560—885)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			MP6130	600 (480—740)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			VP30RT	490 (395—590)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	—	—
			NX4545	490 (390—590)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	—	—
		280—350HB	**F7030**	590 (425—755)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			MP6120 VP15TF	460 (330—590)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			MP6130	510 (290—560)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			VP30RT	390 (260—525)	.005 (.002—.008)	**JL**	.006 (.004—.010)	**JM**	.007 (.004—.011)	**JH**
			NX4545	330 (260—395)	.004 (.002—.006)	**JL**	.005 (.004—.008)	**JM**	—	—
M	Stainless Steel	≤270HB	**MP7130 VP15TF**	720 (560—885)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	.008 (.004—.012)	**JH**
			MP7140 VP30RT	490 (395—590)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	—	—
			NX4545	490 (390—590)	.006 (.003—.009)	**JL**	.007 (.004—.011)	**JM**	—	—
K	Cast Iron Ductile Cast Iron	Tensile Strength ≤450MPa	**MC5020**	655 (490—820)	—	—	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH FT**
			VP15TF NX4545	590 (425—820)	.007 (.004—.011)	**JL**	.008 (.004—.012)	**JM**	.010 (.004—.014)	**JH**
N	Aluminum Alloys	—	**HTi10**	2130 (1000—3300)	.006 (.004—.008)	**JP**	.008 (.004—.012)	**JP**	.012 (.008—.016)	**JP**
S	Titanium Alloys	—	**MP9120 VP15TF**	165 (130—195)	.005 (.002—.008)	**JL**	.006 (.003—.009)	**JM**	—	—
			MP9130	140 (100—180)	.005 (.002—.008)	**JL**	.006 (.003—.009)	**JM**	—	—
	Heat Resistant Alloys	—	**MP9120 VP15TF**	130 (65—165)	.004 (.002—.006)	**JL**	.005 (.003—.008)	**JM**	—	—
			MP9130	110 (55—140)	.004 (.002—.006)	**JL**	.005 (.003—.008)	**JM**	—	—
H	Hardened Steel	40—55HRC	**VP15TF**	200 (120—280)	.003 (.002—.005)	**JL**	.004 (.002—.006)	**JM**	.005 (.003—.007)	**JH**

INSTRUCTIONS FOR USING INSERTS

■ INSTRUCTIONS FOR USE OF THE JP BREAKER

- The JP breaker has sharp cutting edges. Wear gloves when handling.
- When machining aluminum alloy, welding to the cutting edge tends to occur, often leading to insert failure. To prevent this, wet cutting is recommended.

■ INSTRUCTIONS FOR USE OF WIPER INSERTS

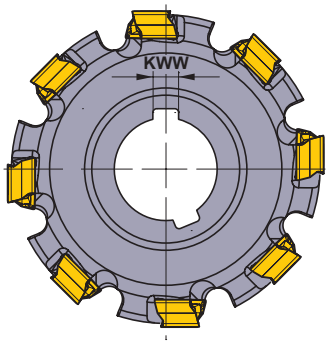
- Wiper inserts for the ASX400 are single-cornered.
- When installing the wiper insert, place the insert so that the small chamfer is located as shown.

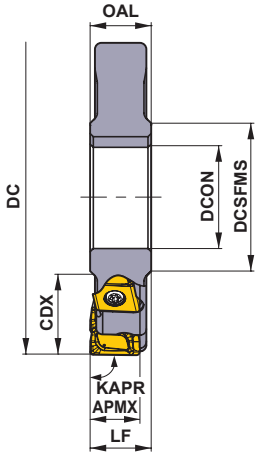
SIDE CUTTER

90° KAPR

VAS400

P M K N S H





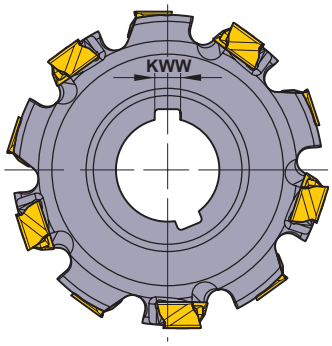
■HALF SIDE

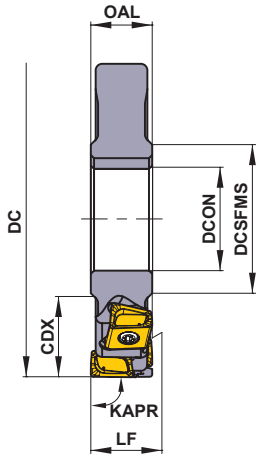
Max. Depth of Cut **APMX** : RE<.118" .480"
RE≥.118" .449"

(inch)

DC	Order Number	Hand	Stock	No. of Teeth	LF	CDX	DCON	DCSFMS	OAL	KWW	Insert Type
4.000	**VAS400UA041010L0.75D**	L	□	10	.750	1.040	1.250	1.750	.750	.318	LNGU13
4.000	**VAS400UA041010R0.75D**	R	□	10	.750	1.040	1.250	1.750	.750	.318	LNGU13
4.000	**VAS400UA041010L1.00D**	L	□	10	1.000	1.040	1.250	1.750	1.000	.318	LNGU13
4.000	**VAS400UA041010R1.00D**	R	□	10	1.000	1.040	1.250	1.750	1.000	.318	LNGU13
5.000	**VAS400UA051212L0.75E**	L	□	12	.750	1.380	1.500	2.120	.750	.385	LNGU13
5.000	**VAS400UA051212R0.75E**	R	□	12	.750	1.380	1.500	2.120	.750	.385	LNGU13
5.000	**VAS400UA051212L1.00E**	L	□	12	1.000	1.380	1.500	2.120	1.000	.385	LNGU13
5.000	**VAS400UA051212R1.00E**	R	□	12	1.000	1.380	1.500	2.120	1.000	.385	LNGU13
6.000	**VAS400UA061414L0.75E**	L	□	14	.750	1.890	1.500	2.120	.750	.385	LNGU13
6.000	**VAS400UA061414R0.75E**	R	□	14	.750	1.890	1.500	2.120	.750	.385	LNGU13
6.000	**VAS400UA061414L1.00E**	L	□	14	1.000	1.890	1.500	2.120	1.000	.385	LNGU13
6.000	**VAS400UA061414R1.00E**	R	□	14	1.000	1.890	1.500	2.120	1.000	.385	LNGU13
8.000	**VAS400UA082020L0.75F**	L	□	20	.750	2.560	2.000	2.750	.750	.510	LNGU13
8.000	**VAS400UA082020R0.75F**	R	□	20	.750	2.560	2.000	2.750	.750	.510	LNGU13
8.000	**VAS400UA082020L1.00F**	L	□	20	1.000	2.560	2.000	2.750	1.000	.510	LNGU13
8.000	**VAS400UA082020R1.00F**	R	□	20	1.000	2.560	2.000	2.750	1.000	.510	LNGU13

● : USA Stock □ : Made to Order





■FULL SIDE

(inch)

DC	Order Number	Stock	Effective No. of Teeth	Total No. of Teeth	LF	CDX	DCON	DCSFMS	OAL	KWW	Insert Type
4.000	**VAS400UA041005N0.75D**	●	5	10	.750	1.040	1.250	1.750	.750	.318	LNGU13
4.000	**VAS400UA041005N1.00D**	●	5	10	1.000	1.040	1.250	1.750	1.000	.318	LNGU13
5.000	**VAS400UA051206N0.75E**	●	6	12	.750	1.380	1.500	2.120	.750	.385	LNGU13
5.000	**VAS400UA051206N1.00E**	●	6	12	1.000	1.380	1.500	2.120	1.000	.385	LNGU13
6.000	**VAS400UA061407N0.75E**	●	7	14	.750	1.890	1.500	2.120	.750	.385	LNGU13
6.000	**VAS400UA061407N1.00E**	●	7	14	1.000	1.890	1.500	2.120	1.000	.385	LNGU13
8.000	**VAS400UA082010N0.75F**	●	10	20	.750	2.560	2.000	2.750	.750	.510	LNGU13
8.000	**VAS400UA082010N1.00F**	●	10	20	1.000	2.560	2.000	2.750	1.000	.510	LNGU13

SPARE PARTS

Arbor Type	*	
	Clamp Screw	Wrench (Insert)
VAS400UA	TS405	TKY15T

* Clamp Torque (lbf-in) : TS405=31

ISO13399 ➤ K003
CUTTING CONDITIONS ➤ K151
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

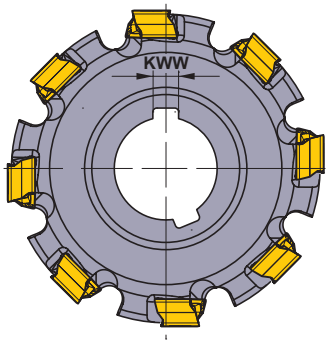
SIDE CUTTER

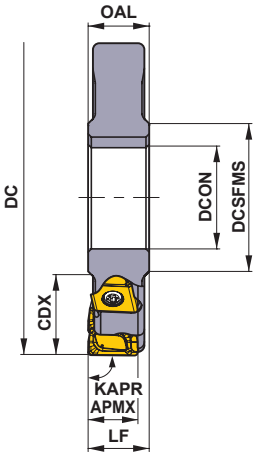
90° KAPR

VAS400 Engineering Specials

P M K N S H

Metric Standard



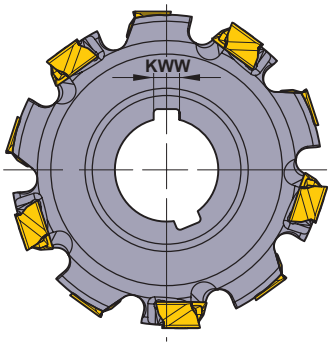


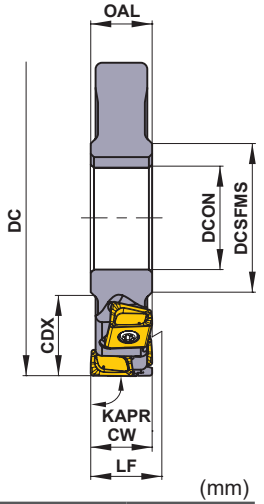
Max. Cutting Diameter **DC** : ø400 mm
Max. Depth of Cut **APMX** : RE<3.0 mm 12.2 mm
RE≥3.0 mm 11.4 mm

■ HALF SIDE

(mm)

DC	No. of Teeth	LF	CDX	DCON	DCSFMS	OAL	KWW	Insert Type
80	8	≥18	20	27	40	≥18	7	LNGU13
100	10	≥18	27	32	46	≥18	8	LNGU13
125	12	≥18	35	40	55	≥18	10	LNGU13
160	14	≥18	52.5	40	55	≥18	10	LNGU13





■ FULL SIDE

Largest Width **CW** : 100 mm
Max. Cutting Diameter **DC** : ø400 mm

(mm)

DC	Effective No. of Teeth	Total No. of Teeth	LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	Insert Type
80	4	8	≥18	18 – 24	20	27	40	≥18	7	LNGU13
100	5	10	≥18	18 – 24	27	32	46	≥18	8	LNGU13
125	6	12	≥18	18 – 24	35	40	55	≥18	10	LNGU13
160	7	14	≥18	18 – 24	52.5	40	55	≥18	10	LNGU13

*1 In case of adjustment piece specification. **LF** : ≥24

*2 **CW** of RE<3.0 mm is 24 mm, and RE≤3.0 mm is 22.8 mm. Multilevel designs available for **CW** over each sizes.

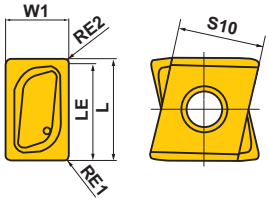
Note 1) Please contact us for details of any geometry.

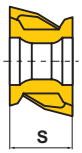
INSERTS

Workpiece Material		
P	Steel	
K	Cast Iron	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated			Dimensions (inch)							Geometry
					MP6120	VP15TF		L	LE	S	S10	RE1	RE2	W1	
Low Resistance Type **M** Breaker	**LNGU130804PNER-M**	R	G	E		●		.512	.480	.315	.433	.016	.031	.315	
	LNGU130804PNEL-M	L	G	E		●		.512	.480	.315	.433	.016	.031	.315	
	LNGU130808PNER-M	R	G	E		●		.512	.480	.315	.433	.031	.031	.315	
	LNGU130808PNEL-M	L	G	E		●		.512	.480	.315	.433	.031	.031	.315	
	LNGU130812PNER-M	R	G	E		●		.512	.480	.315	.433	.047	.031	.315	
	LNGU130812PNEL-M	L	G	E		●		.512	.480	.315	.433	.047	.031	.315	
	LNGU130816PNER-M	R	G	E		●		.512	.480	.315	.433	.063	.031	.315	
	LNGU130816PNEL-M	L	G	E		●		.512	.480	.315	.433	.063	.031	.315	
	LNGU130820PNER-M	R	G	E		●		.512	.480	.315	.433	.079	.031	.315	
	LNGU130820PNEL-M	L	G	E		●		.512	.480	.315	.433	.079	.031	.315	
	LNGU130824PNER-M	R	G	E		●		.512	.480	.315	.433	.094	.031	.315	
	LNGU130824PNEL-M	L	G	E		●		.512	.480	.315	.433	.094	.031	.315	
	LNGU130830PNER-M	R	G	E		●		.512	.449	.315	.433	.118	.063	.315	
	LNGU130830PNEL-M	L	G	E		●		.512	.449	.315	.433	.118	.063	.315	
	LNGU130840PNER-M	R	G	E		●		.512	.449	.315	.433	.157	.063	.315	
	LNGU130840PNEL-M	L	G	E		●		.512	.449	.315	.433	.157	.063	.315	
	LNGU130850PNER-M	R	G	E		●		.512	.449	.315	.433	.197	.063	.315	
	LNGU130850PNEL-M	L	G	E		●		.512	.449	.315	.433	.197	.063	.315	
Strong Cutting Edge Type **R** Breaker	**LNGU130804PNER-R**	R	G	E	●	●		.512	.480	.315	.433	.016	.031	.315	
	LNGU130804PNEL-R	L	G	E	●	●		.512	.480	.315	.433	.016	.031	.315	
	LNGU130808PNER-R	R	G	E	●	●		.512	.480	.315	.433	.031	.031	.315	
	LNGU130808PNEL-R	L	G	E	●	●		.512	.480	.315	.433	.031	.031	.315	
	LNGU130812PNER-R	R	G	E	●	●		.512	.480	.315	.433	.047	.031	.315	
	LNGU130812PNEL-R	L	G	E	●	●		.512	.480	.315	.433	.047	.031	.315	
	LNGU130816PNER-R	R	G	E	●	●		.512	.480	.315	.433	.063	.031	.315	
	LNGU130816PNEL-R	L	G	E	●	●		.512	.480	.315	.433	.063	.031	.315	
	LNGU130820PNER-R	R	G	E	●	●		.512	.480	.315	.433	.079	.031	.315	
	LNGU130820PNEL-R	L	G	E	●	●		.512	.480	.315	.433	.079	.031	.315	
	LNGU130824PNER-R	R	G	E	●	●		.512	.480	.315	.433	.094	.031	.315	
	LNGU130824PNEL-R	L	G	E	●	●		.512	.480	.315	.433	.094	.031	.315	
	LNGU130830PNER-R	R	G	E	●	●		.512	.449	.315	.433	.118	.063	.315	
	LNGU130830PNEL-R	L	G	E	●	●		.512	.449	.315	.433	.118	.063	.315	
	LNGU130840PNER-R	R	G	E	●	●		.512	.449	.315	.433	.157	.063	.315	
	LNGU130840PNEL-R	L	G	E	●	●		.512	.449	.315	.433	.157	.063	.315	
	LNGU130850PNER-R	R	G	E	●	●		.512	.449	.315	.433	.197	.063	.315	
	LNGU130850PNEL-R	L	G	E	●	●		.512	.449	.315	.433	.197	.063	.315	





Right hand insert shown.

● : USA Stock
<10 inserts in one case>

ISO13399 ➤ K003
CUTTING CONDITIONS ➤ K151
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

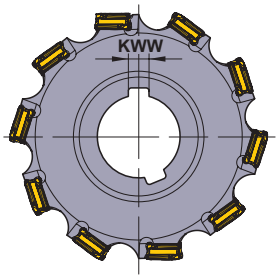
SIDE CUTTER

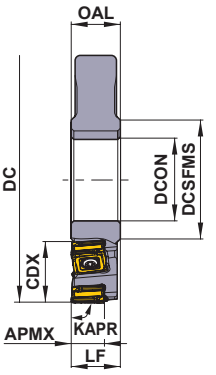
90° KAPR

VOS400 Engineering Specials

P M **K** N S H

Metric Standard



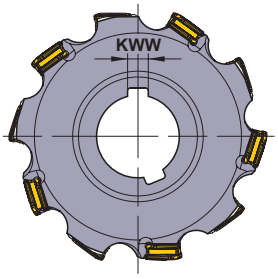


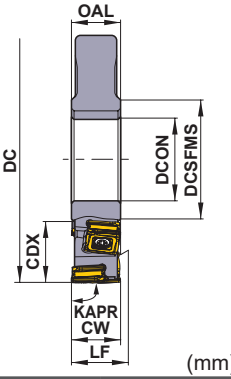
■ HALF SIDE

Max. Cutting Diameter **DC** : ø400 mm

(mm)

DC	No. of Teeth	LF	CDX	DCON	DCSFMS	OAL	KWW	APMX
80	8	≥16	20	27	40	≥16.8	7	10
100	10	≥16	27	32	46	≥16.8	8	10
125	12	≥16	35	40	55	≥16.8	10	10
160	14	≥16	52.5	40	55	≥16.8	10	10





■ FULL SIDE

Largest Width **CW** : 100 mm
Max. Cutting Diameter **DC** : ø400 mm

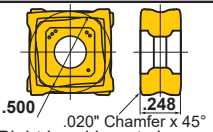
(mm)

DC	Effective No. of Teeth	Total No. of Teeth	LF	CW	CDX	DCON	DCSFMS	OAL	KWW
80	4	8	≥16	16 – 20	20	27	40	≥16	7
100	5	10	≥16	16 – 20	27	32	46	≥16	8
125	6	12	≥16	16 – 20	35	40	55	≥16	10
160	7	14	≥16	16 – 20	52.5	40	55	≥16	10

Note 1) Multilevel designs available for CW over 20 mm.
Note 2) Please contact us for detail of any geometry.

INSERT

(inch)

Shape	Order Number	Hand	Class	Edge Preparation	Coated VP15TF	Geometry
	SONX1206PER	R	N	E	●	
	SONX1206PEL	L	N	E	★	

Right hand insert shown.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

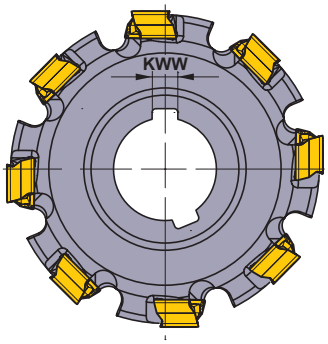
SIDE CUTTER

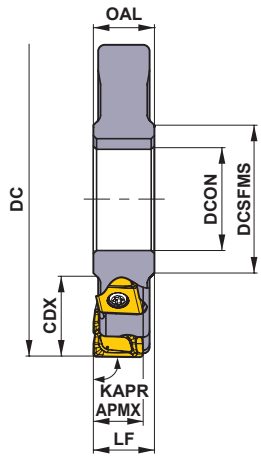
90° KAPR

VAS500 Engineering Specials

P | M | K | N | S | H

Metric Standard





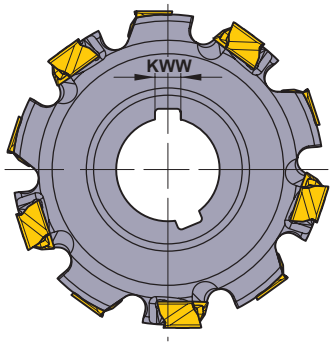
Max. Cutting Diameter **DC** : ø660 mm
Max. Depth of Cut **APMX** : RE<3.0 mm 16.2 mm
RE≥3.0 mm 15.4 mm

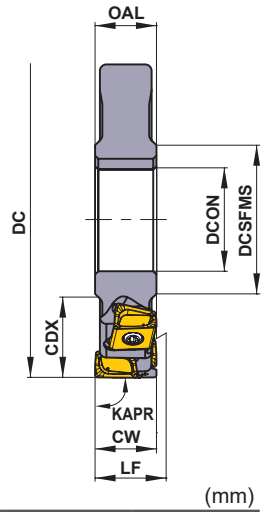
■ HALF SIDE

(mm)

DC	No. of Teeth	LF *	CDX	DCON	DCSFMS	OAL	KWW	Insert Type
100	8	≥23	27	32	46	≥23	8	LNGU17
125	10	≥23	35	40	55	≥23	10	LNGU17
160	12	≥23	52.5	40	55	≥23	10	LNGU17
200	16	≥23	65	50	70	≥23	12	LNGU17

* In case of adjustment piece specification. **LF** : ≥29





■ FULL SIDE

Largest Width **CW** : 100 mm
Max. Cutting Diameter **DC** : ø660 mm

(mm)

DC	Effective No. of Teeth	Total No. of Teeth	LF *1	CW *2	CDX	DCON	DCSFMS	OAL	KWW	Insert Type
100	4	8	≥23	23 – 32	27	32	46	≥23	8	LNGU17
125	5	10	≥23	23 – 32	35	40	55	≥23	10	LNGU17
160	6	12	≥23	23 – 32	52.5	40	55	≥23	10	LNGU17
200	8	16	≥23	23 – 32	65	50	70	≥23	12	LNGU17

*1 In case of adjustment piece specification. **LF** : ≥29

*2 **CW** of RE<3.0 mm is 32 mm, and RE≤3.0 mm is 30.8 mm.

Note 1) Please contact us for details of any geometry.

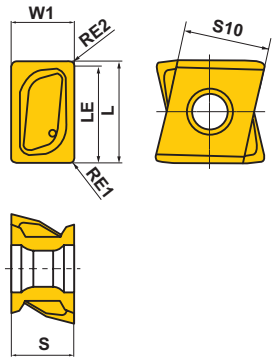
ISO13399	➤ K003	SPARE PARTS	➤ M001
CUTTING CONDITIONS	➤ K151	TECHNICAL DATA	➤ N001

INSERTS

Workpiece Material		
	P	Steel
	K	Cast Iron

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting
Edge Preparation :
E : Round

Shape	Order Number	Hand	Class	Edge Preparation	Coated		Dimensions (mm)							Geometry
					MP6120	VP15TF	L	LE	S	S10	RE1	RE2	W1	
Strong Cutting Edge Type **R** Breaker	**LNGU171004PNER-R**	R	G	E	★	★	17	16.2	10	13	0.4	0.8	10	
	LNGU171004PNEL-R	L	G	E	★	★	17	16.2	10	13	0.4	0.8	10	
	LNGU171008PNER-R	R	G	E	★	★	17	16.2	10	13	0.8	0.8	10	
	LNGU171008PNEL-R	L	G	E	★	★	17	16.2	10	13	0.8	0.8	10	
	LNGU171012PNER-R	R	G	E	★	★	17	16.2	10	13	1.2	0.8	10	
	LNGU171012PNEL-R	L	G	E	★	★	17	16.2	10	13	1.2	0.8	10	
	LNGU171016PNER-R	R	G	E	★	★	17	16.2	10	13	1.6	0.8	10	
	LNGU171016PNEL-R	L	G	E	★	★	17	16.2	10	13	1.6	0.8	10	
	LNGU171020PNER-R	R	G	E	★	★	17	16.2	10	13	2	0.8	10	
	LNGU171020PNEL-R	L	G	E	★	★	17	16.2	10	13	2	0.8	10	
	LNGU171024PNER-R	R	G	E	★	★	17	16.2	10	13	2.4	0.8	10	
	LNGU171024PNEL-R	L	G	E	★	★	17	16.2	10	13	2.4	0.8	10	
	LNGU171030PNER-R	R	G	E	★	★	17	15.4	10	13	3	1.6	10	
	LNGU171030PNEL-R	L	G	E	★	★	17	15.4	10	13	3	1.6	10	
	LNGU171040PNER-R	R	G	E	★	★	17	15.4	10	13	4	1.6	10	
	LNGU171040PNEL-R	L	G	E	★	★	17	15.4	10	13	4	1.6	10	
	LNGU171050PNER-R	R	G	E	★	★	17	15.4	10	13	5	1.6	10	
	LNGU171050PNEL-R	L	G	E	★	★	17	15.4	10	13	5	1.6	10	
	LNGU171060PNER-R	R	G	E	★	★	17	15.4	10	13	6	1.6	10	
	LNGU171060PNEL-R	L	G	E	★	★	17	15.4	10	13	6	1.6	10	
	LNGU171070PNER-R	R	G	E	★	★	17	15.4	10	13	7	1.6	10	
	LNGU171070PNEL-R	L	G	E	★	★	17	15.4	10	13	7	1.6	10	



Right hand insert shown.

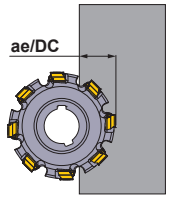
★ : Stocked in Japan
<10 inserts in one case>

VAS400/500

RECOMMENDED CUTTING CONDITIONS (Dry Cutting)

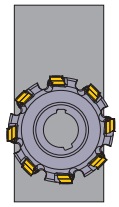
Shoulder Milling

(inch)

	Workpiece Material	Properties	Insert Grade	**vc** (SFM)	Depth of Cut **ap**	Width of Cut **ae/DC**	Feed per Tooth **fz** (IPT)	Cutting Mode
P	Mild Steel	Hardness ≤180HB	MP6120 VP15TF	490(425—590)	≤APMX	<10%	.004(.003—.006)	
				490(425—590)	≤APMX	<30%	.004(.003—.006)	
				490(425—590)	≤APMX	≤50%	.004(.003—.006)	
	Carbon Steel Alloy Steel	Hardness 180—280HB	MP6120 VP15TF	490(425—590)	≤.079	≤50%	.005(.003—.008)	
				490(425—590)	≤.157	<10%	.005(.003—.008)	
				490(425—590)	≤.157	≤50%	.004(.003—.006)	
				490(425—590)	≤APMX	<10%	.004(.003—.006)	
				490(425—590)	≤APMX	≤50%	.004(.003—.005)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	490(425—590)	≤.079	≤50%	.005(.003—.008)	
				490(425—590)	≤.157	<10%	.005(.003—.008)	
				490(425—590)	≤.157	≤50%	.004(.003—.006)	
				490(425—590)	≤APMX	<10%	.004(.003—.006)	
				490(425—590)	≤APMX	≤50%	.004(.003—.005)	
	Ductile Cast Iron	Tensile Strength ≤450MPa	VP15TF	425(360—525)	≤.079	≤50%	.005(.003—.008)	
				425(360—525)	≤.157	<10%	.005(.003—.008)	
				425(360—525)	≤.157	≤50%	.004(.003—.006)	
				425(360—525)	≤APMX	<10%	.004(.003—.006)	
				425(360—525)	≤APMX	≤50%	.004(.003—.005)	
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP15TF	425(360—525)	≤.079	≤50%	.005(.003—.008)	
				425(360—525)	≤.157	<10%	.005(.003—.008)	
				425(360—525)	≤.157	≤50%	.004(.003—.006)	
				425(360—525)	≤APMX	<10%	.004(.003—.006)	
				425(360—525)	≤APMX	≤50%	.004(.003—.005)	

Face Milling (Center Cutting)

(inch)

	Workpiece Material	Properties	Insert Grade	**vc** (SFM)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Cutting Mode
P	Mild Steel	Hardness ≤180HB	MP6120 VP15TF	490(425—590)	≤APMX	.004(.003—.006)	
	Carbon Steel Alloy Steel	Hardness 180—280HB	MP6120 VP15TF	490(425—590)	≤.079	.005(.003—.008)	
				490(425—590)	≤.157	.004(.003—.006)	
				490(425—590)	≤APMX	.004(.003—.005)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	VP15TF	490(425—590)	≤.079	.005(.003—.008)	
				490(425—590)	≤.157	.004(.003—.006)	
				490(425—590)	≤APMX	.004(.003—.005)	
	Ductile Cast Iron	Tensile Strength ≤450MPa	VP15TF	490(425—590)	≤.079	.005(.003—.008)	
				490(425—590)	≤.157	.004(.003—.006)	
				490(425—590)	≤APMX	.004(.003—.005)	
	Ductile Cast Iron	Tensile Strength ≤800MPa	VP15TF	425(360—525)	≤.079	.005(.003—.008)	
				425(360—525)	≤.157	.004(.003—.006)	
				425(360—525)	≤APMX	.004(.003—.005)	

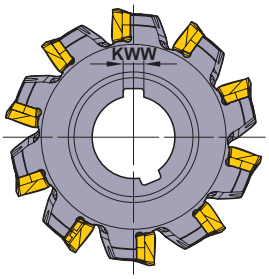
SIDE CUTTER

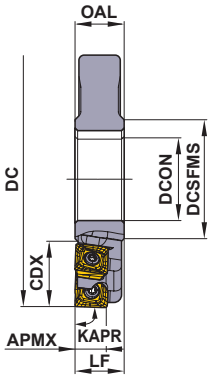
90° KAPR

ASX400 Engineering Specials

P M K N S H

Metric Standard



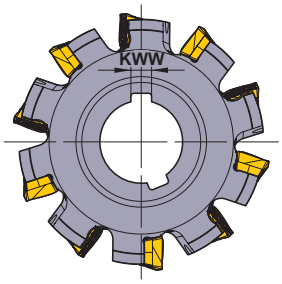


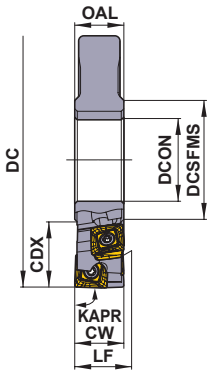
Max. Cutting Diameter **DC** : ø400 mm

■ HALF SIDE

(mm)

DC	No. of Teeth	LF	CDX	DCON	DCSFMS	OAL	KWW	APMX
80	8	≥16	20	27	40	≥16.8	7	10
100	10	≥16	27	32	46	≥16.8	8	10
125	12	≥16	35	40	55	≥16.8	10	10
160	14	≥16	52.5	40	55	≥16.8	10	10





Largest Width **CW** : 100 mm
Max. Cutting Diameter **DC** : ø400 mm

■ FULL SIDE

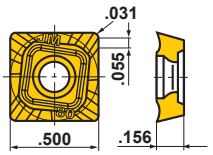
(mm)

DC	Effective No. of Teeth	Total No. of Teeth	LF	CW	CDX	DCON	DCSFMS	OAL	KWW
80	4	8	≥16	16 – 20	20	27	40	≥16	7
100	5	10	≥16	16 – 20	27	32	46	≥16	8
125	6	12	≥16	16 – 20	35	40	55	≥16	10
160	7	14	≥16	16 – 20	52.5	40	55	≥16	10

Note 1) Multilevel designs available for CW over 20 mm.
Note 2) Please contact us for detail of any geometry.

INSERT

(inch)

Shape	Order Number	Hand	Class	Edge Preparation	Coated VP15TF		Geometry
	SOMT12T308PEER-JM	R	M	E	●		
	SOMT12T308PEEL-JM	L	M	E	★		

Right hand insert shown.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

MULTI-FUNCTIONAL MILLING

90° KAPR

APX3000

P M K N S H

Fig.1

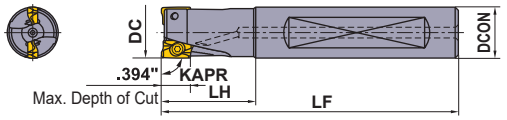


Fig.2

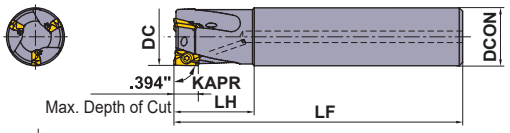


Fig.3

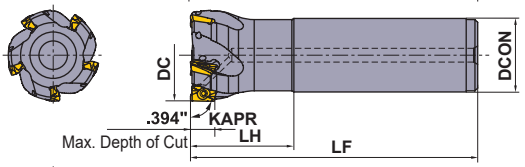
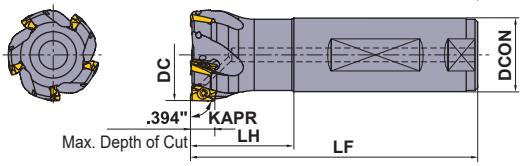


Fig.4



■ SHANK TYPE

With Air / coolant through.

Right hand tool holder only.

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions(inch) DC	DCON	LF	LH	RMPX	Fig.	* Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.008 | .079	APX3000UR081FA10SA	●	1	.500	.625	3.250	1.120	6°	1	TPS25	TIP07F	MK1KS
			APX3000UR081SA08SA	●	1	.500	.500	3.250	1.120	6°	2	TPS25	TIP07F	MK1KS
			APX3000UR102FA10SA	●	2	.625	.625	3.625	1.190	11.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR102SA10SA	●	2	.625	.625	3.625	1.190	11.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR122FA12SA	●	2	.750	.750	4.375	1.380	7.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR122SA12SA	●	2	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR123FA12SA	●	3	.750	.750	4.375	1.380	7.5°	1	TPS25	TIP07F	MK1KS
			APX3000UR123SA12SA	●	3	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR163FA12SA	●	3	1.000	.750	4.375	1.570	4.5°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA12SA	●	3	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR164FA12SA	●	4	1.000	.750	4.375	1.570	4.5°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA12SA	●	4	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR163FA16SA	●	3	1.000	1.000	4.750	1.570	4.5°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16SA	●	3	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR164FA16SA	●	4	1.000	1.000	4.750	1.570	4.5°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA16SA	●	4	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR205FA20SA	●	5	1.250	1.250	5.125	1.970	3.1°	1	TPS25−1	TIP07F	MK1KS
			APX3000UR205SA20SA	●	5	1.250	1.250	5.125	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR246FA20SA	●	6	1.500	1.250	5.125	1.970	2.3°	4	TPS25−1	TIP07F	MK1KS
			APX3000UR246SA20SA	●	6	1.500	1.250	5.125	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 | .126	APX3000UR081SA08SB	●	1	.500	.500	3.250	1.120	6°	2	TPS25	TIP07F	MK1KS
			APX3000UR102SA10SB	●	2	.625	.625	3.625	1.190	11.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR122SA12SB	●	2	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR123SA12SB	●	3	.750	.750	4.375	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR163SA12SB	●	3	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA12SB	●	4	1.000	.750	4.375	1.570	4.5°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16SB	●	3	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR164SA16SB	●	4	1.000	1.000	4.750	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR205SA20SB	●	5	1.250	1.250	5.125	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR246SA20SB	●	6	1.500	1.250	5.125	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS

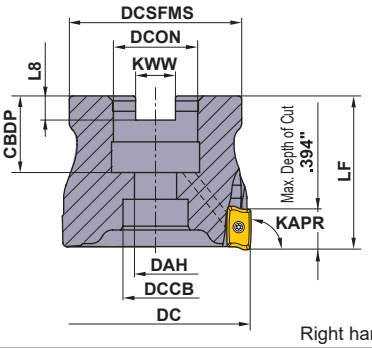
* Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

 ● : USA Stock

Type		RE (inch)	Order Number	Stock	Number of Teeth	Dimensions(inch)				RMPX	Fig.	* Insert Screw	Wrench	Anti-seize Lubricant
				R		DC	DCON	LF	LH					
Long	A Holders	.008 I .079	**APX3000UR122SA12LA**	●	2	.750	.750	7.250	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR162SA16LA	●	2	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16LA	●	3	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR203SA20LA	●	3	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR204SA20LA	●	4	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR243SA20LA	●	3	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR244SA20LA	●	4	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
	B Holders	.094 I .126	**APX3000UR122SA12LB**	●	2	.750	.750	7.250	1.380	7.5°	2	TPS25	TIP07F	MK1KS
			APX3000UR162SA16LB	●	2	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR163SA16LB	●	3	1.000	1.000	8.500	1.570	4.5°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR203SA20LB	●	3	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR204SA20LB	●	4	1.250	1.250	9.000	1.970	3.1°	2	TPS25−1	TIP07F	MK1KS
			APX3000UR243SA20LB	●	3	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS
			APX3000UR244SA20LB	●	4	1.500	1.250	9.000	1.970	2.3°	3	TPS25−1	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

ISO13399 ➤ K003
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



■ ARBOR TYPE

With Air / coolant through.

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (inch)									RMPX	*			
			R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB		Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
A Holders	.008 I .079	**APX3000R1504A**	●	4	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.4°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1505A	●	5	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.4°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1506A	●	6	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.4°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0205A	●	5	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0207A	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R2506A	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1.3°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0306A	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0309A	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
B Holders	.094 I .126	**APX3000R1504B**	●	4	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.5°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1505B	●	5	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.5°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R1506B	●	6	1.500	1.575	.750	.748	.415	1.320	.313	.187	.600	2.5°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0205B	●	5	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R0207B	●	7	2.000	1.575	.750	.748	.415	1.811	.313	.187	.600	1.6°	TPS25−1	TIP07F	MK1KS	HSCU37513H
		APX3000R2506B	●	6	2.500	1.969	1.000	1.024	.539	2.360	.375	.219	.787	1.3°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0306B	●	6	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H
		APX3000R0309B	●	9	3.000	1.969	1.000	1.024	.539	2.756	.375	.219	.787	1.0°	TPS25−1	TIP07F	MK1KS	HSCU50014H

* Clamp Torque (lbf-in) : TPS25−1=8.9

Note 1) The cutter body includes a set bolt for an arbor.

■ Combination of Holder and Insert Corner Radius

Holder	A Holder							B Holder		
	APX3000○○○○○○○○○A							APX3000○○○○○○○○○B		
Insert Corner Radius (RE)	.008"	.016"	.031"	.039"	.047"	.063"	.079"	.094"	.118"	.126"

Fig.1

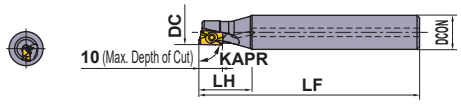


Fig.2

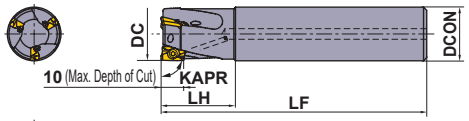
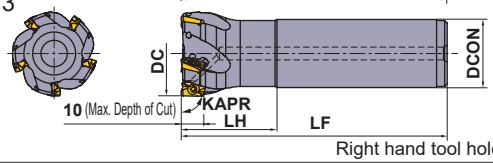


Fig.3



Metric Standard

■ STRAIGHT SHANK TYPE (A Holders)

With Air / coolant through.

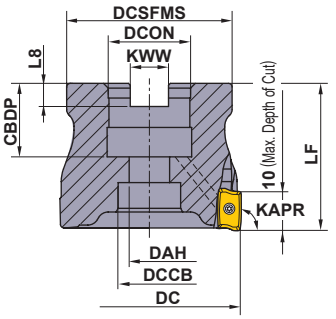
Right hand tool holder only.

Type	RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	DCON	LF	LH	RMPX	Fig.	* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
Standard	.008 – .079	APX3000R121SA16SA	★	1	12	16	85	25	6.0°	1	TPS25	TIP07F	MK1KS	AO□T1236
		APX3000R141SA16SA	★	1	14	16	85	25	6.0°	1	TPS25	TIP07F	MK1KS	
		APX3000R162SA16SA	★	2	16	16	85	25	11.3°	2	TPS25	TIP07F	MK1KS	
		APX3000R182SA16SA	★	2	18	16	85	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20SA	★	2	20	20	100	30	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R203SA20SA	★	3	20	20	100	30	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R223SA20SA	★	3	22	20	115	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25SA	★	2	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25SA	★	3	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R254SA25SA	★	4	25	25	115	35	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R284SA25SA	★	4	28	25	115	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R304SA32SA	★	4	30	32	125	45	3.4°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32SA	★	3	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R324SA32SA	★	4	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R325SA32SA	★	5	32	32	125	45	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R403SA32SA	★	3	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R405SA32SA	★	5	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R406SA32SA	★	6	40	32	125	45	2.2°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R507SA32SA	★	7	50	32	125	45	1.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R638SA32SA	★	8	63	32	125	45	1.3°	3	TPS25−1	TIP07F	MK1KS	
Long	.008 – .079	APX3000R182SA16LA	★	2	18	16	120	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20LA	★	2	20	20	150	60	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R222SA20LA	★	2	22	20	150	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25LA	★	2	25	25	170	70	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25LA	★	3	25	25	170	70	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R282SA25LA	★	2	28	25	170	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R283SA25LA	★	3	28	25	170	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R322SA32LA	★	2	32	32	190	90	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32LA	★	3	32	32	190	90	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R352SA32LA	★	2	35	32	190	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R353SA32LA	★	3	35	32	190	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
Extra Long	.008 – .079	APX3000R182SA16ELA	★	2	18	16	180	25	8.6°	3	TPS25	TIP07F	MK1KS	
		APX3000R202SA20ELA	★	2	20	20	200	70	6.9°	2	TPS25	TIP07F	MK1KS	
		APX3000R222SA20ELA	★	2	22	20	200	30	5.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R252SA25ELA	★	2	25	25	220	80	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R253SA25ELA	★	3	25	25	220	80	4.6°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R282SA25ELA	★	2	28	25	220	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R283SA25ELA	★	3	28	25	220	35	3.8°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R322SA32ELA	★	2	32	32	260	100	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R323SA32ELA	★	3	32	32	260	100	3.1°	2	TPS25−1	TIP07F	MK1KS	
		APX3000R352SA32ELA	★	2	35	32	260	45	2.7°	3	TPS25−1	TIP07F	MK1KS	
		APX3000R353SA32ELA	★	3	35	32	260	45	2.7°	3	TPS25−1	TIP07F	MK1KS	

* Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9

Note 1) When using inserts with corner radius RE≥.094"(2.4 mm), B-Holders are required as shown on page K161.

ISO13399 ➤ K003
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Metric Standard

For Metric Arbors

■ ARBOR TYPE (A Holders)

With Air / coolant through.

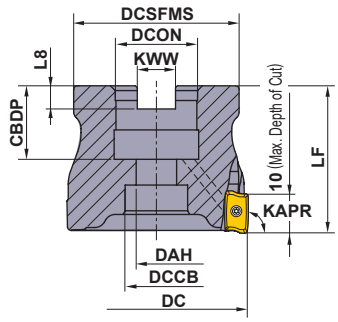
Right hand tool holder only.

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)									RMPX	* Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB					
.008 I .079	APX3000-032A05RA	★	5	32	40	16	18	9	30	8.4	5.6	14	3.1°	TPS25−1	TIP07F	MK1KS	HSC08030H
	APX3000-040A06RA	★	6	40	40	16	18	9	34	8.4	5.6	14	2.2°	TPS25−1	TIP07F	MK1KS	HSC08030H
	APX3000-050A07RA	★	7	50	40	22	20	11	45	10.4	6.3	17	1.7°	TPS25−1	TIP07F	MK1KS	HSC10030H
	APX3000-063A08RA	★	8	63	40	22	20	11	55	10.4	6.3	17	1.3°	TPS25−1	TIP07F	MK1KS	HSC10030H
	APX3000-080A09RA	★	9	80	50	27	23	13	70	12.4	7	20	1.0°	TPS25−1	TIP07F	MK1KS	HSC12035H
	APX3000-100A11RA	★	11	100	63	32	26	17	80	14.4	8	26	0.8°	TPS25−1	TIP07F	MK1KS	HSC16040H

★ Clamp Torque (lbf-in) : TPS25−1=8.9

Note 1) When using inserts with corner radius RE≥.094"(2.4 mm), B-Holders are required as shown on page K161.

Note 2) Set bolt not included.



Metric Standard

For Inch Arbors

■ ARBOR TYPE (A Holders)

With Air / coolant through.

Right hand tool holder only.

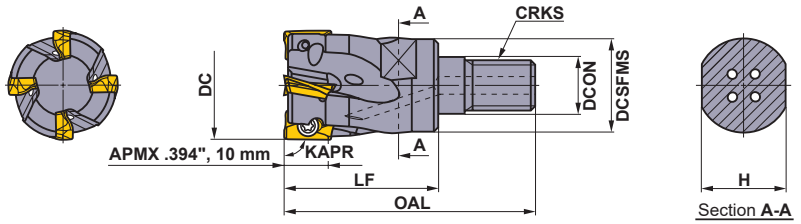
RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]								RMPX	*			
		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8 DCCB		Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
.008 | .079	**APX3000R08009CA**	★	9	80	50	25.4 [1.0"]	26	13	70	9.5	6 20	1.0°	TPS25−1	TIP07F	MK1KS	HSC12035H
	APX3000R10011DA	★	11	100	63	31.75 [1.25"]	32	17	80	12.7	8 26	0.8°	TPS25−1	TIP07F	MK1KS	HSC16040H

* Clamp Torque (lbf-in) : TPS25−1=8.9

Note 1) When using inserts with corner radius RE≥.094"(2.4 mm), B-Holders are required as shown on page K161.

Note 2) Set bolt not included.

ISO13399 ➤ K003
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



■ SCREW-IN TYPE

With Air / coolant through.

Right hand tool holder only.

DC	Order Number	Stock	Number of Teeth	Dimensions (inch)						WT	*1			
				LF	OAL	DCON	DCSFMS	H	CRKS*2	(lbs)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.625	**APX3000UR102AM08A30**	●	2	1.181	1.890	.335	.512	.394	M8	.2	TPS25	TIP07F	MK1KS	AO□T1236
.750	**APX3000UR122AM10A30**	●	2	1.181	1.929	.413	.709	.551	M10	.2	TPS25	TIP07F	MK1KS	AO□T1236
.750	**APX3000UR123AM10A30**	●	3	1.181	1.929	.413	.709	.551	M10	.2	TPS25	TIP07F	MK1KS	AO□T1236
.875	**APX3000UR142AM10A30**	●	2	1.181	1.929	.413	.709	.551	M10	.2	TPS25-1	TIP07F	MK1KS	AO□T1236
.875	**APX3000UR143AM10A30**	●	3	1.181	1.929	.413	.709	.551	M10	.2	TPS25-1	TIP07F	MK1KS	AO□T1236
1.000	**APX3000UR163AM12A35**	●	3	1.378	2.244	.492	.827	.748	M12	.4	TPS25-1	TIP07F	MK1KS	AO□T1236
1.000	**APX3000UR164AM12A35**	●	4	1.378	2.244	.492	.827	.748	M12	.4	TPS25-1	TIP07F	MK1KS	AO□T1236
1.125	**APX3000UR184AM12A35**	●	4	1.378	2.244	.492	.827	.748	M12	.4	TPS25-1	TIP07F	MK1KS	AO□T1236
1.250	**APX3000UR205AM16A40**	●	5	1.575	2.480	.669	1.142	.945	M16	.7	TPS25-1	TIP07F	MK1KS	AO□T1236
1.375	**APX3000UR225AM16A40**	●	5	1.575	2.480	.669	1.142	.945	M16	.7	TPS25-1	TIP07F	MK1KS	AO□T1236

*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9
*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7

Metric Standard

■ SCREW-IN TYPE

With Air / coolant through.

DC	Order Number	Stock	Number of Teeth	Dimensions (mm)						WT	*1			
				LF	OAL	DCON	DCSFMS	H	CRKS*2	(kg)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
16	**APX3000R162M08A30**	★	2	30	48	8.5	13	10	M8	0.1	TPS25	TIP07F	MK1KS	AO□T1236
18	**APX3000R182M08A30**	★	2	30	48	8.5	13	10	M8	0.1	TPS25	TIP07F	MK1KS	AO□T1236
20	**APX3000R203M10A30**	★	3	30	49	10.5	18	14	M10	0.1	TPS25	TIP07F	MK1KS	AO□T1236
22	**APX3000R223M10A30**	★	3	30	49	10.5	18	14	M10	0.1	TPS25-1	TIP07F	MK1KS	AO□T1236
25	**APX3000R254M12A35**	★	4	35	57	12.5	21	19	M12	0.2	TPS25-1	TIP07F	MK1KS	AO□T1236
28	**APX3000R284M12A35**	★	4	35	57	12.5	21	19	M12	0.2	TPS25-1	TIP07F	MK1KS	AO□T1236
30	**APX3000R304M16A40**	★	4	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236
32	**APX3000R325M16A40**	★	5	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236
35	**APX3000R355M16A40**	★	5	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236
40	**APX3000R406M16A40**	★	6	40	63	17	29	24	M16	0.3	TPS25-1	TIP07F	MK1KS	AO□T1236

*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS25−1=8.9
*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7

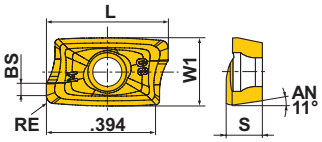
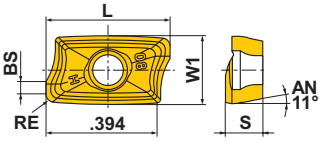
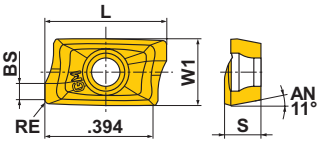
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✠ : Unstable Cutting

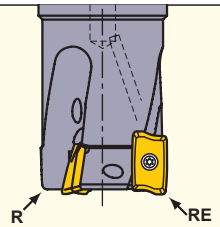
Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated								Carbide		Dimensions (inch)					Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	TF15		L	W1	S	BS	RE	
General **M** Breaker	**AOMT123602PEER-M**	M	E		●	●	●	●	●	●	●			.472	.260	.142	.071	.008	
	AOMT123604PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.063	.016	
	AOMT123608PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.047	.031	
	AOMT123610PEER-M	M	E		●	●	●	●	●	★	★			.472	.260	.142	.039	.039	
	AOMT123612PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.031	.047	
	AOMT123616PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.063	
	AOMT123620PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.079	
	AOMT123624PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.094	
	AOMT123630PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.118	
	AOMT123632PEER-M	M	E		●	●	●	●	●	●	●			.472	.260	.142	.016	.126	
Strong Cutting Edge Type **H** Breaker	**AOMT123604PEER-H**	M	E	●	●	●	●	●	●	●	●			.472	.260	.142	.063	.016	
	AOMT123608PEER-H	M	E	●	●	●	●	●	●	●	●			.472	.260	.142	.047	.031	
	AOMT123616PEER-H	M	E	●	●	●	●	●	●	●	●			.472	.260	.142	.016	.063	
For Machining of Aluminum Alloys **GM** Breaker	**AOGT123602PEFR-GM**	G	F									●		.472	.260	.142	.071	.008	
	AOGT123604PEFR-GM	G	F									●		.472	.260	.142	.063	.016	
	AOGT123608PEFR-GM	G	F									●		.472	.260	.142	.047	.031	

Note 1) For large R inserts
APX offers various nose radii for inserts, however one holder can not secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
We offer B-Holders that secures .094", .118" and .126" radius, only for popular inch sizes.
Customers may modify holders as below, so that larger nose radii can be secured.

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius RE≥R.094", please machine the holder with a radius form as shown on the right table.



RE	R
.094"	.106" (B-Holder)
.118"	
.126"	

R : Holder End Radius
RE : Insert Corner Radius

Or additional B-Holders are available as non stock, produced to order only.
"Order numbers"; Please add "B" to the end of the order number of A-Holders.
Ex) APX3000R160M08A30→APX3000R162M08A30B

ISO13399	➤ K003	OPERATION GUIDANCE	➤ K181
SCREW-IN HOLDERS	➤ K382	SPARE PARTS	➤ M001
		TECHNICAL DATA	➤ N001

RECOMMENDED CUTTING CONDITIONS

■ CUTTING SPEED

(inch)

Workpiece Material		Properties	Insert Grade Priority 1st	Insert Grade Priority 2nd	Chip Breaker		Cutting Width **ae** ≤.25DC	.25–.5DC	.5–.75DC	DC (Slot)
							Cutting Speed **vc** (SFM)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	755(590–885)	720(560–850)	590(460–690)	590(460–690)
			MP6130	VP20RT	M	H	655(490–785)	620(460–755)	490(360–590)	490(370–600)
	Carbon Steel Alloy Steel	180–350HB	MP6120	VP15TF	M	H	590(460–690)	560(425–655)	460(360–525)	460(360–525)
			MP6130	VP20RT	M	H	490(360–590)	460(330–560)	360(260–425)	360(260–425)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	590(460–690)	560(425–655)	460(360–525)	460(360–525)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H		820(655–985)	785(620–950)	690(525–850)	460(360–525)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H		425(330–490)	395(295–460)	330(260–395)	330(260–395)
N	Aluminum Alloys	–	TF15		GM		1640(655–3280)	1640(655–3280)	1640(655–3280)	1640(655–3280)
S	Titanium Alloys	≤350HB	MP9120	VP15TF	M	H	165(130–230)			165(130–230)
			MP9130	VP20RT	M	H	130(100–195)			130(100–195)
	Heat Resistant Alloys	–	MP9120	VP15TF	M	H	130(100–195)			130(100–195)
			MP9130	VP20RT	M	H	100(65–130)			100(65–130)
H	Hardened Steel	40–55HRC	VP15TF		H		295(230–330)	280(195–330)	230(165–260)	230(165–260)

■ DEPTH OF CUT / FEED PER TOOTH

(inch)

Workpiece Material		Properties	Cutting Width **ae**	DC ϕ.500"–ϕ.625"(ϕ12–ϕ16 mm) Depth of Cut **ap**	DC ϕ.500"–ϕ.625"(ϕ12–ϕ16 mm) Feed per Tooth **fz** (IPT)	DC ϕ.750"–ϕ1.000"(ϕ20–ϕ25 mm) Depth of Cut **ap**	DC ϕ.750"–ϕ1.000"(ϕ20–ϕ25 mm) Feed per Tooth **fz** (IPT)	DC ϕ1.250"–ϕ3.000"(ϕ28–ϕ100 mm) Depth of Cut **ap**	DC ϕ1.250"–ϕ3.000"(ϕ28–ϕ100 mm) Feed per Tooth **fz** (IPT)
P	Mild Steel Carbon Steel Alloy Steel	≤180HB 180–350HB	≤.25DC	≤.157	.006	≤.197	.010	≤.197	.008
				.157–.276	.004	.197–.276	.008	.197–.276	.006
						.276–.335	.006	.276–.335	.004
						.335–.394	.004	.335–.394	.003
			.25–.5DC	≤.079	.006	≤.118	.010	≤.118	.008
				.078–.197	.004	.118–.217	.008	.118–.217	.006
						.217–.315	.006	.217–.315	.004
						.315–.394	.004	.315–.394	.003
			.5–.75DC	≤.157	.004	≤.157	.006	≤.118	.004
						.157–.394	.004	.118–.276	.003
			DC (Slot)	≤.118	.004	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003
M	Stainless Steel	≤270HB	≤.25DC	≤.157	.006	≤.197	.008	≤.197	.008
				.157–.276	.004	.197–.276	.006	.197–.276	.006
						.276–.335	.004	.276–.335	.004
						.335–.394	.003	.335–.394	.004
			.25–.5DC	≤.079	.006	≤.118	.008	≤.118	.008
				.078–.197	.004	.118–.217	.006	.118–.217	.006
						.217–.315	.004	.217–.315	.004
						.315–.394	.003	.315–.394	.003
			.5–.75DC	≤.157	.004	≤.157	.004	≤.118	.004
						.157–.394	.003	.118–.276	.003
			DC (Slot)	≤.157	.004	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	≤.157	.006	≤.197	.010	≤.197	.008
				.157–.276	.004	.197–.276	.008	.197–.276	.006
						.276–.335	.006	.276–.335	.004
						.335–.394	.004	.335–.394	.003
			.25–.5DC	≤.079	.006	≤.118	.010	≤.118	.008
				.079–.197	.004	.118–.217	.008	.118–.217	.006
						.217–.315	.006	.217–.315	.004
						.315–.394	.004	.315–.394	.003
			.5–.75DC	≤.157	.004	≤.157	.006	≤.118	.004
						.157–.394	.004	.118–.276	.003
			DC (Slot)	≤.118	.004	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	≤.157	.004	≤.197	.008	≤.197	.008
				.157–.276	.003	.197–.276	.006	.197–.276	.006
						.276–.335	.004	.276–.335	.004
						.335–.394	.003	.335–.394	.003
			.25–.5DC	≤.079	.004	≤.118	.008	≤.118	.008
				.079–197	.003	.118–.217	.006	.118–.217	.006
						.217–.315	.004	.217–.315	.004
						.315–.394	.003	.315–.394	.003
			.5–.75DC	≤.157	.003	≤.157	.004	≤.118	.004
						.315–.394	.003	.118–.276	.003
			DC (Slot)	≤.118	.003	≤.157	.004	≤.118	.004
						.157–.276	.003	.118–.197	.003

■ CUTTING CONDITIONS FOR SLOT MILLING

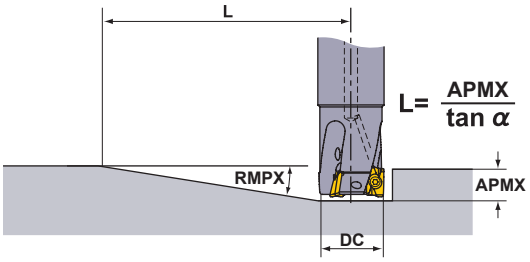
(inch)

Workpiece Material		Properties	Cutting Width **ae**	DC					
				ϕ.500"–ϕ.625"(ϕ12–ϕ16 mm)		**ϕ.750"–ϕ1.000"(ϕ20–ϕ25 mm)**		**ϕ1.250"–ϕ3.000"(ϕ28–ϕ100 mm)**	
				Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
N	Aluminum Alloys	–	≤.25DC	≤.157	.006	≤.157	.010	≤.157	.008
				.157–.276	.004	.157–.276	.006	.157–.276	.004
			.25–.5DC	≤.157	.004	≤.157	.008	≤.157	.008
				.157–.276	.004	.157–.276	.004	.157–.276	.004
			.5–.75DC	≤.197	.004	≤.197	.006	≤.197	.004
			DC (Slot)	≤.197	.004	≤.197	.008	≤.197	.006
S	Titanium Alloys	≤350HB	≤.25DC	≤.157	.006	≤.157	.006	≤.157	.004
				.157–.276	.004	.157–.276	.004	.157–.276	.003
			.25–.5DC	≤.118	.002	≤.118	.002	≤.118	.002
	Heat Resistant Alloys	–	.5–.75DC	≤.079	.004	≤.079	.002	≤.079	.002
			DC (Slot)	≤.039	.002	≤.039	.002	≤.039	.002
H	Hardened Steel	40–55HRC	≤.25DC	≤.157	.004	≤.197	.006	≤.197	.006
				.157–.276	.003	.197–.276	.004	.197–.276	.004
						.276–.335	.003		
			.25–.5DC	≤.079	.004	≤.118	.006	≤.118	.006
				.079–.197	.003	.118–.217	.004		
			.5–.75DC	≤.157	.003	≤.157	.003	≤.118	.003
			DC (Slot)	≤.118	.003	≤.157	.003	≤.118	.003

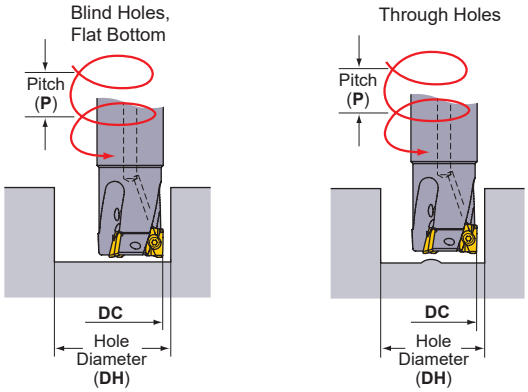
Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
• When using the long shank type and extra long shank type.
• When using long tool overhang with the standard or arbor type.
• When the application has poor clamping rigidity or when using a low rigidity machine.
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

■ RAMPING/HELICAL MILLING

● **Ramping**



● **Helical Milling**



Refer to the table below when using .031 inch radius for maximum ramping angle, pitch and minimum/maximum hole diameter. Use cutting conditions for slot milling to calculate speed and feed when ramping / helical milling.

Cutting Edge Diameter **DC** (inch)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance *1 **L** (inch)	Maximum Hole Diameter *2 **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
.500	6.0°	3.8	0.92	.09	.87	.07	.63	.020
.625	11.5°	1.9	1.17	.35	1.1	.27	.79	.079
.750	7.5°	3.0	1.42	.19	1.35	.17	1.03	.079
1.000	4.5°	5.0	1.92	.23	1.85	.19	1.58	.079
1.250	3.1°	7.3	2.42	.17	2.35	.15	2.05	.079
1.500	2.3°	9.8	2.92	.15	2.85	.13	2.56	.079
2.000	1.6°	14.1	3.92	.07	3.85	.07	3.55	.079
2.500	1.3°	17.4	4.92	.07	4.85	.07	4.56	.079
3.000	1.0°	22.6	5.92	.07	5.85	.07	5.52	.079

*1 L(=.394"/tanα). Cutters' moving distance until depth of cut reaches .394" at a maximum ramping angle.
*2 In case corner radius of .031". Other than that, find with the below formula.
{(cutting edge diameter DC) - (corner radius) - .008"} x 2
Note 1) When machining highly ductile materials with ramping angles above, chips could be continuous.
In this case, decrease the ramping angle or feed per tooth.

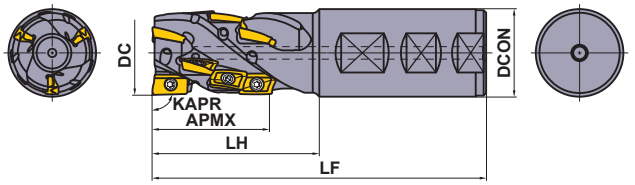
DEEP SHOULDER MILLING

90° KAPR

APX3000

LONG CUTTING EDGE

P M K N S H



■SHANK TYPE (A Holders)

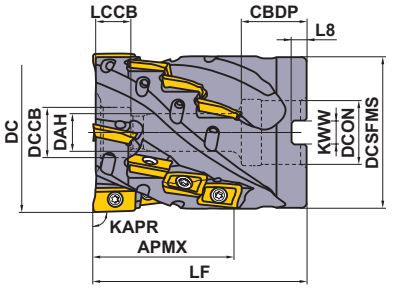
Right hand tool holder only.

RE	Order Number	Stock R	Coolant Thru	Number of Flutes	Total	Dimensions (inch) DC	DCON	LF	LH	APMX	* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.008 I .079	APX3KUR121FN12S11A04	●	N	1	4	.750	.750	5.000	1.750	1.102	TPS25	TIP07F	MK1KS	AO□T1236
	APX3KUR162FA16S11A06	●	Y	2	6	1.000	1.000	5.000	1.750	1.102	TPS25-1	TIP07F	MK1KS	
	APX3KUR162FA16M14A08	●	Y	2	8	1.000	1.000	5.250	2.000	1.456	TPS25-1	TIP07F	MK1KS	
	APX3KUR202FA20S14A08	●	Y	2	8	1.250	1.250	5.250	2.000	1.456	TPS25-1	TIP07F	MK1KS	
	APX3KUR202FA20M18A10	●	Y	2	10	1.250	1.250	5.750	2.500	1.811	TPS25-1	TIP07F	MK1KS	
	APX3KUR243FA24S18A15	●	Y	3	15	1.500	1.500	5.750	2.500	1.811	TPS25-1	TIP07F	MK1KS	
	APX3KUR243FA24M21A18	●	Y	3	18	1.500	1.500	6.000	2.750	2.165	TPS25-1	TIP07F	MK1KS	

Y=Yes, N=No ✶ Clamp Torque (lbf-in) : TPS25=8.9, TPS25-1=8.9

Note 1) When using inserts with corner radius RE≥.094", machining of the holder is required as shown on page K161.

Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting). Insert RE .008" and .016" can also be used.



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.000"	HSCUF37520	

■SHELL TYPE (A Holders)

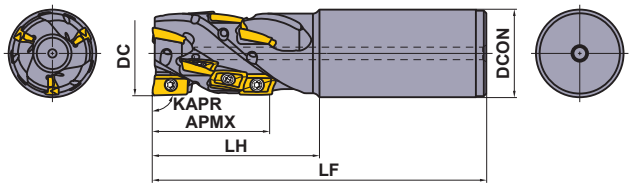
With Air / coolant through.

RE	Order Number	Stock R	Number of Flutes	Total	Dimensions (inch) DC	LF	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	APMX	* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.008 I .079	APX3KUR2.0004AA18A20	●	4	20	2.000	2.500	.750	.750	.395	.630	.457	1.936	.313	.187	1.811	TPS25-1	TIP07F	MK1KS	AO□T1236

✶ Clamp Torque (lbf-in) : TPS25-1 = 8.9

Note 1) When using inserts with corner radius RE≥.094", machining of the holder is required as shown on page K161.

Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting). Insert RE .008" and .016" can also be used.



Metric Standard

■SHANK TYPE (A Holders)

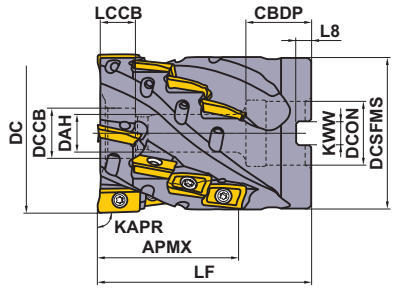
Right hand tool holder only.

RE (inch)	Order Number	Stock R	Coolant Thru	Number of Flutes	Total	Dimensions (mm) DC	DCON	LF	LH	APMX	* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.008 I .079	APX3KR2004SN20S028A	★	N	1	4	20	20	125	45	28	TPS25	TIP07F	MK1KS	AO□T1236
	APX3KR2506SA25S028A	★	Y	2	6	25	25	125	45	28	TPS25-1	TIP07F	MK1KS	
	APX3KR2508SA25M037A	★	Y	2	8	25	25	130	50	37	TPS25-1	TIP07F	MK1KS	
	APX3KR3208SA32S037A	★	Y	2	8	32	32	130	50	37	TPS25-1	TIP07F	MK1KS	
	APX3KR3210SA32M046A	★	Y	2	10	32	32	140	60	46	TPS25-1	TIP07F	MK1KS	
	APX3KR3212SA32S037A	★	Y	3	12	32	32	130	50	37	TPS25-1	TIP07F	MK1KS	
	APX3KR3215SA32M046A	★	Y	3	15	32	32	140	60	46	TPS25-1	TIP07F	MK1KS	
	APX3KR4015SA42S046A	★	Y	3	15	40	42	140	60	46	TPS25-1	TIP07F	MK1KS	
	APX3KR4018SA42M055A	★	Y	3	18	40	42	150	70	55	TPS25-1	TIP07F	MK1KS	

Y=Yes, N=No ★ Clamp Torque (lbf-in) : TPS25=8.9, TPS25-1=8.9

Note 1) When using inserts with corner radius RE≥ .094", machining of the holder is required as shown on page K161.

Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting). Insert RE .008" and .016" can also be used.



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ40mm	HSC08040	
ϕ50mm	HSC10445	

The bore diameter (DCON) is equivalent to a metric size.

Metric Standard For Metric Arbors

■SHELL TYPE (A Holders)

With Air / coolant through.

RE (inch)	Order Number	Stock R	Number of Flutes	Total	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	APMX	* Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.008 I .079	APX3K-040A16A037RA	★	4	16	40	50	16	18	9	14	9.9	38.5	8.4	5.6	37	TPS25-1	TIP07F	MK1KS	AO□T1236
	APX3K-050A20A046RA	★	4	20	50	60	22	20	11	17	11.9	48.4	10.4	6.3	46	TPS25-1	TIP07F	MK1KS	

★ Clamp Torque (lbf-in) : TPS25-1 = 8.9

Note 1) When using inserts with corner radius RE≥ .094", machining of the holder is required as shown on page K161.

Note 2) Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting). Insert RE .008" and .016" can also be used.

ISO13399 ➤ K003
INSERTS ➤ K161
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

(inch)

	Workpiece Material	Insert				Cutting Width **ae**		
		Grade Priority		Chip Breaker		≤.25DC	.25—.75DC	DC (Slot)
		1st	2nd			Cutting Speed **vc** (SFM)		
P	Mild Steel	MP6120	VP15TF	M	H	590(460—720)	490(360—590)	395(330—460)
		MP6130	VP20RT	M	H	525(395—655)	425(330—525)	330(260—395)
	Carbon Steel Alloy Steel, Alloy Tool Steel	MP6120	VP15TF	M	H	490(330—655)	395(295—490)	330(260—395)
		MP6130	VP20RT	M	H	425(295—560)	295(230—360)	260(195—330)
	Pre-hardened Steel	MP6120	VP15TF	M	H	395(260—525)	330(230—425)	295(165—395)
		MP6130	VP20RT	M	H	330(230—425)	295(195—395)	230(165—330)
M	Stainless Steel	MP7130		M		490(395—590)	395(330—460)	330(260—395)
K	Gray Cast Iron	MC5020		H		655(490—820)	590(490—690)	
		VP15TF		M	H	590(395—785)	490(330—655)	330(195—460)
	Ductile Cast Iron	VP15TF		M	H	525(395—655)	460(330—590)	260(195—330)
N	Aluminum Alloys	TF15	MP9120	GM	M	1310(655—2625)	1310(655—2625)	1310(655—2625)
S	Titanium Alloys	MP9130		M		130(100—195)		130(100—195)
		MP9120		M		165(130—230)		165(130—230)
	Heat Resistant Alloys	MP9120	VP15TF	M	H	130(100—195)		130(100—195)
		MP9130	VP20RT	M	H	100(65—130)		100(65—130)

■ Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Cutting Width **ae**	DC					
				ø.750"(ø20mm)		ø1.000"(ø25mm)		ø1.250"–ø2.000"(ø32mm–ø50mm)	
				Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	≤0.25DC	≤1.102	.006	≤1.457	.007	≤2.165	.008
			0.25-0.75DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Carbon Steel Alloy Steel	180–280HB	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Alloy Tool Steel	≤350HB (Annealing)	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Pre-hardened Steel	35–45HRC	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
M	Ferritic and Martensitic Stainless Steel	–	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Duplex Stainless Steel	≤280HB	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
	Precipitation Hardening Stainless Steel	<450HB	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤0.25DC	≤1.102	.006	≤1.457	.007	≤2.165	.008
			0.25-0.75DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			DC (Slot)	≤.709	.004	≤.709	.004	≤.709	.004
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤0.25DC	≤1.102	.005	≤1.457	.006	≤2.165	.007
			0.25-0.75DC	≤1.102	.004	≤1.457	.005	≤2.165	.006
			DC (Slot)	≤.709	.003	≤.709	.003	≤.709	.003
N	Aluminum Alloys	–	≤0.25DC	≤1.102	.006	≤1.457	.007	≤2.165	.008
			0.25-0.75DC			≤.354	.007	≤.354	.008
			DC (Slot)			≤.354	.007	≤.354	.008
S	Titanium Alloys	≤350HB	≤0.25DC	≤1.102	.004	≤1.457	.004	≤2.165	.004
			0.25-0.75DC						
			DC (Slot)	≤.709	.002	≤.709	.002	≤.709	.002
	Heat Resistant Alloys	–	≤0.25DC	≤1.102	.003	≤1.457	.003	≤2.165	.003
			0.25-0.75DC						
			DC (Slot)	≤.709	.002	≤.709	.002	≤.709	.002

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece materials, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

MULTI-FUNCTIONAL MILLING

90° KAPR

APX4000

P M K N S H

Fig.1

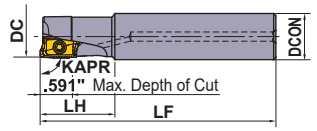


Fig.2

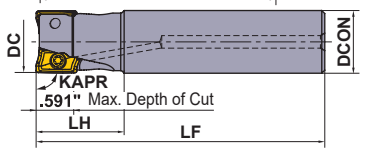


Fig.3

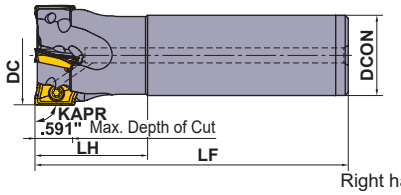


Fig.4

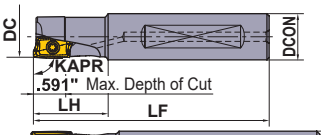


Fig.5

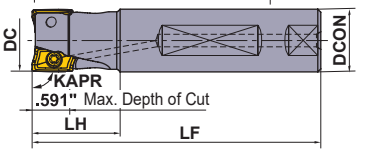
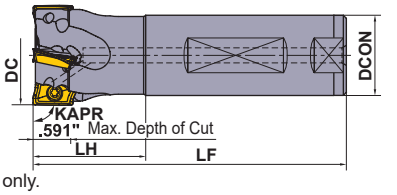


Fig.6



■ SHANK TYPE

With Air / coolant through.

Right hand tool holder only.

•APX4000UR○○○SA○○ = Ground shank : See figure 1, 2 and 3.

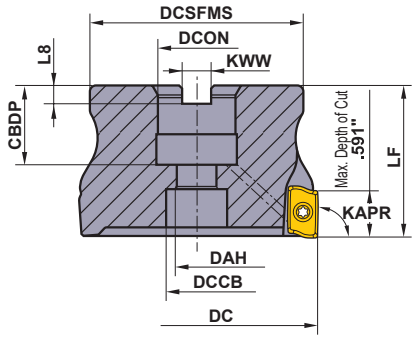
•APX4000UR○○○FA○○ = Flat shank : See figure 4 and 5.

Type		RE (inch)	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	DCON	LF	LH	RMPX	Fig.	* Insert Screw	Wrench	Anti-seize Lubricant
Standard	A Holders	.016 I .079	APX4000UR121FA12SA	●	1	.750	.750	4.000	1.250	14°	4	TPS4S	TIP15W	MK1KS
			APX4000UR121SA12SA	●	1	.750	.750	4.000	1.250	14°	1	TPS4S	TIP15W	MK1KS
			APX4000UR162SA12SA	●	2	1.000	.750	4.000	1.250	11°	3	TPS4	TIP15W	MK1KS
			APX4000UR162FA16SA	●	2	1.000	1.000	4.500	1.250	11°	4	TPS4	TIP15W	MK1KS
			APX4000UR162SA16SA	●	2	1.000	1.000	4.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202FA20SA	●	2	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR202SA20SA	●	2	1.250	1.250	5.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203FA20SA	●	3	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR203SA20SA	●	3	1.250	1.250	5.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243FA20SA	●	3	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR243SA20SA	●	3	1.500	1.250	5.000	1.750	7°	3	TPS43	TIP15W	MK1KS
			APX4000UR244FA20SA	●	4	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR244SA20SA	●	4	1.500	1.250	5.000	1.750	7°	3	TPS43	TIP15W	MK1KS
	B Holders	.126 I .157	APX4000UR121FA12SB	●	1	.750	.750	4.000	1.250	14°	4	TPS4S	TIP15W	MK1KS
			APX4000UR162FA16SB	●	2	1.000	1.000	4.500	1.250	11°	5	TPS4	TIP15W	MK1KS
			APX4000UR202FA20SB	●	2	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR203FA20SB	●	3	1.250	1.250	5.000	1.750	7°	5	TPS4	TIP15W	MK1KS
			APX4000UR243FA20SB	●	3	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
			APX4000UR244FA20SB	●	4	1.500	1.250	5.000	1.750	7°	6	TPS43	TIP15W	MK1KS
Long	A Holders	.016 I .079	APX4000UR162SA16LA	●	2	1.000	1.000	8.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202SA20LA	●	2	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203SA20LA	●	3	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243SA24LA	●	3	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR244SA24LA	●	4	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR243SA24ELA	●	3	1.500	1.500	14.000	1.750	7°	2	TPS43	TIP15W	MK1KS
	B Holders	.126 I .157	APX4000UR162SA16LB	●	2	1.000	1.000	8.500	1.250	11°	2	TPS4	TIP15W	MK1KS
			APX4000UR202SA20LB	●	2	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR203SA20LB	●	3	1.250	1.250	9.000	1.750	7°	2	TPS4	TIP15W	MK1KS
			APX4000UR243SA24LB	●	3	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR244SA24LB	●	4	1.500	1.500	9.000	1.750	7°	2	TPS43	TIP15W	MK1KS
			APX4000UR243SA24ELB	●	3	1.500	1.500	14.000	1.750	7°	2	TPS43	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS4=35.6, TPS4S=31, TPS43=35.6

Note 1) When using inserts with corner radius RE≥.126"(3.2 mm), B-Holders or C-Holders are required as shown on page K175.

● : USA Stock



■ ARBOR TYPE

With Air / coolant through.

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (inch)									RMPX	*			
			R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB		Insert Screw	Wrench	Anti-seize Lubricant	Coolant thru Set Bolt
A Holders	.016 I .079	APX4000UR0204A	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR0205A	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR2505CA	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2°	TPS43	TIP15W	MK1KS	HSCU50014H
		APX4000UR0306DA	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0307DA	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0408EA	●	8	4.000	2.500	1.500	1.181	.787	3.799	.625	.375	1.181	1.5°	TPS43	TIP15W	MK1KS	HSCU75016H
B Holders	.126 I .157	APX4000UR0204B	●	4	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR0205B	●	5	2.000	1.625	.750	.748	.415	1.875	.313	.187	.600	4°	TPS43	TIP15W	MK1KS	HSCU37513H
		APX4000UR2505CB	●	5	2.500	2.000	1.000	1.024	.539	2.375	.375	.219	.787	2°	TPS43	TIP15W	MK1KS	HSCU50014H
		APX4000UR0306DB	●	6	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0307DB	●	7	3.000	2.500	1.250	1.260	.669	2.874	.500	.281	1.024	2°	TPS43	TIP15W	MK1KS	HSCU62516H
		APX4000UR0408EB	●	8	4.000	2.500	1.500	1.181	.787	3.799	.625	.375	1.181	1.5°	TPS43	TIP15W	MK1KS	HSCU75016H

* Clamp Torque (lbf-in) : TPS43=35.6

Note 1) When using inserts with corner radius RE≥.197"(5.0 mm), C-Holders are required as shown on page K175.

Note 2) The cutter body includes a set bolt for an arbor.

■ Combination of Holder and Insert Corner Radius

Holder	A Holder						B Holder		C Holder	
	APX4000UR○○○○○○A						APX4000UR○○○○○○B		APX4000UR○○○○○○C	
Insert Corner Radius (RE)	.016"	.031"	.039"	.047"	.063"	.079"	.126"	.157"	.197"	.250"

ISO13399 ➢ K003
OPERATION GUIDANCE ➢ K181
SPARE PARTS ➢ M001
TECHNICAL DATA ➢ N001

Fig.1

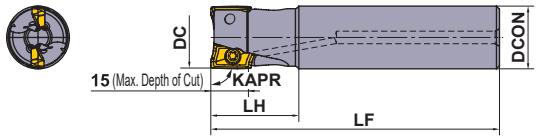
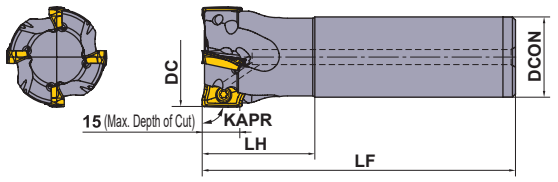


Fig.2



Metric Standard

■ STRAIGHT SHANK TYPE (A Holders)

With Air / coolant through.

Right hand tool holder only.

Type	RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)				RMPX	Fig.	*			
			R		DC	DCON	LF	LH			Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
Long	.016 I .079	**APX4000R252SA25SA**	★	2	25	25	115	35	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R322SA32SA	★	2	32	32	125	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R323SA32SA	★	3	32	32	125	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R403SA32SA	★	3	40	32	125	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R404SA32SA	★	4	40	32	125	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R504SA32SA	★	4	50	32	125	45	4°	2	TPS43	TIP15W	MK1KS	
		APX4000R505SA32SA	★	5	50	32	125	45	4°	2	TPS43	TIP15W	MK1KS	
		APX4000R634SA32SA	★	4	63	32	125	45	3°	2	TPS43	TIP15W	MK1KS	
		APX4000R636SA32SA	★	6	63	32	125	45	3°	2	TPS43	TIP15W	MK1KS	
		APX4000R252SA25LA	★	2	25	25	170	35	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R282SA25LA	★	2	28	25	170	35	9°	2	TPS4	TIP15W	MK1KS	
		APX4000R322SA32LA	★	2	32	32	190	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R323SA32LA	★	3	32	32	190	45	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R352SA32LA	★	2	35	32	190	45	6°	2	TPS4	TIP15W	MK1KS	AOMT1848
		APX4000R353SA32LA	★	3	35	32	190	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R402SA32LA	★	2	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R403SA32LA	★	3	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R404SA32LA	★	4	40	32	190	45	6°	2	TPS43	TIP15W	MK1KS	
Extra Long	.016 I .079	**APX4000R252SA25ELA**	★	2	25	25	220	80	11°	1	TPS4	TIP15W	MK1KS	
		APX4000R282SA25ELA	★	2	28	25	220	35	9°	2	TPS4	TIP15W	MK1KS	
		APX4000R322SA32ELA	★	2	32	32	260	100	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R323SA32ELA	★	3	32	32	260	100	7°	1	TPS4	TIP15W	MK1KS	
		APX4000R352SA32ELA	★	2	35	32	260	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R353SA32ELA	★	3	35	32	260	45	6°	2	TPS4	TIP15W	MK1KS	
		APX4000R402SA32ELA	★	2	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R403SA32ELA	★	3	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	
		APX4000R404SA32ELA	★	4	40	32	260	45	6°	2	TPS43	TIP15W	MK1KS	

* Clamp Torque (lbf-in) : TPS4=35.6, TPS43=35.6

Note 1) When using inserts with corner radius RE≥.126" (3.2 mm), B-Holders or C-Holders are required as shown on K175.

Fig.1

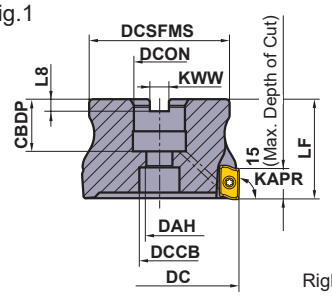
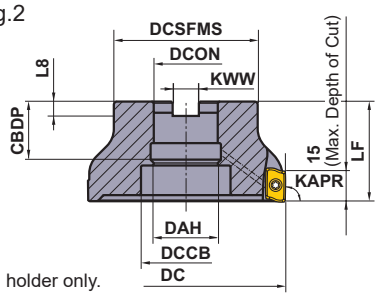


Fig.2



Right hand tool holder only.

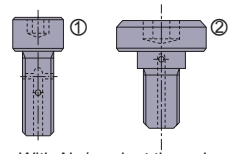
Metric Standard

For Inch Arbors

■ ARBOR TYPE (A Holders)

With Air / coolant through.

Cutter Diameter DC	Set Bolt	Geometry
ϕ80	HSC12035H	①
ϕ100	HSC16040H	
ϕ125	MBA20040H	②
ϕ160	MBA24045H	



With Air / coolant through.

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]									WT	RMPX	Fig.	*			
		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	(kg)			Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.016 | .079	**APX4000R08007CA**	★	7	80	50	25.4 [1.0"]	26	13	70	9.5	6	20	1.2	2°	1	TPS43	TIP15W	MK1KS	AOMT1848
	APX4000R10008DA	★	8	100	63	31.75 [1.25"]	32	17	80	12.7	8	26	2.1	1.5°	1	TPS43	TIP15W	MK1KS	
	APX4000R12509EA	★	9	125	63	38.1 [1.5"]	40	40	100	15.9	10	56	3.3	1°	2	TPS43	TIP15W	MK1KS	
	APX4000R16010FA	★	10	160	63	50.8 [2.0"]	40	53	100	19.1	11	72	4.8	1°	2	TPS43	TIP15W	MK1KS	

* Clamp Torque (lbf-in) : TPS43=35.6

Note 1) When using inserts with corner radius RE≥.126"(3.2 mm), B-Holders or C-Holders are required as shown on K175.

Note 2) Set bolt not included.

ISO13399 ➤ K003
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1

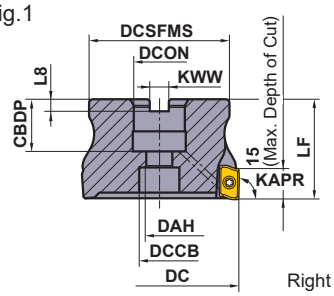
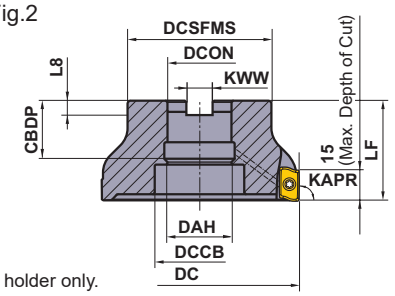


Fig.2

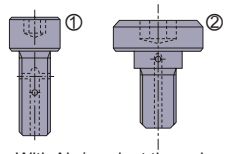


Right hand tool holder only.

Metric Standard

For Metric Arbors

Cutter Diameter DC	Set Bolt	Geometry
ϕ40	HSC08030H	①
ϕ50, ϕ63	HSC10030H	①
ϕ80	HSC12035H	①
ϕ100	HSC16040H	①
ϕ125	MBA20040H	②
ϕ160	MBA20040H	②



With Air / coolant through.

■ ARBOR TYPE (A Holders)

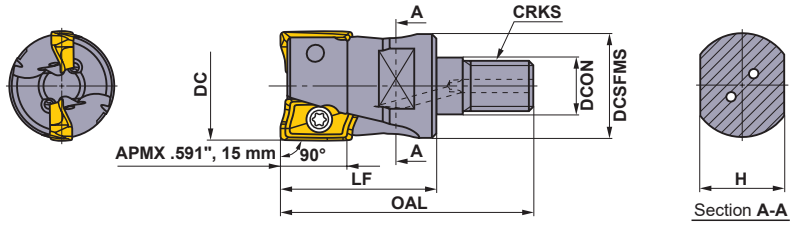
With Air / coolant through.

RE (inch)	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT	RMPX	Fig.	*			
		R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	(kg)			Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
.016 I .079	APX4000-040A04RA	★	4	40	40	16	18	9	34	8.4	5.6	14	0.2	6°	1	TPS43	TIP15W	MK1KS	AOMT1848
	APX4000-050A05RA	★	5	50	40	22	20	11	45	10.4	6.3	17	0.3	4°	1	TPS43	TIP15W	MK1KS	
	APX4000-063A06RA	★	6	63	40	22	20	11	50	10.4	6.3	17	0.5	3°	1	TPS43	TIP15W	MK1KS	
	APX4000-080A07RA	★	7	80	50	27	23	13	60	12.4	7	20	1.2	2°	1	TPS43	TIP15W	MK1KS	
	APX4000-100A08RA	★	8	100	50	32	25	17	70	14.4	8	27	2.1	1.5°	1	TPS43	TIP15W	MK1KS	
	APX4000-125A09RA	★	9	125	63	40	40	42	90	16.4	9	56	3.3	1°	2	TPS43	TIP15W	MK1KS	
	APX4000-160A10RA	★	10	160	63	40	40	42	100	16.4	9	72	4.8	1°	2	TPS43	TIP15W	MK1KS	

* Clamp Torque (lbf-in) : TPS43=35.6

Note 1) When using inserts with corner radius RE≥.126"(3.2 mm), B-Holders or C-Holders are required as shown on page K175.

Note 2) Set bolt not included.



■ SCREW-IN TYPE

With Air / coolant through.

Right hand tool holder only.

DC	Order Number	Stock	Number of Teeth	Dimensions (inch)						WT	*1			
				LF	OAL	DCON	DCSFMS	H	CRKS*2	(lbs)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
1.000	**APX4000UR162AM12A35**	●	2	1.378	2.244	.492	.925	.748	M12	.4	TPS4	TIP15W	MK1KS	AOMT1848
1.125	**APX4000UR182AM12A35**	●	2	1.378	2.244	.492	.925	.748	M12	.4	TPS4	TIP15W	MK1KS	AOMT1848
1.250	**APX4000UR203AM16A40**	●	3	1.575	2.480	.669	1.122	.945	M16	.7	TPS4	TIP15W	MK1KS	AOMT1848
1.375	**APX4000UR223AM16A40**	●	3	1.575	2.480	.669	1.122	.945	M16	.7	TPS4	TIP15W	MK1KS	AOMT1848

*1 Clamp Torque (lbf-in) : TPS4=35.6, TPS43=35.6
*2 Clamp Torque of the Head (lbf-ft) : M12=59.2, M16=66.7

Metric Standard

■ SCREW-IN TYPE

With Air / coolant through.

DC	Order Number	Stock	Number of Teeth	Dimensions (mm)						WT	*1			
				LF	OAL	DCON	DCSFMS	H	CRKS*2	(kg)	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
25	**APX4000R252M12A35**	★	2	35	57	12.5	23.5	19	M12	0.2	TPS4	TIP15W	MK1KS	AOMT1848
28	**APX4000R282M12A35**	★	2	35	57	12.5	23.5	19	M12	0.2	TPS4	TIP15W	MK1KS	AOMT1848
32	**APX4000R322M16A40**	★	2	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
32	**APX4000R323M16A40**	★	3	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
35	**APX4000R352M16A40**	★	2	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
35	**APX4000R353M16A40**	★	3	40	63	17	28.5	24	M16	0.3	TPS4	TIP15W	MK1KS	AOMT1848
40	**APX4000R403M16A40**	★	3	40	63	17	28.5	24	M16	0.3	TPS43	TIP15W	MK1KS	AOMT1848
40	**APX4000R404M16A40**	★	4	40	63	17	28.5	24	M16	0.3	TPS43	TIP15W	MK1KS	AOMT1848

*1 Clamp Torque (lbf-in) : TPS4=35.6, TPS43=35.6
*2 Clamp Torque of the Head (lbf-ft) : M12=59.2, M16=66.7

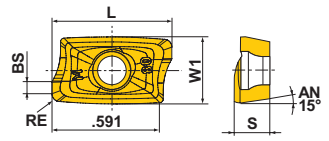
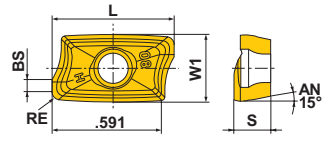
ISO13399 ➤ K003
SCREW-IN HOLDERS ➤ K382
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp Edge

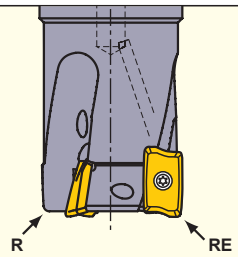
Shape	Order Number	Class	Edge Preparation	Coated								Dimensions (inch)					Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	VP20RT	L	W1	S	BS	RE	
General **M** Breaker	**AOMT184804PEER-M**	M	E		●	●	●	●	●	●	●	.709	.354	.189	.071	.016	
	AOMT184808PEER-M	M	E		●	●	●	●	●	●	●	.709	.354	.189	.055	.031	
	AOMT184810PEER-M	M	E		●			●	●	★		.709	.354	.189	.039	.039	
	AOMT184812PEER-M	M	E		●			●	●	●		.709	.354	.189	.031	.047	
	AOMT184816PEER-M	M	E		●	●	●	●	●	●	●	.709	.354	.189	.016	.063	
	AOMT184820PEER-M	M	E		●			●	●	★		.709	.354	.189	.016	.079	
Strong Cutting Edge Type **H** Breaker	**AOMT184804PEER-H**	M	E	●	●	●	●	●	●	●	●	.709	.354	.189	.071	.016	
	AOMT184808PEER-H	M	E	●	●	●	●	●	●	●	●	.709	.354	.189	.055	.031	
	AOMT184816PEER-H	M	E	●	●	●	●	●	●	●	●	.709	.354	.189	.016	.063	
	AOMT184832PEER-H	M	E			●	●				●	.709	.354	.189	.016	.126	
	AOMT184840PEER-H	M	E			●	●				●	.709	.354	.189	.016	.157	
	AOMT184850PEER-H	M	E			●	●				●	.709	.354	.189	—	.197	
	AOMT184864PEER-H	M	E			●	●				●	.709	.354	.189	—	.250	

Note 1) For large R inserts
APX offers various nose radii for inserts, however one holder can not secure every insert radius.
We offer A-Holders that properly secures up to .079" radius.
We offer B-Holders that secures .126" and .157" radius, only for popular inch sizes.
Customers may modify holders as below, so that larger nose radii can be secured.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

Note on Use of Inserts with Large Corner Radii

When using inserts with corner radius RE≥R.126", please machine the holder with a radius form as shown on the right table.



RE	R
.126"	.098" B-Holders
.157"	
.197"	.197" C-Holders
.250"	

R : Holder End Radius
RE : Insert Corner Radius

Or additional B-Holders and C-Holders are available as non stock, produced to order only.
"Order numbers"; Please replace the last letter "A" of A-Holders to "B" or "C".
In case of screw-in holders, please add "B" or "C" to the end of the order number of A-Holders.
Ex) APX4000R08007CA→APX4000R08007CC
APX4000R252M12A35→APX4000R252M12A35C

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

(inch)

Workpiece Material		Properties	Insert				Cutting Width **ae**			
			Grade Priority		Chip Breaker		≤.25DC	.25—.5DC	.5—.75DC	DC (Slot)
			1st	2nd			Cutting Speed **vc** (SFM)			
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	755(590—885)	720(560—850)	590(460—690)	590(460—690)
			MP6130	VP20RT	M	H	655(490—785)	620(460—755)	490(360—590)	490(360—590)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	590(460—690)	560(430—655)	460(360—525)	460(360—590)
			MP6130	VP20RT	M	H	490(360—590)	460(330—560)	360(260—425)	360(260—425)
M	Stainless Steel	≤270HB	MP7130	VP20RT	M	H	590(460—690)	560(425—655)	460(360—525)	460(360—525)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H		820(655—985)	785(620—950)	690(525—850)	460(360—525)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H		425(330—490)	395(295—460)	330(260—395)	330(260—395)
S	Titanium Alloys	≤350HB	MP9120	VP15TF	H	M	165(130—230)			165(130—230)
			MP9130	VP20RT	H	M	130(100—195)			130(100—195)
	Heat Resistant Alloys	—	MP9120	VP15TF	H	M	130(100—195)			130(100—195)
			MP9130	VP20RT	H	M	100(65—130)			100(65—130)
H	Hardened Steel	40—55HRC	VP15TF		H		295(230—330)	280(195—330)	230(165—260)	230(165—260)

RECOMMENDED CUTTING CONDITIONS

■ Depth of Cut / Feed per Tooth

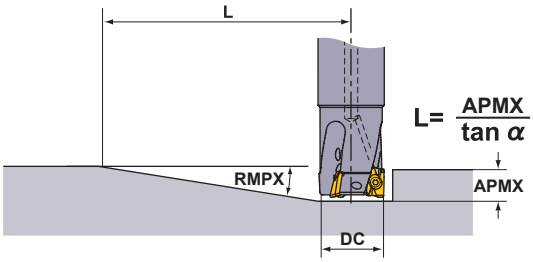
(inch)

Workpiece Material		Properties	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth **fz** (IPT) DC		
					ϕ.750"–ϕ1.500"(ϕ25–ϕ40 mm)	ϕ2.000"–ϕ3.000"(ϕ50–ϕ80 mm)	ϕ4.000"(ϕ100–ϕ160 mm)
P	Mild Steel Carbon Steel Alloy Steel	≤180HB	≤.5DC	≤.197	.012	.012	.010
				.197–.295	.010	.010	.008
				.295–.394	.008	.008	.006
				.394–.492	.006	.006	.004
				.492–.591	.004	.004	.003
			.5–.75DC	≤.197	.008	.008	.006
				.295–.394	.006	.006	.004
				.394–.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
		180–350HB	≤.5DC	≤.197	.012	.010	.010
				.197–.295	.010	.008	.008
				.295–.394	.008	.006	.006
				.394–.492	.006	.004	.004
				.492–.591	.004	.003	.003
			.5–.75DC	≤.197	.008	.006	.006
				.295–.394	.006	.004	.004
				.394–.591	.004	.003	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
M	Stainless Steel	≤270HB	≤.5DC	≤.197	.012	.010	.010
				.197–.295	.010	.008	.008
				.295–.394	.008	.006	.006
				.394–.492	.006	.004	.004
				.492–.591	.004	.003	.003
			.5–.75DC	≤.197	.008	.006	.006
				.295–.394	.006	.004	.004
				.394–.591	.004	.003	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.5DC	≤.197	.012	.012	.010
				.197–.295	.010	.010	.008
				.295–.394	.008	.008	.006
				.394–.492	.006	.006	.004
				.492–.591	.004	.004	.003
			.5–.75DC	≤.197	.008	.008	.006
				.197–.394	.006	.006	.004
				.394–.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.5DC	≤.197	.010	.010	.010
				.197–.295	.008	.008	.008
				.295–.394	.006	.006	.006
				.394–.492	.004	.004	.004
				.492–.591	.003	.003	.003
			.5–.75DC	≤.197	.008	.008	.006
				.197–.394	.006	.006	.004
				.394–.591	.004	.004	.003
			DC (Slot)	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
S	Titanium Alloys	≤350HB	≤.25DC	≤.197	.006	.004	.004
				.197–.295	.004	.002	.002
				.295–.394	.002	–	–
			DC (Slot)	≤.197	.002	.002	.002
	Heat Resistant Alloys	–	≤.25DC	≤.079	.004	.002	.002
			DC (Slot)	≤.039	.002	.002	.002
H	Hardened Steel	40–55HRC	≤.25DC	≤.197	.006	.006	.006
				.197–.295	.004	.004	.004
				.295–.394	.003	.003	.003
			.25–.5DC	≤.197	.004	.004	.004
				.197–.295	.003	.003	.003
			.5–.75DC	≤.197	.003	.003	.003
			DC (Slot)	≤.197	.003	.003	.003

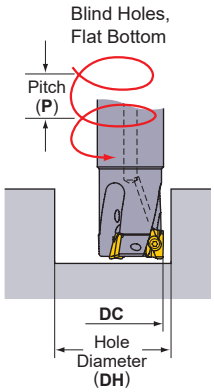
Note 1) These cutting conditions are a guide to the standard shank type and the arbor type.
Please make adjustments according to the machining conditions.
Note 2) Vibration is liable to occur in certain cases. Please reduce the depth of cut and / or reduce cutting conditions in the following cases.
• When using the long shank type and extra long shank type.
• When using long tool overhang with the standard or arbor type.
• When the application has poor clamping rigidity or when using a low rigidity machine.
Note 3) In case of coarse and fine pitch cutters, the coarse pitch type is recommended to prevent vibration.
Note 4) For heavy interrupted and unstable cutting, the H breaker is first recommendation.

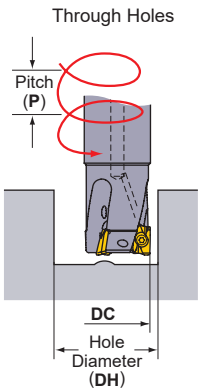
■ Ramping / Helical Milling

● **Ramping**



● **Helical Milling**





Refer to the table below when using .031 inch radius for maximum ramping angle, pitch and minimum/maximum hole diameter. Use cutting conditions for slot milling to calculate speed and feed when ramping / helical milling.

Cutting Edge Diameter **DC** (inch)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
	Maximum Ramping Angle **RMPX**	Minimum Distance *1 **L** (inch)	Maximum Hole Diameter *2 **DH max.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)	Minimum Hole Diameter **DH min.** (inch)	Maximum Pitch **P max.** (inch)
.750	14°	2.7	1.42	.51	1.31	.43	.80	.019
1.000	11°	3.4	1.92	.55	1.81	.47	1.30	.157
1.250	7°	5.4	2.42	.43	2.31	.39	1.80	.196
1.500	7°	5.4	2.92	.51	2.81	.47	2.30	.275
2.000	4°	9.4	3.92	.39	3.81	.39	3.30	.275
2.500	2°	18.8	4.92	.23	4.81	.23	4.30	.157
3.000	2°	18.8	5.92	.31	5.81	.27	5.30	.236
4.000	1.5°	25.1	7.92	.31	7.81	.27	7.30	.236

*1 L(=.591"/tanα). Cutters' moving distance until depth of cut reaches .591" at a maximum ramping angle.
*2 In case corner radius of .031". Other than that, find with the below formula.
{(cutting edge diameter DC) - (corner radius) - .008"} x 2
Note 1) When machining highly ductile materials with ramping angles above, chips could be continuous.
In this case, decrease the ramping angle or feed per tooth.

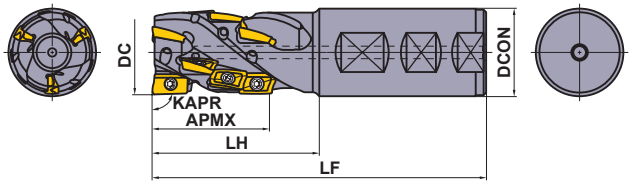
DEEP SHOULDER MILLING

90° KAPR

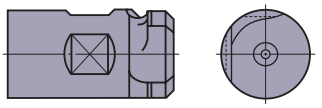
APX4000

LONG CUTTING EDGE

P M K N S H



*1 Combination Type



■SHANK TYPE (A Holders)

With Air / coolant through.

Right hand tool holder only.

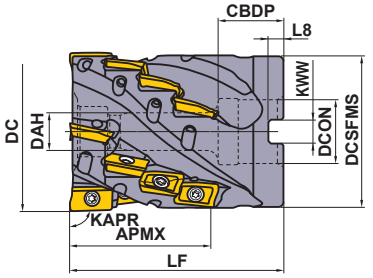
Order Number	Stock	Number of Flutes	Total	Dimensions (inch)					*2			
	R			DC	DCON	LF	LH	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4KUR2408WA24S35A	●	2	8	1.500	1.500	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	AOMT1848
APX4KUR2412WA24S35A	●	3	12	1.500	1.500	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	
*1 APX4KUR3212WA32S35A	●	3	12	2.000	2.000	6.500	3.250	2.200	TPS43	TIP15W	MK1KS	
*1 APX4KUR3218WA32M53A	●	3	18	2.000	2.000	7.750	4.500	3.300	TPS43	TIP15W	MK1KS	

*2 Clamp Torque (lbf-in) : TPS43=35.4

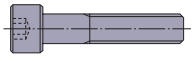
Note 1) When using inserts with corner radius RE≥.126" on the bottom, B-Holders or C-Holders are required as shown on page K175.

Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).

Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.000"	HSCUF37520	
ϕ2.500"	HSCUF50028	

■SHELL TYPE (A Holders)

With Air / coolant through.

Order Number	Stock	Number of Flutes	Total	Dimensions (inch)									*			
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4KUR0209A16A	●	3	9	2.000	2.500	.750	1.063	.415	1.918	.313	.187	1.650	TPS43	TIP15W	MK1KS	AOMT1848
APX4KUR2516CA22A	●	4	16	2.500	3.500	1.000	1.339	.539	2.409	.375	.219	2.200	TPS43	TIP15W	MK1KS	

* Clamp Torque (lbf-in) : TPS43=35.4

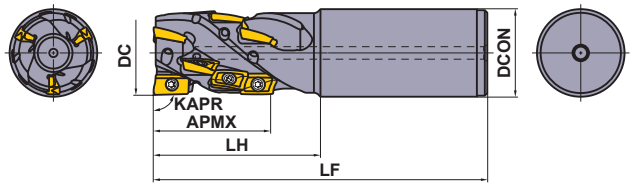
Note 1) When using inserts with corner radius Re≥.126" on the bottom, B-Holders or C-Holders are required as shown on page K175.

Note 2) Only corner radius Re .016" and .031" can be used for the peripheral cutting edges expect the bottom cutting edge (the end cuttting edge).

Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

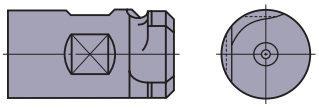
Note 4) In case of internal coolant supply, please use a face mill arbor with through coolant channels; Regular center-thru or side-thru arbors can't be used.

Note 5) The cutter body includes a non-coolant through set bolt for an arbor.



Metric Standard

∗1 Combination Type



■SHANK TYPE (A Holders)

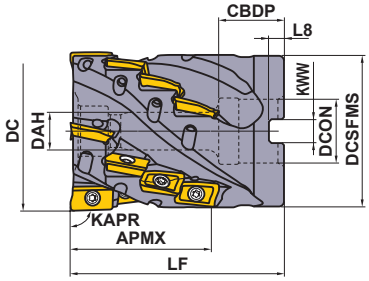
With Air / coolant through.

Right hand tool holder only.

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]					∗2			
	R			DC	DCON	LF	LH	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4KR4008SA42S056A	★	2	8	40	42	160	80	56	TPS43	TIP15W	MK1KS	AOMT1848
APX4KR4012SA42S056A	★	3	12	40	42	160	80	56	TPS43	TIP15W	MK1KS	
∗1 APX4KR5012WA508S056A	★	3	12	50	50.8 [2.0"]	160	80	56	TPS43	TIP15W	MK1KS	
∗1 APX4KR5018WA508M084A	★	3	18	50	50.8 [2.0"]	190	110	84	TPS43	TIP15W	MK1KS	

∗2 Clamp Torque (lbf-in) : TPS43=35.4

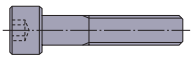
Note 1) When using inserts with corner radius RE≥.126" on the bottom, B-Holders or C-Holders are required as shown on page K175.
Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges except the bottom cutting edge (the end cuttting edge).
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.



Metric Standard

For Inch Arbors

Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ50 mm	HSC10050	
ϕ63 mm	HSC12070	

The bore diameter (DCON) is equivalent to a metric size.

■SHELL TYPE (A Holders)

With Air / coolant through.

Order Number	Stock	Number of Flutes	Total	Dimensions (mm) [inch]									∗			
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4KR06316CA056A	★	4	16	63	85	25.4 [1.0"]	26	13	60.7	9.5	6	56	TPS43	TIP15W	MK1KS	AOMT1848

∗ Clamp Torque (lbf-in) : TPS43=35.4

Metric Standard

For Metric Arbors

■SHELL TYPE (A Holders)

With Air / coolant through.

Order Number	Stock	Number of Flutes	Total	Dimensions (mm)									∗			
	R			DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Insert Screw	Wrench	Anti-seize Lubricant	Insert Type
APX4K-050A09A042RA	★	3	9	50	65	22	22	11	48	10.4	6.3	42	TPS43	TIP15W	MK1KS	AOMT1848
APX4K-063A16A056RA	★	4	16	63	85	27	28	13	60.7	12.4	7	56	TPS43	TIP15W	MK1KS	

∗ Clamp Torque (lbf-in) : TPS43=35.4

Note 1) When using inserts with corner radius RE≥.126" on the bottom, B-Holders or C-Holders are required as shown on page K175.
Note 2) Only corner radius RE .016" and .031" can be used for the peripheral cutting edges except the bottom cutting edge (the end cuttting edge).
Note 3) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 4) In case of internal coolant supply, please use a face mill arbor with through coolant channels; Regular center-thru or side-thru arbors can't be used.
Note 5) Set bolt not included.

ISO13399 ➤ K003
INSERTS ➤ K174
OPERATION GUIDANCE ➤ K181
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

(inch)

Workpiece Material		Properties	Insert Grade Priority 1st	Insert Grade Priority 2nd	Chip Breaker		Cutting Width **ae** ≤.15DC	Cutting Width **ae** .15—.3DC	Cutting Width **ae** DC (Slot)
							Cutting Speed **vc** (SFM)		
P	Mild Steel	≤180HB	MP6120	VP15TF	M	H	655(525—820)	525(395—655)	460(395—525)
			MP6130	VP20RT	M	H	560(425—720)	425(295—560)	360(295—425)
	Carbon Steel Alloy Steel	180—350HB	MP6120	VP15TF	M	H	525(395—655)	395(330—460)	330(260—395)
			MP6130	VP20RT	M	H	425(295—560)	295(230—360)	230(165—295)
M	Stainless Steel	≤270HB	MP7130	VP15TF	M	H	525(395—655)	395(330—460)	330(260—395)
K	Gray Cast Iron	≤350MPa	MC5020	VP15TF	H		755(590—920)	620(460—785)	620(460—785)
	Ductile Cast Iron	≤800MPa	MC5020	VP15TF	H		620(460—720)	560(395—720)	560(395—720)
S	Titanium Alloys	≤350HB	MP9120	VP15TF	H	M	165(130—230)		165(130—230)
			MP9130	VP20RT	H	M	130(100—195)		130(100—195)
	Heat Resistant Alloys	—	MP9120	VP15TF	H	M	130(100—195)		130(100—195)
			MP9130	VP20RT	H	M	100(65—130)		100(65—130)

■ Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth **fz** (IPT) DC ϕ1.5"(Max.ap=2.2") ϕ2.0"(Max.ap=1.65") ϕ40(Max.ap=56 mm(2.205") ϕ50 (Max.ap=42 mm(1.654")	Feed per Tooth **fz** (IPT) DC ϕ2.0"(Max.ap=2.2") ϕ2.5"(Max.ap=2.2") ϕ50(Max.ap=56 mm(2.205") ϕ63 (Max.ap=56 mm(2.205")	Feed per Tooth **fz** (IPT) DC ϕ2.0"(Max.ap=3.3") ϕ50(Max.ap=84 mm(3.307")
P	Mild Steel	≤180HB	≤.3DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.787	.008	.008	.006
				.787—1.969	.006	.006	
	Carbon Steel Alloy Steel	180—350HB	≤.3DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.787	.006	.006	.004
				.787—1.969	.004	.004	
M	Stainless Steel	≤270HB	≤.3DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.394	.004	.004	.003
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.15DC	≤.394	.012	.012	.010
				.394—1.969	.010	.010	.008
				1.969—3.150			.006
			.15—.3DC	≤.394	.010	.010	.008
				.394—1.969	.008	.008	.006
				1.969—3.150			.004
			DC (Slot)	≤.394	.010	.010	.008
				.394—1.969	.008	.008	.006
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.15DC	≤.787	.010	.010	.008
				.787—1.969	.008	.008	.006
				1.969—3.150			.004
			.15—.3DC	≤.787	.008	.008	.006
				.787—1.969	.006	.006	.004
				1.969—3.150			.003
			DC (Slot)	≤.394	.006	.006	.004
				.394—1.969	.004	.004	
S	Titanium Alloys	≤350HB	≤.15DC	≤.787	.004	.004	
				.787—1.969	.004	.004	
			DC (Slot)	≤1.969	.003	.003	
	Heat Resistant Alloys	—	≤.15DC	≤.394	.003	.003	
			DC (Slot)	≤.787	.002	.002	

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece material, where no vibration occurred.
Please adjust processing conditions if the vibration is generated.

OPERATIONAL GUIDANCE

- Use only specified inserts and parts.
- Clamp the inserts at a specified torque of only.
- The maximum spindle speeds **RPMX** are shown in Table 1. Ensure that the cutter operates under the maximum spindle speed **RPMX**.
  The maximum spindle speeds **RPMX** for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

(Table 1) Maximum Spindle Speed RPMX

Cutting Edge Diameter **DC**	ϕ.500"	ϕ.625"	ϕ.750"	ϕ1.000"	ϕ1.250"	ϕ1.500"	ϕ2.000"	ϕ2.500"	ϕ3.000"	ϕ4.000"
Max. Spindle Speed **RPMX** (min^{-1})	9900	19000	16000	12000	9500	7600	6000	4800	3800	3100

Cutting Edge Diameter **DC**(mm)	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30
Max. Spindle Speed **RPMX** (min^{-1})	—	—	19000	17000	15000	14000	12000	11000	10000

Cutting Edge Diameter **DC**(mm)	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Max. Spindle Speed **RPMX** (min^{-1})	9500	9000	7500	6000	5000	3500	3000	2500	1500

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX200

P M K N S H

Fig.1

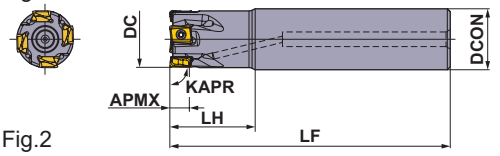


Fig.2

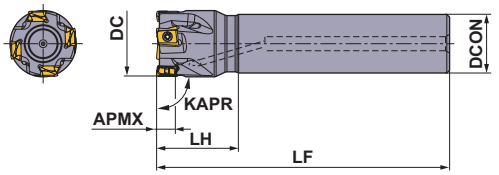


Fig.3

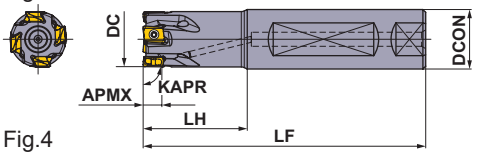
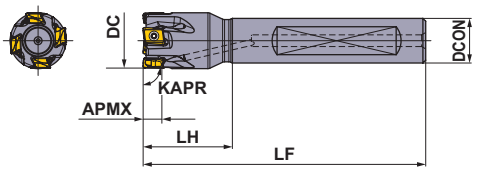


Fig.4



■SHANK TYPE

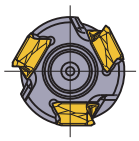
With Air / coolant through.

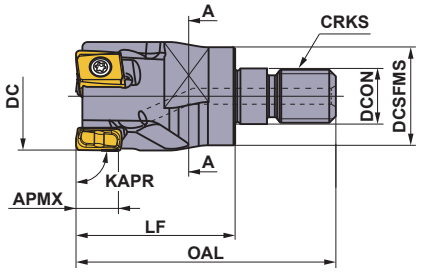
Right hand tool holder only.

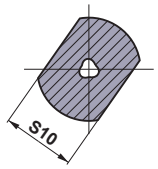
(inch)

DC	Order Number	Stock R	Number of Teeth	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (lbs)	Fig.	Insert Type
.625	**VPX200UR1002FA10S**	●	2	.625	3.625	1.250	.315	1.87°	38100	.3	3	LOGU09
.625	**VPX200UR1002SA10S**	●	2	.625	3.625	1.250	.315	1.87°	38100	.3	1	LOGU09
.625	**VPX200UR1002SA10L**	●	2	.625	6.000	1.500	.315	1.87°	38100	.5	1	LOGU09
.750	**VPX200UR1202FA10S**	●	2	.625	4.375	1.250	.315	1.43°	34200	.3	4	LOGU09
.750	**VPX200UR1202SA10S**	●	2	.625	4.375	1.250	.315	1.43°	34200	.4	2	LOGU09
.750	**VPX200UR1203FA10S**	●	3	.625	4.375	1.250	.315	1.43°	34200	.3	4	LOGU09
.750	**VPX200UR1203SA10S**	●	3	.625	4.375	1.250	.315	1.43°	34200	.3	2	LOGU09
.750	**VPX200UR1202FA12S**	●	2	.750	4.375	1.500	.315	1.43°	34200	.4	3	LOGU09
.750	**VPX200UR1202SA12S**	●	2	.750	4.375	1.500	.315	1.43°	34200	.5	1	LOGU09
.750	**VPX200UR1203FA12S**	●	3	.750	4.375	1.500	.315	1.43°	34200	.4	3	LOGU09
.750	**VPX200UR1203SA12S**	●	3	.750	4.375	1.500	.315	1.43°	34200	.5	1	LOGU09
.750	**VPX200UR1202SA12L**	●	2	.750	7.250	2.000	.315	1.43°	34200	.8	1	LOGU09
.875	**VPX200UR1402SA12L**	●	2	.750	7.250	1.500	.315	1.14°	31200	.8	2	LOGU09
1.000	**VPX200UR1603FA12S**	●	3	.750	4.750	1.500	.315	.95°	28800	.6	4	LOGU09
1.000	**VPX200UR1603SA12S**	●	3	.750	4.750	1.500	.315	.95°	28800	.6	2	LOGU09
1.000	**VPX200UR1604FA12S**	●	4	.750	4.750	1.500	.315	.95°	28800	.6	4	LOGU09
1.000	**VPX200UR1604SA12S**	●	4	.750	4.750	1.500	.315	.95°	28800	.6	2	LOGU09
1.000	**VPX200UR1603SA12L**	●	3	.750	8.500	1.500	.315	.95°	28800	1.0	2	LOGU09
1.000	**VPX200UR1603FA16S**	●	3	1.000	4.750	1.750	.315	.95°	28800	.9	3	LOGU09
1.000	**VPX200UR1603SA16S**	●	3	1.000	4.750	1.750	.315	.95°	28800	.9	1	LOGU09
1.000	**VPX200UR1604FA16S**	●	4	1.000	4.750	1.750	.315	.95°	28800	.9	3	LOGU09
1.000	**VPX200UR1604SA16S**	●	4	1.000	4.750	1.750	.315	.95°	28800	.9	1	LOGU09
1.000	**VPX200UR1603SA16L**	●	3	1.000	8.500	2.500	.315	.95°	28800	1.7	1	LOGU09
1.125	**VPX200UR1803SA16L**	●	3	1.000	8.500	1.750	.315	.82°	26800	1.8	2	LOGU09
1.250	**VPX200UR2003FA16S**	●	3	1.000	5.125	1.750	.315	.71°	25200	1.1	4	LOGU09
1.250	**VPX200UR2003SA16S**	●	3	1.000	5.125	1.750	.315	.71°	25200	1.1	2	LOGU09
1.250	**VPX200UR2005FA16S**	●	5	1.000	5.125	1.750	.315	.71°	25200	1.1	4	LOGU09
1.250	**VPX200UR2005SA16S**	●	5	1.000	5.125	1.750	.315	.71°	25200	1.1	2	LOGU09
1.250	**VPX200UR2003SA16L**	●	3	1.000	9.000	1.750	.315	.71°	25200	1.9	2	LOGU09
1.250	**VPX200UR2003FA20S**	●	3	1.250	5.125	2.000	.315	.71°	25200	1.5	3	LOGU09
1.250	**VPX200UR2003SA20S**	●	3	1.250	5.125	2.000	.315	.71°	25200	1.6	1	LOGU09
1.250	**VPX200UR2004FA20S**	●	4	1.250	5.125	2.000	.315	.71°	25200	1.5	3	LOGU09
1.250	**VPX200UR2004SA20S**	●	4	1.250	5.125	2.000	.315	.71°	25200	1.6	1	LOGU09
1.250	**VPX200UR2005FA20S**	●	5	1.250	5.125	2.000	.315	.71°	25200	1.5	3	LOGU09
1.250	**VPX200UR2005SA20S**	●	5	1.250	5.125	2.000	.315	.71°	25200	1.6	1	LOGU09
1.250	**VPX200UR2003SA20L**	●	3	1.250	9.000	3.000	.315	.71°	25200	2.8	1	LOGU09
1.500	**VPX200UR2404FA20S**	●	4	1.250	5.125	2.000	.315	.57°	22600	1.7	4	LOGU09
1.500	**VPX200UR2404SA20S**	●	4	1.250	5.125	2.000	.315	.57°	22600	1.8	2	LOGU09
1.500	**VPX200UR2406FA20S**	●	6	1.250	5.125	2.000	.315	.57°	22600	1.7	4	LOGU09
1.500	**VPX200UR2406SA20S**	●	6	1.250	5.125	2.000	.315	.57°	22600	1.7	2	LOGU09
1.500	**VPX200UR2404SA20L**	●	4	1.250	9.000	2.000	.315	.57°	22600	3.1	2	LOGU09

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.







A-A Section

Right hand tool holder only.

■ SCREW-IN TYPE

With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (lbs)	APMX	RMPX	Insert Type
.625	**VPX200UR1002AM0830**	●	2	.335	.571	1.890	1.181	.394	M08	.1	.315	1.87°	LOGU09
.750	**VPX200UR1202AM1030**	●	2	.413	.728	1.929	1.181	.551	M10	.1	.315	1.43°	LOGU09
.750	**VPX200UR1203AM1030**	●	3	.413	.728	1.929	1.181	.551	M10	.1	.315	1.43°	LOGU09
.875	**VPX200UR1402AM1030**	●	2	.413	.728	1.929	1.181	.551	M10	.2	.315	1.14°	LOGU09
.875	**VPX200UR1403AM1030**	●	3	.413	.728	1.929	1.181	.551	M10	.1	.315	1.14°	LOGU09
1.000	**VPX200UR1603AM1235**	●	3	.492	.925	2.244	1.378	.748	M12	.2	.315	.95°	LOGU09
1.000	**VPX200UR1604AM1235**	●	4	.492	.925	2.244	1.378	.748	M12	.2	.315	.95°	LOGU09
1.125	**VPX200UR1803AM1235**	●	3	.492	.925	2.244	1.378	.748	M12	.3	.315	.82°	LOGU09
1.125	**VPX200UR1804AM1235**	●	4	.492	.925	2.244	1.378	.748	M12	.3	.315	.82°	LOGU09
1.250	**VPX200UR2003AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.315	.71°	LOGU09
1.250	**VPX200UR2004AM1640**	●	4	.669	1.122	2.480	1.575	.945	M16	.5	.315	.71°	LOGU09
1.250	**VPX200UR2005AM1640**	●	5	.669	1.122	2.480	1.575	.945	M16	.5	.315	.71°	LOGU09
1.375	**VPX200UR2203AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.315	.64°	LOGU09
1.375	**VPX200UR2205AM1640**	●	5	.669	1.122	2.480	1.575	.945	M16	.5	.315	.64°	LOGU09
1.500	**VPX200UR2404AM1640**	●	4	.669	1.122	2.480	1.575	.945	M16	.6	.315	.57°	LOGU09
1.500	**VPX200UR2406AM1640**	●	6	.669	1.122	2.480	1.575	.945	M16	.6	.315	.57°	LOGU09

Note 1) For screw-in type arbors, refer to page K382.

SPARE PARTS

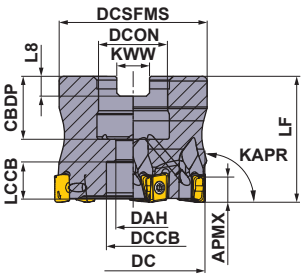
(inch)

DC	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
.625	**VPX200UR10**	TPS27F1	TIP07F	MK1KS
.750	**VPX200UR12**	TPS27F1	TIP07F	MK1KS
.875	**VPX200UR14**	TPS27F2	TIP07F	MK1KS
1.000	**VPX200UR16**	TPS27F2	TIP07F	MK1KS
1.125	**VPX200UR18**	TPS27F2	TIP07F	MK1KS
1.250	**VPX200UR20**	TPS27F2	TIP07F	MK1KS
1.375	**VPX200UR22**	TPS27F2	TIP07F	MK1KS
1.500	**VPX200UR24**	TPS27F2	TIP07F	MK1KS

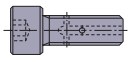
* Clamp Torque (lbf-in) : TPS27F1 = 8.9,TPS27F2 = 8.9

ISO13399	➢ K003
INSERTS	➢ K192

SCREW-IN HOLDERS	➢ K382
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001



Right hand tool holder only.

DCON	Set Bolt	Geometry
ϕ.500"	HSCU25011H	
ϕ.750"	HSCU37513H	
ϕ1.000"	HSCU50014H	
		With Air / coolant through.

■ARBOR TYPE

With Air / coolant through.

DC=inch size, DCON=Inch size

(inch)

DC	Order Number	Stock R	Number of Teeth	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})	Insert Type
1.250	**VPX200UR1.2503SA**	●	3	1.375	.500	.120	.315	.72°	25200	LOGU09
1.250	**VPX200UR1.2505SA**	●	5	1.375	.500	.120	.315	.72°	25200	LOGU09
1.500	**VPX200UR1.5004SA**	●	4	1.750	.500	.260	.315	.57°	22600	LOGU09
1.500	**VPX200UR1.5006SA**	●	6	1.750	.500	.250	.315	.57°	22600	LOGU09
1.500	**VPX200UR1.5004AA**	●	4	1.750	.750	.220	.315	.57°	22600	LOGU09
1.500	**VPX200UR1.5006AA**	●	6	1.750	.750	.210	.315	.57°	22600	LOGU09
2.000	**VPX200UR2.0005AA**	●	5	1.750	.750	.410	.315	.41°	19000	LOGU09
2.000	**VPX200UR2.0007AA**	●	7	1.750	.750	.410	.315	.41°	19000	LOGU09
2.500	**VPX200UR2.5006CA**	●	6	2.000	1.000	.740	.315	.32°	16700	LOGU09
2.500	**VPX200UR2.5009CA**	●	9	2.000	1.000	.740	.315	.32°	16700	LOGU09

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
1.250	**VPX200UR1.2503SA**	.500	.630	.276	.433	.304	1.125	.250	.156
1.250	**VPX200UR1.2505SA**	.500	.630	.276	.433	.304	1.125	.250	.156
1.500	**VPX200UR1.5004SA**	.500	.630	.276	.433	.679	1.438	.250	.156
1.500	**VPX200UR1.5006SA**	.500	.630	.276	.433	.679	1.438	.250	.156
1.500	**VPX200UR1.5004AA**	.750	.748	.413	.630	.561	1.438	.313	.187
1.500	**VPX200UR1.5006AA**	.750	.748	.413	.630	.561	1.438	.313	.187
2.000	**VPX200UR2.0005AA**	.750	.748	.413	.630	.561	1.750	.313	.187
2.000	**VPX200UR2.0007AA**	.750	.748	.413	.630	.561	1.750	.313	.187
2.500	**VPX200UR2.5006CA**	1.000	.945	.539	.787	.693	2.188	.375	.219
2.500	**VPX200UR2.5009CA**	1.000	.945	.539	.787	.693	2.188	.375	.219

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F2 = 8.9

Fig.1

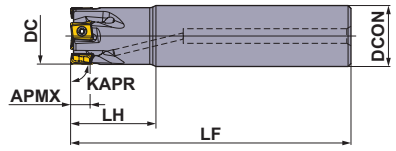
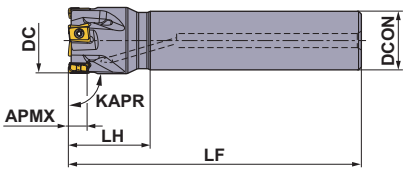


Fig.2



Right hand tool holder only.

Metric Standard

■SHANK TYPE

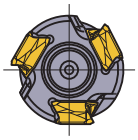
With Air / coolant through.

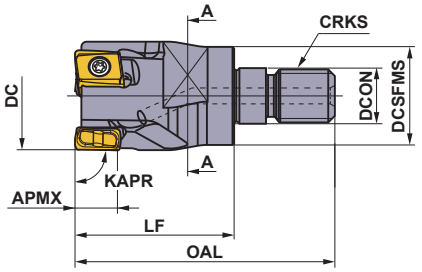
(mm)

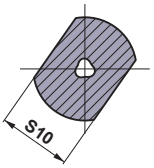
DC	Order Number	Stock R	Number of Teeth	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (kg)	Fig.	Insert Type
16	**VPX200R1602SA16S**	★	2	16	85	25	8	1.85°	37900	0.11	1	LOGU09
18	**VPX200R1802SA16S**	★	2	16	85	25	8	1.56°	35300	0.12	2	LOGU09
18	**VPX200R1802SA16L**	★	2	16	120	25	8	1.56°	35300	0.17	2	LOGU09
20	**VPX200R2002SA16S**	★	2	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2003SA16S**	★	3	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2002SA20S**	★	2	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2003SA20S**	★	3	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2002SA20L**	★	2	20	150	60	8	1.35°	33200	0.32	1	LOGU09
22	**VPX200R2202SA20S**	★	2	20	115	30	8	1.16°	31400	0.26	2	LOGU09
22	**VPX200R2203SA20S**	★	3	20	115	30	8	1.16°	31400	0.25	2	LOGU09
22	**VPX200R2202SA20L**	★	2	20	150	30	8	1.16°	31400	0.34	2	LOGU09
25	**VPX200R2503SA20S**	★	3	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2504SA20S**	★	4	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2503SA25S**	★	3	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2504SA25S**	★	4	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2503SA25L**	★	3	25	170	70	8	0.97°	29000	0.57	1	LOGU09
28	**VPX200R2803SA25S**	★	3	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2804SA25S**	★	4	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2803SA25L**	★	3	25	170	35	8	0.84°	27200	0.61	2	LOGU09
30	**VPX200R3003SA25S**	★	3	25	125	35	8	0.77°	26000	0.46	2	LOGU09
30	**VPX200R3004SA25S**	★	4	25	125	35	8	0.77°	26000	0.46	2	LOGU09
32	**VPX200R3203SA32S**	★	3	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3204SA32S**	★	4	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3205SA32S**	★	5	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3203SA32L**	★	3	32	190	90	8	0.71°	25100	1.06	1	LOGU09
35	**VPX200R3503SA32L**	★	3	32	190	45	8	0.63°	23800	1.14	2	LOGU09
40	**VPX200R4004SA32S**	★	4	32	125	45	8	0.54°	22000	0.81	2	LOGU09
40	**VPX200R4006SA32S**	★	6	32	125	45	8	0.54°	22000	0.80	2	LOGU09
50	**VPX200R5005SA32S**	★	5	32	125	45	8	0.42°	19200	0.91	2	LOGU09
50	**VPX200R5007SA32S**	★	7	32	125	45	8	0.42°	19200	0.91	2	LOGU09

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

ISO13399 ➤ K003
INSERTS ➤ K192
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001







A-A Section

Right hand tool holder only.

Metric Standard

■ SCREW-IN TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX	RMPX	Insert Type
16	**VPX200R1602AM0830**	★	2	8.5	14.5	48	30	10	M08	0.03	8	1.85°	LOGU09
18	**VPX200R1802AM0830**	★	2	8.5	14.5	48	30	10	M08	0.04	8	1.56°	LOGU09
20	**VPX200R2002AM1030**	★	2	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
20	**VPX200R2003AM1030**	★	3	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
22	**VPX200R2202AM1030**	★	2	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
22	**VPX200R2203AM1030**	★	3	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
25	**VPX200R2503AM1235**	★	3	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
25	**VPX200R2504AM1235**	★	4	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
32	**VPX200R3203AM1640**	★	3	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3204AM1640**	★	4	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3205AM1640**	★	5	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
35	**VPX200R3503AM1640**	★	3	17.0	28.5	63	40	24	M16	0.24	8	0.63°	LOGU09
35	**VPX200R3505AM1640**	★	5	17.0	28.5	63	40	24	M16	0.23	8	0.63°	LOGU09
40	**VPX200R4004AM1640**	★	4	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09
40	**VPX200R4006AM1640**	★	6	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09

Note 1) For screw-in type arbors, refer to page K382.

SPARE PARTS

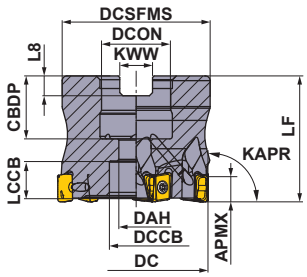
(mm)

DC	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
16	**VPX200R16**	TPS27F1	TIP07F	MK1KS
18	**VPX200R18**	TPS27F1	TIP07F	MK1KS
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
30	**VPX200R30**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS
50	**VPX200R50**	TPS27F2	TIP07F	MK1KS

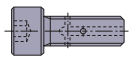
* Clamp Torque (lbf-in) : TPS27F1 = 8.9,TPS27F2 = 8.9

Metric Standard

For Metric Arbors



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ32, ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	With Air / coolant through.

■ARBOR TYPE

With Air / coolant through.

DC=mm size, DCON=mm size (mm)

DC	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Insert Type
32	**VPX200-032A03AR**	★	3	35	16	0.11	8	0.71°	25100	LOGU09
32	**VPX200-032A05AR**	★	5	35	16	0.11	8	0.71°	25100	LOGU09
40	**VPX200-040A04AR**	★	4	40	16	0.23	8	0.54°	22000	LOGU09
40	**VPX200-040A06AR**	★	6	40	16	0.22	8	0.54°	22000	LOGU09
50	**VPX200-050A05AR**	★	5	40	22	0.36	8	0.42°	19200	LOGU09
50	**VPX200-050A07AR**	★	7	40	22	0.36	8	0.42°	19200	LOGU09
63	**VPX200-063A06AR**	★	6	40	22	0.66	8	0.32°	16700	LOGU09
63	**VPX200-063A09AR**	★	9	40	22	0.66	8	0.32°	16700	LOGU09

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A03AR**	16	18	9	14	8	30	8.4	5.6
32	**VPX200-032A05AR**	16	18	9	14	8	30	8.4	5.6
40	**VPX200-040A04AR**	16	18	9	14	13	37	8.4	5.6
40	**VPX200-040A06AR**	16	18	9	14	13	37	8.4	5.6
50	**VPX200-050A05AR**	22	20	11	17	11	47	10.4	6.3
50	**VPX200-050A07AR**	22	20	11	17	11	47	10.4	6.3
63	**VPX200-063A06AR**	22	20	11	17	11	60	10.4	6.3
63	**VPX200-063A09AR**	22	20	11	17	11	60	10.4	6.3

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F2 = 8.9

ISO13399	➤ K003	SCREW-IN HOLDERS	➤ K382
INSERTS	➤ K192	SPARE PARTS	➤ M001
		TECHNICAL DATA	➤ N001

DEEP SHOULDER MILLING

VPX200

NEW

LONG CUTTING EDGE

P M K N S H

Fig.1

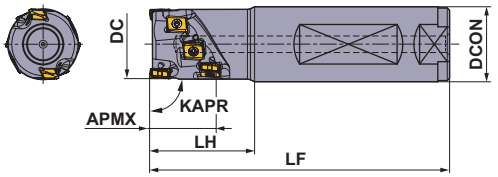
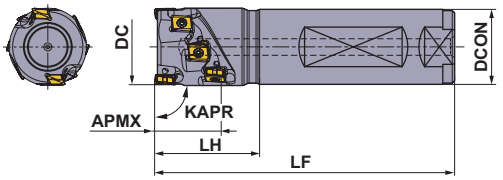


Fig.2



Right hand tool holder only.

■SHANK TYPE

KAPR= 90°
With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Total	DCON	LF	LH	APMX	RMPX	WT (lbs)	Fig.	Insert Type *
.875	**VPX200UR142FA12S0504**	●	2	4	.750	4.375	1.250	.551	1.14°	.485	2	LOGU09
1.000	**VPX200UR162FA16S0806**	●	2	6	1.000	4.750	1.500	.827	0.95°	.904	1	LOGU09
1.000	**VPX200UR162FA16S1108**	●	2	8	1.000	5.000	1.750	1.102	0.95°	.926	1	LOGU09
1.125	**VPX200UR182FA16S0806**	●	2	6	1.000	4.750	1.500	.827	0.82°	.948	2	LOGU09
1.125	**VPX200UR182FA16S1108**	●	2	8	1.000	5.000	1.750	1.102	0.82°	.992	2	LOGU09
1.250	**VPX200UR202FA20S1108**	●	2	8	1.250	5.000	1.750	1.102	0.71°	1.455	1	LOGU09
1.250	**VPX200UR203FA20S1112**	●	3	12	1.250	5.000	1.750	1.102	0.71°	1.433	1	LOGU09
1.250	**VPX200UR202FA20S1310**	●	2	10	1.250	5.250	2.000	1.378	0.71°	1.499	1	LOGU09
1.250	**VPX200UR203FA20S1315**	●	3	15	1.250	5.250	2.000	1.378	0.71°	1.477	1	LOGU09
1.375	**VPX200UR222FA20S1108**	●	2	8	1.250	5.000	1.750	1.102	0.64°	1.543	2	LOGU09
1.375	**VPX200UR223FA20S1112**	●	3	12	1.250	5.000	1.750	1.102	0.64°	1.587	2	LOGU09
1.375	**VPX200UR222FA20S1310**	●	2	10	1.250	5.250	2.000	1.378	0.64°	1.543	2	LOGU09
1.375	**VPX200UR223FA20S1315**	●	3	15	1.250	5.250	2.000	1.378	0.64°	1.587	2	LOGU09
1.500	**VPX200UR243FA20S1315**	●	3	15	1.250	5.250	2.000	1.378	0.57°	1.676	2	LOGU09
1.500	**VPX200UR244FA20S1320**	●	4	20	1.250	5.250	2.000	1.378	0.57°	1.676	2	LOGU09
1.500	**VPX200UR243FA20S1618**	●	3	18	1.250	5.500	2.250	1.654	0.57°	1.764	2	LOGU09
1.500	**VPX200UR244FA20S1624**	●	4	24	1.250	5.500	2.250	1.654	0.57°	1.742	2	LOGU09

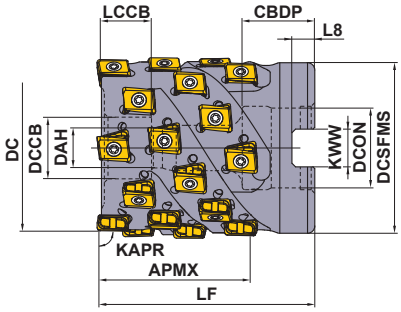
* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

SPARE PARTS

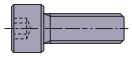
(inch)

DC	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
.875	**VPX200UR14**	TPS27F2	TIP07F	MK1KS
1.000	**VPX200UR16**	TPS27F2	TIP07F	MK1KS
1.125	**VPX200UR16**	TPS27F2	TIP07F	MK1KS
1.250	**VPX200UR20**	TPS27F2	TIP07F	MK1KS
1.375	**VPX200UR22**	TPS27F2	TIP07F	MK1KS
1.500	**VPX200UR24**	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F2 = 8.9



Right hand tool holder only.

DC	APMX	Set Bolt	Geometry
1.250	1.378	HSCUF25020	
1.500	1.654	HSCUF25020	
2.000	1.654	HSCUF37520	

■SHELL TYPE

DCON = inch size, With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Total	LF	DCON	WT (kg)	APMX	RMPX	Insert Type *
1.250	**VPX200UR1.2502AA1310**	●	2	10	2.250	.500	.529	1.378	0.72°	LOGU09
1.250	**VPX200UR1.2503AA1315**	●	3	15	2.250	.500	.485	1.378	0.72°	LOGU09
1.500	**VPX200UR1.5003AA1618**	●	3	18	2.375	.500	.728	1.654	0.57°	LOGU09
1.500	**VPX200UR1.5004AA1624**	●	4	24	2.375	.500	.705	1.654	0.57°	LOGU09
2.000	**VPX200UR2.0004AA1624**	●	4	24	2.375	.750	1.279	1.654	0.41°	LOGU09
2.000	**VPX200UR2.0005AA1630**	●	5	30	2.375	.750	1.257	1.654	0.41°	LOGU09

* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
1.250	**VPX200UR1.2502AA1310**	.500	.630	.276	.433	.313	1.438	.250	.156
1.250	**VPX200UR1.2503AA1315**	.500	.630	.276	.433	.313	1.438	.250	.156
1.500	**VPX200UR1.5003AA1618**	.500	.630	.276	.433	.320	1.438	.250	.156
1.500	**VPX200UR1.5004AA1624**	.500	.630	.276	.433	.320	1.438	.250	.156
2.000	**VPX200UR2.0004AA1624**	.750	.748	.413	.630	.438	1.750	.313	.187
2.000	**VPX200UR2.0005AA1630**	.750	.748	.413	.630	.438	1.750	.313	.187

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F2 = 8.9

ISO13399	➢ K003
CUTTING CONDITIONS	➢ K205
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

Fig.1

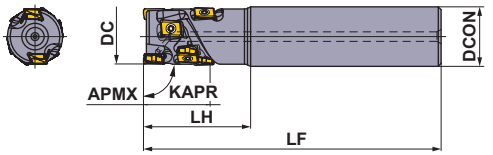
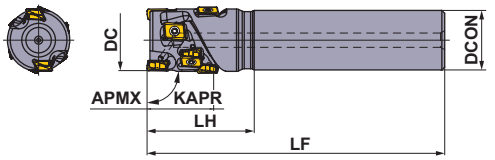


Fig.2



Right hand tool holder only.

Metric Standard

■SHANK TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Total	DCON	LF	LH	APMX	RMPX	WT (kg)	Fig.	Insert Type
20	**VPX200R202SA20S01404**	★	2	4	20	100	30	14	1.35°	0.21	1	LOGU09
22	**VPX200R222SA20S01404**	★	2	4	20	115	30	14	1.16°	0.26	2	LOGU09
25	**VPX200R252SA25S02106**	★	2	6	25	115	35	21	0.97°	0.39	1	LOGU09
25	**VPX200R252SA25S02808**	★	2	8	25	125	45	28	0.97°	0.41	1	LOGU09
28	**VPX200R282SA25S02106**	★	2	6	25	115	35	21	0.84°	0.40	2	LOGU09
28	**VPX200R282SA25S02808**	★	2	8	25	125	45	28	0.84°	0.43	2	LOGU09
32	**VPX200R322SA32S02808**	★	2	8	32	125	45	28	0.71°	0.68	1	LOGU09
32	**VPX200R323SA32S02812**	★	3	12	32	125	45	28	0.71°	0.67	1	LOGU09
32	**VPX200R322SA32S03510**	★	2	10	32	130	50	35	0.71°	0.70	1	LOGU09
32	**VPX200R323SA32S03515**	★	3	15	32	130	50	35	0.71°	0.68	1	LOGU09
35	**VPX200R352SA32S02808**	★	2	8	32	125	45	28	0.63°	0.72	2	LOGU09
35	**VPX200R353SA32S02812**	★	3	12	32	125	45	28	0.63°	0.71	2	LOGU09
35	**VPX200R352SA32S03510**	★	2	10	32	130	50	35	0.63°	0.74	2	LOGU09
35	**VPX200R353SA32S03515**	★	3	15	32	130	50	35	0.63°	0.73	2	LOGU09
40	**VPX200R403SA32S03515**	★	3	15	32	130	50	35	0.54°	0.81	2	LOGU09
40	**VPX200R404SA32S03520**	★	4	20	32	130	50	35	0.54°	0.80	2	LOGU09
40	**VPX200R403SA32S04218**	★	3	18	32	140	60	42	0.54°	0.88	2	LOGU09
40	**VPX200R404SA32S04224**	★	4	24	32	140	60	42	0.54°	0.86	2	LOGU09

SPARE PARTS

(mm)

DC	Tool Holder Type	*		
		Clamp Screw	Wrench	Anti-seize Lubricant
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F1 = 8.9,TPS27F2 = 8.9

Fig.1

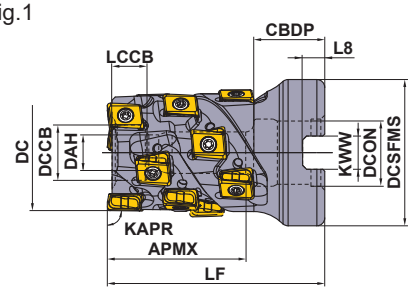
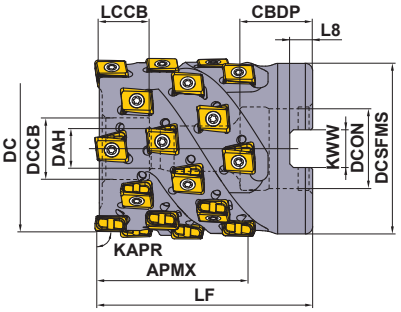
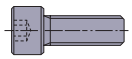


Fig.2



Right hand tool holder only.

DC	APMX	Set Bolt	Geometry
ϕ32	35	HSC08045	
ϕ40	42	HSC08050	
ϕ50	42	HSC10045	

Metric Standard

■SHELL TYPE

DCON = mm size, With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Total	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type *
32	**VPX200-032A02A035R10**	★	2	10	55	16	0.22	35	0.71°	1	LOGU09
32	**VPX200-032A03A035R15**	★	3	15	55	16	0.20	35	0.71°	1	LOGU09
40	**VPX200-040A03A042R18**	★	3	18	60	16	0.34	42	0.54°	2	LOGU09
40	**VPX200-040A04A042R24**	★	4	24	60	16	0.33	42	0.54°	2	LOGU09
50	**VPX200-050A04A042R24**	★	4	24	60	22	0.55	42	0.42°	2	LOGU09
50	**VPX200-050A05A042R30**	★	5	30	60	22	0.54	42	0.42°	2	LOGU09

* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A02A035R10**	16	18	9	14	8	37	8.4	5.6
32	**VPX200-032A03A035R15**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A03A042R18**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A04A042R24**	16	18	9	14	8	37	8.4	5.6
50	**VPX200-050A04A042R24**	22	20	11	17	13	47	10.4	6.3
50	**VPX200-050A05A042R30**	22	20	11	17	13	47	10.4	6.3

SPARE PARTS

Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F2 = 8.9

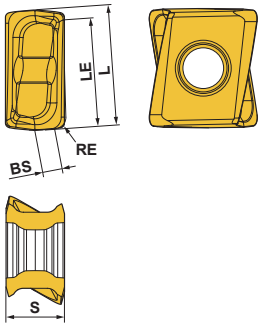
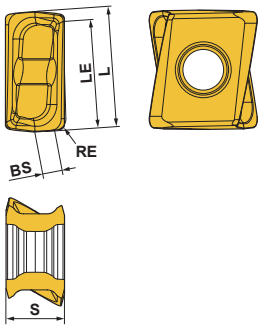
ISO13399	➢ K003
CUTTING CONDITIONS	➢ K205
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape	Order Number	Class	Edge Preparation	Coated							Carbide		Dimensions(inch)					Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF		TF15	L	RE	LE	S	BS	
Low Cutting Resistance Type **L Breaker**	**LOGU0904020PNER-L**	G	E	●	●	●	●	●	●	●			.343	.008	.299	.169	.067	
	LOGU0904040PNER-L	G	E	●	●	●	●	●	●	●			.343	.016	.299	.169	.063	
	LOGU0904080PNER-L	G	E	●	●	●	●	●	●	●			.343	.031	.299	.169	.047	
	LOGU0904100PNER-L	G	E	●	●	●	●	●	●	●			.343	.039	.299	.169	.039	
	LOGU0904120PNER-L	G	E	●	●	●	●	●	●	●			.343	.047	.299	.169	.035	
	LOGU0904160PNER-L	G	E	●	●	●	●	●	●	●			.343	.063	.299	.169	.020	
	LOGU0904020PNFR-L	G	F									●	.343	.008	.299	.169	.067	
	LOGU0904040PNFR-L	G	F									●	.343	.016	.299	.169	.063	
	LOGU0904080PNFR-L	G	F									●	.343	.031	.299	.169	.047	
	LOGU0904100PNFR-L	G	F									●	.343	.039	.299	.169	.039	
	LOGU0904120PNFR-L	G	F									●	.343	.047	.299	.169	.035	
	LOGU0904160PNFR-L	G	F									●	.343	.063	.299	.169	.020	Right hand insert only.
General Use **M Breaker**	**LOGU0904020PNER-M**	G	E	●	●	●	●	●	●	●			.343	.008	.299	.169	.067	
	LOGU0904040PNER-M	G	E	●	●	●	●	●	●	●			.343	.016	.299	.169	.063	
	LOGU0904080PNER-M	G	E	●	●	●	●	●	●	●			.343	.031	.299	.169	.047	
	LOGU0904100PNER-M	G	E	●	●	●	●	●	●	●			.343	.039	.299	.169	.039	
	LOGU0904120PNER-M	G	E	●	●	●	●	●	●	●			.343	.047	.299	.169	.035	
	LOGU0904160PNER-M	G	E	●	●	●	●	●	●	●			.343	.063	.299	.169	.020	
	LOGU0904020PNFR-M	G	F									●	.343	.008	.299	.169	.067	
	LOGU0904040PNFR-M	G	F									●	.343	.016	.299	.169	.063	
	LOGU0904080PNFR-M	G	F									●	.343	.031	.299	.169	.047	
	LOGU0904100PNFR-M	G	F									●	.343	.039	.299	.169	.039	
	LOGU0904120PNFR-M	G	F									●	.343	.047	.299	.169	.035	
	LOGU0904160PNFR-M	G	F									●	.343	.063	.299	.169	.020	Right hand insert only.

● : USA Stock
<10 inserts in one case>

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX300

P M K N S H

Fig.1

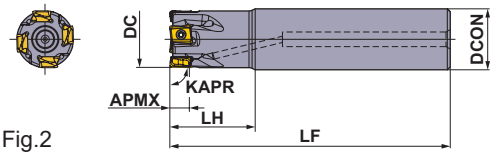


Fig.2

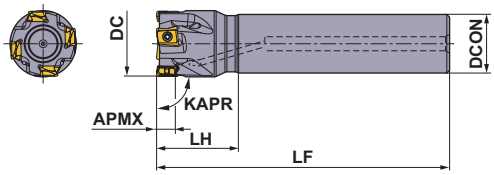


Fig.3

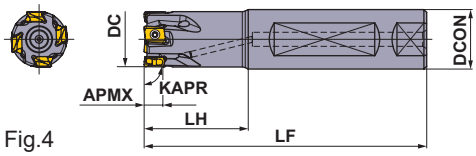
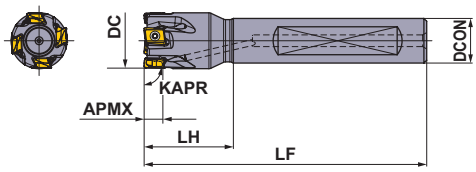


Fig.4



■SHANK TYPE

With Air / coolant through.

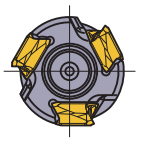
Right hand tool holder only.

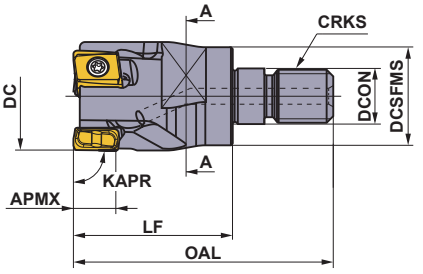
(inch)

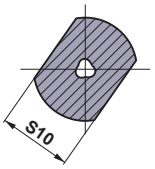
DC	Order Number	Stock R	Number of Teeth	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (lbs)	Fig.	Insert Type
1.000	**VPX300UR1602FA16S**	●	2	1.000	4.750	1.750	.433	2.07°	23900	.8	3	LOGU12
1.000	**VPX300UR1602SA16S**	●	2	1.000	4.750	1.750	.433	2.07°	23900	.9	1	LOGU12
1.000	**VPX300UR1602SA16L**	●	2	1.000	8.500	2.500	.433	2.07°	23900	1.7	1	LOGU12
1.125	**VPX300UR1802SA16L**	●	2	1.000	8.500	1.750	.433	1.73°	22200	1.9	2	LOGU12
1.250	**VPX300UR2002FA16S**	●	2	1.000	5.125	1.750	.433	1.49°	20700	1.1	4	LOGU12
1.250	**VPX300UR2002SA16S**	●	2	1.000	5.125	1.750	.433	1.49°	20700	1.1	2	LOGU12
1.250	**VPX300UR2003FA16S**	●	3	1.000	5.125	1.750	.433	1.49°	20700	1.1	4	LOGU12
1.250	**VPX300UR2003SA16S**	●	3	1.000	5.125	1.750	.433	1.49°	20700	1.1	2	LOGU12
1.250	**VPX300UR2003SA16L**	●	3	1.000	9.000	1.750	.433	1.49°	20700	1.9	2	LOGU12
1.250	**VPX300UR2002FA20S**	●	2	1.250	5.125	2.000	.433	1.49°	20700	1.5	3	LOGU12
1.250	**VPX300UR2002SA20S**	●	2	1.250	5.125	2.000	.433	1.49°	20700	1.5	1	LOGU12
1.250	**VPX300UR2003FA20S**	●	3	1.250	5.125	2.000	.433	1.49°	20700	1.5	3	LOGU12
1.250	**VPX300UR2003SA20S**	●	3	1.250	5.125	2.000	.433	1.49°	20700	1.5	1	LOGU12
1.250	**VPX300UR2003SA20L**	●	3	1.250	9.000	3.000	.433	1.49°	20700	2.8	1	LOGU12
1.500	**VPX300UR2402FA20S**	●	2	1.250	5.125	2.000	.433	1.13°	18500	1.7	4	LOGU12
1.500	**VPX300UR2402SA20S**	●	2	1.250	5.125	2.000	.433	1.13°	18500	1.7	2	LOGU12
1.500	**VPX300UR2403FA20S**	●	3	1.250	5.125	2.000	.433	1.13°	18500	1.7	4	LOGU12
1.500	**VPX300UR2403SA20S**	●	3	1.250	5.125	2.000	.433	1.13°	18500	1.7	2	LOGU12
1.500	**VPX300UR2403SA20L**	●	3	1.250	9.000	2.000	.433	1.13°	18500	3.0	2	LOGU12

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

ISO13399 ➤ K003
INSERTS ➤ K203
CUTTING CONDITIONS ➤ K205
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001







A-A Section

Right hand tool holder only.

■ SCREW-IN TYPE

With Air / coolant through.

(inch)

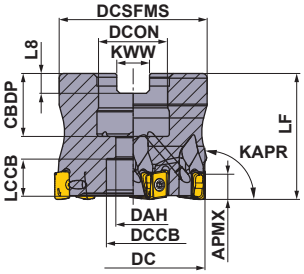
DC	Order Number	Stock R	Number of Teeth	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (lbs)	APMX	RMPX	Insert Type
1.000	**VPX300UR1602AM1235**	●	2	.492	.925	2.244	1.378	.748	M12	.2	.433	2.07°	LOGU12
1.125	**VPX300UR1802AM1235**	●	2	.492	.925	2.244	1.378	.748	M12	.3	.433	1.73°	LOGU12
1.250	**VPX300UR2002AM1640**	●	2	.669	1.122	2.480	1.575	.945	M16	.4	.433	1.49°	LOGU12
1.250	**VPX300UR2003AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.4	.433	1.49°	LOGU12
1.375	**VPX300UR2202AM1640**	●	2	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.28°	LOGU12
1.375	**VPX300UR2203AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.28°	LOGU12
1.500	**VPX300UR2403AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.13°	LOGU12
1.500	**VPX300UR2404AM1640**	●	4	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.13°	LOGU12

Note 1) For screw-in type arbors, refer to page K382.

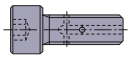
SPARE PARTS

Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6



Right hand tool holder only.

DCON	Set Bolt	Geometry
ϕ.500"	HSCU25011H	
ϕ.750"	HSCU37513H	
ϕ1.000"	HSCU50014H	
		With Air / coolant through.

■ARBOR TYPE

With Air / coolant through.

DC=inch size, DCON=Inch size

(inch)

DC	Order Number	Stock R	Number of Teeth	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})	Insert Type
1.500	**VPX300UR1.5003SA**	●	3	1.750	.500	.240	.433	1.13°	18500	LOGU12
1.500	**VPX300UR1.5004SA**	●	4	1.750	.500	.240	.433	1.13°	18500	LOGU12
2.000	**VPX300UR2.0004AA**	●	4	1.750	.750	.400	.433	.78°	15400	LOGU12
2.000	**VPX300UR2.0006AA**	●	6	1.750	.750	.390	.433	.78°	15400	LOGU12
2.500	**VPX300UR2.5006CA**	●	6	2.000	1.000	.700	.433	.59°	13400	LOGU12
2.500	**VPX300UR2.5008CA**	●	8	2.000	1.000	.720	.433	.59°	13400	LOGU12
3.000	**VPX300UR3.0007CA**	●	7	2.000	1.000	.940	.433	.48°	11900	LOGU12
3.000	**VPX300UR3.0010CA**	●	10	2.000	1.000	.950	.433	.48°	11900	LOGU12

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
1.500	**VPX300UR1.5003SA**	.500	.630	.276	.433	.663	1.438	.250	.156
1.500	**VPX300UR1.5004SA**	.500	.630	.276	.433	.663	1.438	.250	.156
2.000	**VPX300UR2.0004AA**	.750	.748	.413	.630	.545	1.750	.313	.187
2.000	**VPX300UR2.0006AA**	.750	.748	.413	.630	.545	1.750	.313	.187
2.500	**VPX300UR2.5006CA**	1.000	.945	.539	.787	.677	2.188	.375	.219
2.500	**VPX300UR2.5008CA**	1.000	.945	.539	.787	.677	2.188	.375	.219
3.000	**VPX300UR3.0007CA**	1.000	.945	.539	.787	.677	2.188	.375	.219
3.000	**VPX300UR3.0010CA**	1.000	.945	.539	.787	.677	2.188	.375	.219

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

ISO13399	➢ K003	SCREW-IN HOLDERS	➢ K382
INSERTS	➢ K203	SPARE PARTS	➢ M001
CUTTING CONDITIONS	➢ K205	TECHNICAL DATA	➢ N001

Fig.1

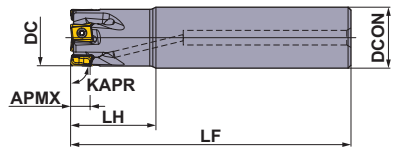
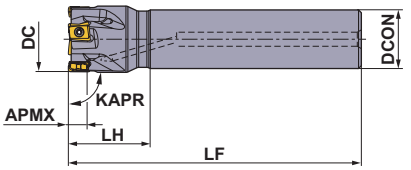


Fig.2



Right hand tool holder only.

Metric Standard

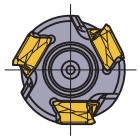
■SHANK TYPE

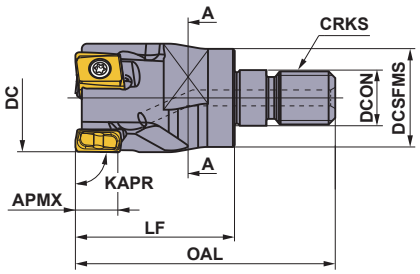
With Air / coolant through.

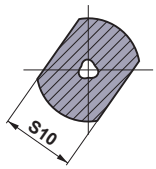
(mm)

DC	Order Number	Stock R	Number of Teeth	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (kg)	Fig.	Insert Type
25	**VPX300R2502SA25S**	★	2	25	115	35	11	2.13°	24100	0.38	1	LOGU12
25	**VPX300R2502SA25L**	★	2	25	170	70	11	2.13°	24100	0.56	1	LOGU12
28	**VPX300R2802SA25S**	★	2	25	115	35	11	1.77°	22500	0.40	2	LOGU12
28	**VPX300R2802SA25L**	★	2	25	170	35	11	1.77°	22500	0.60	2	LOGU12
30	**VPX300R3002SA25S**	★	2	25	125	35	11	1.61°	21500	0.45	2	LOGU12
30	**VPX300R3003SA25S**	★	3	25	125	35	11	1.61°	21500	0.44	2	LOGU12
32	**VPX300R3202SA32S**	★	2	32	125	45	11	1.47°	20600	0.69	1	LOGU12
32	**VPX300R3203SA32S**	★	3	32	125	45	11	1.47°	20600	0.68	1	LOGU12
32	**VPX300R3203SA32L**	★	3	32	190	90	11	1.47°	20600	1.04	1	LOGU12
35	**VPX300R3503SA32L**	★	3	32	190	45	11	1.28°	19500	1.10	2	LOGU12
40	**VPX300R4003SA32S**	★	3	32	125	45	11	1.06°	17900	0.76	2	LOGU12
40	**VPX300R4004SA32S**	★	4	32	125	45	11	1.06°	17900	0.76	2	LOGU12
50	**VPX300R5004SA32S**	★	4	32	125	45	11	0.79°	15500	0.89	2	LOGU12
50	**VPX300R5006SA32S**	★	6	32	125	45	11	0.79°	15500	0.88	2	LOGU12

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.







A-A Section

Metric Standard

Right hand tool holder only.

■ SCREW-IN TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX	RMPX	Insert Type
25	**VPX300R2502AM1235**	★	2	12.5	23.5	57	35	19	M12	0.10	11	2.13°	LOGU12
28	**VPX300R2802AM1235**	★	2	12.5	23.5	57	35	19	M12	0.12	11	1.77°	LOGU12
32	**VPX300R3202AM1640**	★	2	17.0	28.5	63	40	24	M16	0.20	11	1.47°	LOGU12
32	**VPX300R3203AM1640**	★	3	17.0	28.5	63	40	24	M16	0.19	11	1.47°	LOGU12
35	**VPX300R3502AM1640**	★	2	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
35	**VPX300R3503AM1640**	★	3	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
40	**VPX300R4003AM1640**	★	3	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12
40	**VPX300R4004AM1640**	★	4	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12

Note 1) For screw-in type arbors, refer to page K382.

SPARE PARTS

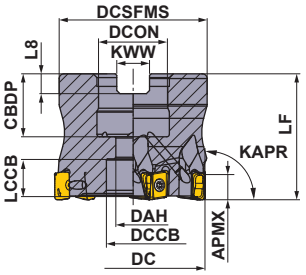
Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

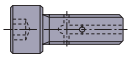
ISO13399	➢ K003	SCREW-IN HOLDERS	➢ K382
INSERTS	➢ K203	SPARE PARTS	➢ M001
CUTTING CONDITIONS	➢ K205	TECHNICAL DATA	➢ N001

Metric Standard

For Metric Arbors



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	
ϕ80	HSC12035H	
		With Air / coolant through.

■ARBOR TYPE

With Air / coolant through.

DC=mm size, DCON=mm size, DCON=Inch size

(mm)

DC	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Insert Type
40	**VPX300-040A03AR**	★	3	40	16.0	0.21	11	1.06°	17900	LOGU12
40	**VPX300-040A04AR**	★	4	40	16.0	0.21	11	1.06°	17900	LOGU12
50	**VPX300-050A04AR**	★	4	40	22.0	0.34	11	0.79°	15500	LOGU12
50	**VPX300-050A06AR**	★	6	40	22.0	0.33	11	0.79°	15500	LOGU12
63	**VPX300-063A06AR**	★	6	40	22.0	0.61	11	0.60°	13400	LOGU12
63	**VPX300-063A08AR**	★	8	40	22.0	0.62	11	0.60°	13400	LOGU12
80	**VPX300R08007CA**	★	7	50	25.4[1.0"]	1.00	11	0.45°	11500	LOGU12
80	**VPX300R08010CA**	★	10	50	25.4[1.0"]	1.00	11	0.45°	11500	LOGU12
80	**VPX300-080A07AR**	★	7	50	27.0	0.99	11	0.45°	11500	LOGU12
80	**VPX300-080A10AR**	★	10	50	27.0	0.99	11	0.45°	11500	LOGU12

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**VPX300-040A03AR**	16.0	18	9	14	12.4	37	8.4	5.6
40	**VPX300-040A04AR**	16.0	18	9	14	12.4	37	8.4	5.6
50	**VPX300-050A04AR**	22.0	20	11	17	10.4	47	10.4	6.3
50	**VPX300-050A06AR**	22.0	20	11	17	10.4	47	10.4	6.3
63	**VPX300-063A06AR**	22.0	20	11	17	10.4	60	10.4	6.3
63	**VPX300-063A08AR**	22.0	20	11	17	10.4	60	10.4	6.3
80	**VPX300R08007CA**	25.4[1.0"]	26	13	20	13.4	56	9.5	6.0
80	**VPX300R08010CA**	25.4[1.0"]	26	13	20	13.4	56	9.5	6.0
80	**VPX300-080A07AR**	27.0	23	13	20	13.4	56	12.4	7.0
80	**VPX300-080A10AR**	27.0	23	13	20	13.4	56	12.4	7.0

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

● : USA Stock ★ : Stocked in Japan

INSERTS ➢ K203

DEEP SHOULDER MILLING

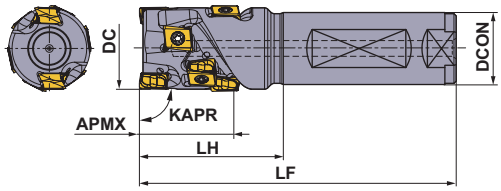
90° KAPR

VPX300

NEW

LONG CUTTING EDGE

P M K N S H



Right hand tool holder only.

■SHANK TYPE

With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Total	DCON	LF	LH	APMX	RMPX	WT (lbs)	Insert Type *
1.500	**VPX300UR242FA20S0804**	●	2	4	1.250	5.000	1.750	.827	1.13°	1.609	LOGU12
1.500	**VPX300UR242FA20S1206**	●	2	6	1.250	5.250	2.000	1.220	1.13°	1.653	LOGU12
1.500	**VPX300UR242FA20S1608**	●	2	8	1.250	5.500	2.500	1.654	1.13°	1.698	LOGU12

* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

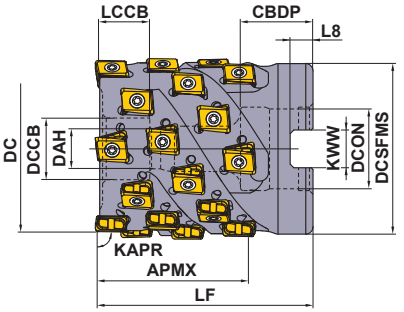
SPARE PARTS

(inch)

DC	Tool Holder Type	*		
		Clamp Screw	Wrench	Anti-seize Lubricant
1.500	**VPX200UR24**	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

ISO13399 ➤ K003
CUTTING CONDITIONS ➤ K205
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Right hand tool holder only.

Order Number	APMX	Set Bolt	Geometry
VPX300UR1.5002AA1206	1.220	HSCUF25015	
VPX300UR1.5002AA1608	1.654	HSCUF25020	
VPX300UR2.0003AA1209	1.220	HSCUF37518	
VPX300UR2.0003AA1612	1.654	HSCUF37520	
VPX300UR2.0003AA2015	2.047	HSCUF37525	
VPX300UR2.5004AA1616	1.654	HSCUF50020	
VPX300UR2.5004AA2020	2.047	HSCUF50023	
VPX300UR3.0005AA2025	2.047	HSCUF62525	
VPX300UR3.0005AA2835	2.874	HSCUF62530	

■SHELL TYPE

DCON=inch size, With Air / coolant through.

(inch)

DC	Order Number	Stock R	Number of Teeth	Total	LF	DCON	WT (lbs)	APMX	RMPX	Insert Type *
1.500	**VPX300UR1.5002AA1206**	●	2	6	2.000	.500	.573	1.220	1.13°	LOGU12
1.500	**VPX300UR1.5002AA1608**	●	2	8	2.375	.500	.661	1.654	1.13°	LOGU12
2.000	**VPX300UR2.0003AA1209**	●	3	9	2.250	.750	1.146	1.220	0.78°	LOGU12
2.000	**VPX300UR2.0003AA1612**	●	3	12	2.500	.750	1.213	1.654	0.78°	LOGU12
2.000	**VPX300UR2.0003AA2015**	●	3	15	3.000	.750	1.477	2.047	0.78°	LOGU12
2.500	**VPX300UR2.5004AA1616**	●	4	16	2.750	1.000	2.337	1.654	0.59°	LOGU12
2.500	**VPX300UR2.5004AA2020**	●	4	20	3.000	1.000	2.513	2.047	0.59°	LOGU12
3.000	**VPX300UR3.0005AA2025**	●	5	25	3.250	1.250	4.034	2.047	0.48°	LOGU12
3.000	**VPX300UR3.0005AA2835**	●	5	35	3.750	1.250	4.497	2.874	0.48°	LOGU12

* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

MOUNTING DIMENSIONS

(inch)

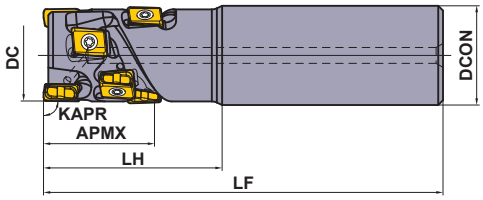
DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
1.500	**VPX300UR1.5002AA1206**	.500	.630	.276	.433	.362	1.438	.250	.156
1.500	**VPX300UR1.5002AA1608**	.500	.630	.276	.433	.344	1.438	.250	.156
2.000	**VPX300UR2.0003AA1209**	.750	.748	.413	.630	.455	1.750	.313	.187
2.000	**VPX300UR2.0003AA1612**	.750	.748	.413	.630	.469	1.750	.313	.187
2.000	**VPX300UR2.0003AA2015**	.750	.748	.413	.630	.457	1.750	.313	.187
2.500	**VPX300UR2.5004AA1616**	1.000	.945	.539	.787	.600	2.375	.375	.219
2.500	**VPX300UR2.5004AA2020**	1.000	.945	.539	.787	.614	2.375	.375	.219
3.000	**VPX300UR3.0005AA2025**	1.250	1.260	.669	1.024	.707	2.875	.500	.281
3.000	**VPX300UR3.0005AA2835**	1.250	1.260	.669	1.024	.695	2.875	.500	.281

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

● : USA Stock ★ : Stocked in Japan



Right hand tool holder only.

Metric Standard

■SHANK TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Total	DCON	LF	LH	APMX	RMPX	WT (kg)	Insert Type *
40	**VPX300R402SA32S02104**	★	2	4	32	125	45	21	1.06°	0.78	LOGU12
40	**VPX300R402SA32S03106**	★	2	6	32	130	50	31	1.06°	0.79	LOGU12
40	**VPX300R402SA32S04208**	★	2	8	32	140	60	42	1.06°	0.84	LOGU12

* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

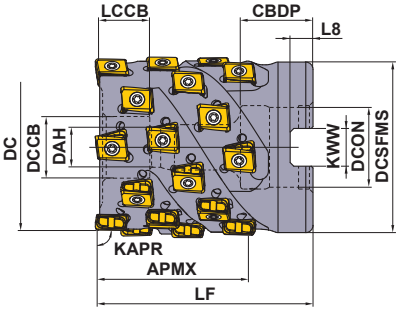
SPARE PARTS

(mm)

DC	Tool Holder Type	*		
		Clamp Screw	Wrench	Anti-seize Lubricant
40	**VPX300R40**	TPS40F1	TIP15W	MK1KS

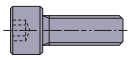
* Clamp Torque (lbf-in) : TPS40F1 = 31.0

ISO13399 ➤ K003
CUTTING CONDITIONS ➤ K205
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Metric Standard

Right hand tool holder only.

Order Number	APMX	Set Bolt	Geometry
VPX300-040A02A031	31	HSC08040	
VPX300-040A02A042	42	HSC08050	
VPX300-050A03A031	31	HSC10040	
VPX300-050A03A042	42	HSC10050	
VPX300-050A03A052	52	HSC10060	
VPX300-063A04A042	42	HSC12050	
VPX300-063A04A052	52	HSC12060	
VPX300-080A05A052	52	HSC12060	
VPX300-080A05A063	63	HSC12070	
VPX300R08005CA052	52	HSC16055	
VPX300R08005CA063	63	HSC16065	

■SHELL TYPE

DCON=mm size, With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Total	LF	DCON	WT (kg)	APMX	RMPX	Insert Type *
40	**VPX300-040A02A031R06**	★	2	6	50	16	0.26	31	1.06°	LOGU12
40	**VPX300-040A02A042R08**	★	2	8	60	16	0.31	42	1.06°	LOGU12
50	**VPX300-050A03A031R09**	★	3	9	55	22	0.47	31	0.79°	LOGU12
50	**VPX300-050A03A042R12**	★	3	12	65	22	0.55	42	0.79°	LOGU12
50	**VPX300-050A03A052R15**	★	3	15	75	22	0.63	52	0.79°	LOGU12
63	**VPX300-063A04A042R16**	★	4	16	65	27	0.92	42	0.6°	LOGU12
63	**VPX300-063A04A052R20**	★	4	20	75	27	1.06	52	0.6°	LOGU12
80	**VPX300-080A05A052R25**	★	5	25	75	27	1.94	52	0.45°	LOGU12
80	**VPX300-080A05A063R30**	★	5	30	85	27	2.20	63	0.45°	LOGU12

DCON=inch size, With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Teeth	Total	LF	DCON	WT (kg)	APMX	RMPX	Insert Type *
80	**VPX300R08005CA05225**	★	5	25	75	31.75	1.81	52	0.45°	LOGU12
80	**VPX300R08005CA06330**	★	5	30	85	31.75	2.06	63	0.45°	LOGU12

* Corner radius RE .031" is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008" and .016" can also be used for the peripheral cutting edges.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**VPX300-040A02A031R06**	16	18	9	14	8.4	37	8.4	5.6
40	**VPX300-040A02A042R08**	16	18	9	14	8.4	37	8.4	5.6
50	**VPX300-050A03A031R09**	22	20	11	17	12.4	47	10.4	6.3
50	**VPX300-050A03A042R12**	22	20	11	17	12.4	47	10.4	6.3
50	**VPX300-050A03A052R15**	22	20	11	17	12.4	47	10.4	6.3
63	**VPX300-063A04A042R16**	27	23	13	20	12.4	76	12.4	7.0
63	**VPX300-063A04A052R20**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300-080A05A052R25**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300-080A05A063R30**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300R08005CA05225**	31.75	32	17	26	17.4	76	12.7	8.0
80	**VPX300R08005CA06330**	31.75	32	17	26	17.4	76	12.7	8.0

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

■ INSERTS

(inch)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated							Carbide		L	RE	LE	S	BS	Geometry
				MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF		TF15						
Low Cutting Resistance L Breaker	**LOGU1207020PNER-L**	G	E	●	●	●	★	★	★	★			.488	.008	.445	.276	.118	
	LOGU1207040PNER-L	G	E	●	●	●	●	●	★	●			.488	.016	.445	.276	.110	
	LOGU1207080PNER-L	G	E	●	●	●	●	●	●	●			.488	.031	.445	.276	.102	
	LOGU1207100PNER-L	G	E	●	★	★	★	★	★	★			.488	.039	.445	.276	.098	
	LOGU1207120PNER-L	G	E	●	●	★	★	★	★	★			.488	.047	.445	.276	.094	
	LOGU1207160PNER-L	G	E	●	●	●	●	●	●	●			.488	.063	.445	.276	.071	
	LOGU1207200PNER-L	G	E	●	★	★	★	★	★	★			.488	.079	.445	.276	.055	
	LOGU1207240PNER-L	G	E	●	★	★	★	★	★	★			.488	.094	.445	.276	.047	
	LOGU1207300PNER-L	G	E	●	★	★	★	★	★	★			.488	.118	.445	.276	.024	
	LOGU1207320PNER-L	G	E	●	●	●	★	★	★	★			.488	.126	.445	.276	.016	
	LOGU1207020PNFR-L	G	F									★	.488	.008	.445	.276	.118	
	LOGU1207040PNFR-L	G	F									●	.488	.016	.445	.276	.110	
	LOGU1207080PNFR-L	G	F									●	.488	.031	.445	.276	.102	
	LOGU1207100PNFR-L	G	F									★	.488	.039	.445	.276	.098	
	LOGU1207120PNFR-L	G	F									★	.488	.047	.445	.276	.094	
	LOGU1207160PNFR-L	G	F									●	.488	.063	.445	.276	.071	
	LOGU1207200PNFR-L	G	F									★	.488	.079	.445	.276	.055	
	LOGU1207240PNFR-L	G	F									★	.488	.094	.445	.276	.047	
	LOGU1207300PNFR-L	G	F									★	.488	.118	.445	.276	.024	
	LOGU1207320PNFR-L	G	F									★	.488	.126	.445	.276	.016	Right hand insert only.
General Use M Breaker	**LOGU1207020PNER-M**	G	E	●	●	●	●	●	●	●			.488	.008	.445	.276	.118	
	LOGU1207040PNER-M	G	E	●	●	●	●	●	●	●			.488	.016	.445	.276	.110	
	LOGU1207080PNER-M	G	E	●	●	●	●	●	●	●			.488	.031	.445	.276	.094	
	LOGU1207100PNER-M	G	E	●	●	●	●	●	●	●			.488	.039	.445	.276	.091	
	LOGU1207120PNER-M	G	E	●	●	●	●	●	●	●			.488	.047	.445	.276	.083	
	LOGU1207160PNER-M	G	E	●	●	●	●	●	●	●			.488	.063	.445	.276	.067	
	LOGU1207200PNER-M	G	E	●	●	●	●	●	●	●			.488	.079	.445	.276	.055	
	LOGU1207240PNER-M	G	E	●	●	●	●	●	●	●			.488	.094	.445	.276	.039	
	LOGU1207300PNER-M	G	E	●	●	●	●	●	●	●			.488	.118	.445	.276	.020	
	LOGU1207320PNER-M	G	E	●	●	●	●	●	●	●			.488	.126	.445	.276	.012	
	LOGU1207020PNFR-M	G	F									●	.488	.008	.445	.276	.118	
	LOGU1207040PNFR-M	G	F									●	.488	.016	.445	.276	.110	
	LOGU1207080PNFR-M	G	F									●	.488	.031	.445	.276	.094	
	LOGU1207100PNFR-M	G	F									●	.488	.039	.445	.276	.091	
	LOGU1207120PNFR-M	G	F									●	.488	.047	.445	.276	.083	
	LOGU1207160PNFR-M	G	F									●	.488	.063	.445	.276	.067	
	LOGU1207200PNFR-M	G	F									●	.488	.079	.445	.276	.055	
	LOGU1207240PNFR-M	G	F									●	.488	.094	.445	.276	.039	
	LOGU1207300PNFR-M	G	F									●	.488	.118	.445	.276	.020	
	LOGU1207320PNFR-M	G	F									●	.488	.126	.445	.276	.012	Right hand insert only.

VPX200

CHIP BREAKER RECOMMENDATION

■ Chip Breaker Selection Table

Workpiece Material		Properties	Cutting Conditions	Chip Breaker		Grade	
				1st Recommended	2nd Recommended	1st Recommended	2nd Recommended
P	Mild Steel	Hardness ≤180HB	● ◐	L	M	MP6120	VP15TF
			✣	M	L	MP6130	–
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180-350HB ≤350HB (Annealing)	●	L	M	MP6120	VP15TF
			◐	M	L	MP6120	VP15TF
			✣	M	L	MP6130	–
	Pre-hardened Steel	Hardness 35—45HRC	● ◐	M	L	MP6120	VP15TF
			✣	M	L	MP6130	–
M	Austenitic Stainless Steel	Hardness ≤280HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	–
		Hardness >200HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	–
	Duplex Stainless Steel	Hardness ≤280HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	–
	Ferritic and Martensitic Stainless Steel	–	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	–
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ◐	L	M	MP7130	VP15TF
			✣	M	L	MP7130	–
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◐	M	L	MC5020	VP15TF
			✣	M	L	VP15TF	–
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◐	M	L	MC5020	VP15TF
			✣	M	L	VP15TF	–
N	Aluminum Alloys	Content Si<5%	● ◐	L	M	TF15	–
			✣	M	L	TF15	–
S	Titanium Alloys (Ti-6Al-4V,etc.)	–	● ◐	L	M	MP9120	VP15TF
			✣	M	L	MP9130	–
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	–	● ◐	L	M	MP9120	VP15TF
			✣	M	L	MP9130	–
	Heat Resistant Alloys	–	● ◐	M	L	MP9120	VP15TF
			✣	M	L	MP9130	–
H	Hardened Steel	Hardness 40—55HRC	● ◐ ✣	M	–	VP15TF	–

VPX200/VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
					Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ◔	MP6120,VP15TF	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			✲	MP6130	655 (490—785)	620 (460—755)	490 (360—590)	490 (360—590)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ◔	MP6120,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			✲	MP6130	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	MP6120,VP15TF	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✲	MP6130	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◔ ✲	MP7130,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
		Hardness >200HB	● ◔ ✲	MP7130,VP15TF	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
	Duplex Stainless Steel	Hardness ≤280HB	● ◔ ✲	MP7130,VP15TF	460 (360—560)	425 (295—490)	330 (230—395)	330 (230—395)
	Ferritic and Martensitic Stainless Steel	—	● ◔ ✲	MP7130,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ◔ ✲	MP7130,VP15TF	425 (330—525)	395 (260—460)	295 (195—360)	295 (195—360)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	820 (655—985)	785 (620—950)	690 (525—850)	690 (525—850)
			● ◔ ✲	VP15TF	655 (490—820)	620 (460—785)	525 (360—690)	525 (360—690)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◔	MC5020	590 (490—655)	560 (460—620)	490 (395—560)	490 (395—560)
			● ◔ ✲	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
N	Aluminum Alloys	Content Si<5%	● ◔ ✲	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
H	Hardened Steel	Hardness 40—55HRC	● ◔ ✲	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16 mm-ø18 mm) Depth of Cut **ap**	ø.625-ø.750(ø16 mm-ø18 mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20 mm-ø25 mm) Depth of Cut **ap**	ø.875-ø1.000(ø20 mm-ø25 mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28 mm-ø63 mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28 mm-ø63 mm) Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ● ✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ● ✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ● ✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ● ✲	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ● ✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ● ✲	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ● ✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
M	Austenitic Stainless Steel	—	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ●	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ●	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ●	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ●	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				✲	≤.157	.002—.003	≤.236	.002—.003	≤.236	.002—.003
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16 mm-ø18 mm) Depth of Cut **ap**	ø.625-ø.750(ø16 mm-ø18 mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20 mm-ø25 mm) Depth of Cut **ap**	ø.875-ø1.000(ø20 mm-ø25 mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28 mm-ø63 mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28 mm-ø63 mm) Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.004—.008
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.004—.008
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.003—.004
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐	≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
N	Aluminum Alloys	Content Si< 5%	≤.25DC	● ◐	≤.236	.004—.008	≤.315	.004—.010	≤.315	.004—.010
				✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
			.25—.5DC	● ◐	≤.197	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.5—.75DC	● ◐	≤.157	.003—.005	≤.236	.002—.006	≤.236	.003—.006
				✲	≤.157	.002—.004	≤.236	.002—.006	≤.236	.003—.006
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.006	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.005	≤.157	.003—.005
H	Hardened Steel	Hardness 40—55HRC	≤.25DC	● ◐	≤.157	.003—.006	≤.157	.003—.006	≤.157	.003—.006
				✲	≤.157	.003—.005	≤.157	.003—.005	≤.157	.003—.005
			.25—.5DC	● ◐	≤.118	.003—.005	≤.118	.003—.005	≤.118	.003—.005
				✲	≤.118	.002—.004	≤.118	.003—.004	≤.118	.002—.004
			.5—.75DC	● ◐	≤.079	.002—.004	≤.079	.003—.004	≤.079	.002—.004
				✲	≤.079	.002—.003	≤.079	.002—.003	≤.079	.002—.003
			DC(Slot)	● ◐	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				✲	≤.039	.002—.003	≤.039	.002—.003	≤.039	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
					Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ●	MP6120	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			● ●	VP15TF				
			✤	MP6130				
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ●	MP6120	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ●	VP15TF				
			✤	MP6130				
	Pre-hardened Steel	Hardness 35—45HRC	● ●	MP6120	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			● ●	VP15TF				
			✤	MP6130				
M	Austenitic Stainless Steel	Hardness ≤200HB	● ● ✤	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ●	VP15TF				
		Hardness >200HB	● ● ✤	MP7130	330 (260—425)	295 (230—360)	230 (165—330)	230 (165—330)
			● ●	VP15TF				
	Duplex Stainless Steel	Hardness ≤280HB	● ● ✤	MP7130	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ●	VP15TF				
	Ferritic and Martensitic Stainless Steel	—	● ● ✤	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ●	VP15TF				
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ● ✤	MP7130	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
			● ●	VP15TF				
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ●	MC5020	590 (525—720)	560 (490—690)	490 (425—620)	490 (425—620)
			● ● ✤	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ●	MC5020	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			● ● ✤	VP15TF	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
N	Aluminum Alloys	Content Si<5%	● ● ✤	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ●	MP9120	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			● ●	VP15TF	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			✤	MP9130	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ●	MP9120	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			● ●	VP15TF	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			✤	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
	Heat Resistant Alloys	—	● ●	MP9120	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			● ●	VP15TF	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			✤	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
H	Hardened Steel	Hardness 40—55HRC	● ● ✤	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16 mm-ø18 mm)		ø.875-ø1.000(ø20 mm-ø25 mm)		ø1.125-ø2.500(ø28 mm-ø63 mm)	
					Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ◐ ✣	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◐ ✣	≤.197	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◐ ✣	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◐ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ◐ ✣	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◐ ✣	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◐ ✣	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◐ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◐ ✣	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◐ ✣	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐ ✣	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◐ ✣	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◐ ✣	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐ ✣	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
M	Austenitic Stainless Steel	—	≤.25DC	○ ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✣	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◐	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✣	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✣	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.005
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◐	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✣	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	○ ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✣	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◐	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✣	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◐	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.006
				✣	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	○ ◐	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◐	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				✣	≤.157	.002—.003	≤.236	.002—.003	≤.236	.002—.003
			DC(Slot)	○ ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX200

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16 mm-ø18 mm) Depth of Cut **ap**	ø.625-ø.750(ø16 mm-ø18 mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20 mm-ø25 mm) Depth of Cut **ap**	ø.875-ø1.000(ø20 mm-ø25 mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28 mm-ø63 mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28 mm-ø63 mm) Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.004—.008
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.003—.006	≤.315	.004—.008
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ●	≤.157	.003—.005	≤.236	.002—.004	≤.236	.004—.006
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.004
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ●	≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.002—.004
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
N	Aluminum Alloys	Content Si< 5%	≤.25DC	● ●	≤.236	.004—.008	≤.315	.004—.010	≤.315	.004—.010
				✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
			.25—.5DC	● ●	≤.197	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.5—.75DC	● ●	≤.157	.003—.005	≤.236	.002—.006	≤.236	.003—.006
				✲	≤.157	.002—.004	≤.236	.002—.006	≤.236	.003—.006
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.006	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.005	≤.157	.003—.005
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	≤.25DC	● ● ✲	≤.236	.003—.006	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤.25DC	● ● ✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Heat Resistant Alloys	—	≤.25DC	● ● ✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
H	Hardened Steel	Hardness 40—55HRC	≤.25DC	● ●	≤.157	.003—.006	≤.157	.003—.006	≤.157	.003—.006
				✲	≤.157	.003—.005	≤.157	.003—.005	≤.157	.003—.005
			.25—.5DC	● ●	≤.118	.003—.005	≤.118	.003—.005	≤.118	.003—.005
				✲	≤.118	.002—.004	≤.118	.002—.004	≤.118	.002—.004
			.5—.75DC	● ●	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
				✲	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
			DC(Slot)	● ●	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				✲	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	Insert Chip Breaker	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
						Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ◔	MP6120 VP15TF	M	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			✲	MP6130	M	655 (490—785)	620 (560—850)	490 (360—590)	490 (360—590)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ◔	MP6120 VP15TF	M	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—590)
			✲	MP6130	M	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	MP6120 VP15TF	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✲	MP6130	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◔ ✲	MP7130 VP15TF	M	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
		Hardness >200HB	● ◔ ✲	MP7130 VP15TF	M	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
	Duplex Stainless Steel	Hardness ≤280HB	● ◔ ✲	MP7130 VP15TF	M	460 (360—560)	425 (295—490)	330 (230—395)	330 (230—395)
	Ferritic and Martensitic Stainless Steel	—	● ◔ ✲	MP7130 VP15TF	M	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ◔ ✲	MP7130 VP15TF	M	425 (330—525)	395 (260—460)	295 (195—360)	295 (195—360)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	M	820 (655—985)	785 (620—950)	690 (525—850)	690 (525—850)
			● ◔ ✲	VP15TF	M	655 (490—820)	620 (460—785)	525 (360—690)	525 (360—690)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◔	MC5020	M	590 (490—655)	560 (460—620)	490 (395—560)	490 (395—560)
			● ◔ ✲	VP15TF	M	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
N	Aluminum Alloys	Content Si<5%	● ◔ ✲	TF15	M	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
H	Hardened Steel	Hardness 40—55HRC	● ◔ ✲	VP15TF	M	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Dry Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø1.000 (ø25 mm) Depth of Cut **ap**	ø1.000 (ø25 mm) Feed per Tooth. **fz** (IPT)	ø1.125—ø3.000 (ø28 mm-ø80 mm) Depth of Cut **ap**	ø1.125—ø3.000 (ø28 mm-ø80 mm) Feed per Tooth. **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ● ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ● ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ● ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ● ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ● ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ● ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ● ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ● ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ● ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ● ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ● ✲	≤.197	.002—.004	≤.197	.003—.005
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ● ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ● ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ● ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ● ✲	≤.197	.002—.004	≤.197	.003—.005
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤.433	.004—.006	≤.433	.004—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.005
				✲	≤.433	.003—.005	≤.433	.002—.004
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.002—.004
				✲	≤.315	.002—.003	≤.315	.002—.003
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

(inch)

Workpiece Material		Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø1.000 (ø25 mm) Depth of Cut **ap**	ø1.000 (ø25 mm) Feed per Tooth. **fz** (IPT)	ø1.125—ø3.000 (ø28 mm-ø80 mm) Depth of Cut **ap**	ø1.125—ø3.000 (ø28 mm-ø80 mm) Feed per Tooth. **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.433	.004—.008	≤.433	.004—.012
				✠	≤.433	.003—.006	≤.433	.004—.010
			.25—.5DC	● ◐	≤.433	.003—.006	≤.433	.004—.010
				✠	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◐	≤.315	.003—.005	≤.315	.004—.008
				✠	≤.315	.002—.004	≤.315	.003—.006
			DC(Slot)	● ◐	≤.197	.002—.004	≤.197	.003—.006
				✠	≤.197	.002—.003	≤.197	.003—.005
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	● ◐	≤.433	.004—.008	≤.433	.004—.010
				✠	≤.433	.004—.006	≤.433	.004—.008
			.25—.5DC	● ◐	≤.433	.004—.006	≤.433	.004—.008
				✠	≤.433	.003—.005	≤.433	.004—.006
			.5—.75DC	● ◐	≤.315	.003—.005	≤.315	.004—.006
				✠	≤.315	.003—.005	≤.315	.003—.005
			DC(Slot)	● ◐	≤.197	.002—.004	≤.197	.003—.005
				✠	≤.197	.002—.003	≤.197	.002—.004
N	Aluminum Alloys	Content Si< 5%	≤.25DC	● ◐	≤.433	.004—.010	≤.433	.004—.010
				✠	≤.433	.004—.008	≤.433	.004—.008
			.25—.5DC	● ◐	≤.433	.004—.008	≤.433	.004—.008
				✠	≤.433	.004—.006	≤.433	.004—.006
			.5—.75DC	● ◐	≤.315	.002—.006	≤.315	.003—.006
				✠	≤.315	.002—.006	≤.315	.003—.006
			DC(Slot)	● ◐	≤.197	.002—.006	≤.197	.003—.006
				✠	≤.197	.002—.006	≤.197	.003—.005
H	Hardened Steel	Hardness 40—55HRC	≤.25DC	● ◐	≤.197	.003—.006	≤.197	.003—.006
				✠	≤.197	.003—.005	≤.197	.003—.005
			.25—.5DC	● ◐	≤.157	.003—.005	≤.157	.003—.005
				✠	≤.157	.002—.004	≤.157	.002—.004
			.5—.75DC	● ◐	≤.118	.002—.004	≤.118	.002—.004
				✠	≤.118	.002—.003	≤.118	.002—.003
			DC(Slot)	● ◐	≤.079	.002—.004	≤.079	.002—.004
				✠	≤.079	.002—.003	≤.079	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Cutting Speed

(inch)

Workpiece Material		Properties	Cutting Conditions	Insert Grade	Insert Chip Breaker	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
						Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ●	MP6120	M	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			● ●	VP15TF	M	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			✤	MP6130	M	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ●	MP6120	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ●	VP15TF	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✤	MP6130	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
	Pre-hardened Steel	Hardness 35—45HRC	● ●	MP6120	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			● ●	VP15TF	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			✤	MP6130	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steel	Hardness ≤200HB	● ● ✤	MP7130	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ●	VP15TF	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
		Hardness >200HB	● ● ✤	MP7130	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ●	VP15TF	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
	Duplex Stainless Steel	Hardness ≤280HB	● ● ✤	MP7130	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ●	VP15TF	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
	Ferritic and Martensitic Stainless Steel	—	● ● ✤	MP7130	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ●	VP15TF	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ● ✤	MP7130	M	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
			● ●	VP15TF	M	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ●	MC5020	M	590 (525—720)	560 (490—690)	490 (425—620)	490 (425—620)
			● ● ✤	VP15TF	M	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ●	MC5020	M	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			● ● ✤	VP15TF	M	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
N	Aluminum Alloys	Content Si<5%	● ● ✤	TF15	M	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ●	MP9120	M	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			● ●	VP15TF	M	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			✤	MP9130	M	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ●	MP9120	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			● ●	VP15TF	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			✤	MP9130	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
	Heat Resistant Alloys	—	● ●	MP9120	M	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			● ●	VP15TF	M	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			✤	MP9130	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
H	Hardened Steel	Hardness 40—55HRC	● ● ✤	VP15TF	M	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC**			
					ø1.000 (ø25 mm)		**ø1.125—ø3.000 (ø28 mm-ø80 mm)**	
					Depth of Cut **ap**	Feed per Tooth. **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth. **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ◔ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◔ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ◔ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◔ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.005
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.005
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.006
				✲	≤.433	.002—.004	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤.433	.004—.006	≤.433	.004—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.005
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.002—.004
				✲	≤.315	.002—.003	≤.315	.002—.003
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX300

RECOMMENDED CUTTING CONDITIONS

■ Wet Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16mm-ø18mm) Depth of Cut **ap**	ø.625-ø.750(ø16mm-ø18mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20mm-ø25mm) Depth of Cut **ap**	ø.875-ø1.000(ø20mm-ø25mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28mm-ø63mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28mm-ø63mm) Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.004—.008
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.003—.006	≤.315	.004—.008
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ●	≤.157	.003—.005	≤.236	.002—.004	≤.236	.004—.006
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.004
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	● ●	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.25—.5DC	● ●	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ●	≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.002—.004
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ●	≤.236	.004—.008	≤.315	.004—.010	≤.315	.004—.010
				✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
			.25—.5DC	● ●	≤.197	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.5—.75DC	● ●	≤.157	.003—.005	≤.236	.002—.006	≤.236	.003—.006
				✲	≤.157	.002—.004	≤.236	.002—.006	≤.236	.003—.006
			DC(Slot)	● ●	≤.079	.002—.004	≤.157	.002—.006	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.005	≤.157	.003—.005
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	≤.25DC	● ● ✲	≤.236	.003—.006	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤.25DC	● ● ✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Heat Resistant Alloys	—	≤.25DC	● ● ✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ● ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
H	Hardened Steel	Hardness 40—55HRC	≤.25DC	● ●	≤.157	.003—.006	≤.157	.003—.006	≤.157	.003—.006
				✲	≤.157	.003—.005	≤.157	.003—.005	≤.157	.003—.005
			.25—.5DC	● ●	≤.118	.003—.005	≤.118	.003—.005	≤.118	.003—.005
				✲	≤.118	.002—.004	≤.118	.002—.004	≤.118	.002—.004
			.5—.75DC	● ●	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
				✲	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
			DC(Slot)	● ●	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				✲	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX200/300
DEEP SHOULDER MILLING

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

RECOMMENDED CUTTING CONDITIONS

Cutting Speed

(inch)

Workpiece Material		Properties	Cutting Conditions	Grade	Width of Cut **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)	Cutting Mode
					Cutting Speed **vc** (SFM)				
P	Mild Steel	Hardness ≤180HB	● ◔	MP6120,VP15TF	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, Wet
			✲	MP6130	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, Wet
	Carbon Steel Alloy Steel	Hardness 180—350HB	● ◔	MP6120,VP15TF	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Dry, Wet
			✲	MP6130	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Dry, Wet
	Pre-hardened Steel	Hardness 180—350HB	● ◔	MP6120,VP15TF	330(260—395)	295(230—360)	260(195—330)	260(195—330)	Dry, Wet
			✲	MP6130	330(260—395)	295(230—360)	260(195—330)	260(195—330)	Dry, Wet
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◔	MP7130,VP15TF	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
			✲	MP7130	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
		Hardness >200HB	● ◔	MP7130,VP15TF	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
			✲	MP7130	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
	Ferritic and Martensitic Stainless Steel	—	● ◔	MP7130,VP15TF	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
			✲	MP7130	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
	Duplex Stainless Steel	Hardness ≤280HB	● ◔	MP7130,VP15TF	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
			✲	MP7130	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ◔	MP7130,VP15TF	295(230—395)	260(195—360)	195(130—295)	195(130—295)	Dry, Wet
			✲	MP7130	295(230—395)	260(195—360)	195(130—295)	195(130—295)	Dry, Wet
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	590(525—720)	560(490—690)	490(425—620)	490(425—620)	Dry, Wet
			◔ ✲	VP15TF	425(330—490)	395(295—460)	330(260—395)	330(260—395)	Dry, Wet
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◔	MC5020	525(460—590)	490(425—560)	425(360—490)	425(360—490)	Dry, Wet
			◔ ✲	VP15TF	360(260—460)	330(230—425)	260(195—395)	260(195—395)	Dry, Wet
N	Aluminum Alloys	Content Si<5%	● ◔ ✲	TF15	1970(1310—3280)	1970(1310—3280)	1970(1310—3280)	1970(1310—3280)	Dry, Wet
S	Titanium Alloys (Ti-6Al-4V etc.)	—	● ◔	MP9120	165(130—230)	165(130—230)	165(130—230)	165(130—230)	Wet
			●	VP15TF	165(130—230)	165(130—230)	165(130—230)	165(130—230)	Wet
			◔ ✲	MP9130	165(130—230)	165(130—230)	165(130—230)	165(130—230)	Wet
	Titanium Alloys (Ti-6Al-5V-5Mo-3Cr etc.)	—	● ◔	MP9120	100(65—130)	100(65—130)	100(65—130)	100(65—130)	Wet
			●	VP15TF	100(65—130)	100(65—130)	100(65—130)	100(65—130)	Wet
			◔ ✲	MP9130	100(65—130)	100(65—130)	100(65—130)	100(65—130)	Wet
	Heat Resistant Alloys	—	● ◔	MP9120	130(100—195)	130(100—195)	130(100—195)	130(100—195)	Wet
			●	VP15TF	130(100—195)	130(100—195)	130(100—195)	130(100—195)	Wet
			◔ ✲	MP9130	130(100—195)	130(100—195)	130(100—195)	130(100—195)	Wet

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
· When tool overhang is long
· Rigidity of machine, workpiece material or attachment of workpiece material is low
· Corner radius during pocket milling
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX200
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Width of Cut **ae**	Cutting Conditions	DC			
					ø20—ø28mm, ø.875—ø1.125"		ø32—ø50mm, ø1.250—ø1.500"	
					Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ● ✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ● ✲	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
			DC(Slot)	● ● ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Carbon Steel Alloy Steel	Hardness 180—280HB	≤.25DC	● ● ✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ● ✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ● ✲	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
			DC(Slot)	● ● ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Carbon Steel Alloy Steel	Hardness 280—350HB	≤.25DC	● ● ✲	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ● ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ● ✲	≤.236	.004(.003—.005)	≤.551	.003(.002—.004)
			DC(Slot)	● ● ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ● ✲	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ● ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ● ✲	≤.236	.004(.003—.005)	≤.551	.003(.002—.004)
			DC(Slot)	● ● ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
				✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.003)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

(inch)

	Workpiece Material	Properties	Width of Cut **ae**	Cutting Conditions	DC			
					ø20—ø28mm, ø.875—ø1.125"		**ø32—ø50mm, ø1.250—ø1.500"**	
					Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✠	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✠	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
				✠	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✠	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Ductile Cast Iron	—	≤.25DC	● ◐	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✠	≤.551	.004(.003—.005)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
				✠	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
				✠	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✠	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◐	≤.551	.006(.004—.008)	≤APMX	.007(.004—.010)
				✠	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤.315	.005(.004—.006)	≤1.102	.006(.004—.008)
				✠	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.002—.006)
				✠	≤.236	.003(.002—.004)	≤.551	.004(.002—.006)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.004(.002—.006)
				✠	≤.157	.003(.002—.003)	≤.157	.004(.002—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ◐ ✠	≤.551	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐ ✠	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✠	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✠	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ◐ ✠	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✠	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✠	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✠	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✠	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✠	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✠	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✠	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
· When tool overhang is long
· Rigidity of machine, workpiece material or attachment of workpiece material is low
· Corner radius during pocket milling
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX300
DEEP SHOULDER MILLING

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Width of Cut **ae**	Cutting Conditions	DC			
					ø40mm, ø.1.500"		ø50—ø80mm, ø2.000—ø3.000"	
					Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✲	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
			.25—.5DC	● ● ✲	≤APMX	.005(.004—.006)	≤1.220	.006(.004—.008)
			.5—.75DC	● ● ✲	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
			DC(Slot)	● ● ✲	≤.197	.003(.002—.004)	≤.197	.004(.003—.005)
	Carbon Steel Alloy Steel	Hardness 180—280HB	≤.25DC	● ● ✲	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
			.25—.5DC	● ● ✲	≤APMX	.005(.004—.006)	≤1.220	.006(.004—.008)
			.5—.75DC	● ● ✲	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
			DC(Slot)	● ● ✲	≤.197	.003(.002—.004)	≤.197	.004(.003—.005)
	Carbon Steel Alloy Steel	Hardness 280—350HB	≤.25DC	● ● ✲	≤APMX	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ● ✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ● ✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ● ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ● ✲	≤APMX	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ● ✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ● ✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ● ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
				✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	○ ◔	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
				✲	≤.827	.003(.002—.003)	≤.827	.003(.002—.003)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

(inch)

	Workpiece Material	Properties	Width of Cut **ae**	Cutting Conditions	DC			
					ø40mm, ø.1.500"		**ø50—ø80mm, ø2.000—ø3.000"**	
					Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
				✲	≤APMX	.005(.003—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤APMX	.005(.003—.006)	≤1.220	.006(.004—.008)
				✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
				✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐	≤.197	.003(.002—.004)	≤.197	.005(.003—.006)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.004)
	Ductile Cast Iron	—	≤.25DC	● ◐	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◐	≤APMX	.007(.004—.010)	≤APMX	.007(.004—.010)
				✲	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤APMX	.006(.004—.008)	≤1.220	.006(.004—.008)
				✲	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
				✲	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
			DC(Slot)	● ◐	≤.197	.004(.002—.006)	≤.197	.005(.003—.006)
				✲	≤.197	.004(.002—.005)	≤.197	.004(.003—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ◐ ✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)

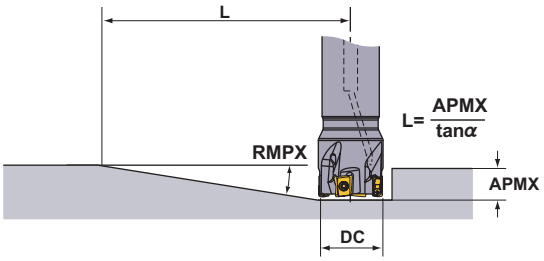
Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
· When tool overhang is long
· Rigidity of machine, workpiece material or attachment of workpiece material is low
· Corner radius during pocket milling
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

VPX200 Including long types for deep cutting

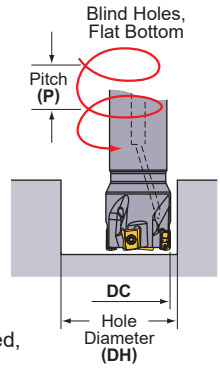
RECOMMENDED CUTTING CONDITIONS

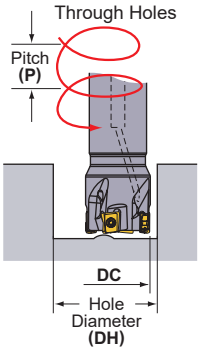
Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(inch)

Cutting Edge Diameter **DC**	**RE**	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle **RMPX**	Minimum * Distance **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
.625	.008	1.87°	9.7	1.213	.060	1.072	.046	.942	.032
	.016	1.87°	9.7	1.197	.059	1.073	.046	.942	.032
	.031	1.87°	9.7	1.165	.055	1.073	.046	.942	.032
	.039	1.87°	9.7	1.150	.054	1.073	.046	.942	.032
	.047	1.87°	9.7	1.134	.052	1.073	.046	.942	.032
	.063	1.87°	9.7	1.102	.049	1.073	.046	.942	.032
.750	.008	1.43°	12.6	1.463	.056	1.323	.045	1.187	.034
	.016	1.43°	12.6	1.447	.055	1.323	.045	1.187	.034
	.031	1.43°	12.6	1.415	.052	1.323	.045	1.187	.034
	.039	1.43°	12.6	1.400	.051	1.323	.045	1.187	.034
	.047	1.43°	12.6	1.384	.050	1.323	.045	1.187	.034
	.063	1.43°	12.6	1.352	.047	1.323	.045	1.187	.034
.875	.008	1.14°	15.9	1.713	.052	1.574	.044	1.435	.035
	.016	1.14°	15.9	1.697	.051	1.574	.044	1.435	.035
	.031	1.14°	15.9	1.665	.049	1.574	.044	1.435	.035
	.039	1.14°	15.9	1.650	.048	1.574	.044	1.435	.035
	.047	1.14°	15.9	1.634	.047	1.574	.044	1.435	.035
	.063	1.14°	15.9	1.602	.045	1.575	.044	1.435	.035
1.000	.008	0.95°	19.0	1.963	.050	1.824	.043	1.685	.036
	.016	0.95°	19.0	1.947	.049	1.824	.043	1.685	.036
	.031	0.95°	19.0	1.915	.048	1.824	.043	1.685	.036
	.039	0.95°	19.0	1.900	.047	1.824	.043	1.685	.036
	.047	0.95°	19.0	1.884	.046	1.824	.043	1.685	.036
	.063	0.95°	19.0	1.852	.044	1.825	.043	1.685	.036
1.125	.008	0.82°	22.0	2.213	.049	2.074	.043	1.935	.036
	.016	0.82°	22.0	2.197	.048	2.074	.043	1.935	.036
	.031	0.82°	22.0	2.165	.047	2.074	.043	1.935	.036
	.039	0.82°	22.0	2.150	.046	2.074	.043	1.935	.036
	.047	0.82°	22.0	2.134	.045	2.074	.043	1.935	.036
	.063	0.82°	22.0	2.102	.044	2.075	.043	1.935	.036
1.250	.008	0.71°	25.4	2.463	.047	2.320	.042	2.183	.036
	.016	0.71°	25.4	2.447	.047	2.320	.042	2.183	.036
	.031	0.71°	25.4	2.415	.045	2.320	.042	2.183	.036
	.039	0.71°	25.4	2.400	.045	2.320	.042	2.183	.036
	.047	0.71°	25.4	2.384	.044	2.320	.042	2.183	.036
	.063	0.71°	25.4	2.352	.043	2.321	.042	2.183	.036

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan α).

(inch)

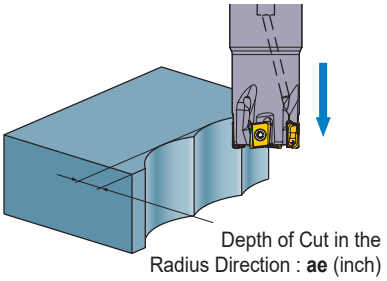
Cutting Edge Diameter **DC**	**RE**	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle **RMPX**	Minimum * Distance **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
1.375	.008	0.64°	28.2	2.713	.047	2.574	.042	2.435	.037
	.016	0.64°	28.2	2.697	.046	2.574	.042	2.435	.037
	.031	0.64°	28.2	2.665	.045	2.574	.042	2.435	.037
	.039	0.64°	28.2	2.650	.045	2.574	.042	2.435	.037
	.047	0.64°	28.2	2.634	.044	2.574	.042	2.435	.037
	.063	0.64°	28.2	2.602	.043	2.574	.042	2.435	.037
1.500	.008	0.57°	31.7	2.963	.046	2.820	.041	2.683	.037
	.016	0.57°	31.7	2.947	.045	2.820	.041	2.683	.037
	.031	0.57°	31.7	2.915	.044	2.820	.041	2.683	.037
	.039	0.57°	31.7	2.900	.044	2.820	.041	2.683	.037
	.047	0.57°	31.7	2.884	.043	2.820	.041	2.683	.037
	.063	0.57°	31.7	2.852	.042	2.821	.041	2.683	.037
2.000	.008	0.41°	44.0	3.963	.044	3.820	.041	3.683	.038
	.016	0.41°	44.0	3.947	.044	3.820	.041	3.683	.038
	.031	0.41°	44.0	3.915	.043	3.820	.041	3.683	.038
	.039	0.41°	44.0	3.900	.043	3.820	.041	3.683	.038
	.047	0.41°	44.0	3.884	.042	3.820	.041	3.683	.038
	.063	0.41°	44.0	3.852	.042	3.820	.041	3.683	.038
2.500	.008	0.32°	56.4	4.963	.043	4.820	.041	4.683	.038
	.016	0.32°	56.4	4.947	.043	4.820	.041	4.683	.038
	.031	0.32°	56.4	4.915	.042	4.820	.041	4.683	.038
	.039	0.32°	56.4	4.900	.042	4.820	.041	4.683	.038
	.047	0.32°	56.4	4.884	.042	4.820	.041	4.683	.038
	.063	0.32°	56.4	4.852	.041	4.820	.041	4.683	.038

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan α).

For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● Plunging

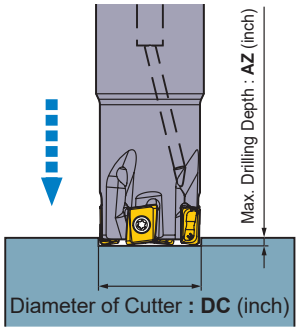


(inch)

DC	ae max.
.625	.154
.750	.154
.875	.157
1.000	.157
1.125	.157
1.250	.157
1.375	.157
1.500	.157
2.000	.157
2.500	.157

Note 1) No step feed necessary.

● Drilling



(inch)

DC	AZ max.
.625	.012
.750	.012
.875	.012
1.000	.012
1.125	.012
1.250	.012
1.375	.012
1.500	.012
2.000	.012
2.500	.012

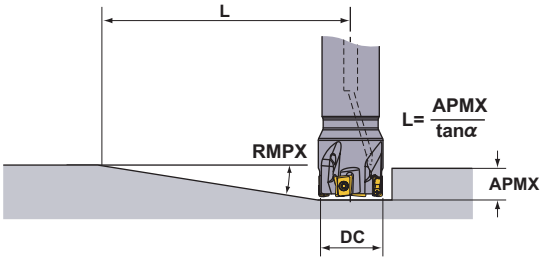
Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips
(or coolant for when machining aluminum alloy).

VPX300 Including long types for deep cutting

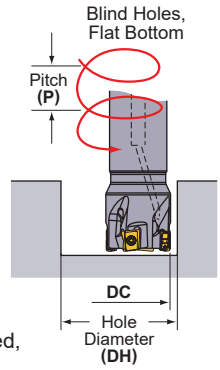
RECOMMENDED CUTTING CONDITIONS

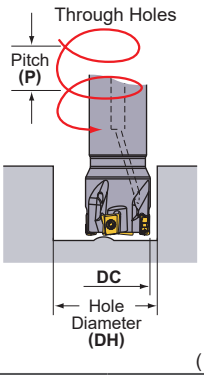
Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(inch)

Cutting Edge Diameter DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle RMPX	Minimum * Distance L	Maximum Hole Diameter DH max.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.
1.000	.008	2.07°	12.0	1.963	.109	1.713	.081	1.483	.055
	.016	2.07°	12.0	1.947	.108	1.713	.081	1.483	.055
	.031	2.07°	12.0	1.915	.104	1.713	.081	1.483	.055
	.039	2.07°	12.0	1.900	.102	1.713	.081	1.483	.055
	.047	2.07°	12.0	1.884	.100	1.713	.081	1.483	.055
	.063	2.07°	12.0	1.852	.097	1.713	.081	1.483	.055
	.079	2.07°	12.0	1.821	.093	1.713	.081	1.483	.055
	.094	2.07°	12.0	1.789	.090	1.713	.081	1.483	.055
	.118	2.07°	12.0	1.742	.084	1.713	.081	1.483	.055
	.126	2.07°	12.0	1.726	.082	1.713	.081	1.483	.055
1.125	.008	1.73°	14.4	2.213	.103	1.963	.080	1.726	.057
	.016	1.73°	14.4	2.197	.102	1.963	.080	1.726	.057
	.031	1.73°	14.4	2.165	.099	1.963	.080	1.726	.057
	.039	1.73°	14.4	2.150	.097	1.963	.080	1.726	.057
	.047	1.73°	14.4	2.134	.096	1.963	.080	1.726	.057
	.063	1.73°	14.4	2.102	.093	1.963	.080	1.726	.057
	.079	1.73°	14.4	2.071	.090	1.963	.080	1.726	.057
	.094	1.73°	14.4	2.039	.087	1.963	.080	1.726	.057
	.118	1.73°	14.4	1.992	.082	1.963	.080	1.726	.057
	.126	1.73°	14.4	1.976	.081	1.963	.079	1.726	.057
1.250	.008	1.49°	16.7	2.463	.099	2.214	.079	1.973	.059
	.016	1.49°	16.7	2.447	.098	2.214	.079	1.973	.059
	.031	1.49°	16.7	2.415	.095	2.214	.079	1.973	.059
	.039	1.49°	16.7	2.400	.094	2.214	.079	1.973	.059
	.047	1.49°	16.7	2.384	.093	2.214	.079	1.973	.059
	.063	1.49°	16.7	2.352	.090	2.214	.079	1.973	.059
	.079	1.49°	16.7	2.321	.088	2.214	.079	1.973	.059
	.094	1.49°	16.7	2.289	.085	2.214	.079	1.973	.059
	.118	1.49°	16.7	2.242	.081	2.214	.079	1.973	.059
	.126	1.49°	16.7	2.226	.080	2.214	.079	1.973	.059
1.375	.008	1.28°	19.4	2.713	.094	2.465	.076	2.221	.059
	.016	1.28°	19.4	2.697	.093	2.465	.076	2.221	.059
	.031	1.28°	19.4	2.665	.091	2.465	.076	2.221	.059
	.039	1.28°	19.4	2.650	.089	2.465	.076	2.221	.059
	.047	1.28°	19.4	2.634	.088	2.465	.076	2.221	.059
	.063	1.28°	19.4	2.602	.086	2.465	.076	2.221	.059
	.079	1.28°	19.4	2.571	.084	2.465	.076	2.221	.059
	.094	1.28°	19.4	2.539	.082	2.465	.076	2.221	.059
	.118	1.28°	19.4	2.492	.078	2.465	.077	2.221	.059
	.126	1.28°	19.4	2.476	.077	2.465	.077	2.221	.059

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .433" is achieved at the maximum ramping angle L (= .433"/tan α).

(inch)

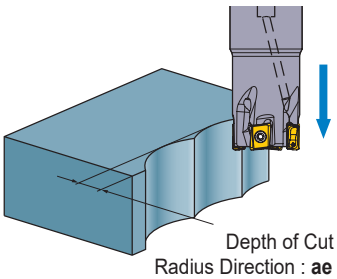
Cutting Edge Diameter **DC**	**RE**	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle **RMPX**	Minimum * Distance **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
1.500	.008	1.13°	22.0	2.963	.091	2.711	.075	2.469	.060
	.016	1.13°	22.0	2.947	.090	2.711	.075	2.469	.060
	.031	1.13°	22.0	2.915	.088	2.711	.075	2.469	.060
	.039	1.13°	22.0	2.900	.087	2.711	.075	2.469	.060
	.047	1.13°	22.0	2.884	.086	2.711	.075	2.469	.060
	.063	1.13°	22.0	2.852	.084	2.711	.075	2.469	.060
	.079	1.13°	22.0	2.821	.082	2.711	.075	2.469	.060
	.094	1.13°	22.0	2.789	.080	2.711	.075	2.469	.060
	.118	1.13°	22.0	2.742	.077	2.711	.075	2.469	.060
	.126	1.13°	22.0	2.726	.076	2.711	.075	2.469	.060
2.000	.008	0.78°	31.8	3.963	.084	3.711	.073	3.469	.063
	.016	0.78°	31.8	3.947	.083	3.711	.073	3.469	.063
	.031	0.78°	31.8	3.915	.082	3.711	.073	3.469	.063
	.039	0.78°	31.8	3.900	.081	3.711	.073	3.469	.063
	.047	0.78°	31.8	3.884	.081	3.711	.073	3.469	.063
	.063	0.78°	31.8	3.852	.079	3.711	.073	3.469	.063
	.079	0.78°	31.8	3.821	.078	3.711	.073	3.469	.063
	.094	0.78°	31.8	3.789	.077	3.711	.073	3.469	.063
	.118	0.78°	31.8	3.742	.075	3.711	.073	3.469	.063
	.126	0.78°	31.8	3.726	.074	3.711	.073	3.469	.063
2.500	.008	0.59°	42.1	4.963	.080	4.711	.072	4.469	.064
	.016	0.59°	42.1	4.947	.079	4.711	.072	4.469	.064
	.031	0.59°	42.1	4.915	.078	4.711	.072	4.469	.064
	.039	0.59°	42.1	4.900	.078	4.711	.072	4.469	.064
	.047	0.59°	42.1	4.884	.077	4.711	.072	4.469	.064
	.063	0.59°	42.1	4.852	.076	4.711	.072	4.469	.064
	.079	0.59°	42.1	4.821	.075	4.711	.072	4.469	.064
	.094	0.59°	42.1	4.789	.074	4.711	.072	4.469	.064
	.118	0.59°	42.1	4.742	.073	4.711	.072	4.469	.064
	.126	0.59°	42.1	4.726	.072	4.711	.072	4.469	.064
3.000	.008	0.48°	51.7	5.955	.078	5.711	.071	5.469	.065
	.016	0.48°	51.7	5.939	.077	5.711	.071	5.469	.065
	.031	0.48°	51.7	5.907	.077	5.711	.071	5.469	.065
	.039	0.48°	51.7	5.892	.076	5.711	.071	5.469	.065
	.047	0.48°	51.7	5.876	.076	5.711	.071	5.469	.065
	.063	0.48°	51.7	5.844	.075	5.711	.071	5.469	.065
	.079	0.48°	51.7	5.813	.074	5.711	.071	5.469	.065
	.094	0.48°	51.7	5.781	.073	5.711	.071	5.469	.065
	.118	0.48°	51.7	5.734	.072	5.711	.071	5.469	.065
	.126	0.48°	51.7	5.718	.072	5.711	.071	5.469	.065

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .433" is achieved at the maximum ramping angle L (= .433"/tan α).

For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● Plunging

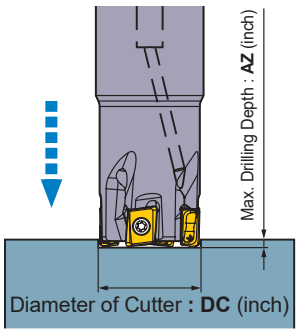


(inch)

DC	ae max.
1.000	.256
1.125	.260
1.250	.260
1.375	.260
1.500	.264
2.000	.264
2.500	.264
3.000	.264

Note 1) No step feed necessary.

● Drilling



(inch)

DC	AZ max.
1.000	.022
1.125	.022
1.250	.022
1.375	.022
1.500	.022
2.000	.022
2.500	.022
3.000	.022

Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminum alloy).

MULTI FUNCTIONAL MILLING

<ALUMINUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

AXD4000

P M K N S H

Fig. 1

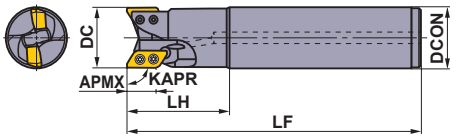
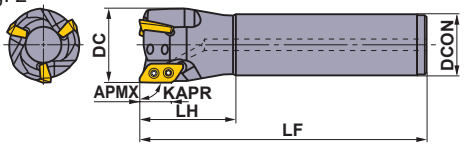


Fig. 2



Right hand tool holder only.

■ SHANK TYPE

With Air / coolant through.

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	LH	DCON	WT (lbs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
1.000	A Type	.016-.125	**AXD4000UR162SA12SA**	●	2	6.000	2.000	.750	.6	.610	49000	2	XDGX1750
1.000	B Type	.157-.197	**AXD4000UR162SA12SB**	●	2	6.000	2.000	.750	.6	.583	49000	2	XDGX1750
1.000	A Type	.016-.125	**AXD4000UR162SA16SA**	●	2	6.000	2.000	1.000	1.1	.610	49000	1	XDGX1750
1.000	B Type	.157-.197	**AXD4000UR162SA16SB**	●	2	6.000	2.000	1.000	1.1	.583	49000	1	XDGX1750
1.000	A Type	.016-.125	**AXD4000UR162SA16LA**	●	2	8.500	3.000	1.000	1.6	.610	49000	1	XDGX1750
1.000	B Type	.157-.197	**AXD4000UR162SA16LB**	●	2	8.500	3.000	1.000	1.6	.583	49000	1	XDGX1750
1.250	A Type	.016-.125	**AXD4000UR202SA20SA**	●	2	6.000	2.000	1.250	1.8	.610	48000	1	XDGX1750
1.250	B Type	.157-.197	**AXD4000UR202SA20SB**	●	2	6.000	2.000	1.250	1.8	.583	48000	1	XDGX1750
1.250	A Type	.016-.125	**AXD4000UR202SA20LA**	●	2	9.000	3.500	1.250	2.7	.610	48000	1	XDGX1750
1.250	B Type	.157-.197	**AXD4000UR202SA20LB**	●	2	9.000	3.500	1.250	2.7	.583	48000	1	XDGX1750
1.500	A Type	.016-.125	**AXD4000UR243SA20SA**	●	3	6.000	2.000	1.250	1.9	.610	41000	2	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR243SA20SB**	●	3	6.000	2.000	1.250	1.9	.583	41000	2	XDGX1750
1.500	A Type	.016-.125	**AXD4000UR243SA20LA**	●	3	9.000	2.000	1.250	2.9	.610	41000	2	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR243SA20LB**	●	3	9.000	2.000	1.250	2.9	.583	41000	2	XDGX1750

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating this tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF and LH dimension decreases.

SPARE PARTS

(inch)

*		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (lbf-in) : TS3SB=13

Fig. 1

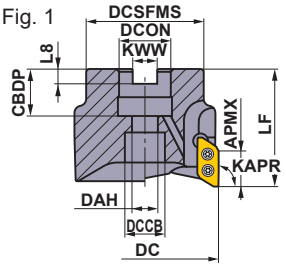
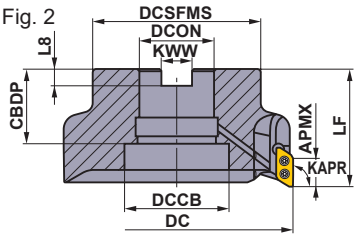
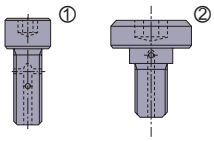


Fig. 2



Right hand tool holder only.

DC	DCON	Set Bolt	Geometry
1.500	.500	HSCU25014H	①
2.000	.750	HSCU37513H	
2.500, 3.000	1.000	HSCU50014H	
3.000	1.250	HSCU62516H	
4.000	1.500	HSCU75016H	
5.000	1.500	MBAU75016H	② With Air / coolant through.



■ ARBOR TYPE

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (ibs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
1.500	A Type	.016-.125	**AXD4000UR1502A**	●	2	2.000	.500	.6	.610	41000	1	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR1502B**	□	2	2.000	.500	.6	.583	41000	1	XDGX1750
1.500	A Type	.016-.125	**AXD4000UR1503A**	●	3	2.000	.500	.6	.610	41000	1	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR1503B**	●	3	2.000	.500	.6	.583	41000	1	XDGX1750
2.000	A Type	.016-.125	**AXD4000UR0202A**	●	2	2.000	.750	.9	.610	35000	1	XDGX1750
2.000	B Type	.157-.197	**AXD4000UR0202B**	□	2	2.000	.750	.9	.583	35000	1	XDGX1750
2.000	A Type	.016-.125	**AXD4000UR0203A**	●	3	2.000	.750	.9	.610	35000	1	XDGX1750
2.000	B Type	.157-.197	**AXD4000UR0203B**	□	3	2.000	.750	.9	.583	35000	1	XDGX1750
2.000	A Type	.016-.125	**AXD4000UR0204A**	●	4	2.000	.750	.9	.610	35000	1	XDGX1750
2.000	B Type	.157-.197	**AXD4000UR0204B**	●	4	2.000	.750	.9	.583	35000	1	XDGX1750
2.500	A Type	.016-.125	**AXD4000UR2504CA**	●	4	2.000	1.000	1.4	.610	30000	1	XDGX1750
2.500	B Type	.157-.197	**AXD4000UR2504CB**	□	4	2.000	1.000	1.4	.583	30000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0303CA**	●	3	2.000	1.000	1.9	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0303CB**	●	3	2.000	1.000	1.9	.583	27000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0305CA**	●	5	2.000	1.000	1.8	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0305CB**	●	5	2.000	1.000	1.8	.583	27000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0303DA**	●	3	2.500	1.250	2.9	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0303DB**	□	3	2.500	1.250	2.9	.583	27000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0305DA**	●	5	2.500	1.250	2.9	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0305DB**	●	5	2.500	1.250	2.9	.583	27000	1	XDGX1750
4.000	A Type	.016-.125	**AXD4000UR0404EA**	●	4	2.500	1.500	5.5	.610	23000	1	XDGX1750
4.000	B Type	.157-.197	**AXD4000UR0404EB**	□	4	2.500	1.500	5.5	.583	23000	1	XDGX1750
4.000	A Type	.016-.125	**AXD4000UR0406EA**	●	6	2.500	1.500	5.5	.610	23000	1	XDGX1750
4.000	B Type	.157-.197	**AXD4000UR0406EB**	□	6	2.500	1.500	5.5	.583	23000	1	XDGX1750
5.000	A Type	.016-.125	**AXD4000UR0505EA**	●	5	2.500	1.500	6.7	.610	20000	2	XDGX1750
5.000	B Type	.157-.197	**AXD4000UR0505EB**	□	5	2.500	1.500	6.7	.583	20000	2	XDGX1750
5.000	A Type	.016-.125	**AXD4000UR0507EA**	●	7	2.500	1.500	6.7	.610	20000	2	XDGX1750
5.000	B Type	.157-.197	**AXD4000UR0507EB**	□	7	2.500	1.500	6.7	.583	20000	2	XDGX1750

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating this tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF dimension decreases.
Note 4) The cutter body includes a set bolt for an arbor.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

MOUNTING DIMENSIONS

(inch)

DC	Tool Holder Type	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.500	**AXD4000UR150_A**	.500	.630	.276	.433	.500	1.440	.250	.156	1
1.500	**AXD4000UR150_B**	.500	.630	.276	.433	.465	1.440	.250	.156	1
2.000	**AXD4000UR020_A**	.750	.748	.413	.433	.582	1.750	.313	.187	1
2.000	**AXD4000UR020_B**	.750	.748	.413	.433	.548	1.750	.313	.187	1
2.500	**AXD4000UR25_CA**	1.000	.984	.539	.787	.622	2.190	.375	.219	1
2.500	**AXD4000UR25_CB**	1.000	.984	.539	.787	.587	2.190	.375	.219	1
3.000	**AXD4000UR03_CA**	1.000	.945	.539	.787	.661	2.190	.375	.219	1
3.000	**AXD4000UR03_CB**	1.000	.945	.539	.787	.627	2.190	.375	.219	1
3.000	**AXD4000UR03_DA**	1.250	1.260	.669	1.024	.767	2.880	.500	.281	1
3.000	**AXD4000UR03_DB**	1.250	1.260	.669	1.024	.733	2.880	.500	.281	1
4.000	**AXD4000UR04_EA**	1.500	1.181	.787	1.181	.925	3.810	.625	.375	1
4.000	**AXD4000UR04_EB**	1.500	1.181	.787	1.181	.891	3.810	.625	.375	1
5.000	**AXD4000UR05_EA**	1.500	1.575	—	2.205	.846	3.810	.625	.375	2
5.000	**AXD4000UR05_EB**	1.500	1.575	—	2.205	.812	3.810	.625	.375	2

SPARE PARTS

(inch)

*		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (lbf-in) : TS3SB=13

Fig. 1

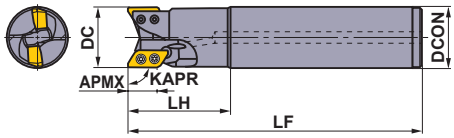
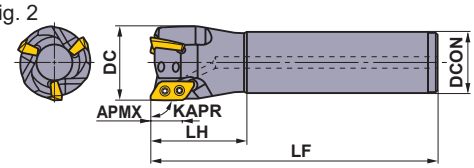


Fig. 2



Metric Standard

SHANK TYPE

With Air / coolant through.

Right hand tool holder only.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	LH	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
20	A Type	0.4-3.2	**AXD4000R201SA20SA**	★	1	110	35	20	0.22	15.5	15000	1	XDGX1750
20	B Type	4.0-5.0	**AXD4000R201SA20SB**	★	1	110	35	20	0.22	14.8	15000	1	XDGX1750
25	A Type	0.4-3.2	**AXD4000R252SA25SA**	★	2	125	50	25	0.38	15.5	49000	1	XDGX1750
25	B Type	4.0-5.0	**AXD4000R252SA25SB**	★	2	125	50	25	0.38	14.8	49000	1	XDGX1750
25	A Type	0.4-3.2	**AXD4000R252SA25LA**	★	2	170	80	25	0.53	15.5	49000	1	XDGX1750
25	B Type	4.0-5.0	**AXD4000R252SA25LB**	★	2	170	80	25	0.53	14.8	49000	1	XDGX1750
28	A Type	0.4-3.2	**AXD4000R282SA25SA**	★	2	125	50	25	0.41	15.5	48500	2	XDGX1750
28	B Type	4.0-5.0	**AXD4000R282SA25SB**	★	2	125	50	25	0.41	14.8	48500	2	XDGX1750
28	A Type	0.4-3.2	**AXD4000R282SA25ELA**	★	2	220	50	25	0.76	15.5	48500	2	XDGX1750
28	B Type	4.0-5.0	**AXD4000R282SA25ELB**	★	2	220	50	25	0.76	14.8	48500	2	XDGX1750
32	A Type	0.4-3.2	**AXD4000R322SA32SA**	★	2	150	50	32	0.80	15.5	48000	1	XDGX1750
32	B Type	4.0-5.0	**AXD4000R322SA32SB**	★	2	150	50	32	0.80	14.8	48000	1	XDGX1750
32	A Type	0.4-3.2	**AXD4000R322SA32LA**	★	2	200	80	32	1.09	15.5	48000	1	XDGX1750
32	B Type	4.0-5.0	**AXD4000R322SA32LB**	★	2	200	80	32	1.09	14.8	48000	1	XDGX1750
35	A Type	0.4-3.2	**AXD4000R352SA32SA**	★	2	150	50	32	0.84	15.5	45000	2	XDGX1750
35	B Type	4.0-5.0	**AXD4000R352SA32SB**	★	2	150	50	32	0.84	14.8	45000	2	XDGX1750
35	A Type	0.4-3.2	**AXD4000R352SA32ELA**	★	2	250	50	32	1.45	15.5	45000	2	XDGX1750
35	B Type	4.0-5.0	**AXD4000R352SA32ELB**	★	2	250	50	32	1.45	14.8	45000	2	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403SA32SA**	★	3	150	50	32	0.87	15.5	41000	2	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403SA32SB**	★	3	150	50	32	0.87	14.8	41000	2	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403SA42SA**	★	3	170	80	42	1.53	15.5	41000	1	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403SA42SB**	★	3	170	80	42	1.53	14.8	41000	1	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403SA32ELA**	★	3	250	50	32	1.48	15.5	41000	2	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403SA32ELB**	★	3	250	50	32	1.48	14.8	41000	2	XDGX1750

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF and LH dimension decreases.

SPARE PARTS

(mm)

DC	* Clamp Screw	Wrench	Anti-seize Lubricant
20	TS3SBS	TKY08D	MK1KS
>20	TS3SB	TKY08D	MK1KS

* Clamp Torque (lbf-in) : TS3SBS=13, TS3SB=13

★ : Stocked in Japan

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig. 1

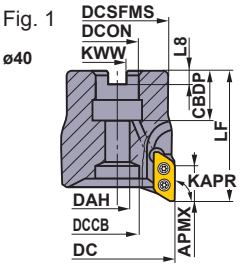


Fig. 2

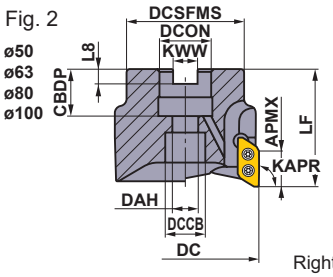
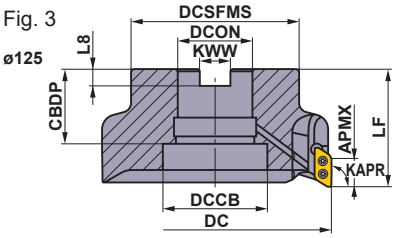


Fig. 3



Right hand tool holder only.

DC		Set Bolt	Geometry	
mm	inch			
ϕ40		HFF08043H	①	① ② ③
ϕ50, ϕ63		HSC10030H	②	
ϕ80	ϕ80	HSC12035H		
ϕ100	ϕ100	HSC16040H		
ϕ125	ϕ125	MBA20040H	③	With Air / coolant through.

Metric Standard

For inch arbors

■ ARBOR TYPE

DCON = inch size, With Air / coolant through.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
80	A Type	0.4-3.2	**AXD4000R08005CA**	★	5	50	25.4	1.0	15.5	27000	2	XDGX1750
80	B Type	4.0-5.0	**AXD4000R08005CB**	★	5	50	25.4	1.0	14.8	27000	2	XDGX1750
100	A Type	0.4-3.2	**AXD4000R10006DA**	★	6	63	31.75	2.0	15.5	23000	2	XDGX1750
100	B Type	4.0-5.0	**AXD4000R10006DB**	★	6	63	31.75	2.0	14.8	23000	2	XDGX1750
125	A Type	0.4-3.2	**AXD4000R12507EA**	★	7	63	38.1	2.8	15.5	20000	3	XDGX1750
125	B Type	4.0-5.0	**AXD4000R12507EB**	★	7	63	38.1	2.8	14.8	20000	3	XDGX1750

Metric Standard

For metric arbors

DCON = mm size, With Air / coolant through.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
40	A Type	0.4-3.2	**AXD4000-040A02RA**	★	2	50	16	0.3	15.5	41000	1	XDGX1750
40	B Type	4.0-5.0	**AXD4000-040A02RB**	★	2	50	16	0.3	14.8	41000	1	XDGX1750
40	A Type	0.4-3.2	**AXD4000-040A03RA**	★	3	50	16	0.3	15.5	41000	1	XDGX1750
40	B Type	4.0-5.0	**AXD4000-040A03RB**	★	3	50	16	0.3	14.8	41000	1	XDGX1750
50	A Type	0.4-3.2	**AXD4000-050A02RA**	★	2	50	22	0.4	15.5	35000	2	XDGX1750
50	B Type	4.0-5.0	**AXD4000-050A02RB**	★	2	50	22	0.4	14.8	35000	2	XDGX1750
50	A Type	0.4-3.2	**AXD4000-050A04RA**	★	4	50	22	0.4	15.5	35000	2	XDGX1750
50	B Type	4.0-5.0	**AXD4000-050A04RB**	★	4	50	22	0.4	14.8	35000	2	XDGX1750
63	A Type	0.4-3.2	**AXD4000-063A05RA**	★	5	50	22	0.6	15.5	30000	2	XDGX1750
63	B Type	4.0-5.0	**AXD4000-063A05RB**	★	5	50	22	0.6	14.8	30000	2	XDGX1750
80	A Type	0.4-3.2	**AXD4000-080A05RA**	★	5	50	27	1.0	15.5	27000	2	XDGX1750
80	B Type	4.0-5.0	**AXD4000-080A05RB**	★	5	50	27	1.0	14.8	27000	2	XDGX1750
100	A Type	0.4-3.2	**AXD4000-100A06RA**	★	6	63	32	2.0	15.5	23000	2	XDGX1750
100	B Type	4.0-5.0	**AXD4000-100A06RB**	★	6	63	32	2.0	14.8	23000	2	XDGX1750
125	A Type	0.4-3.2	**AXD4000-125B07RA**	★	7	63	40	2.8	15.5	20000	3	XDGX1750
125	B Type	4.0-5.0	**AXD4000-125B07RB**	★	7	63	40	2.8	14.8	20000	3	XDGX1750

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .063" and above, as corner radius increases the LF dimension decreases.
Note 4) Set bolt not included.

★ : **Stocked in Japan**

MOUNTING DIMENSIONS

(mm)

DC	Tool Holder Type	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
40	**AXD4000-040A**	16	18	8.5	12	10.40	34	8.4	5.6	1
50	**AXD4000-050A**	22	20	11.0	17	15.99	45	10.4	6.3	2
63	**AXD4000-063A**	22	20	11.0	17	19.99	50	10.4	6.3	2
80	**AXD4000R080**	25.4	26	13.0	20	14.49	60	9.5	6.0	2
80	**AXD4000-080A**	27	23	13.0	20	14.49	60	12.4	7.0	2
100	**AXD4000R100**	31.75	32	17.0	26	18.99	70	12.7	8.0	2
100	**AXD4000-100A**	32	26	17.0	26	24.99	78	14.4	8.0	2
125	**AXD4000R125**	38.1	40	—	56	20.99	90	15.9	10.0	3
125	**AXD4000-125B**	40	40	—	56	20.99	90	16.4	9.0	3

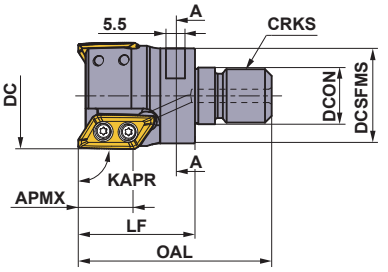
SPARE PARTS

(mm)

*		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (N • m) : TS3SB=1.5

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Right hand tool holder only.

Metric Standard

NEW

■ SCREW-IN TYPE

With Air / coolant through.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Insert Type
25	A Type	0.4-3.2	**AXD4000R252AM1228A**	★	2	12.5	23.5	50	28	19	M12	0.06	15.0	49000	XDGX1750
25	B Type	4.0-5.0	**AXD4000R252AM1228B**	★	2	12.5	23.5	50	28	19	M12	0.06	14.8	49000	XDGX1750
28	A Type	0.4-3.2	**AXD4000R282AM1228A**	★	2	12.5	23.5	50	28	19	M12	0.07	15.0	48500	XDGX1750
28	B Type	4.0-5.0	**AXD4000R282AM1228B**	★	2	12.5	23.5	50	28	19	M12	0.07	14.8	48500	XDGX1750
32	A Type	0.4-3.2	**AXD4000R322AM1635A**	★	2	17.0	28.5	58	35	24	M16	0.15	15.0	48000	XDGX1750
32	B Type	4.0-5.0	**AXD4000R322AM1635B**	★	2	17.0	28.5	58	35	24	M16	0.15	14.8	48000	XDGX1750
35	A Type	0.4-3.2	**AXD4000R353AM1635A**	★	3	17.0	28.5	58	35	24	M16	0.15	15.0	41000	XDGX1750
35	B Type	4.0-5.0	**AXD4000R353AM1635B**	★	3	17.0	28.5	58	35	24	M16	0.15	14.8	41000	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403AM1635A**	★	3	17.0	28.5	58	35	24	M16	0.18	15.0	38000	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403AM1635B**	★	3	17.0	28.5	58	35	24	M16	0.18	14.8	38000	XDGX1750

Note 1) For screw-in type arbors, refer to page K382.

Note 2) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page K256.

★ : **Stocked in Japan**

SPARE PARTS

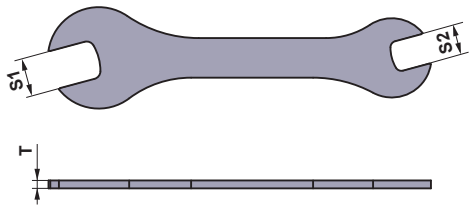
(mm)

*		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (N • m) : TS3SB=1.5

Parts Sold Separately

Arbor Mounting Spanner



(mm)

Order Number	Dimensions		
	S1 *	S2 *	T
AKY1924050A	24	19	5

* Clamp Torque (N • m) : 19 = 80, 24 = 90

Note 1) Due to the structure of the head, it may not be possible to use a commercially available spanner to attach the arbor. It is recommended to use the dedicated spanner.

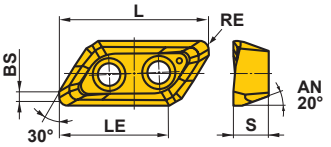
ISO13399 ➤ K003
SCREW-IN HOLDERS ➤ K382
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Workpiece Material		
	P	Steel
	N	Aluminum Alloys
	S	Heat resistant Alloys, Titanium Alloys

Cutting Conditions (Guide):
● :Stable Cutting ◐ :General Cutting ✲ :Unstable Cutting
Edge Preparation:
F :Sharp Edge **E** :Round

Shape	Order Number	Class	Edge Preparation	Stock: Coated LC15TF	Stock: Coated MP6120	Stock: Coated MP9120	Stock: Carbide TF15	Dimensions (inch) L	LE	S	BS	RE *	Geometry
Low Cutting Resistance **GL** Breaker	**XDGX175004PDFR-GL**	G	F	★			●	.906	.665	.197	.067	.016	
	XDGX175008PDFR-GL	G	F	★			●	.906	.669	.197	.051	.031	
	XDGX175012PDFR-GL	G	F	★			●	.906	.669	.197	.035	.047	
	XDGX175016PDFR-GL	G	F	★			●	.866	.646	.197	.055	.063	
	XDGX175020PDFR-GL	G	F	★			●	.866	.646	.197	.039	.079	
	XDGX175024PDFR-GL	G	F	★			●	.866	.646	.197	.024	.094	
	XDGX175030PDFR-GL	G	F	★			●	.831	.634	.197	.031	.118	
	XDGX175032PDFR-GL	G	F	★			●	.831	.634	.197	.024	.125	
	XDGX175040PDFR-GL	G	F	★			●	.787	.614	.197	.031	.157	
	XDGX175050PDFR-GL	G	F	★			●	.764	.602	.197	.016	.197	
Strong Cutting Edge Wear Resistant Type **GM** Breaker	**XDGX175004PDFR-GM**	G	F				●	.906	.669	.197	.067	.016	
	XDGX175008PDFR-GM	G	F				●	.906	.669	.197	.051	.031	
	XDGX175012PDFR-GM	G	F				●	.906	.669	.197	.035	.047	
	XDGX175016PDFR-GM	G	F				●	.866	.626	.197	.055	.063	
	XDGX175020PDFR-GM	G	F				●	.866	.626	.197	.039	.079	
	XDGX175024PDFR-GM	G	F				●	.866	.626	.197	.024	.094	
	XDGX175030PDFR-GM	G	F				●	.831	.630	.197	.031	.118	
	XDGX175032PDFR-GM	G	F				●	.831	.630	.197	.024	.125	
	XDGX175040PDFR-GM	G	F				●	.787	.583	.197	.019	.157	
	XDGX175050PDFR-GM	G	F				●	.764	.591	.197	.016	.197	
Strong Cutting Edge **GM** Breaker	**XDGX175004PDER-GM**	G	E		●	●		.906	.669	.197	.067	.016	
	XDGX175008PDER-GM	G	E		●	●		.906	.669	.197	.051	.031	
	XDGX175012PDER-GM	G	E		●	●		.906	.669	.197	.035	.047	
	XDGX175016PDER-GM	G	E		●	●		.866	.626	.197	.055	.063	
	XDGX175020PDER-GM	G	E		●	●		.866	.626	.197	.039	.079	
	XDGX175024PDER-GM	G	E		●	●		.866	.626	.197	.024	.094	
	XDGX175030PDER-GM	G	E		●	●		.831	.630	.197	.031	.118	
	XDGX175032PDER-GM	G	E		●	●		.831	.630	.197	.024	.125	
	XDGX175040PDER-GM	G	E		●	●		.787	.583	.197	.019	.157	
	XDGX175050PDER-GM	G	E		●	●		.764	.591	.197	.016	.197	



* Be aware that the corner R(RE) has a different shape than the machined workpiece R.
When a GM breaker is recommended, stress the dimensional precision of the workpiece shape.

■ HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	A Type Holder	B Type Holder
	(Inch) AXD4000UR○○○○○○A / AXD4000UR○○○○○○○○A (Metric) AXD4000–○○○○○○○A / AXD4000R○○○○○○○○A	(Inch) AXD4000UR○○○○○B / AXD4000UR○○○○○○○○B (Metric) AXD4000–○○○○○○○B / AXD4000R○○○○○○○○B

Insert Corner Radius (RE)	.016"	.031"	.047"	.063"	.079"	.094"	.118"	.126"	.157"	.197"
	XDGX 175004PD○R-○○	XDGX 175008PD○R-○○	XDGX 175012PD○R-○○	XDGX 175016PD○R-○○	XDGX 175020PD○R-○○	XDGX 175024PD○R-○○	XDGX 175030PD○R-○○	XDGX 175032PD○R-○○	XDGX 175040PD○R-○○	XDGX 175050PD○R-○○

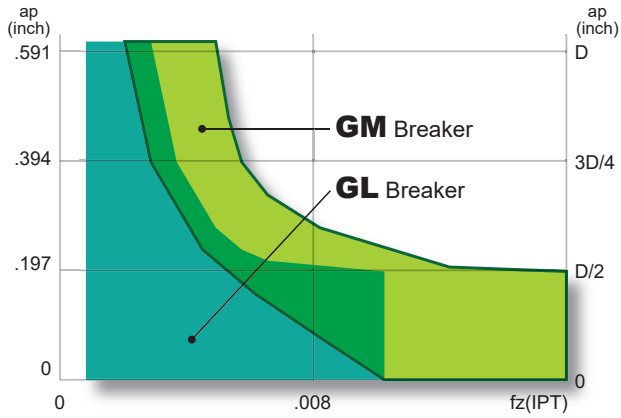
Note 1) Not interchangeable with the corresponding inserts of the A type and B type holders.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

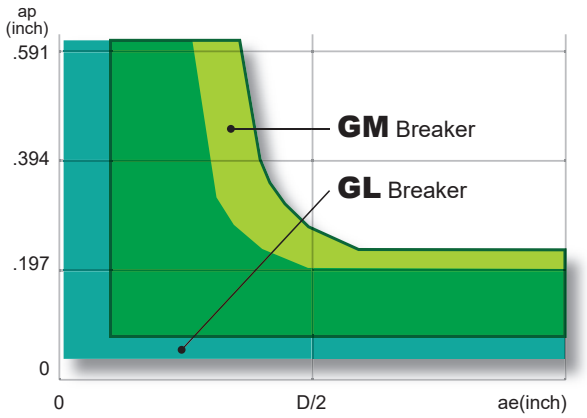
Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below.
1st recommendation for stable cutting condition is the GL breaker with a strong cutting edge.

Selection of insert according to the feed per tooth and the required cutting depth



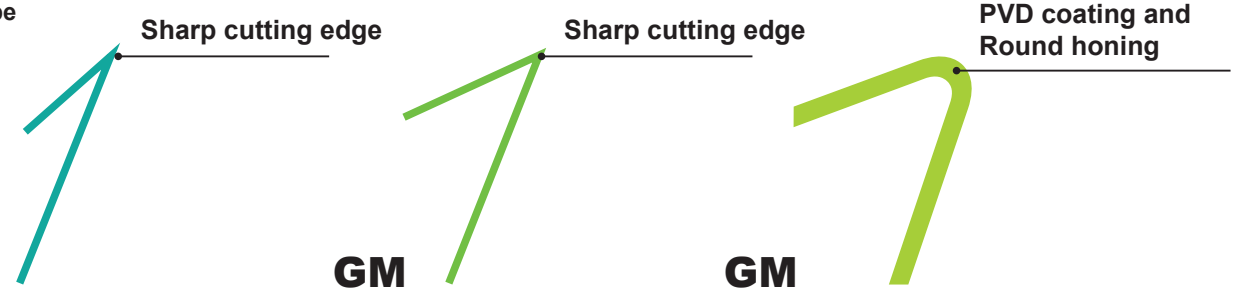
Selection of insert according to the width of cut and the required cutting depth



1st recommendation for machining aluminum alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of insert according to cutting edge

Insert type

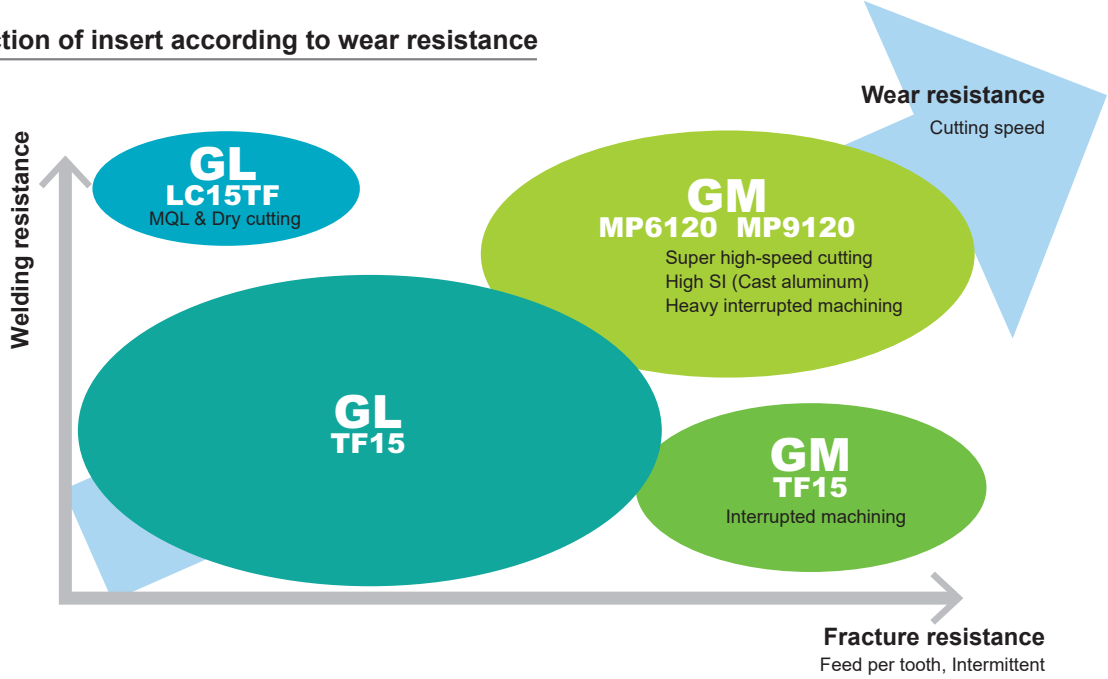


GL
TF15/LC15TF
Low cutting resistance
(LC15TF: Excellent weld resistance)

GM
TF15
Tougher cutting edge

GM
MP9120
Tougher cutting edge & wear resistance
Machining of difficult-to-cut materials & aluminum

Selection of insert according to wear resistance



RECOMMENDED CUTTING CONDITIONS

■Cutting Speed

(inch)

Workpiece Material			Grade	Breaker	vc (SFM)
P	Mild Steel	≤180HB	MP6120	GM	655 (490—720)
	Carbon Steel Alloy Steel	180—280HB	MP6120	GM	655 (490—720)
N	Aluminum Alloys	Si<5%	TF15 LC15TF	GL	3280 (655—9840)
			TF15 MP9120	GM	3280 (655—9840)
		5%≤Si≤10% Si>10%	MP9120	GM	3280 (655—9840)
S	Titanium Alloys	—	MP9120	GM	130 (100—195)

■Feed per Tooth

(inch)

Workpiece Material			Breaker	ae	ap	Feed per Tooth (IPT) Cutting Edge Diameter DC					
						—	1.000"	1.250"	1.500"	2.000"—3.000"	4.000",5.000"
						20 mm	25,28 mm	32,35 mm	40 mm	50—80 mm	100,125 mm
P	Mild Steel	≤180HB	GM	≤ .25 DC	≤ .197	≤ .002	≤ .006	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .394	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .571	≤ .002	≤ .004	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .002	≤ .005	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	—	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .571	—	≤ .003	≤ .004	≤ .004	≤ .005	—
				≤ .75 DC	≤ .197	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .394	—	≤ .004	≤ .004	≤ .005	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .002	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006
	Carbon Steel Alloy Steel	180—280HB	GM	≤ .25 DC	≤ .197	≤ .002	≤ .006	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .394	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .571	≤ .002	≤ .004	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .002	≤ .005	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	—	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .571	—	≤ .003	≤ .004	≤ .004	≤ .005	—
				≤ .75 DC	≤ .197	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .394	—	≤ .004	≤ .004	≤ .005	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .002	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006

Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

(inch)

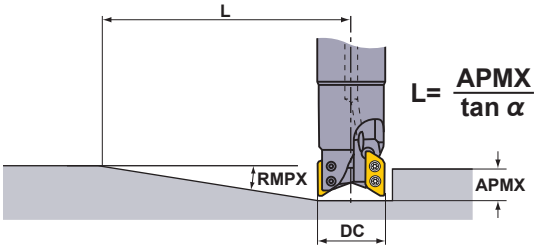
Workpiece Material			Breaker	ae	ap	Feed per Tooth (IPT)					
						Cutting Edge Diameter **DC**					
							1.000"	1.250"	1.500"	2.000"—3.000"	4.000",5.000"
						20 mm	25,28 mm	32,35 mm	40 mm	50—80 mm	100,125 mm
N	Aluminum Alloys	Si<5%	GL	≤ .25 DC	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
					≤ .394	≤ .002	≤ .008	≤ .008	≤ .008	≤ .008	≤ .008
					≤ .571	≤ .002	≤ .006	≤ .006	≤ .006	≤ .006	≤ .006
				≤ .5 DC	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
					≤ .394	—	≤ .008	≤ .008	≤ .008	≤ .008	≤ .008
					≤ .571	—	≤ .006	≤ .006	≤ .006	≤ .006	≤ .006
				≤ .75 DC	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
					≤ .394	—	≤ .008	≤ .008	≤ .008	≤ .008	≤ .008
					≤ .571	—	≤ .006	≤ .006	≤ .006	≤ .006	≤ .006
				DC (Slot)	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
		Si<5%	GM	≤ .25 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .002	≤ .012	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .571	≤ .002	≤ .010	≤ .010	≤ .012	≤ .012	≤ .012
				≤.5 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	—	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .571	—	≤ .008	≤ .010	≤ .010	≤ .012	≤ .012
				≤ .75 DC	≤ .197	≤ .002	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	—	≤ .010	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .571	—	≤ .008	≤ .008	≤ .008	≤ .010	≤ .010
				DC (Slot)	≤ .197	≤ .002	≤ .010	≤ .010	≤ .012	≤ .014	≤ .014
		5%≤Si≤10% Si>10%	GM	≤ .25 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .002	≤ .012	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .571	≤ .002	≤ .010	≤ .010	≤ .012	≤ .012	≤ .012
				≤ .5 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	—	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .571	—	≤ .008	≤ .010	≤ .010	≤ .012	≤ .012
				≤ .75 DC	≤ .197	≤ .002	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	—	≤ .010	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .571	—	≤ .008	≤ .008	≤ .008	≤ .010	≤ .010
				DC (Slot)	≤ .197	≤ .002	≤ .010	≤ .010	≤ .012	≤ .014	≤ .014
S	Titanium Alloys	—	GM	≤ .25 DC	≤ .197	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .394	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .571	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004	≤ .004
				≤ .5 DC	≤ .197	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .394	—	≤ .003	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .571	—	≤ .003	≤ .004	≤ .004	≤ .004	≤ .004
				≤ .75 DC	≤ .197	≤ .002	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
					≤ .394	—	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
					≤ .571	—	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
				DC (Slot)	≤ .197	≤ .002	≤ .002	≤ .002	≤ .002	≤ .002	≤ .002

Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred.
If vibrations occur make adjustments according to the machining conditions.

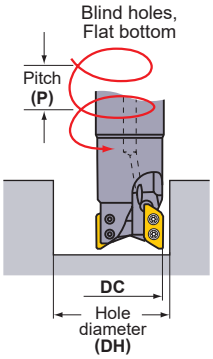
Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

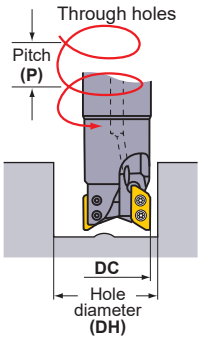
■ Ramping / Helical Cutting (Aluminum Alloy)

● Ramping



● Helical Cutting





(inch)

Type	DC	RE	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			RMPX	L *1	DH max.	P max.	DH min.	P max.	DH min.	P max.
A Type	.787 [20 mm]	.016—.047	20.7°	1.65	1.524 *2	.551	1.421	.551	.866	.079
		.063—.094	19.9°	1.69	1.429 *3	.512	1.362	.512	.866	.079
		.118—.125	18.9°	1.81	1.319 *4	.472	1.311	.472	.866	.039
	1.000	.016—.047	22.6°	1.50	1.949 *2	.551	1.832	.551	1.267	.315
		.063—.094	22.1°	1.54	1.854 *3	.512	1.766	.512	1.267	.315
		.118—.125	20.7°	1.65	1.728 *4	.472	1.707	.472	1.267	.315
	1.102 [28 mm]	.016—.047	19.2°	1.77	2.154 *2	.551	2.047	.551	1.417	.315
		.063—.094	18.5°	1.85	2.059 *3	.512	1.984	.512	1.417	.315
		.118—.125	16.7°	2.05	1.949 *4	.472	1.925	.472	1.417	.276
	1.250	.016—.047	15.6°	2.20	2.449 *2	.551	2.331	.551	1.762	.433
		.063—.094	14.9°	2.32	2.354 *3	.512	2.264	.512	1.762	.394
		.118—.125	14.0°	2.48	2.244 *4	.472	2.203	.472	1.762	.394
	1.378 [35 mm]	.016—.047	13.4°	2.60	2.705 *2	.551	2.591	.551	1.969	.433
		.063—.094	12.7°	2.71	2.610 *3	.512	2.531	.512	1.969	.394
		.118—.125	11.8°	2.95	2.500 *4	.472	2.472	.472	1.969	.354
	1.500	.016—.047	13.0°	2.68	2.933 *2	.551	2.827	.551	2.262	.512
		.063—.094	12.3°	2.83	2.839 *3	.512	2.760	.512	2.262	.512
		.118—.125	11.6°	2.99	2.728 *4	.472	2.701	.472	2.262	.472
	2.000	.016—.047	8.7°	4.02	3.933 *2	.551	3.827	.551	3.258	.551
		.063—.094	8.2°	4.25	3.839 *3	.512	3.757	.512	3.257	.512
		.118—.125	7.6°	4.61	3.728 *4	.472	3.696	.472	3.257	.472
	2.500	.016—.047	6.6°	5.28	4.933 *2	.551	4.824	.551	4.259	.551
		.063—.094	6.1°	5.75	4.839 *3	.512	4.756	.512	4.259	.512
		.118—.125	5.7°	6.14	4.728 *4	.472	4.695	.472	4.258	.472
	3.000	.016—.047	5.3°	6.61	5.933 *2	.551	5.824	.551	5.260	.551
		.063—.094	4.9°	7.13	5.839 *3	.512	5.756	.512	5.260	.512
		.118—.125	4.5°	7.76	5.728 *4	.472	5.746	.472	5.259	.472
	4.000	.016—.047	3.8°	9.21	7.933 *2	.551	7.824	.551	7.261	.551
		.063—.094	3.5°	10.00	7.839 *3	.512	7.755	.512	7.261	.512
		.118—.125	3.2°	10.94	7.728 *4	.472	7.694	.472	7.260	.472
	5.000	.016—.047	2.9°	12.05	9.933 *2	.551	9.823	.551	9.261	.551
		.063—.094	2.7°	12.95	9.839 *3	.512	9.755	.512	9.261	.512
		.118—.125	2.5°	14.02	9.728 *4	.472	9.693	.472	9.260	.472

Note 1) Ramping, helical, and drilling are not recommended for machining of steel and titanium alloys.

(inch)

Type	DC	RE	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			RMPX	L *1	DH max.	P max.	DH min.	P max.	DH min.	P max.
B Type	.787	.157	17.5°	1.850	1.240	.394	1.252	.394	.866	.039
	[20 mm]	.197	16.6°	2.795	1.161	.236	1.224	.276	.866	.039
	1.000	.157	17.9°	1.81	1.665	.394	1.635	.394	1.269	.236
		.197	14.7°	2.24	1.587	.354	1.596	.354	1.269	.197
	1.102	.157	14.1°	2.323	1.870	.394	1.858	.394	1.417	.236
	[28 mm]	.197	13°	2.559	1.791	.354	1.827	.354	1.417	.197
	1.250	.157	12.9°	2.56	2.165	.394	2.130	.394	1.762	.354
		.197	12.2°	2.72	2.087	.354	2.090	.354	1.762	.315
	1.378	.157	10.8°	3.071	2.421	.394	2.402	.394	1.969	.315
	[35mm]	.197	10.2°	3.268	2.343	.354	2.370	.354	1.969	.315
	1.500	.157	10.7°	3.11	2.650	.394	2.622	.394	2.261	.394
		.197	10.1°	3.31	2.571	.354	2.583	.354	2.261	.354
	2.000	.157	6.9°	4.84	3.650	.394	3.621	.394	3.257	.394
		.197	6.5°	5.12	3.571	.354	3.580	.354	3.256	.354
	2.500	.157	5.1°	6.54	4.650	.394	4.600	.394	4.258	.394
		.197	4.8°	6.97	4.571	.354	4.578	.354	4.257	.354
	3.000	.157	4.1°	8.15	5.650	.394	5.619	.394	5.258	.394
		.197	3.8°	8.78	5.571	.354	5.578	.354	5.258	.354
	4.000	.157	2.9°	11.54	7.650	.394	7.618	.394	7.259	.394
		.197	2.7°	12.36	7.571	.354	7.577	.354	7.258	.354
	5.000	.157	2.2°	15.20	9.650	.394	9.618	.394	9.260	.394
		.197	2.1°	15.91	9.571	.354	9.577	.354	9.259	.354

The recommended ramping or helical cutting feed is .002 IPT or less.

*1 Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows:
L=(maximum depth of cut APMX / tan α). Maximum depth of cut A type is .610", B type is .583".

*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of .047".

*3 The maximum diameter when machining a blind hole with a flat face using a corner radius of .094".

*4 The maximum diameter when machining a blind hole with a flat face using a corner radius of .125".
For other corner radius, use to following formula. {(cutting edge diameter DC) - (corner radius RE) - β} ×2

DC	β
1.0" — 1.25"	.010"
1.5"—5.0"	.018"

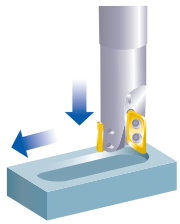
■ Max. Drilling Depth (Aluminum Alloy)

(inch)

Type	RE	Max.Drilling Depth			
		ϕ.787"	ϕ1.000"	ϕ1.250"	ϕ1.500"—ϕ5.000"
A Type	.016—.047	.209	.205	.205	.209
	.063—.094	.189	.181	.185	.189
	.118—.125	.169	.146	.165	.173
B Type	.157	.146	.106	.142	.150
	.197	.134	.091	.130	.138

The recommended drilling feed is .002 IPT or less.

AXD4000 can be effectively used for pocket machining without the need for a prepared hole.



MULTI FUNCTIONAL MILLING

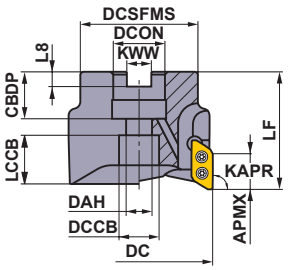
<ALUMINUM ALLOY MATERIAL CUTTING>

90° KAPR

AXD4000A NEW

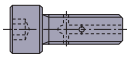
P | M | K | **N** | S | H

ø2.000"



Right hand tool holder only.

(inch)

DC	Set Bolt	Geometry
ϕ2.000"	HSCU37513H	 With Air / coolant through.

■ARBOR TYPE

DCON=inch size, With Air / coolant through.

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Insert Type
2.000	D	.016-.126	**AXD4000AUR2.0004AAD**	●	4	2.000	.750	.9	.610	34000	XDGX1750
2.000	E	.157-.197	**AXD4000AUR2.0004AAE**	●	4	2.000	.750	.9	.583	34000	XDGX1750

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
RPMX (max. rev/min) for holders must also be considered.
Note 2) Tool should be set with balancing quality of G6.3 (ISO1940) or ISO16084, in case over 6000 min^{-1} spindle rotation.
Note 3) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 4) Note for inserts with a corner radius of .063" and above, as corner radius increases the LF dimensions decrease.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
2.000	**AXD4000AUR2.0004AAD**	.750	.748	.413	.630	.560	1.750	.313	.187
2.000	**AXD4000AUR2.0004AAE**	.750	.748	.413	.630	.527	1.750	.313	.187

SPARE PARTS

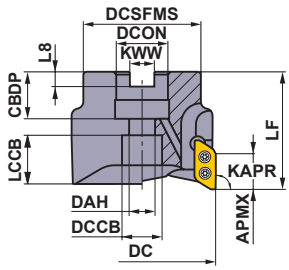
*		
Clamp Screw	Wrench	Anti-seize Lubricant
TPS3SB	TIP10D	MK1KS

* Clamp Torque (lbf-in) : TPS3SB = 26.6

Note 1) Clamp screw and wrench of AXD4000A are different from AXD4000.

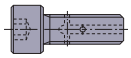
Metric Standard

ø50



Right hand tool holder only.

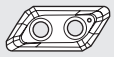
(mm)

DC	Set Bolt	Geometry
ϕ50	HSC10030H	 With Air / coolant through.

■ARBOR TYPE

DCON = inch size, With Air / coolant through.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	 Insert Type
50	D	0.4—3.2	**AXD4000A-050A04RD**	★	4	50	22	0.4	15.5	34000	XDGX1750
50	E	4.0—5.0	**AXD4000A-050A04RE**	★	4	50	22	0.4	14.8	34000	XDGX1750

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
RPMX (max. rev/min) for holders must also be considered.
Note 2) Tool should be set with balancing quality of G6.3 (ISO1940) or ISO16084, in case over 6000 min^{-1} spindle rotation.
Note 3) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 4) Note for inserts with a corner radius of .063" and above, as corner radius increases the LF dimensions decrease.

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**AXD4000A-050A04RD**	22	20	11	17	15.4	45	10.4	6.3
50	**AXD4000A-050A04RE**	22	20	11	17	14.6	45	10.4	6.3

SPARE PARTS

*		
Clamp Screw	Wrench	Anti-seize Lubricant
TPS3SB	TIP10D	MK1KS

* Clamp Torque (lbf-in) : TPS3SB = 26.6

Note 1) Clamp screw and wrench of AXD4000A are different from AXD4000.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

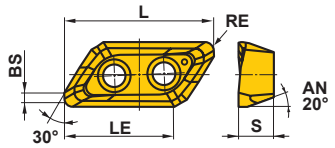
(inch)

Workpiece Material	N	Aluminum Alloys	●	✲			●	✲

Cutting Conditions (Guide):
● :Stable Cutting ◐ :General Cutting ✲ :Unstable Cutting

Edge Preparation:
F :Sharp **E** :Round

Shape	Order Number	Class	Edge Preparation	Stock: Coated LC15TF	Stock: Coated MP9120			Stock: Carbide MT2010	Stock: Carbide TF15	Dimensions L	LE	S	BS	RE*	Geometry
Strong Cutting Edge **GM** Breaker	XDGX175004PDFR-GM	G	F					●	●	.906	.689	.197	.066	.016	
	XDGX175008PDFR-GM	G	F					●	●	.906	.689	.197	.047	.031	
	XDGX175012PDFR-GM	G	F					●	●	.906	.689	.197	.035	.047	
	XDGX175016PDFR-GM	G	F					●	●	.866	.689	.197	.054	.063	
	XDGX175020PDFR-GM	G	F					●	●	.866	.689	.197	.033	.079	
	XDGX175024PDFR-GM	G	F					●	●	.866	.689	.197	.017	.094	
	XDGX175030PDFR-GM	G	F					●	●	.831	.689	.197	.023	.118	
	XDGX175032PDFR-GM	G	F					●	●	.831	.689	.197	.015	.126	
	XDGX175040PDFR-GM	G	F					●	●	.787	.689	.197	.020	.157	
	XDGX175050PDFR-GM	G	F					●	●	.764	.689	.197	.014	.197	
Strong Cutting Edge Fracture Resistance Type **GM** Breaker	XDGX175004PDER-GM	G	E		●					.906	.689	.197	.066	.016	
	XDGX175008PDER-GM	G	E		●					.906	.689	.197	.047	.031	
	XDGX175012PDER-GM	G	E		●					.906	.689	.197	.035	.047	
	XDGX175016PDER-GM	G	E		●					.866	.689	.197	.054	.063	
	XDGX175020PDER-GM	G	E		●					.866	.689	.197	.033	.079	
	XDGX175024PDER-GM	G	E		●					.866	.689	.197	.017	.094	
	XDGX175030PDER-GM	G	E		●					.831	.689	.197	.023	.118	
	XDGX175032PDER-GM	G	E		●					.831	.689	.197	.015	.126	
	XDGX175040PDER-GM	G	E		●					.787	.689	.197	.020	.157	
	XDGX175050PDER-GM	G	E		●					.764	.689	.197	.014	.197	
Low Cutting Resistance **GL** Breaker	XDGX175004PDFR-GL	G	F	★					●	.906	.689	.197	.067	.016	
	XDGX175008PDFR-GL	G	F	★					●	.906	.689	.197	.052	.031	
	XDGX175012PDFR-GL	G	F	★					●	.906	.689	.197	.037	.047	
	XDGX175016PDFR-GL	G	F	★					●	.866	.689	.197	.056	.063	
	XDGX175020PDFR-GL	G	F	★					●	.866	.689	.197	.041	.079	
	XDGX175024PDFR-GL	G	F	★					●	.866	.689	.197	.026	.094	
	XDGX175030PDFR-GL	G	F	★					●	.831	.689	.197	.033	.118	
	XDGX175032PDFR-GL	G	F	★					●	.831	.689	.197	.026	.126	
	XDGX175040PDFR-GL	G	F	★					●	.787	.689	.197	.033	.157	
	XDGX175050PDFR-GL	G	F	★					●	.764	.689	.197	.016	.197	



* The insert nose R differs from radius form which is remains on workpiece material after machining due to the effects of the axial rake angle at the time of setting.
GM breaker is recommended if stress the dimensional precision of the workpiece shape.

■ HOLDER AND INSERT CORNER RADIUS COMBINATION

Holder	D Type Holder								E Type Holder	
	AXD4000AUR2.0004AAD, AXD4000A–050A04RD								AXD40000AUR2.0004AAE AXD4000A–050A04RE	
Insert Corner Radius (RE)	R.016"	R.031"	R.047"	R.063"	R.079"	R.094"	R.118"	R.126"	R.157"	R.197"
	XDGX 175004PD R-	XDGX 175008PD R-	XDGX 175012PD R-	XDGX 175016PD R-	XDGX 175020PD R-	XDGX 175024PD R-	XDGX 175030PD R-	XDGX 175032PD R-	XDGX 175040PD R-	XDGX 175050PD R-

Note 1) Other combinations of holder and insert corner R are not acceptable.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

Inserts to be used with the AXD4000A ,which include clamping screws, must be ordered via Kit-order numbers referenced below.

INSERT KIT

Package contents of insert kit (10 inserts and 20 clamp screws)

Workpiece Material	N	Aluminum Alloys	◔	✣			◔	✣		Cutting Conditions (Guide): ● :Stable Cutting ◔ :General Cutting ✣ :Unstable Cutting

Shape	Order Number	Stock						Inserts		Clamp Screw		Use
		Coated				Carbide						
		LC15TF	MP9120			MT2010	TF15	Order Number	Pieces	Order Number	Pieces	
Strong Cutting Edge **GM** Breaker	**K-XDGX175004PDFR-GM**					□	□	XDGX175004PDFR-GM	10	TPS3SB	20	First Recommendation High Speed, High Efficiency and High Load Machining
	K-XDGX175008PDFR-GM					□	□	XDGX175008PDFR-GM	10	TPS3SB	20	
	K-XDGX175012PDFR-GM					□	□	XDGX175012PDFR-GM	10	TPS3SB	20	
	K-XDGX175016PDFR-GM					□	□	XDGX175016PDFR-GM	10	TPS3SB	20	
	K-XDGX175020PDFR-GM					□	□	XDGX175020PDFR-GM	10	TPS3SB	20	
	K-XDGX175024PDFR-GM					□	□	XDGX175024PDFR-GM	10	TPS3SB	20	
	K-XDGX175030PDFR-GM					□	□	XDGX175030PDFR-GM	10	TPS3SB	20	
	K-XDGX175032PDFR-GM					□	□	XDGX175032PDFR-GM	10	TPS3SB	20	
	K-XDGX175040PDFR-GM					□	□	XDGX175040PDFR-GM	10	TPS3SB	20	
	K-XDGX175050PDFR-GM					□	□	XDGX175050PDFR-GM	10	TPS3SB	20	
Strong Cutting Edge Fracture Resistance Type **GM** Breaker	**K-XDGX175004PDER-GM**		□					XDGX175004PDER-GM	10	TPS3SB	20	
	K-XDGX175008PDER-GM		□					XDGX175008PDER-GM	10	TPS3SB	20	
	K-XDGX175012PDER-GM		□					XDGX175012PDER-GM	10	TPS3SB	20	
	K-XDGX175016PDER-GM		□					XDGX175016PDER-GM	10	TPS3SB	20	
	K-XDGX175020PDER-GM		□					XDGX175020PDER-GM	10	TPS3SB	20	
	K-XDGX175024PDER-GM		□					XDGX175024PDER-GM	10	TPS3SB	20	
	K-XDGX175030PDER-GM		□					XDGX175030PDER-GM	10	TPS3SB	20	
	K-XDGX175032PDER-GM		□					XDGX175032PDER-GM	10	TPS3SB	20	
	K-XDGX175040PDER-GM		□					XDGX175040PDER-GM	10	TPS3SB	20	
	K-XDGX175050PDER-GM		□					XDGX175050PDER-GM	10	TPS3SB	20	
Low Cutting Resistance **GL** Breaker	**K-XDGX175004PDFR-GL**	□					□	XDGX175004PDFR-GL	10	TPS3SB	20	General Machining
	K-XDGX175008PDFR-GL	□					□	XDGX175008PDFR-GL	10	TPS3SB	20	
	K-XDGX175012PDFR-GL	□					□	XDGX175012PDFR-GL	10	TPS3SB	20	
	K-XDGX175016PDFR-GL	□					□	XDGX175016PDFR-GL	10	TPS3SB	20	
	K-XDGX175020PDFR-GL	□					□	XDGX175020PDFR-GL	10	TPS3SB	20	
	K-XDGX175024PDFR-GL	□					□	XDGX175024PDFR-GL	10	TPS3SB	20	
	K-XDGX175030PDFR-GL	□					□	XDGX175030PDFR-GL	10	TPS3SB	20	
	K-XDGX175032PDFR-GL	□					□	XDGX175032PDFR-GL	10	TPS3SB	20	
	K-XDGX175040PDFR-GL	□					□	XDGX175040PDFR-GL	10	TPS3SB	20	
	K-XDGX175050PDFR-GL	□					□	XDGX175050PDFR-GL	10	TPS3SB	20	

For safety reasons, clamping screws must be replaced at the same time as inserts.

Note 1) Use the GM type insert when using with a high-speed, high-power spindle machine that is the ideal choice for AXD4000A (spindle RPM of 20000 min^{-1} or more, motor power of 80 kw or more).

Note 2) Clamp screw and wrench of AXD4000A are different from AXD4000.

Note 3) For insert dimensions, refer to page K242.

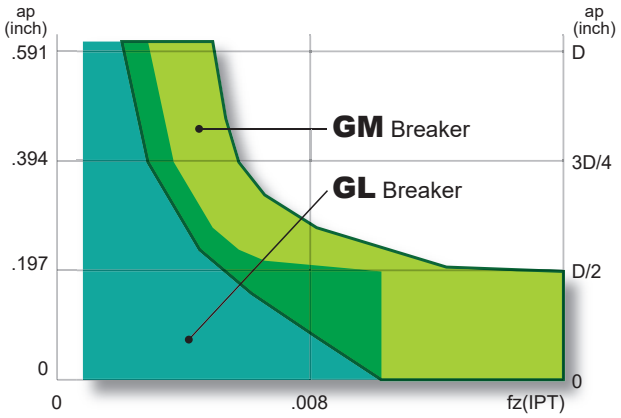
□ : Non stock, produced to order only.

Please order in the ① insert kit order number and ② insert grades.

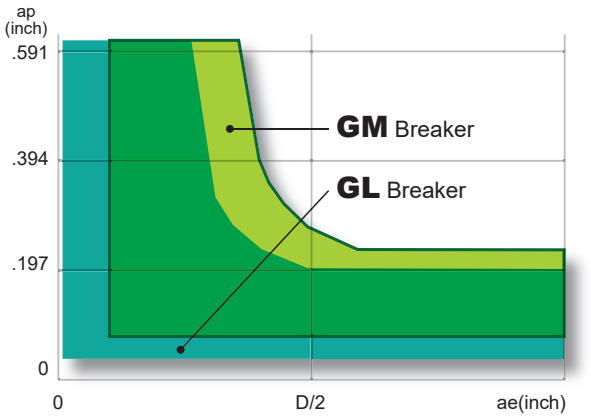
Selection of insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below. The first recommendation for efficient, high load machining with a high-speed spindle is the GM breaker with a strong cutting edge.

Selection of insert according to the feed per tooth and the required cutting depth

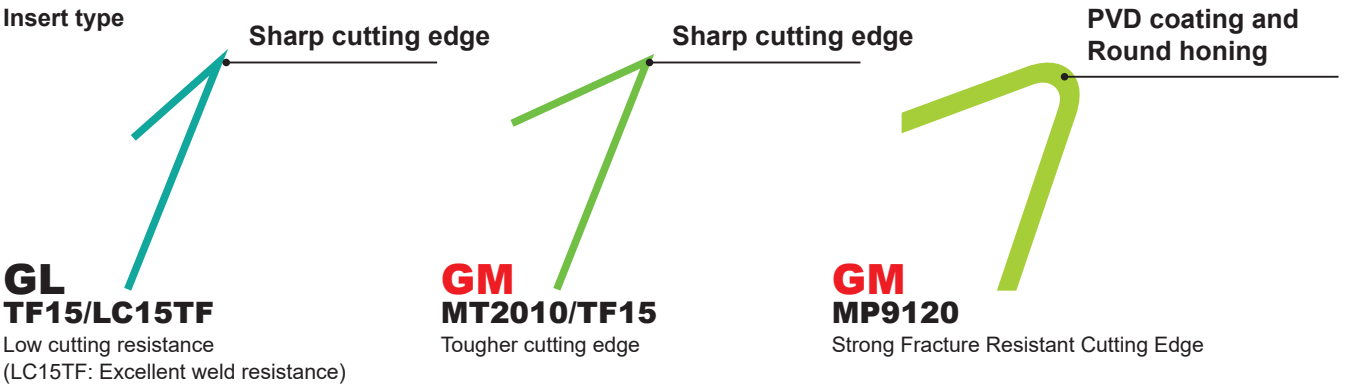


Selection of insert according to the width of cut and the required cutting depth

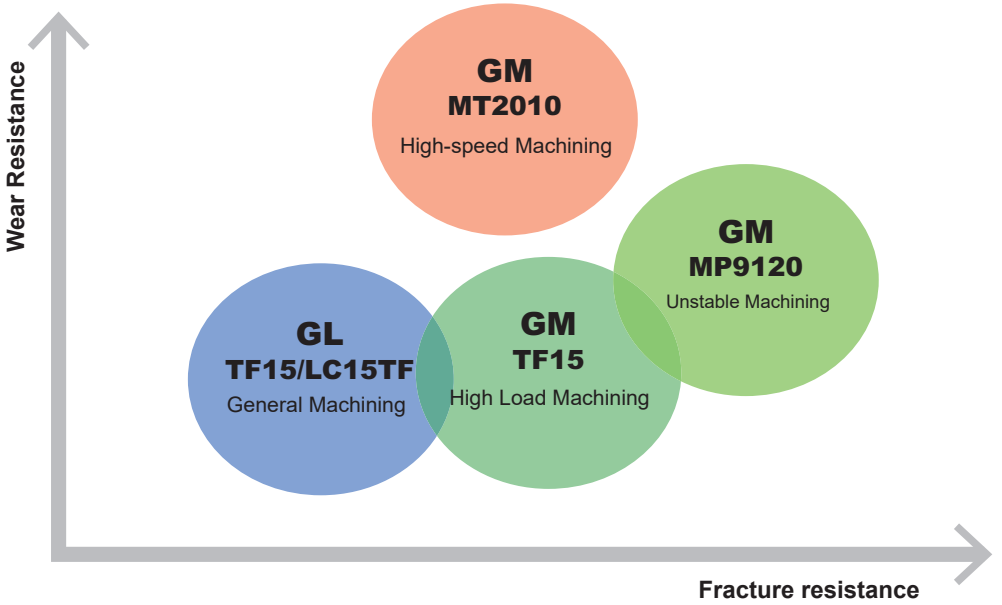


1st recommendation for machining aluminum alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of insert according to cutting edge



Selection of insert according to wear resistance



RECOMMENDED CUTTING CONDITIONS

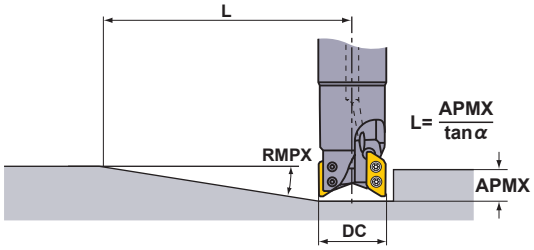
(inch)

	Workpiece Material	Properties	Grade	Breaker	Cutting Speed **vc** (SFM)	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (IPT)
N	Aluminum Alloys	Content Si<5%	MT2010 TF15 MP9120	**GM**	13120(6560—16500)	≤.5 DC	≤ .197	≤ .014
							≤ .394	≤ .012
							≤ .571	≤ .010
						≤.75 DC	≤ .197	≤ .012
							≤ .394	≤ .010
							≤ .571	≤ .008
						DC (Slot)	≤ .197	≤ .012
			TF15 LC15TF	**GL**	13120(6560—16500)	≤.75 DC	≤ .197	≤ .008
							≤ .394	≤ .006
							≤ .571	≤ .004
						DC (Slot)	≤ .197	≤ .008

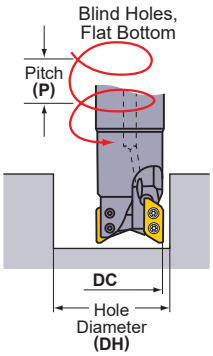
Note 1) The above cutting conditions are determined based on high workpiece materials and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece materials has poor clamping rigidity or when the machine rigidity or workpiece materials rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

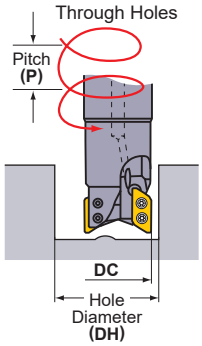
■ Ramping / Helical Milling / Drilling

● **Ramping**



● **Helical Milling**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(inch)

DC inch	DC mm	Type	Insert Corner R **RE**	Ramping: Max. Ramping Angle **RMPX**	Ramping: Min. Distance *1 **L**	Helical Milling (Blind Hole, Flat Bottom): Max. Hole Diameter **DH max.**	Max. Pitch **P max.**	Min. Hole Diameter **DH min.**	Max. Pitch **P max.**	Helical Milling (Through Hole): Min. Hole Diameter **DH min.**	Max. Pitch **P max.**	Drilling
1.969	50.0	D	.016–.047	8.2°	4.252	3.811 *2	.551	3.756	.551	3.197	.551	.217
			.063–.094	7.6°	4.606	3.717 *3	.512	3.685	.512	3.197	.512	.197
			.118–.126	6.9°	5.079	3.654 *4	.472	3.622	.472	3.197	.472	.177
		E	.157	6.3°	5.314	3.591	.394	3.543	.394	3.197	.394	.154
			.197	5.8°	5.748	3.512	.354	3.496	.354	3.197	.354	.142
2.000	50.8	D	.016–.047	8.7°	4.016	3.874 *2	.551	3.819	.551	3.260	.551	.217
			.063–.094	8.2°	4.252	3.780 *3	.512	3.748	.512	3.260	.512	.197
			.118–.126	7.6°	4.606	3.717 *4	.472	3.685	.472	3.260	.472	.177
		E	.157	6.9°	4.843	3.654	.394	3.606	.394	3.260	.394	.154
			.197	6.5°	5.118	3.575	.354	3.559	.354	3.260	.354	.142

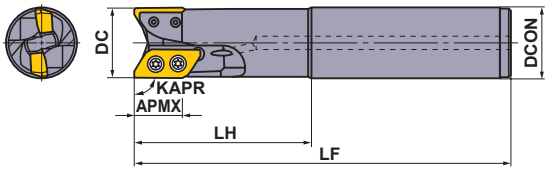
*1 Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows: L= (maximum depth of cut APMX/tan α). Maximum depth of cut D type is .610", E type is .583".
*2 Corner radius of .047". For other corner radii, use the following formula. {(cutting edge diameter DC)—(corner radius RE)– .022"}×2
*3 Corner radius of .094". For other corner radii, use the following formula. {(cutting edge diameter DC)—(corner radius RE)– .022"}×2
*4 Corner radius of .126". For other corner radii, use the following formula. {(cutting edge diameter DC)—(corner radius RE)– .022"}×2
Note 1) The recommended ramping feed is .002 IPT or under.

MULTI FUNCTIONAL MILLING
<CUTTING FOR ALUMINUM ALLOYS>

90° KAPR

AXD7000

P M K N S H



SHANK TYPE

With Air / coolant through.

Right hand tool holder only.

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	LH	DCON	WT (lbs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
1.250	A Type	.031-.125	**AXD7000UR202SA20SA**	●	2	6.000	2.000	1.250	.6	.827	41000	1	XDGX2270
1.250	B Type	.157-.197	**AXD7000UR202SA20SB**	●	2	6.000	2.000	1.250	.6	.803	41000	1	XDGX2270
1.500	A Type	.031-.125	**AXD7000UR242SA24SA**	●	2	7.000	3.000	1.500	1.1	.827	36000	1	XDGX2270
1.500	B Type	.157-.197	**AXD7000UR242SA24SB**	●	2	7.000	3.000	1.500	1.1	.803	36000	1	XDGX2270

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .118" and above, as corner radius increases the LF and LH dimension decreases.

Fig.1

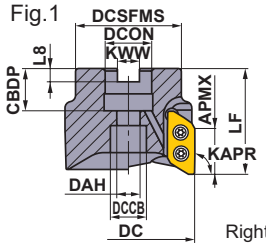
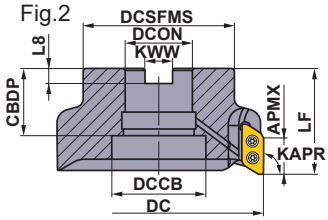


Fig.2



Right hand tool holder only.

DC	DCON	Coolant thru Set Bolt	Geometry
2.000	.750	HSCU37513H	① ②
3.000	1.250	HSCU62516H	①
4.000	1.500	HSCU75016H	①
5.000	1.500	MBAU75016H	②

With Air / coolant through.

■ ARBOR TYPE

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (ibs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
2.000	A Type	.031-.125	**AXD7000UR0203A**	●	3	2.000	.750	.9	.827	30000	1	XDGX2270
2.000	B Type	.157-.197	**AXD7000UR0203B**	●	3	2.000	.750	.9	.803	30000	1	XDGX2270
3.000	A Type	.031-.125	**AXD7000UR0303DA**	●	3	2.500	1.250	2.6	.827	23000	1	XDGX2270
3.000	B Type	.157-.197	**AXD7000UR0303DB**	●	3	2.500	1.250	2.6	.803	23000	1	XDGX2270
4.000	A Type	.031-.125	**AXD7000UR0405EA**	●	5	2.500	1.500	5.4	.827	19000	1	XDGX2270
4.000	B Type	.157-.197	**AXD7000UR0405EB**	□	5	2.500	1.500	5.4	.803	19000	1	XDGX2270
5.000	A Type	.031-.125	**AXD7000UR0506EA**	●	6	2.500	1.500	6.6	.827	16000	2	XDGX2270
5.000	B Type	.157-.197	**AXD7000UR0506EB**	□	6	2.500	1.500	6.6	.803	16000	2	XDGX2270

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .118" and above, as corner radius increases the LF dimension decreases.
Note 4) The cutter body includes a set bolt for an arbor.

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
2.000	**AXD7000UR0203A**	.750	.748	.415	.600	.591	1.875	.313	.187	1
2.000	**AXD7000UR0203B**	.750	.748	.415	.600	.055	1.875	.313	.187	1
3.000	**AXD7000UR0303DA**	1.250	1.260	.669	1.024	.080	2.750	.500	.281	1
3.000	**AXD7000UR0303DB**	1.250	1.260	.669	1.024	.076	2.750	.500	.281	1
4.000	**AXD7000UR0405EA**	1.500	1.181	.787	1.181	.914	3.810	.625	.375	1
4.000	**AXD7000UR0405EB**	1.500	1.181	.787	1.181	.835	3.810	.625	.375	1
5.000	**AXD7000UR0506EA**	1.500	1.575	2.205	1.181	.794	3.810	.625	.375	2
5.000	**AXD7000UR0506EB**	1.500	1.575	2.205	1.181	.873	3.810	.625	.375	2

SPARE PARTS

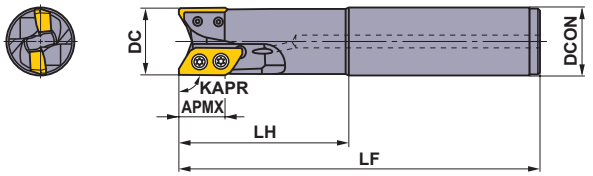
(inch)

DC	* Clamp Screw	Wrench	Anti-seize Lubricant
Shank 1.200	TS4SB	TKY15D	MK1KS
Shank 1.500 and Arbor	TS4SBL	TKY15D	MK1KS

* Clamp Torque (lbf-in) : TS4SB = 31, TS4SBL = 31

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1



Metric Standard

■ SHANK TYPE

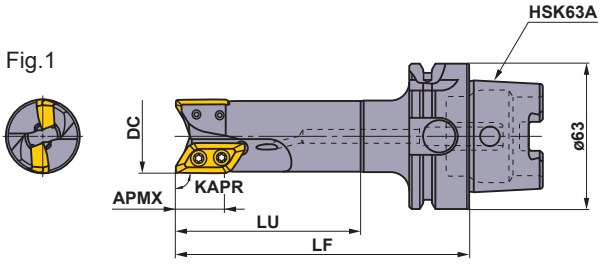
With Air / coolant through.

Right hand tool holder only.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	LH	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
32	A Type	0.8-3.2	**AXD7000R322SA32SA**	★	2	170	80	32	0.85	21.0	41000	1	XDGX2270
32	B Type	4.0-5.0	**AXD7000R322SA32SB**	★	2	170	80	32	0.85	20.4	41000	1	XDGX2270
40	A Type	0.8-3.2	**AXD7000R402SA42SA**	★	2	170	80	42	1.44	21.0	36000	1	XDGX2270
40	B Type	4.0-5.0	**AXD7000R402SA42SB**	★	2	170	80	42	1.44	20.4	36000	1	XDGX2270

Fig.1



Metric Standard

■ HSK63A SHANK TYPE

With Air / coolant through.

Right hand tool holder only.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	LH	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
32	A Type	0.8-3.2	**AXD7000R03202A-H63A**	★	2	127	80	1.06	21.0	41000	1	XDGX2270
40	A Type	0.8-3.2	**AXD7000R04002A-H63A**	★	2	132	85	1.34	21.0	36000	1	XDGX2270
50	A Type	0.8-3.2	**AXD7000R05003A-H63A**	★	3	137	90	2.40	21.0	30000	1	XDGX2270

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for insert with a corner radius of .118" and above, as corner radius increases the LF and LH dimension decreases.

SPARE PARTS

(mm)

DC	*		
	Clamp Screw	Wrench	Anti-seize Lubricant
32	TS4SB	TKY15D	MK1KS
40, 50	TS4SBL	TKY15D	MK1KS

* Clamp Torque (lbf-in) : TS4SB=31, TS4SBL=31

★ : Stocked in Japan

Fig.1

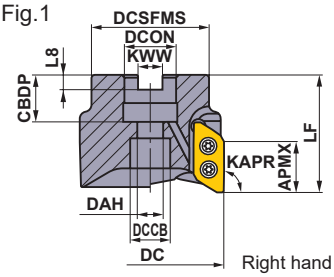
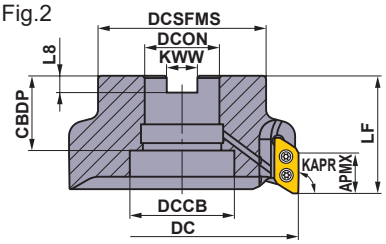
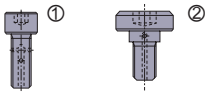


Fig.2



Right hand tool holder only.

DC		Set Bolt	Geometry	
mm	inch			
ϕ50, ϕ63		HSC10030H	①	
ϕ80	ϕ80	HSC12035H		
ϕ100	ϕ100	HSC16040H		
ϕ125	ϕ125	MBA20040H	②	With Air / coolant through.

Metric Standard

For inch arbors

■ ARBOR TYPE

DCON = inch size, With Air / coolant through.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
80	A Type	0.8-3.2	**AXD7000R08004CA**	★	4	63	25.4	1.2	21.0	23000	1	XDGX2270
80	B Type	4.0-5.0	**AXD7000R08004CB**	★	4	63	25.4	1.2	20.4	23000	1	XDGX2270
100	A Type	0.8-3.2	**AXD7000R10005DA**	★	5	63	31.75	1.8	21.0	19000	1	XDGX2270
100	B Type	4.0-5.0	**AXD7000R10005DB**	★	5	63	31.75	1.8	20.4	19000	1	XDGX2270
125	A Type	0.8-3.2	**AXD7000R12506EA**	★	6	63	38.1	2.7	21.0	16000	2	XDGX2270
125	B Type	4.0-5.0	**AXD7000R12506EB**	★	6	63	38.1	2.7	20.4	16000	2	XDGX2270

Metric Standard

For metric arbors

DCON = mm size, With Air / coolant through.

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	Number of Teeth	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
50	A Type	0.8-3.2	**AXD7000-050A03RA**	★	3	50	22	0.4	21.0	30000	1	XDGX2270
50	B Type	4.0-5.0	**AXD7000-050A03RB**	★	3	50	22	0.4	20.4	30000	1	XDGX2270
63	A Type	0.8-3.2	**AXD7000-063A03RA**	★	3	50	22	0.5	21.0	25000	1	XDGX2270
63	B Type	4.0-5.0	**AXD7000-063A03RB**	★	3	50	22	0.5	20.4	25000	1	XDGX2270
80	A Type	0.8-3.2	**AXD7000-080A04RA**	★	4	63	27	1.2	21.0	23000	1	XDGX2270
80	B Type	4.0-5.0	**AXD7000-080A04RB**	★	4	63	27	1.2	20.4	23000	1	XDGX2270
100	A Type	0.8-3.2	**AXD7000-100A05RA**	★	5	63	32	1.8	21.0	19000	1	XDGX2270
100	B Type	4.0-5.0	**AXD7000-100A05RB**	★	5	63	32	1.8	20.4	19000	1	XDGX2270
125	A Type	0.8-3.2	**AXD7000-125B06RA**	★	6	63	40	2.7	21.0	16000	2	XDGX2270
125	B Type	4.0-5.0	**AXD7000-125B06RB**	★	6	63	40	2.7	20.4	16000	2	XDGX2270

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Before operating the tool read the operation guidance on page K256.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
Note 3) Note for inserts with a corner radius of .118" and above, as corner radius increases the LF dimension decreases.
Note 4) Set bolt not included.

MOUNTING DIMENSIONS

(mm)

DC	Tool Holder Type	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
50	**AXD7000-050A**	22	20	11.0	17	20.72	45	10.4	6.3	1
63	**AXD7000-063A**	22	20	11.0	17	20.72	50	10.4	6.3	1
80	**AXD7000R080**	25.4	26	13.0	20	26.72	63	9.5	6.0	1
80	**AXD7000-080A**	27	23	13.0	20	26.72	63	12.4	7.0	1
100	**AXD7000R100**	31.75	32	17.0	26	18.72	70	12.7	8.0	1
100	**AXD7000-100A**	32	26	17.0	26	24.72	70	14.4	8.0	1
125	**AXD7000R125**	38.1	40	—	56	20.72	90	15.9	10.0	2
125	**AXD7000-125B**	40	40	—	56	20.72	90	16.4	9.0	2

SPARE PARTS

(mm)

*		
Clamp Screw	Wrench	Anti-seize Lubricant
TS4SBL	TKY15D	MK1KS

* Clamp Torque (N • m) : TS4SBL=3.5

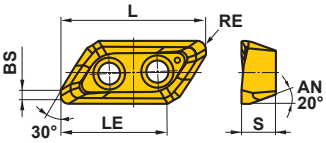
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

INSERTS

Workpiece Material			LC15TF	MP6120	MP9120	TF15
	P	Steel	✣	◐	✣	◐
	N	Aluminum Alloys	✣		✣	◐
	S	Titanium Alloys			◐	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

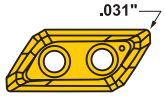
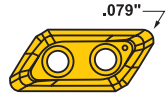
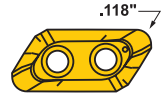
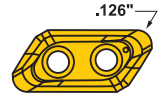
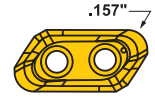
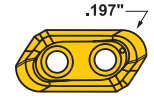
Edge Preparation :
F : Sharp Edge **E** : Round

Shape	Order Number	Class	Edge Preparation	Stock: Coated LC15TF	Stock: Coated MP6120	Stock: Coated MP9120	Stock: Carbide TF15	Dimensions (inch) L	LE	S	BS	RE *	Geometry
	XDGX227008PDFR-GL	G	F	★			●	1.181	.850	.276	.079	.031	
	XDGX227016PDFR-GL	G	F	★			●	1.181	.854	.276	.047	.063	
	XDGX227020PDFR-GL	G	F	★			●	1.181	.854	.276	.031	.079	
	XDGX227024PDFR-GL	G	F	□			●	1.181	.854	.276	.031	.094	
	XDGX227030PDFR-GL	G	F	★			●	1.134	.835	.276	.031	.118	
	XDGX227032PDFR-GL	G	F	★			●	1.134	.835	.276	.024	.125	
	XDGX227040PDFR-GL	G	F	★			●	1.083	.811	.276	.035	.157	
	XDGX227050PDFR-GL	G	F	★			●	1.063	.799	.276	.016	.197	
	XDGX227008PDER-GLA	G	E		●	●		1.181	.854	.276	.079	.031	
	XDGX227016PDER-GLA	G	E		●	●		1.181	.854	.276	.047	.063	
	XDGX227020PDER-GLA	G	E		●	●		1.181	.854	.276	.031	.079	
	XDGX227024PDER-GLA	G	E		●	●		1.181	.854	.276	.031	.094	
	XDGX227030PDER-GLA	G	E		●	●		1.134	.831	.276	.031	.118	
	XDGX227032PDER-GLA	G	E		●	●		1.134	.831	.276	.024	.125	
	XDGX227040PDER-GLA	G	E		●	●		1.083	.803	.276	.035	.157	
	XDGX227050PDER-GLA	G	E		●	●		1.063	.795	.276	.016	.197	

* GLA breaker corner R (RE) is designed with almost the same corner R as the machined corner R of a workpiece.
* Be aware that the corner R(RE) has a different shape than the machined workpiece R.

■ COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	A Type Holder	B Type Holder
	(Inch) AXD7000UR○○○○○○○○A AXD7000UR○○○○○○A AXD7000UR○○○○○A (Metric) AXD7000R○○○○○○○○A AXD7000R○○○○○○A AXD7000R-○○○○○○A AXD7000R○○○○○○-H63A	(Inch) AXD7000UR○○○○○○○○B AXD7000UR○○○○○○B AXD7000UR○○○○○B (Metric) AXD7000R○○○○○○○○B AXD7000R○○○○○○B AXD7000R-○○○○○○B

Insert Corner Radius (RE)	.031"	.063"	.079"	.118"	.126"	.157"	.197"
							
	XDGX 227008PDFR-GL	XDGX 227016PDFR-GL	XDGX 227020PDFR-GL	XDGX 227030PDFR-GL	XDGX 227032PDFR-GL	XDGX 227040PDFR-GL	XDGX 227050PDFR-GL

Note 1) Not interchangeable with the corresponding inserts of the A type and B type holders.

● : USA Stock ★ : Stocked in Japan □ : Made to Order
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

■Cutting Speed

(inch)

Workpiece Material			Grade	Breaker	vc (SFM)
P	Mild Steel	≤180HB	MP6120	GLA	655 (490—720)
	Carbon Steel Alloy Steel	180—280HB	MP6120	GLA	655 (490—720)
N	Aluminum Alloys	Si<5%	LC15TF	GL	3280 (655—9840)
			TF15	GL	3280 (655—9840)
		5%≤Si≤10% Si>10%	LC15TF	GL	3280 (655—9840)
S	Titanium Alloys	—	MP9120	GLA	130 (100—195)

■Feed per Tooth

(inch)

Workpiece Material			Breaker	ae	ap	Feed per Tooth (IPT) Cutting Edge Diameter DC 1.250" 32 mm	1.500" 40 mm	2.000"—3.000" 50—80 mm	4.000",5.000" 100,125 mm
P	Mild Steel	≤180HB	GLA	≤ .25 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .75 DC	≤ .197	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .591	≤ .004	≤ .004	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .005	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .004	≤ .005	≤ .006	≤ .006
	Carbon Steel Alloy Steel	180—280HB	GLA	≤ .25 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .75 DC	≤ .197	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .591	≤ .004	≤ .004	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .005	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .004	≤ .005	≤ .006	≤ .006

Note 1) The above cutting conditions are determined based on high workpiece material and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

Note 2) Note, vibrations may occur in the following conditions.

- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce the cutting conditions.

■Feed per Tooth

(inch)

Workpiece Material		Breaker	ae	ap	Feed per Tooth (IPT) Cutting Edge Diameter **DC** 1.250" 32 mm	1.500" 40 mm	2.000"—3.000" 50—80 mm	4.000",5.000" 100,125 mm
N	Aluminum Alloys	Si<5%	GL	≤ .25 DC	≤ .197	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .012	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .010	≤ .010	≤ .010
				≤ .5 DC	≤ .197	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .008	≤ .010	≤ .010
				≤ .75 DC	≤ .197	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .008	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .006	≤ .006	≤ .008	≤ .008
				DC (Slot)	≤ .197	≤ .010	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .008	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .006	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .004	≤ .006	≤ .008	≤ .008
		5%≤Si≤10% Si>10%	GL	≤ .25 DC	≤ .197	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .012	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .010	≤ .010	≤ .010
				≤ .5 DC	≤ .197	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .008	≤ .010	≤ .010
				≤ .75 DC	≤ .197	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .008	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .006	≤ .006	≤ .008	≤ .008
				DC (Slot)	≤ .197	≤ .010	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .008	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .006	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .004	≤ .006	≤ .008	≤ .008
S	Titanium Alloys	—	GLA	≤ .25 DC	≤ .197	≤ .004	≤ .005	≤ .005	—
					≤ .394	≤ .004	≤ .005	≤ .005	—
					≤ .591	≤ .004	≤ .005	≤ .005	—
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .004	≤ .005	≤ .005	—
					≤ .394	≤ .004	≤ .005	≤ .005	—
					≤ .591	≤ .004	≤ .005	≤ .005	—
					≤ .987	—	≤ .004	≤ .004	—
				≤ .75 DC	≤ .197	≤ .004	≤ .005	≤ .005	—
					≤ .394	≤ .004	≤ .005	≤ .005	—
					≤ .591	≤ .004	≤ .005	≤ .005	—
					≤ .987	—	≤ .004	≤ .004	—
				DC (Slot)	≤ .197	≤ .003	≤ .003	≤ .003	—
					≤ .394	≤ .002	≤ .003	≤ .003	—

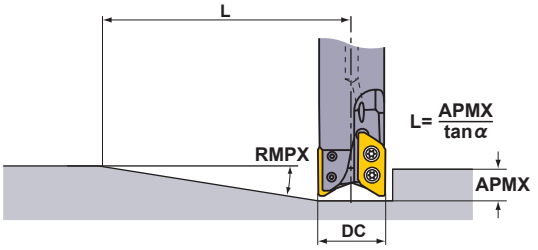
Note 1) The above cutting conditions are determined based on high workpiece material and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.

Note 2) Note, vibrations may occur in the following conditions.

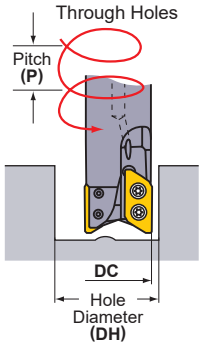
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce the cutting conditions.

■Ramping / Helical Cutting (Aluminum Alloys)

Ramping



Helical Cutting



(inch)

Type	DC	RE	Ramping	
			RMPX	L *1
A Type	1.250	.031—.094	20°	2.272
		.118—.126	19.3°	2.362
	1.500	.031—.094	14.1°	3.292
		.118—.126	13.3°	3.498
	2.000	.031—.094	9.8°	4.788
		.118—.126	9.1°	5.163
	3.000	.031—.094	5.3°	8.915
		.118—.126	4.9°	9.647
	4.000	.031—.094	4.2°	11.262
		.118—.126	3.8°	12.451
	5.000	.031—.094	2.5°	18.941
		.118—.126	2.2°	21.527
B Type	1.250	.157—.197	18°	2.471
	1.500	.157—.197	11°	4.131
	2.000	.157—.197	8°	5.714
	3.000	.157—.197	4°	11.483
	4.000	.157—.197	3°	15.322
	5.000	.157—.197	2°	22.995

(inch)

Type	DC	RE	Helical Cutting	
			DH min.	P max.
A Type	1.250	.031—.094	1.535	.315
		.118—.126	1.535	.315
	1.500	.031—.094	2.047	.394
		.118—.126	2.047	.394
	2.000	.031—.094	3.031	.551
		.118—.126	3.031	.472
	3.000	.031—.094	5.000	.551
		.118—.126	5.000	.512
	4.000	.031—.094	6.969	.669
		.118—.126	6.969	.591
	5.000	.031—.094	9.016	.512
		.118—.126	9.016	.472
B Type	1.250	.157	1.535	.276
		.197	1.535	.276
	1.500	.157	2.047	.315
		.197	2.047	.315
	2.000	.157	3.031	.433
		.197	3.031	.433
	3.000	.157	5.000	.433
		.197	5.000	.433
	4.000	.157	6.969	.472
		.197	6.969	.472
	5.000	.157	9.016	.433
		.197	9.016	.433

Note 1) The recommended ramping feed is .002 IPT or under.

*1 L (Max. Depth of Cut =.591" / tan α). Cutters' moving distance until depth of cut reaches APMX at a maximum ramping angle.
Maximum depth of cut A type is .827", B type is .803".

*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)—(corner radius)—0.3)}×2

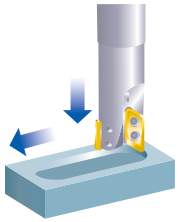
*3 The minimum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)—(corner radius)—(Width of wiper edge BS)—0.1)}×2

■Max. Drilling Depth (Aluminum Alloys)

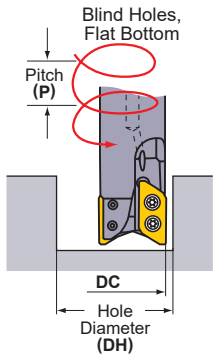
(inch)

Type	RE	Max. Drilling Depth
A Type	.031—.094	.197
	.118, .126	.177
B Type	.157	.157
	.197	.138

AXD7000 can be effectively used for pocket machining without the need for a prepared hole.



Helical Cutting



(inch)

Type	DC	RE	BS	Helical Cutting (Blind Hole, Flat Bottom)			
				DH max. ∗2	P max.	DH min. ∗3	P max.
A Type	1.250"	.031	.079	2.417	.787	2.276	.787
		.063	.047	2.354	.748	2.276	.748
		.079	.031	2.323	.709	2.276	.748
		.094	.016	2.291	.709	2.276	.748
		.118	.031	2.244	.669	2.193	.669
		.125	.024	2.228	.669	2.193	.669
	1.500"	.031	.079	2.902	.787	2.776	.787
		.063	.047	2.839	.748	2.776	.748
		.079	.031	2.807	.709	2.776	.748
		.094	.016	2.776	.709	2.776	.748
		.118	.031	2.728	.669	2.693	.669
		.125	.024	2.713	.669	2.693	.669
	2.000"	.031	.079	3.902	.787	3.768	.787
		.063	.047	3.839	.748	3.768	.748
		.079	.031	3.807	.709	3.768	.748
		.094	.016	3.776	.709	3.768	.748
		.118	.031	3.728	.669	3.768	.669
		.125	.024	3.713	.669	3.687	.669
	3.000"	.031	.079	5.902	.787	5.768	.787
		.063	.047	5.839	.748	5.768	.748
		.079	.031	5.807	.709	5.768	.748
		.094	.016	5.776	.709	5.768	.748
		.118	.031	5.728	.669	5.686	.669
		.125	.024	5.713	.669	5.686	.669
	4.000"	.031	.079	7.902	.787	7.768	.787
		.063	.047	7.839	.748	7.768	.748
		.079	.031	7.807	.709	7.768	.748
		.094	.016	7.776	.709	7.768	.748
		.118	.031	7.728	.669	7.686	.669
		.125	.024	7.713	.669	7.686	.669
	5.000"	.031	.079	9.902	.669	9.767	.630
		.063	.047	9.839	.630	9.767	.630
		.079	.031	9.807	.630	9.767	.630
		.094	.016	9.776	.630	9.767	.630
		.118	.031	9.728	.551	9.685	.551
		.125	.024	9.713	.551	9.685	.551
B Type	1.250"	.157	.035	2.165	.630	2.106	.630
		.197	.016	2.087	.591	2.070	.591
	1.500"	.157	.035	2.650	.630	2.605	.630
		.197	.016	2.571	.591	2.569	.591
	2.000"	.157	.035	3.650	.630	3.599	.630
		.197	.016	3.571	.591	3.563	.591
	3.000"	.157	.035	5.650	.551	5.597	.551
		.197	.016	5.571	.551	5.561	.551
	4.000"	.157	.035	7.650	.591	7.597	.591
		.197	.016	7.571	.591	7.561	.591
	5.000"	.157	.035	9.650	.472	9.597	.472
		.197	.016	9.571	.472	9.560	.472

∗1 L (Max. Depth of Cut =.591" / tan α). Cutters' moving distance until depth of cut reaches APMX at a maximum ramping angle. Maximum depth of cut A type is .827", B type is .803".

∗2 The maximum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type. Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−0.3)}×2

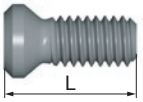
∗3 The minimum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type. Other than that, find with the below formula.
{(cutting edge diameter DC)−(corner radius)−(Width of wiper edge BS)−0.1)}×2

Note 1) The recommended ramping feed is .002 IPT or under.

OPERATIONAL GUIDANCE

Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.

Type	AXD4000		AXD7000	
Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"–ø5.000"	ø1.250"	ø1.500"–ø5.000"
Clamp Screw Number	TS3SBS	TS3SB	TS4SB	TS4SBL
Overall Length **L**(inch)	.256	.315	.353	.413
Clamp Torque (lbf-in)	13	13	31	31



When tightening the clamp screws, follow the order in Figure 1.
The maximum allowable spindle speeds are shown in Table 1.
Ensure that the cutter operates under the maximum allowable spindle speed.
The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

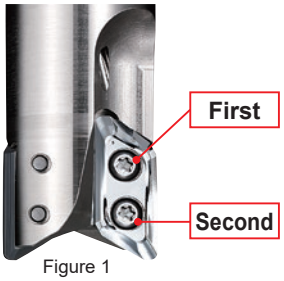


Figure 1

(Table 1) Maximum allowable spindle speed

AXD4000

Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min^{-1})	15000	49000	48000	41000	35000	30000	27000	23000	20000

AXD7000

Cutting Edge Diameter **DC**(inch)	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min^{-1})	41000	36000	30000	25000	23000	19000	16000

Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G6.3 or better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.
∗ The balance quality of the holder (without inserts and clamp screws) is G6.3 or better at 10000 min^{-1}.

(Table 2) Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

AXD4000

Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min^{-1})	15000	12000	9500	7600	6000	4800	3800	3000	2400

AXD7000

Cutting Edge Diameter **DC**(inch)	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min^{-1})	9500	7600	6000	4800	3800	3000	2400

When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
Use the specified set bolt when using the arbor type with through coolant.
The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

Memo

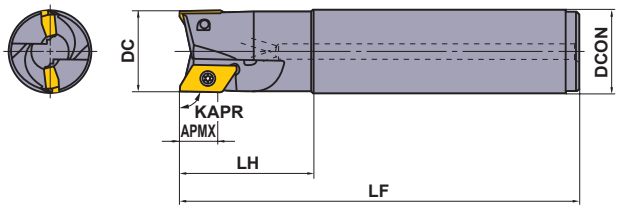
MULTI FUNCTIONAL MILLING

<FOR ALUMINUM ALLOY AND DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

BXD4000

P M K N S H



STRAIGHT SHANK TYPE

Right hand tool holder only.

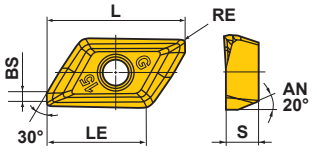
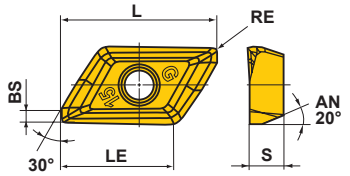
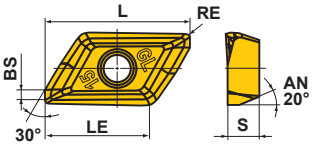
Type	RE	Order Number	Stock R	Number of Teeth	Dimensions (inch) DC	LF	DCON	LH	APMX (inch)	RMPX *2	Max. Spindle Speed (min-1) Balance Unknown	G40 *1 Balanced	*1 Insert Screw	Wrench
A Holders	.016 | .125	BXD4000R162SA12S	●	2	1.000	6.000	.750	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R162SA16S	●	2	1.000	6.000	1.000	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R202SA20S	●	2	1.250	6.000	1.250	2.000	.591	13°	9500	33000	TS4SL	TKY15W
		BXD4000R243SA20S	●	3	1.500	6.000	1.250	2.000	.591	10°	7600	29000	TS4SL	TKY15W
B Holders	.157 | .197	BXD4000R162SA12SB	●	2	1.000	6.000	.750	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R162SA16SB	●	2	1.000	6.000	1.000	2.000	.591	20°	12000	38000	TS4SL	TKY15W
		BXD4000R202SA20SB	●	2	1.250	6.000	1.250	2.000	.591	13°	9500	33000	TS4SL	TKY15W
		BXD4000R243SA20SB	●	3	1.500	6.000	1.250	2.000	.591	10°	7600	29000	TS4SL	TKY15W

*1 Clamp Torque (lbf-in) : TS4SL=35 *2 RMPX : Max. Ramping Angle

Note 1) You need to balance the tool and holder together so that it confirms to G40 or higher standards.

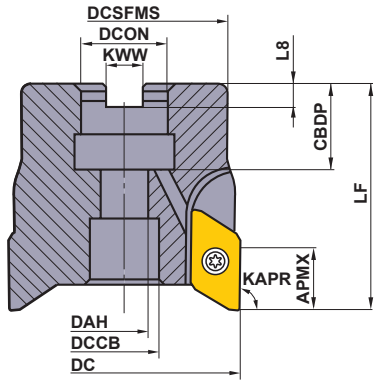
INSERTS WITH BREAKER

Workpiece Material		
P	Steel	● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
M	Stainless Steel	
K	Cast Iron	**Cutting Conditions (Guide) :**
N	Non-Ferrous Metal	**Edge Preparation :**
S	Heat resistant Alloys, Titanium Alloys	**E** : Round **F** : Sharp Edge

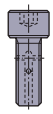
Shape	Order Number	Class	Edge Preparation	Coated VP15TF	Coated LC15TF	Carbide TF15	Dimensions (inch) L	LE	S	BS	RE	Geometry
G breaker	XDGT1550PDFR-G04	G	F		★	●	.866	.610	.197	.059	.016	
	XDGT1550PDFR-G08	G	F		★	●	.866	.610	.197	.043	.031	
	XDGT1550PDFR-G12	G	F		★	★	.866	.610	.197	.028	.047	
	XDGT1550PDFR-G16	G	F		★	●	.866	.614	.197	.016	.063	
	XDGT1550PDFR-G20	G	F		★	●	.854	.614	.197	.008	.079	
	XDGT1550PDFR-G30	G	F		★	●	.787	.583	.197	.024	.118	
	XDGT1550PDFR-G32	G	F		★	●	.787	.583	.197	.016	.126	
	XDGT1550PDFR-G40	G	F		★	●	.748	.567	.197	.020	.157	
	XDGT1550PDFR-G50	G	F		★	●	.709	.551	.197	.016	.197	
	XDGT1550PDER-G04	G	E	●			.866	.610	.197	.059	.016	
	XDGT1550PDER-G08	G	E	●			.866	.610	.197	.043	.031	
	XDGT1550PDER-G12	G	E	★			.866	.610	.197	.028	.047	
	XDGT1550PDER-G16	G	E	●			.866	.614	.197	.016	.063	
	XDGT1550PDER-G20	G	E	●			.854	.614	.197	.008	.079	
	XDGT1550PDER-G30	G	E	●			.787	.583	.197	.024	.118	
	XDGT1550PDER-G32	G	E	●			.787	.583	.197	.016	.126	
	XDGT1550PDER-G40	G	E	●			.748	.567	.197	.020	.157	
	XDGT1550PDER-G50	G	E	●			.709	.551	.197	.016	.197	
Lower Cutting Resistance Type	XDGT1550PDFR-GL04	G	F			●	.866	.610	.197	.059	.016	
	XDGT1550PDFR-GL08	G	F			●	.866	.610	.197	.043	.031	

● : USA Stock ★ : Stocked in Japan

<10 inserts in one case>



DC	Coolant thru Set Bolt
1.5	HSCU25014H
2	HSCU37513H
2.5	HSCU37513H
3	HSCU50014H
4	HSCU75016H



Right hand tool holder only.

■ ARBOR TYPE

Type	RE	Order Number	Stock	Number of Teeth	Dimensions (inch)							APMX	*2 RMPX	Max. Spindle Speed (min^{-1})		*1	
			R		DC	LF	DCON	CBDP	DAH	KWW	L8	(inch)		Balance Unknown	G40 Balanced	Insert Screw	Wrench
A Holders	.016 – .125	**BXD4000R1503**	●	3	1.500	1.969	.500	.630	.276	.250	.156	.591	10°	7600	29000	TS4SL	TKY15W
		BXD4000R0203	●	3	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R0204	●	4	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R2504	●	4	2.500	1.969	.750	.748	.415	.313	.187	.591	5°	4800	21000	TS4SL	TKY15W
		BXD4000R0305	●	5	3.000	1.969	1.000	1.024	.539	.375	.219	.591	3°	3800	19000	TS4SL	TKY15W
		BXD4000R0406	●	6	4.000	2.480	1.500	1.181	.787	.625	.375	.591	3°	3000	16000	TS4SL	TKY15W
B Holders	.157 – .197	**BXD4000R1503B**	●	3	1.500	1.969	.500	.630	.276	.250	.156	.591	10°	7600	29000	TS4SL	TKY15W
		BXD4000R0203B	●	3	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R0204B	●	4	2.000	1.969	.750	.748	.415	.313	.187	.591	7°	6000	24000	TS4SL	TKY15W
		BXD4000R2504B	●	4	2.500	1.969	.750	.748	.415	.313	.187	.591	5°	4800	21000	TS4SL	TKY15W
		BXD4000R0305B	●	5	3.000	1.969	1.000	1.024	.539	.375	.219	.591	3°	3800	19000	TS4SL	TKY15W
		BXD4000R0406B	●	6	4.000	2.480	1.500	1.181	.787	.625	.375	.591	3°	3000	16000	TS4SL	TKY15W

*1 Clamp Torque (lbf-in) : TS4SL=35 *2 RMPX : Max. Ramping Angle
Note 1) You need to balance the tool and holder together so that it confirms to G40 or higher standards.
Note 2) The cutter body includes a set bolt for an arbor.

■ COMBINATION OF HOLDER AND INSERT CORNER RADIUS

Holder	~A Holder							~B Holder	
	BXD4000R○○○○○○○A							BXD4000R○○○○○○○B	
Insert Corner Radius (RE)	.016"	.031"	.047"	.063"	.079"	.118"	.126"	.157"	.197"
	XDGT.....-G04	XDGT.....-G08	XDGT.....-G12	XDGT.....-G16	XDGT.....-G20	XDGT.....-G30	XDGT.....-G32	XDGT.....-G40	XDGT.....-G50

Note 1) Other combinations of holder and insert corner R are not acceptable.

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (IPT)
P	Mild Steel	≤180HB	**VP15TF**	590 (490—655)	.006 (.004—.008)
	Carbon Steel Alloy Steel	≤280HB	**VP15TF**	490 (390—655)	.006 (.004—.008)
		280—350HB	**VP15TF**	460 (390—525)	.006 (.004—.008)
M	Stainless Steel	≤270HB	**VP15TF**	460 (390—525)	.008 (.004—.012)
N	Aluminum Alloys	—	**TF15**	3280 (655—9840)	.012 (.004—.020)
S	Titanium Alloys	—	**VP15TF**	130 (100—195)	.004 (.004—.012)
	Heat Resistant Alloys	—	**VP15TF**	100 (65—130)	.006 (.004—.008)

- The figure above are the guidelines for conditions of general cutting by a standard type tool.
- The conditions vary depending on machine strength, the length of overhang, and work clamping conditions.
- Please adjust table feed when using long shank type tool.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1
ø40

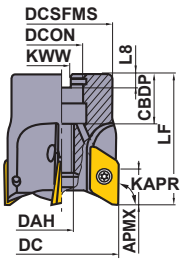


Fig.2
ø50
ø63
ø80
ø100

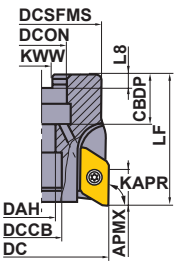
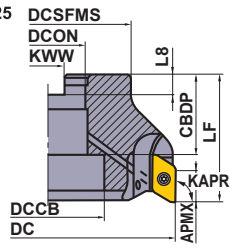
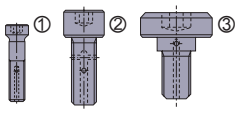


Fig.3
ø125



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ40	HFF08043H	①
ϕ50, ϕ63	HSC10030H	②
ϕ80	HSC12035H	②
ϕ100	HSC16040H	②
ϕ125	MBA20040H	③



With Air / coolant through.

Metric Standard

For metric arbors

■ ARBOR TYPE

Type	RE	Order Number	Stock	Number of Teeth	Dimensions (mm)									WT	APMX	*2 RMPX	Max. Spindle Speed	Fig.	*1 Insert Screw	Wrench	Insert
			R		DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	DCCB	(kg)	(mm)		(min^{-1})				
A Holders	0.4 – 3.2	BXD4000-040A03RA	★	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000-050A04RA	★	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RA	★	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	
		BXD4000-080A05RA	★	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	XDGT1550 PD○R-GL○○
		BXD4000-100A06RA	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RA	★	7	125	63	40	40	—	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	
B Holders	4.0 – 5.0	BXD4000-040A03RB	★	3	40	50	16	18	8.5	32	8.4	5.6	—	0.3	15	9°	29000	1	TS4SL	TKY15W	
		BXD4000-050A04RB	★	4	50	50	22	20	11	41	10.4	6.3	17	0.4	15	6°	24000	2	TS4SL	TKY15W	
		BXD4000-063A05RB	★	5	63	50	22	20	11	50	10.4	6.3	17	0.7	15	5°	21000	2	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000-080A05RB	★	5	80	50	27	23	13	60	12.4	7	20	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000-100A06RB	★	6	100	63	32	26	17	70	14.4	8	26	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000-125B07RB	★	7	125	63	40	40	—	80	16.4	9	56	2.8	15	2°	14000	3	TS4SL	TKY15W	

*1 Clamp Torque (lbf-in) : TS4SL=35
*2 RMPX : Max. Ramping Angle

Metric Standard

For inch arbors

■ ARBOR TYPE

Type	RE	Order Number	Stock	Number of Teeth	Dimensions (mm) [inch]								WT	APMX	*2 RMPX	Max. Spindle Speed	Fig.	*1 Insert Screw	Wrench	Insert
			R		DC	LF	CBDP	L8	DAH	KWW	DCON	DCCB	DCSFMS	(kg)	(mm)		(min^{-1})				
A Holders	0.4 – 3.2	BXD4000R08005CA	★	5	80	50	26	6	13	9.5	25.4 [1.0"]	20	60	1.1	15	3°	19000	2	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000R10006DA	★	6	100	63	32	8	17	12.7	31.75 [1.25"]	26	70	2.0	15	3°	16000	2	TS4SL	TKY15W	
		BXD4000R12507EA	★	7	125	63	40	10	—	15.9	38.1 [1.5"]	56	80	2.8	15	2°	14000	3	TS4SL	TKY15W	XDGT1550 PD○R-GL○○
B Holders	4.0 – 5.0	BXD4000R08005CB	★	5	80	50	26	6	13	9.5	25.4 [1.0"]	20	60	1.1	15	3°	19000	2	TS4SL	TKY15W	
		BXD4000R10006DB	★	6	100	63	32	8	17	12.7	31.75 [1.25"]	26	70	2.0	15	3°	16000	2	TS4SL	TKY15W	XDGT1550 PD○R-G○○
		BXD4000R12507EB	★	7	125	50	40	10	—	15.9	38.1 [1.5"]	56	80	2.8	15	2°	14000	3	TS4SL	TKY15W	

*1 Clamp Torque (lbf-in) : TS4SL=35
*2 RMPX : Max. Ramping Angle
Note 1) The maximum spindle speeds stated above are based on ISO15641.
Note 2) When using the tool at high spindle speeds, please pay special attention to the balancing. The whole tool assembly should be balanced according to G6.3 based on ISO1940 quality grades.
Note 3) Set bolt not included.

Fig.1 Straight Shank

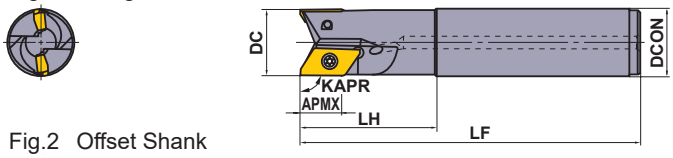
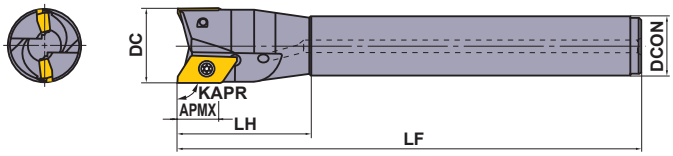


Fig.2 Offset Shank



Metric Standard

■ SHANK TYPE

Right hand tool holder only.

Type	RE	Shank Type	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	APMX	LF	LH	DCON	✶2 RMPX	Max. Spindle Speed (min^{-1})	Fig.	✶1 Insert Screw	Wrench	Insert
A Holders	0.4 — 3.2	Standard	**BXD4000R201SA20SA**	★	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
			BXD4000R252SA25SA	★	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SA	★	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SA	★	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SA	★	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SA	★	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SA	★	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	XDGT1550 PD○R-GL○○
		Long	**BXD4000R252SA25LA**	★	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LA	★	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	**BXD4000R282SA25ELA**	★	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELA	★	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELA	★	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	
B Holders	4.0 — 5.0	Standard	**BXD4000R201SA20SB**	★	1	20	15	110	35	20	28°	15000	1	TS4SL	TKY15W	XDGT1550 PD○R-G○○
			BXD4000R252SA25SB	★	2	25	15	125	50	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R282SA25SB	★	2	28	15	125	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R322SA32SB	★	2	32	15	150	50	32	13°	33000	1	TS4SL	TKY15W	
			BXD4000R352SA32SB	★	2	35	15	150	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32SB	★	3	40	15	170	80	32	9°	29000	2	TS4SL	TKY15W	
			BXD4000R403SA42SB	★	3	40	15	170	80	42	9°	29000	1	TS4SL	TKY15W	
		Long	**BXD4000R252SA25LB**	★	2	25	15	170	80	25	20°	38000	1	TS4SL	TKY15W	
			BXD4000R322SA32LB	★	2	32	15	200	80	32	13°	33000	1	TS4SL	TKY15W	
		Extra Long	**BXD4000R282SA25ELB**	★	2	28	15	220	50	25	17°	35000	2	TS4SL	TKY15W	
			BXD4000R352SA32ELB	★	2	35	15	250	50	32	11°	31000	2	TS4SL	TKY15W	
			BXD4000R403SA32ELB	★	3	40	15	250	65	32	9°	29000	2	TS4SL	TKY15W	

✶1 Clamp Torque (lbf-in) : TS4SL=35 ✶2 RMPX : Max. Ramping Angle

Note 1) You need to balance the tool and holder together so that it confirms to G40 or higher standards.

OPERATIONAL GUIDANCE

Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.

- When tightening the clamp screws, follow the order in Figure 1.
- The maximum allowable spindle speeds are shown in Table 1. Ensure that the cutter operates under the maximum allowable spindle speed.
  The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

(Table 1) Maximum allowable spindle speed

Cutting Edge Diameter **DC**(inch)	ø.750"	ø.950"	ø1.100"	ø1.250"	ø1.350"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Allowable Spindle Speed (min^{-1})	15000※	38000	35000	33000	31000	29000	24000	21000	19000	16000	14000

※ø20 mm with one tooth balancing is necessary to adjust sensitively.

- Even when operating under the maximum allowable spindle speed, if the spindle speed is equal to or higher than the values shown in table 2, it is recommended that the balance quality (with the arbor or milling chuck) conforms to G40 or better based on ISO1940. It is also recommended to replace the clamp screws with new ones when changing inserts. Furthermore, ensure to use machines that are provided with safety measures in case of cutter breakage.

✶ The balance quality of the holder (without inserts and clamp screws) is G40 or better at 10000 min^{-1}.

(Table 2) Maximum spindle speed when balancing with the arbor or milling chuck has not been achieved

Cutting Edge Diameter **DC**(inch)	ø.750"	ø.950"	ø1.100"	ø1.250"	ø1.350"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min^{-1})	15000	12000	10800	9500	8700	7600	6000	4800	3800	3000	2400

- When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
- Use the specified set bolt when using the arbor type with through coolant.
- The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

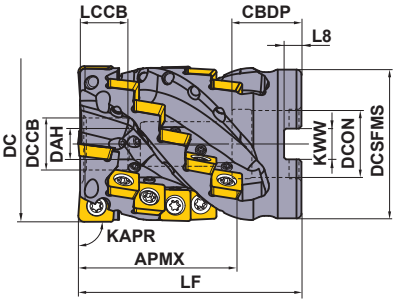
DEEP SHOULDER MILLING
<CUTTING FOR TITANIUM ALLOYS>

90° KAPR

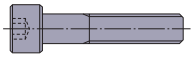
ASPX

NEW

P | M | K | N | **S** | H



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ2.000	HSCUF37523	
ϕ2.500	HSCUF50028	
ϕ3.000	HSCUF62535	

■SHELL TYPE

With Air / coolant through. : Shell type should be combined with a through coolant arbor.

(inch)

DC	Order Number	Stock R	Number of Flutes	Total	LF	DCON	WT (lbs)	APMX
2.000	**ASPX4UR2.0003AA21A15**	●	3	15	3.000	.750	1.1	2.126
2.500	**ASPX4UR2.5004CA25A24**	●	4	24	3.500	1.000	2.2	2.520
3.000	**ASPX4UR3.0005DA29A35**	●	5	35	4.250	1.250	4.4	2.953

MOUNTING DIMENSIONS

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
2.000	**ASPX4UR2.0003AA21A15**	.750	.748	.395	.716	.677	1.750	.313	.187
2.500	**ASPX4UR2.5004CA25A24**	1.000	.945	.520	.850	.709	2.375	.375	.219
3.000	**ASPX4UR3.0005DA29A35**	1.250	1.260	.645	1.063	.750	2.875	.500	.281

SPARE PARTS

Tool Holder Type	Clamp Screw *	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Number of Insert JPGX	Number of Insert SPGX
ASPX4UR2.000	TS55	WU375-S1	TKY25D	HSD04004H08	18	MK1KS	3	12
ASPX4UR2.500	TS55	WU500-S1	TKY25D	HSD04004H08	28	MK1KS	4	20
ASPX4UR3.000	TS55	WU625-S1	TKY25D	HSD04004H08	40	MK1KS	5	30

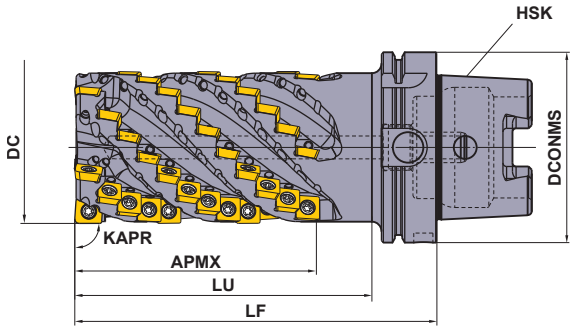
* Clamp Torque (lbf-in) : TS55 = 44.25

	≤140 PSI (≤5.3 gal/min.)	←Standard→	≥720 PSI (≥7.9 gal/min.)	≥1000 PSI (≥13.2 gal/min.)	To Plug a Coolant Hole
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"	–
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**	**HSS04004**

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select the correct nozzle according to the specification.

Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 13.28 lbf-in) to plug the coolant hole.

 ● : USA Stock



The standard type is right-handed (R) only.
The HSK shank type has a built-in movable coolant pipe for installation.

■HSK SHANK TYPE

With Air / coolant through.

(inch)

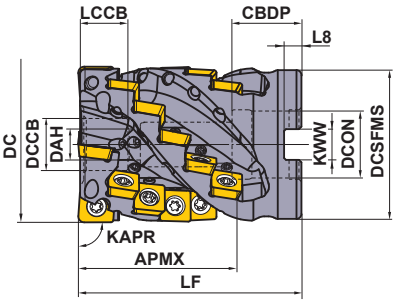
DC	Order Number	Stock R	Number of Flutes	Total	LF	LU	DCONMS	HSK	APMX
3.000	**ASPX4UR485H100A050SA**	●	5	60	7.480	6.142	3.937	HSK-A100	5.000
3.000	**ASPX4UR485H125A050SA**	●	5	60	7.480	6.142	4.921	HSK-A125	5.000

SPARE PARTS

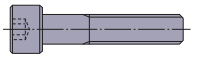
Tool Holder Type	* Clamp Screw	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Number of Insert JPGX	Number of Insert SPGX
ASPX4UR485H100A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55
ASPX4UR485H125A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55

* Clamp Torque (lbf-in) : TS55 = 44.25

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Right hand tool holder only.

Cutter Diameter DC	Set Bolt	Geometry
ϕ50	HSC10070	
ϕ63	HSC12070	
ϕ80	HSC16080	

Metric Standard

■SHELL TYPE

With Air / coolant through. : Shell type should be combined with a through coolant arbor.

(mm)

DC	Order Number	Stock R	Number of Flutes	Total	LF	DCON	WT (kg)	APMX
50	**ASPX4-050A03A054RA15**	★	3	15	85	22	0.6	54
63	**ASPX4-063A04A064RA24**	★	4	24	90	27	1.0	64
80	**ASPX4-080A05A075RA35**	★	5	35	100	32	2.0	75

MOUNTING DIMENSIONS

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
50	**ASPX4-050A03A054RA15**	22	21	10.5	17	14	47	10.4	6.3
63	**ASPX4-063A04A064RA24**	27	28	12.5	21	19	60	12.4	7
80	**ASPX4-080A05A075RA35**	32	28	16.5	27	20	76	14.4	8

SPARE PARTS

Tool Holder Type	*						Number of Insert	
	Clamp Screw	Seal Washer	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	JPGX	SPGX
ASPX4-050A	TS55	W10-S1	TKY25D	HSD04004H08	18	MK1KS	3	12
ASPX4-063A	TS55	W12-S1	TKY25D	HSD04004H08	28	MK1KS	4	20
ASPX4-080A	TS55	W16-S1	TKY25D	HSD04004H08	40	MK1KS	5	30

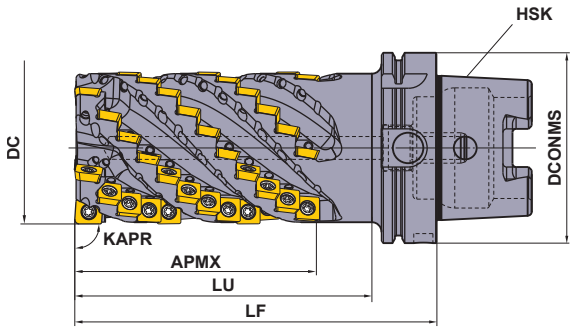
* Clamp Torque (lbf-in) : TS55 = 44.25

	≤1Mpa (≤20 l/min.)	←Standard→	≥5Mpa (≥30 l/min.)	≥7Mpa (≥50 l/min.)	To Plug a Coolant Hole
Nozzle Dia.	ø0.6mm	ø0.8mm	ø1.2mm	ø1.6mm	–
Order Number	**HSD04004H06**	**HSD04004H08**	**HSD04004H12**	**HSD04004H16**	**HSS04004**

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select the correct nozzle according to the specification.

Note 2) Use HSS04004 (JIS B 1177 flat point M4x4, clamp torque 13.28 lbf-in) to plug the coolant hole.

★ : **Stocked in Japan**



The standard type is right-handed (R) only.
The HSK shank type has a built-in movable coolant pipe for installation.

Metric Standard

■HSK SHANK TYPE

With Air / coolant through.

(mm)

DC	Order Number	Stock R	Number of Flutes	Total	LF	LU	DCONMS	HSK	APMX
80	**ASPX4R0805H100A127SA**	★	5	60	190	156	100	HSK-A100	127
80	**ASPX4R0805H125A127SA**	★	5	60	190	156	125	HSK-A125	127

SPARE PARTS

Tool Holder Type	* Clamp Screw	Wrench	Coolant Nozzle	Number	Anti-seize Lubricant	Number of Insert JPGX	Number of Insert SPGX
ASPX4R0805H100A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55
ASPX4R0805H125A	TS55	TKY25D	HSD04004H08	65	MK1KS	5	55

* Clamp Torque (lbf-in) : TS55 = 44.25

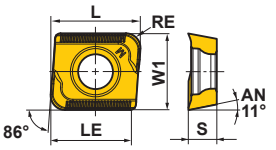
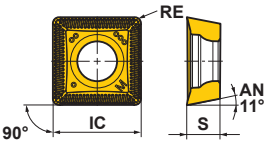
ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

(inch)

Workpiece Material		
S	Heat resistant Alloys, Titanium Alloys	◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting
Edge Preparation :
E : Round

Shape		Order Number	Class	Edge Preparation	Coated MP9140	L	LE	W1	IC	S	RE	Geometry
Bottom	2 Corner	**JPGX1404080PPER-JM**	G	E	●	.595	.528	.500	—	.189	.031	
		JPGX1404120PPER-JM	G	E	●	.593	.524	.500	—	.189	.047	
		JPGX1404160PPER-JM	G	E	●	.591	.524	.500	—	.189	.063	
		JPGX1404240PPER-JM	G	E	●	.586	.520	.500	—	.189	.094	
		JPGX1404320PPER-JM	G	E	●	.580	.516	.500	—	.189	.126	
		JPGX1404400PPER-JM	G	E	●	.576	.512	.500	—	.189	.157	
		JPGX1404500PPER-JM	G	E	●	.570	.512	.500	—	.189	.197	
		JPGX1404635PPER-JM	G	E	●	.563	.508	.500	—	.189	.250	
Peripheral	4 Corner	**SPGX1204100PPER-JM**	G	E	●	—	—	—	.500	.189	.039	

RECOMMENDED CUTTING CONDITIONS

(inch)

	Workpiece Material	Cutting Width **ae**	Cutting Speed **vc** (SFM)	Feed per Tooth **fz** (IPT)
S	Ti Alloys Ti-6Al-4V,Ti-6Al-4V-ELI Ti-10V-2Fe-3Al Ti-5Al-5V-5Mo-3Cr etc.	ae≤0.5DC	195(165—260)	.005(.004—.006)
		0.5DC< ae< 0.8DC	165(130—195)	.004(.003—.005)
		ae≥0.8DC	130(165—195)	.003(.002—.004)

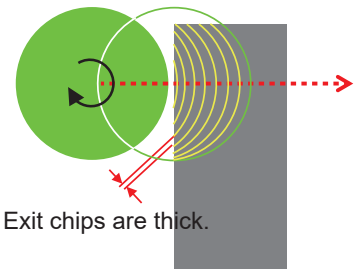
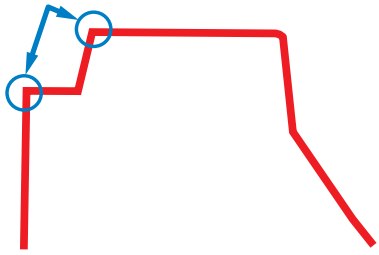
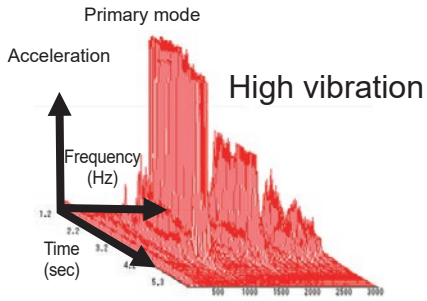
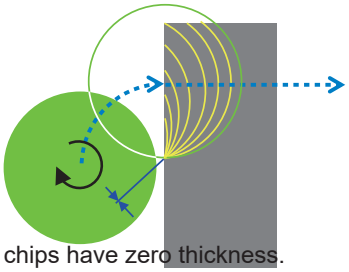
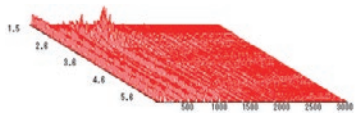
Note 1) The cutting performance depends on machine and clamping rigidity, as well as the supply and pressure of the coolant. Adjust as necessary.
Note 2) Use a machine and spindle size suitable for heavy machining of titanium alloys. (7/24 taper #50 or #60, or high-rigidity HSK-A100 or A125, with an output of 20.1 HP/bhp or higher and torque of 4425 lbf-in or higher for a rotation speed of 500min-1 or less).
Note 3) If chatter and vibration or machine overloading occur, it is recommended to reduce the depth of cut ap.
Note 4) The coolant system combines internal and external lubrication, it is recommended to supply coolant in ample quantities.
Note 5) A gradual roll feed into the workpiece and use of down cutting is recommended. (refer to page K267)

● : USA Stock
(10 inserts in one case)

HOW TO USE

■Positive Effects of a Roll Into Cutting Approach

The roll into cutting approach can control sharp increases in cutting loads and prevent sudden chipping of inserts which is likely to occur at the start of machining.

Approach Method	Cutting Load Simulation	Image of Cutting Vibration Frequency
Direct Approach  	Cutting load increases suddenly. High risk of chipping. 	
Roll Into Cutting Approach  	Cutting load increases smoothly. 	Almost no vibration 

Down cutting is recommended.

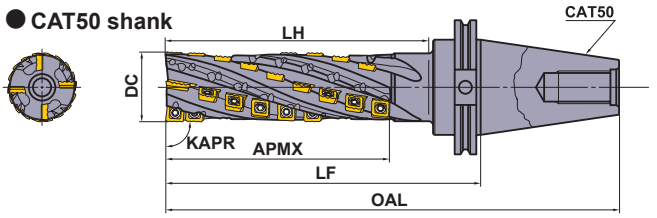
DEEP SHOULDER MILLING

90° KAPR

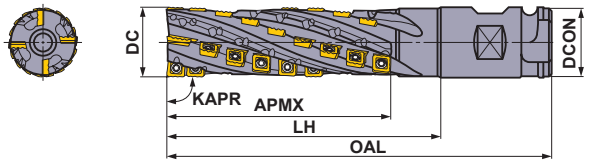
SPX

P M K N S H

● CAT50 shank



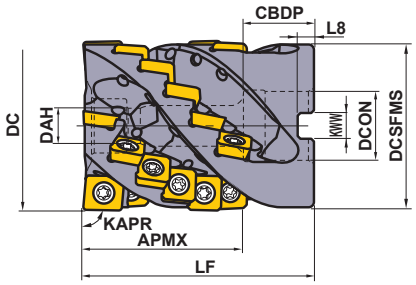
● Straight shank (Combination type)



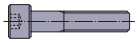
■ SHANK TYPE

Right hand tool holder only.

Type	Order Number	Stock	Number of Flute	Number of Teeth	Dimensions (inch)						Number of Insert		
											Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
				Total	DC	OAL	DCON	LH	LF	APMX	JPMX 190412-○○	MPMX 120412-○○	SPMX 120408-○○
CAT50 Shank	**SPX4R3224CAT50NS**	●	2	24	2.000	11.000	–	–	7.000	4.300	2	2	20
	SPX4R3234CAT50NM	●	2	34	2.000	13.000	–	–	9.000	6.200	2	2	30
Straight Shank (Combination)	**SPX4R05016WNES**	●	2	16	1.969	7.091	2.000	3.937	–	2.835	2	2	12
	SPX4R05024WNS	●	2	24	1.969	8.661	2.000	5.512	–	4.331	2	2	20
	SPX4R05034WNM	●	2	34	1.969	10.630	2.000	7.480	–	6.181	2	2	30



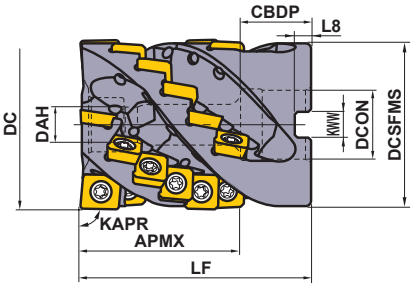
Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ2.500"	HSCUF50028	
ϕ3.000"	HSCUF62528	

■SHELL TYPE

Order Number	Stock	Number of Teeth		Dimensions (inch)									Number of Insert		
													Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4UR2524CA22A	●	4	24	2.500	3.500	1.000	1.339	.539	2.375	.375	.219	2.280	2	2	20
SPX4UR0324DA22A	●	4	24	3.000	3.500	1.250	1.654	.669	2.874	.500	.281	2.280	2	2	20

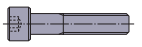
Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels; Regular center-thru or side-thru arbors can't be used.
Note 2) The cutter body includes a non-coolant through set bolt for an arbor.



Metric Standard

For inch arbors

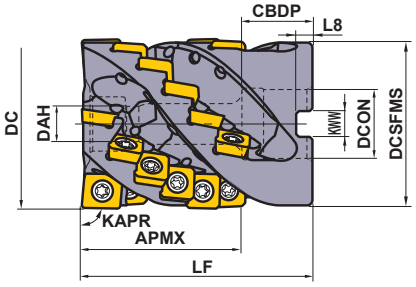
Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63 mm	HSC12070	
ϕ80 mm	HSC16065	

■SHELL TYPE

Order Number	Stock	Number of Teeth		Dimensions (mm) [inch]									Number of Insert		
													Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4R06324CA058A	★	4	24	63	85	25.4 [1.000″]	26	13	60	9.5	6	58	2	2	20
SPX4R08024DA058A	★	4	24	80	85	31.75 [1.250″]	38	17	76.8	12.7	8	58	2	2	20

Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels; Regular center-thru or side-thru arbors can't be used.
Note 2) Set bolt not included.

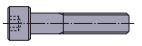


Metric Standard

For metric arbors

The bore diameter (DCON) is equivalent to a metric size.

Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ63 mm	HSC12070	
ϕ80 mm	HSC16065	

■SHELL TYPE

Order Number	Stock	Number of Teeth		Dimensions (mm)									Number of Insert		
													Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
	R	Flutes	Total	DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	JPMX 140412-○○	MPMX 120412-○○	SPMX 120408-○○
SPX4-063A24A058RA	★	4	24	63	85	27	28	13	60	12.4	7	58	2	2	20
SPX4-080A24A058RA	★	4	24	80	85	32	40	17	76.8	14.4	8	58	2	2	20

Note 1) In case of internal coolant supply, please use a face mill arbor with through coolant channels; Regular center-thru or side-thru arbors can't be used.
Note 2) Set bolt not included.

SPARE PARTS

Holder	* Insert Screw	Wrench	Insert		
			Bottom Cutting Edge A	Bottom Cutting Edge B	Peripheral Cutting Edge
SPX	TS55	TKY25D	JPMX190412-WH	MPMX120412-WH	SPMX120408-WH
			JPMX190412-JM	MPMX120412-JM	SPMX120408-JM

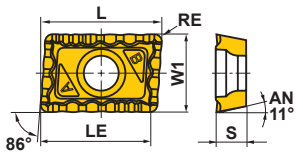
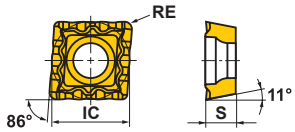
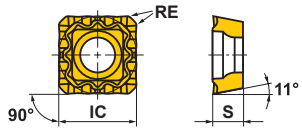
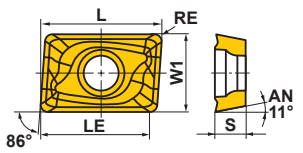
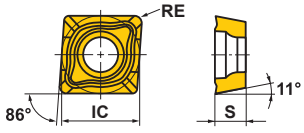
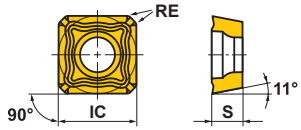
* Clamp Torque (lbf-in) : TS55=66

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat resistant Alloys, Titanium Alloys	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Type		Shape	Order Number	Class	Coated VP15TF	Coated VP20RT	Dimensions (inch) L	LE	W1	IC	S	RE	Geometry
Wavy Cutting Edge Type	Bottom Cutting Edge A		**JPMX190412-WH**	M	●	●	.750	.693	.500	—	.187	.047	
			*** JPMX140412-WH**	M	●	●	.563	.508	.500	—	.187	.047	
	Bottom Cutting Edge B		**MPMX120412-WH**	M	●	●	—	—	—	.500	.187	.047	
	Peripheral Cutting Edge		**SPMX120408-WH**	M	●	●	—	—	—	.500	.187	.031	
Straight Cutting Edge Type	Bottom Cutting Edge A		**JPMX190412-JM**	M	●	●	.750	.693	.500	—	.187	.047	
			*** JPMX140412-JM**	M	●	●	.563	.508	.500	—	.187	.047	
	Bottom Cutting Edge B		**MPMX120412-JM**	M	●	●	—	—	—	.500	.187	.047	
	Peripheral Cutting Edge		**SPMX120408-JM**	M	●	●	—	—	—	.500	.187	.031	

* Only for use with a shell type holder.

RECOMMENDED CUTTING CONDITIONS (Shank Type)

■Cutting Conditions for Shoulder Milling (Number of effective flutes is 2.)

Workpiece Material		Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF WH**	395 (330—460)	<.197	<4DC	.006—.010
			VP15TF JM	395 (330—460)	<.394	<2DC	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF WH**	260 (230—395)	<.197	<4DC	.006—.010
			VP15TF JM	260 (230—395)	<.394	<2DC	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF WH**	260 (200—330)	<.197	<4DC	.004—.008
			VP15TF JM	260 (200—330)	<.394	<2DC	.004—.008
M	Stainless Steel	≤200HB	**VP20RT WH**	260 (230—395)	<.197	<4DC	.004—.008
			VP20RT JM	260 (230—395)	<.394	<2DC	.004—.008
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	330 (260—395)	<.197	<4DC	.006—.016
			VP15TF JM	330 (260—395)	<.197	<4DC	.004—.010
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	260 (200—330)	<.197	<4DC	.006—.014
			VP15TF JM	260 (200—330)	<.197	<4DC	.004—.008
S	Titanium Alloys	≤350HB	**VP20RT WH**	130 (115—165)	<.197	<4DC	.003—.005
			VP20RT JM	130 (115—165)	<.394	<2DC	.003—.005

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece material, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

Note 2) For tools with a cutting edge length of 7.87″ or more, please reduce the cutting speed and table feed by 10-20% and the width of cut by 50%.

Note 3) If the cutting angle between the tool and workpiece material exceeds 90º when machining corners ,Reduce the cutting speed and table feed by 10-20% and ae by 50%. Also if possible, set a radius cutting path for corners.

■Cutting Conditions for Slot Milling

Workpiece Material		Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF WH**	200 (165—395)	DC	<.394	.004—.010
			VP15TF JM	200 (165—395)	DC	<.394	.004—.006
	Carbon Steel Alloy Steel	180—350HB	**VP15TF WH**	200 (165—330)	DC	<.394	.004—.010
			VP15TF JM	200 (165—330)	DC	<.394	.004—.006
	Alloy Tool Steel	≤300HB	**VP15TF WH**	165 (130—260)	DC	<.394	.004—.010
			VP15TF JM	165 (130—260)	DC	<.394	.004—.006
M	Stainless Steel	≤200HB	**VP20RT WH**	200 (165—395)	DC	<.394	.004—.010
			VP20RT JM	200 (165—395)	DC	<.394	.004—.006
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	165 (130—260)	DC	<1.969	.006—.010
			VP15TF JM	165 (130—260)	DC	<1.575	.004—.008
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	130 (115—260)	DC	<1.575	.006—.010
			VP15TF JM	130 (115—260)	DC	<1.181	.004—.008
S	Titanium Alloys	≤350HB	**VP20RT WH**	115 (100—165)	DC	<.394	.003—.005
			VP20RT JM	115 (100—165)	DC	<.394	.003—.005

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece material, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

RECOMMENDED CUTTING CONDITIONS (Shell Type)

■Cutting Conditions for Shoulder Milling (Number of effective flutes is 4.)

	Workpiece Material	Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF JM**	395 (330—460)	<.394	<0.5DC	.006—.012
				395 (330—460)	<.394	>0.5DC	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	395 (260—425)	<.394	<0.5DC	.006—.012
				330 (260—395)	<.394	>0.5DC	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF JM**	330 (200—360)	<.394	<0.5DC	.004—.010
				260 (200—330)	<.394	>0.5DC	.004—.006
M	Stainless Steel	≤200HB	**VP20RT JM**	460 (330—490)	<.394	<0.5DC	.004—.010
				395 (330—460)	<.394	>0.5DC	.004—.008
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	395 (260—425)	<.394	<0.5DC	.010—.016
				330 (260—395)	<.394	>0.5DC	.010—.016
			VP15TF JM	395 (260—425)	<.394	<0.5DC	.006—.012
				330 (260—395)	<.394	>0.5DC	.006—.010
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	330 (200—360)	<.394	<0.5DC	.008—.014
				260 (200—360)	<.394	>0.5DC	.008—.014
			VP15TF JM	330 (200—395)	<.394	<0.5DC	.006—.012
				260 (200—395)	<.394	>0.5DC	.006—.012
S	Titanium Alloys	≤350HB	**VP20RT JM**	150 (115—165)	<.394	<0.5DC	.003—.004
				150 (115—165)	<.394	>0.5DC	.003—.004

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece material, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

■Cutting Conditions for Slot Milling

	Workpiece Material	Hardness	Insert Grade/Breaker	Cutting Speed **vc** (SFM)	Width of Cut **ae** (inch)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (IPT)
P	Mild Steel	≤180HB	**VP15TF JM**	395 (330—460)	DC	<0.25DC	.006—.010
	Carbon Steel Alloy Steel	180—350HB	**VP15TF JM**	330 (260—395)	DC	<0.25DC	.006—.010
	Alloy Tool Steel	≤300HB	**VP15TF JM**	260 (200—330)	DC	<.394	.004—.008
M	Stainless Steel	≤200HB	**VP20RT JM**	330 (260—460)	DC	<.394	.004—.006
K	Cast Iron	Tensile Strength ≤350MPa	**VP15TF WH**	260 (200—330)	DC	<0.25DC	.004—.010
				200 (165—330)	DC	<0.6DC	.004—.008
			VP15TF JM	260 (200—330)	DC	<0.25DC	.004—.008
				200 (165—330)	DC	<0.6DC	.004—.006
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF WH**	260 (200—330)	DC	<0.25DC	.004—.010
				200 (165—330)	DC	<0.5DC	.004—.008
			VP15TF JM	260 (200—330)	DC	<0.25DC	.004—.008
				200 (165—330)	DC	<0.5DC	.004—.006
S	Titanium Alloys	≤350HB	**VP20RT JM**	130 (115—165)	DC	<0.25DC	.002—.004

Note 1) The above cutting conditons are determined based on high rigidity machine and workpiece material, where no vibration occurred. Please adjust processing conditions if the vibration is generated.

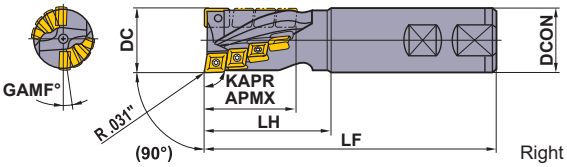
DEEP SHOULDER MILLING

90° KAPR

LER

P M K N S H

Fig.1



DESIGN FEATURES OF LER TYPE END MILL

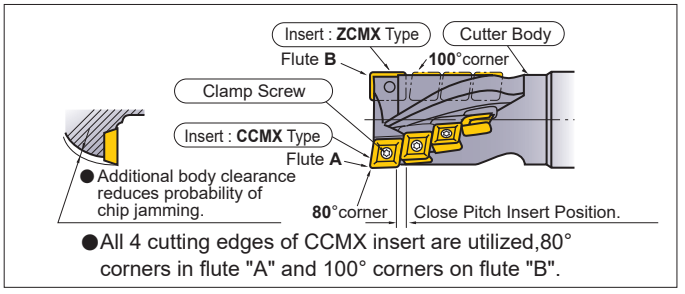
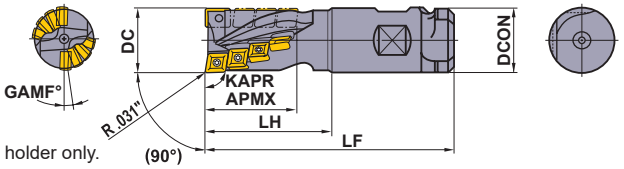


Fig.2 **Combination Shank**



Right hand tool holder only.

Order Number	Stock	Number of Flute	Number of Teeth	Dimensions (inch)						Fig.	*	F D	Insert	
	R			DC	LF	DCON	LH	APMX	GAMF°		Insert Screw	Wrench	Insert	Teeth
LER1606W20	●	2	6	1.000	4.281	1.250	2.000	1.063	8°	1	CS300890T	TKY08F	CCMX083508EN○	5
											CS300890T	TKY08D	ZCMX083508ER○	1
LER2008W20	●	2	8	1.250	4.781	1.250	2.500	1.700	8° 35′	1	CS350990T	TKY10F	CCMX09T308EN○	7
											CS350990T	TKY10D	ZCMX09T308ER○	1
LER2012W20	●	2	12	1.250	5.531	1.250	3.250	2.480	8° 35′	1	CS350990T	TKY10F	CCMX09T308EN○	11
											CS350990T	TKY10D	ZCMX09T308ER○	1
LER2415W24	●	3	15	1.500	5.687	1.500	3.000	2.100	5° 27′	1	CS350990T	TKY10F	CCMX09T308EN○	14
											CS350990T	TKY10D	ZCMX09T308ER○	1
LER3218W32	●	3	18	2.000	6.750	2.000	3.500	2.500	5° 52′	2	CS350990T	TKY10F	CCMX09T308EN○	17
											CS350990T	TKY10D	ZCMX09T308ER○	1

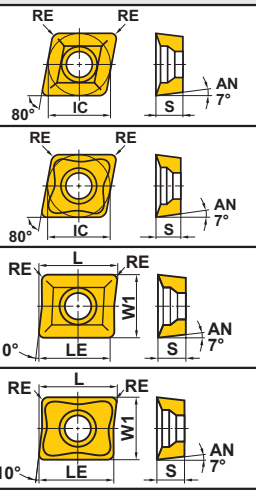
* Clamp Torque (lbf-in) : CS300890T=8.9, CS350990T=22

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Shape		Order Number	Class	Coated F7030	Coated VP15TF	Coated UP20M	Carbide UTi20T	Dimensions (inch) L	LE	W1	IC	S	RE	Geometry
Peripheral and Bottom Inserts		**CCMX083508ENA**	M	★		●	★	—	—	—	.313	.138	.031	
		CCMX09T308ENA	M	●	●	●	★	—	—	—	.375	.156	.031	
	Strong Cutting Edge Type	* **CCMX09T308ENB**	M	★			★	—	—	—	.375	.156	.031	
Bottom Insert (One Pocket Only)		**ZCMX083508ERA**	M	★			★	.409	.335	.313	—	.137	.031	
		ZCMX09T308ERA	M	●	●	●	★	.472	.433	.375	—	.156	.031	
	Strong Cutting Edge Type	* **ZCMX09T308ERB**	M	★		●	★	.472	.433	.375	—	.156	.031	



* These inserts are for slotting only when chipping occurs with standard inserts. Feed must be reduced 25%.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

ISO13399 ➤ K003

RECOMMENDED CUTTING CONDITIONS

■ Slot Milling

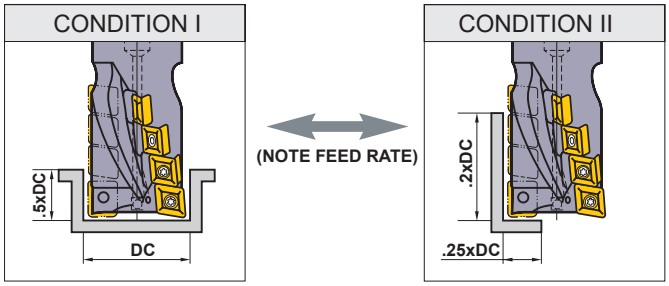
Workpiece Material		Cutting Condition Vs.Tool Diameter					Insert grade
		Spindle Speed / Feed	ϕ1"	ϕ1.25"	ϕ1.5"	ϕ2"	
P	Mild Steel (<160HB)	min^{-1}	2250	1800	1500	1100	VP15TF F7030
		inch/min	7—12	6—10	7—12	6—10	
	Carbon Steel (20HRC)	min^{-1}	2250	1800	1500	1100	
		inch/min	8—14	7—12	8—14	7—12	
	Alloy Steel (30HRC)	min^{-1}	1750	1800	1200	900	
		inch/min	6—10	5—8	6—10	5—8	
M	Stainless Steel (304)	min^{-1}	1900	1500	1250	950	VP15TF
		inch/min	3—5	2.5—4	3—5	2.5—4	
K	Gray Cast Iron (≤450MPA)	min^{-1}	1800	1250	950	650	UTi20T
		inch/min	7—9	7—9	8—10	8—10	

■ Shoulder Milling

Workpiece Material		Cutting Condition Vs.Tool Diameter					Insert grade
		Spindle Speed / Feed	ϕ1"	ϕ1.25"	ϕ1.5"	ϕ2"	
P	Mild Steel (<160HB)	min^{-1}	2250	1800	1500	1100	VP15TF F7030
		inch/min	11—18	9—15	11—18	9—15	
	Carbon Steel (20HRC)	min^{-1}	2250	1800	1500	1100	
		inch/min	12—21	11—18	12—21	11—18	
	Alloy Steel (30HRC)	min^{-1}	1750	1400	1200	900	
		inch/min	9—15	8—12	9—15	8—12	
M	Stainless Steel (304)	min^{-1}	1900	1500	1250	950	VP15TF
		inch/min	7—12	6—10	7—12	6—10	
K	Gray Cast Iron (≤450MPA)	min^{-1}	1800	1250	950	650	UTi20T
		inch/min	8—10	8—10	9.5—11	9.5—11	

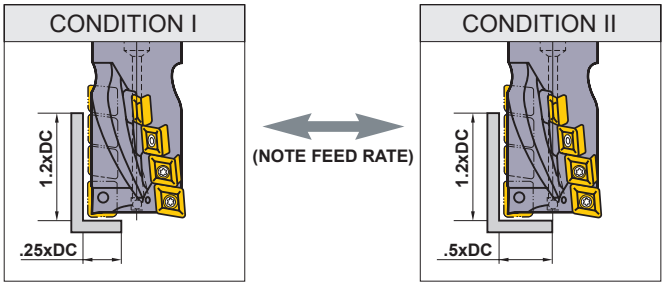
Note 1) These feed rates are for ENA and ERA inserts.
Reduce feed 25% for ENB and ERB inserts.
ENB or ERB inserts not recommended in gummy materials like stainless steel or mild steel.

■ Slot Milling
Forced air is required at cutting edge



- Use higher recommended feed rate under CONDITION I.
- Use lower recommended feed rate under CONDITION II.

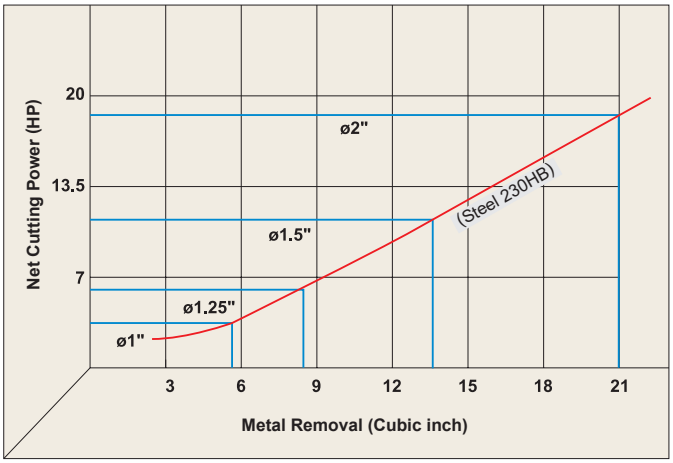
■ Shoulder Milling
Generally down cut is recommended



- Use higher recommended feed rate under CONDITION I.
- Use lower recommended feed rate under CONDITION II.

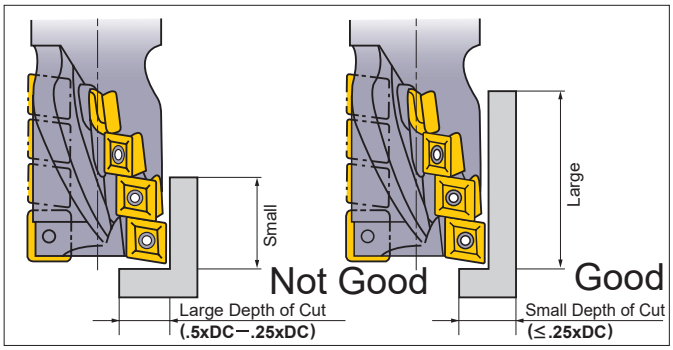
■ Net Cutting Power

- Please use the chart below for reference, please select the conditions that suits the machines power.
- Chip Discharge Q ($inch^3$/min)=Table Feed×Depth of Cut×Cutting Width÷1000



■ For Use of Long Cutting Length Type

- Since the overhang from the milling chuck is long, a large width of cut will cause chattering and tool breakage.
- Keep the width of cut small and the depth of cut in axial direction large. (See the following illustration.)
- For slot milling, keep the table feed at not more than half the value listed in the above table. (Use the standard cutting length type as much as possible.)



K

INDEXABLE MILLING

MULTI FUNCTIONAL MILLING

90° KAPR R

AQX

P M K N S H

Fig.1

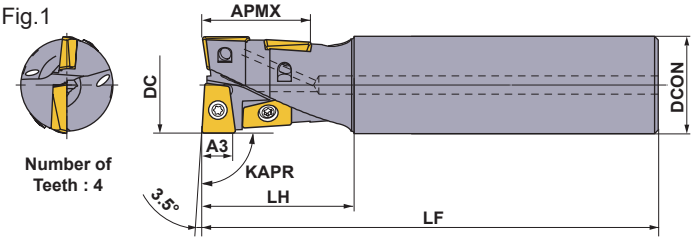


Fig.2

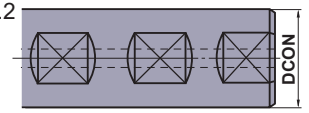
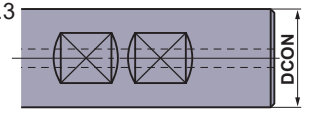


Fig.3



■ STANDARD EDGE TYPE

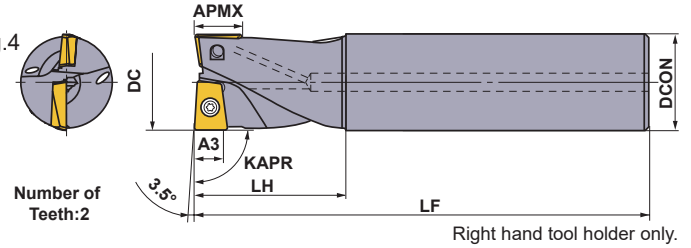
With Air / coolant through.

Right hand tool holder only.

Type	Order Number	Stock	Dimensions (inch)						Fig.	*3 Insert Screw	F D Wrench	Insert
		R	DC	LF	DCON	LH	A3 *1	APMX *2				
Standard	AQXUR124WA12S	●	.750	4.125	.750	1.375	.219	.750	3	TS25	TKY08F	QOG/MT0934R-□□
	AQXUR164WA16S	●	1.000	4.875	1.000	1.625	.281	1.000	2	TS32	TKY08D	QOG/MT1443R-□□
	AQXUR204WA20S	●	1.250	5.250	1.250	2.000	.375	1.250	2	TS407	TKY15D	QOG/MT1651R-□□
	AQXUR244WA20S	●	1.500	5.625	1.250	2.375	.438	1.500	2	TS5	TKY25D	QOG/MT1959R-□□
Long	AQXUR124SA12L	●	.750	7.250	.750	2.375	.219	.750	1	TS25	TKY08F	QOG/MT0934R-□□
	AQXUR134SA12L	●	.797	7.250	.750	1.375	.219	.750	1	TS25	TKY08F	QOG/MT0934R-□□
	AQXUR164SA16L	●	1.000	8.500	1.000	3.000	.281	1.000	1	TS32	TKY08D	QOG/MT1443R-□□
	AQXUR174SA16L	●	1.047	8.500	1.000	1.625	.281	1.000	1	TS32	TKY08D	QOG/MT1443R-□□
	AQXUR204SA20L	●	1.250	9.000	1.250	3.500	.375	1.250	1	TS407	TKY15D	QOG/MT1651R-□□
	AQXUR214SA20L	●	1.297	9.000	1.250	2.000	.375	1.250	1	TS407	TKY15D	QOG/MT1651R-□□
	AQXUR244SA20L	●	1.500	9.500	1.250	2.375	.438	1.500	1	TS5	TKY25D	QOG/MT1959R-□□

*3 Clamp Torque (lbf-in) : TS25=8.9, TS32=8.9, TS407=31, TS5=66

Fig.4



■ SHORT EDGE TYPE

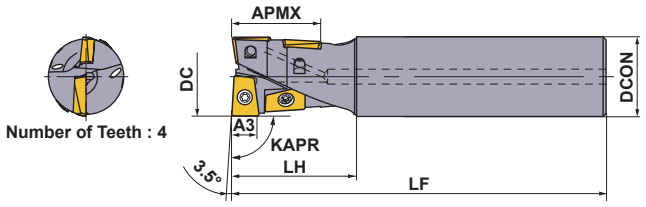
With Air / coolant through.

Right hand tool holder only.

Type	Order Number	Stock	Dimensions (inch)						Fig.	*3 Insert Screw	F D Wrench	Insert
		R	DC	LF	DCON	LH	A3 *1	APMX *2				
Standard	AQXUR102WA10S	●	.625	3.688	.625	1.125	.188	.281	3	TS2A	TKY06F	QOG/MT0830R-□□
	AQXUR122WA12S	●	.750	4.125	.750	1.375	.219	.344	3	TS25	TKY08F	QOG/MT0934R-□□
	AQXUR162WA16S	●	1.000	4.875	1.000	1.625	.281	.469	2	TS32	TKY08D	QOG/MT1443R-□□
	AQXUR202WA20S	●	1.250	5.250	1.250	2.000	.375	.563	2	TS407	TKY15D	QOG/MT1651R-□□
	AQXUR242WA20S	●	1.500	5.625	1.250	2.375	.438	.688	2	TS55	TKY25D	QOG/MT1959R-□□
Long	AQXUR102SA10L	●	.625	6.875	.625	2.000	.188	.281	4	TS2A	TKY06F	QOG/MT0830R-□□
	AQXUR112SA10L	●	.672	6.875	.625	1.125	.188	.281	4	TS2A	TKY06F	QOG/MT0830R-□□
	AQXUR122SA12L	●	.750	7.250	.750	2.375	.219	.344	4	TS25	TKY08F	QOG/MT0934R-□□
	AQXUR132SA12L	●	.797	7.250	.750	1.375	.219	.344	4	TS25	TKY08F	QOG/MT0934R-□□
	AQXUR162SA16L	●	1.000	8.500	1.000	3.000	.281	.469	4	TS32	TKY08D	QOG/MT1443R-□□
	AQXUR172SA16L	●	1.047	8.500	1.000	1.625	.281	.469	4	TS32	TKY08D	QOG/MT1443R-□□
	AQXUR202SA20L	●	1.250	9.000	1.250	3.500	.375	.563	4	TS407	TKY15D	QOG/MT1651R-□□
	AQXUR212SA20L	●	1.297	9.000	1.250	2.000	.375	.563	4	TS407	TKY15D	QOG/MT1651R-□□
	AQXUR242SA20L	●	1.500	9.500	1.250	2.375	.438	.688	4	TS55	TKY25D	QOG/MT1959R-□□

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 APMX: Maximum depth of cut.
*3 Clamp Torque (lbf-in) : TS2A=4.5, TS25=8.9, TS33=13, TS407=31, TS5=66
Note 1) When exceeding A3 depth of cut, reduce feed rates by 50%(Do not exceed APMX depth of cut). Reference page K282.

● : USA Stock ★ : Stocked in Japan



Metric Standard

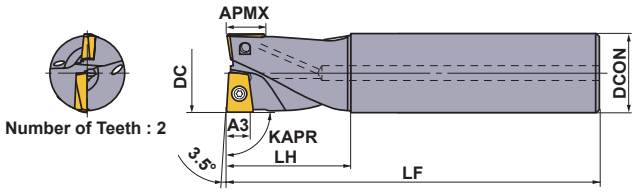
STANDARD EDGE TYPE

Right hand tool holder only.

Type	Order Number	Stock	Coolant Thru *4	Dimensions (mm)						*3 Insert Screw	F D T Wrench	Insert
		R		DC	LF	DCON	LH	A3 *1	APMX *2			
Standard	AQXR164SA16S	★	Y	16	120	16	30	4.5	17.6	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16S	★	N	16	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SA16S	★	Y	17	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SN16S	★	N	17	120	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR204SA20S	★	Y	20	130	20	35	6	22	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20S	★	N	20	130	20	35	6	22	TS25	TKY08F	
	AQXR214SA20S	★	Y	21	130	20	35	6	22	TS25	TKY08F	
	AQXR214SN20S	★	N	21	130	20	35	6	22	TS25	TKY08F	
	AQXR254SA25S	★	Y	25	140	25	40	7.5	27.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25S	★	N	25	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SA25S	★	Y	26	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SN25S	★	N	26	140	25	40	7.5	27.5	TS33	TKY08D	
	AQXR324SA32S	★	Y	32	150	32	50	9.5	35.2	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32S	★	N	32	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SA32S	★	Y	33	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SN32S	★	N	33	150	32	50	9.5	35.2	TS407	TKY15D	
	AQXR354SA32S	★	Y	35	150	32	50	11	40	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32S	★	N	35	150	32	50	11	40	TS407	TKY15D	
	AQXR404SA32S	★	Y	40	160	32	60	12	44	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32S	★	N	40	160	32	60	12	44	TS55	TKY25D	
	AQXR504SA42S	★	Y	50	170	42	70	15	55	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42S	★	N	50	170	42	70	15	55	TS6S	TKY30T	
Long	AQXR164SA16L	★	Y	16	175	16	50	4.5	17.6	TS2A	TKY06F	QOG/MT0830R-G1/M2
	AQXR164SN16L	★	N	16	175	16	50	4.5	17.6	TS2A	TKY06F	
	AQXR174SA16L	★	Y	17	175	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR174SN16L	★	N	17	175	16	30	4.5	17.6	TS2A	TKY06F	
	AQXR204SA20L	★	Y	20	185	20	60	6	22	TS25	TKY08F	QOG/MT1035R-G1/M2
	AQXR204SN20L	★	N	20	185	20	60	6	22	TS25	TKY08F	
	AQXR214SA20L	★	Y	21	185	20	35	6	22	TS25	TKY08F	
	AQXR214SN20L	★	N	21	185	20	35	6	22	TS25	TKY08F	
	AQXR254SA25L	★	Y	25	220	25	75	7.5	27.5	TS33	TKY08D	QOG/MT1342R-G1/M2
	AQXR254SN25L	★	N	25	220	25	75	7.5	27.5	TS33	TKY08D	
	AQXR264SA25L	★	Y	26	220	25	40	7.5	27.5	TS33	TKY08D	
	AQXR264SN25L	★	N	26	220	25	40	7.5	27.5	TS33	TKY08D	
	AQXR324SA32L	★	Y	32	230	32	90	9.5	35.2	TS407	TKY15D	QOG/MT1651R-G1/M2
	AQXR324SN32L	★	N	32	230	32	90	9.5	35.2	TS407	TKY15D	
	AQXR334SA32L	★	Y	33	230	32	50	9.5	35.2	TS407	TKY15D	
	AQXR334SN32L	★	N	33	230	32	50	9.5	35.2	TS407	TKY15D	
	AQXR354SA32L	★	Y	35	230	32	50	11	40	TS407	TKY15D	QOG/MT1856R-G1/M2
	AQXR354SN32L	★	N	35	230	32	50	11	40	TS407	TKY15D	
	AQXR404SA32L	★	Y	40	240	32	60	12	44	TS55	TKY25D	QOG/MT2062R-G1/M2
	AQXR404SN32L	★	N	40	240	32	60	12	44	TS55	TKY25D	
	AQXR504SA42L	★	Y	50	250	42	70	15	55	TS6S	TKY30T	QOG/MT2576R-G1/M2
	AQXR504SN42L	★	N	50	250	42	70	15	55	TS6S	TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 APMX: Maximum depth of cut.
*3 Clamp Torque (lbf-in) : TS2A=4.5, TS25=8.9, TS33=13, TS407=31, TS55=66, TS6S=76
*4 Y=Yes, N=No

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



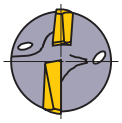
Metric Standard

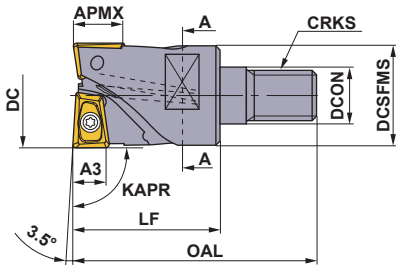
SHORT EDGE TYPE

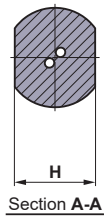
Right hand tool holder only.

Type	Order Number	Stock R	Coolant Thru *4	DC	LF	DCON	LH	A3 *1	APMX *2	Insert Screw *3	Wrench F D T	Insert
Standard	**AQXR162SA16S**	★	Y	16	120	16	30	4.5	7.4	TS2A	TKY06F	QO○T0830R-○○
	AQXR162SN16S	★	N	16	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SA16S	★	Y	17	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SN16S	★	N	17	120	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR202SA20S	★	Y	20	130	20	35	6	9.2	TS25	TKY08F	QO○T1035R-○○
	AQXR202SN20S	★	N	20	130	20	35	6	9.2	TS25	TKY08F	
	AQXR212SA20S	★	Y	21	130	20	35	6	9.2	TS25	TKY08F	
	AQXR212SN20S	★	N	21	130	20	35	6	9.2	TS25	TKY08F	
	AQXR252SA25S	★	Y	25	140	25	40	7.5	11.5	TS33	TKY08D	QO○T1342R-○○
	AQXR252SN25S	★	N	25	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SA25S	★	Y	26	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SN25S	★	N	26	140	25	40	7.5	11.5	TS33	TKY08D	
	AQXR322SA32S	★	Y	32	150	32	50	9.5	14.5	TS407	TKY15D	QO○T1651R-○○
	AQXR322SN32S	★	N	32	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SA32S	★	Y	33	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SN32S	★	N	33	150	32	50	9.5	14.5	TS407	TKY15D	
	AQXR352SA32S	★	Y	35	150	32	50	11	16	TS407	TKY15D	QO○T1856R-○○
	AQXR352SN32S	★	N	35	150	32	50	11	16	TS407	TKY15D	
	AQXR402SA32S	★	Y	40	160	32	60	12	18	TS55	TKY25D	QO○T2062R-○○
	AQXR402SN32S	★	N	40	160	32	60	12	18	TS55	TKY25D	
	AQXR502SA42S	★	Y	50	170	42	70	15	23	TS6S	TKY30T	QO○T2576R-○○
	AQXR502SN42S	★	N	50	170	42	70	15	23	TS6S	TKY30T	
Long	**AQXR162SA16L**	★	Y	16	175	16	50	4.5	7.4	TS2A	TKY06F	QO○T0830R-○○
	AQXR162SN16L	★	N	16	175	16	50	4.5	7.4	TS2A	TKY06F	
	AQXR172SA16L	★	Y	17	175	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR172SN16L	★	N	17	175	16	30	4.5	7.4	TS2A	TKY06F	
	AQXR202SA20L	★	Y	20	185	20	60	6	9.2	TS25	TKY08F	QO○T1035R-○○
	AQXR202SN20L	★	N	20	185	20	60	6	9.2	TS25	TKY08F	
	AQXR212SA20L	★	Y	21	185	20	35	6	9.2	TS25	TKY08F	
	AQXR212SN20L	★	N	21	185	20	35	6	9.2	TS25	TKY08F	
	AQXR252SA25L	★	Y	25	220	25	75	7.5	11.5	TS33	TKY08D	QO○T1342R-○○
	AQXR252SN25L	★	N	25	220	25	75	7.5	11.5	TS33	TKY08D	
	AQXR262SA25L	★	Y	26	220	25	40	7.5	11.5	TS33	TKY08D	
	AQXR262SN25L	★	N	26	220	25	40	7.5	11.5	TS33	TKY08D	
	AQXR322SA32L	★	Y	32	230	32	90	9.5	14.5	TS407	TKY15D	QO○T1651R-○○
	AQXR322SN32L	★	N	32	230	32	90	9.5	14.5	TS407	TKY15D	
	AQXR332SA32L	★	Y	33	230	32	50	9.5	14.5	TS407	TKY15D	
	AQXR332SN32L	★	N	33	230	32	50	9.5	14.5	TS407	TKY15D	
	AQXR352SA32L	★	Y	35	230	32	50	11	16	TS407	TKY15D	QO○T1856R-○○
	AQXR352SN32L	★	N	35	230	32	50	11	16	TS407	TKY15D	
	AQXR402SA32L	★	Y	40	240	32	60	12	18	TS55	TKY25D	QO○T2062R-○○
	AQXR402SN32L	★	N	40	240	32	60	12	18	TS55	TKY25D	
	AQXR502SA42L	★	Y	50	250	42	70	15	23	TS6S	TKY30T	QO○T2576R-○○
	AQXR502SN42L	★	N	50	250	42	70	15	23	TS6S	TKY30T	

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 APMX: Maximum depth of cut.
*3 Clamp Torque (lbf-in) : TS2A=4.5, TS25=8.9, TS33=13, TS407=31, TS55=66, TS6S=76
*4 Y=Yes, N=No







Metric Standard

SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	*5 Coolant Thru	Dimensions (mm)									*3	F D	
	R		DC	DCON	DCSFMS	OAL	LF	H	CRKS *4	A3 *1	APMX *2	Insert Screw	Wrench	Insert
AQXR162M08A30	★	Y	16	8.5	14.7	48	30	10	M8	4.5	7.4	TS2A	TKY06F	QO○T0830R-○○
AQXR172M08A30	★	Y	17	8.5	14.5	48	30	10	M8	4.5	7.4	TS2A	TKY06F	
AQXR202M10A30	★	Y	20	10.5	18.6	49	30	14	M10	6	9.2	TS25	TKY08F	QO○T1035R-○○
AQXR212M10A30	★	Y	21	10.5	18.5	49	30	14	M10	6	9.2	TS25	TKY08F	
AQXR252M12A35	★	Y	25	12.5	23.5	57	35	19	M12	7.5	11.5	TS33	TKY08D	QO○T1342R-○○
AQXR262M12A35	★	Y	26	12.5	23.5	57	35	19	M12	7.5	11.5	TS33	TKY08D	
AQXR322M16A40	★	Y	32	17	28.5	63	40	24	M16	9.5	14.5	TS407	TKY15D	QO○T1651R-○○
AQXR332M16A40	★	Y	33	17	28.5	63	40	24	M16	9.5	14.5	TS407	TKY15D	
AQXR352M16A40	★	Y	35	17	28.5	63	40	24	M16	11	16	TS407	TKY15D	QO○T1856R-○○
AQXR402M16A45	★	Y	40	17	28.5	68	45	24	M16	12	18	TS55	TKY25D	QO○T2062R-○○

*1 Dimension A3 represents the depth of cut when the cutting edge consists of 2 inserts.
*2 APMX: Maximum depth of cut.
*3 Clamp Torque (lbf-in) : TS2A=4.5, TS25=8.9, TS33=13, TS407=31, TS55=66
*4 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
*5 Y=Yes

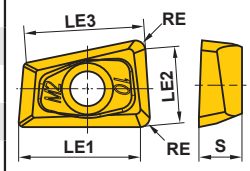
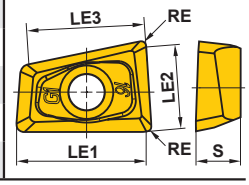
ISO13399 ➤ K003
SCREW-IN HOLDERS ➤ K382
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Material

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting
✠ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp Edge

Shape	Order Number	End Mill Dia.	Class	Edge Preparation	Coated MP6120	MP6130	MP7130	MP7140	MP9120	VP15TF	VP30RT	Carbide HTi10		LE1	LE2	LE3	S	RE	Geometry
M breaker	**QOMT0830R-M2**	ϕ.625, .672	M	E	●	●	●	●	●	●	●			.287	.173	.287	.120	.031	
	QOMT0934R-M2	ϕ.750, .797	M	E	●	●	●	●	●	●	●			.358	.220	.350	.134	.031	
	QOMT1443R-M2	ϕ1.000, 1.047	M	E	●	●	●	●	●	●	●			.484	.307	.465	.169	.031	
	QOMT1651R-M2	ϕ1.250, 1.297	M	E	●	●	●	●	●	●	●			.606	.390	.575	.200	.031	
	QOMT1959R-M2	ϕ1.500	M	E	●	●	●	●	●	●	●			.728	.472	.681	.232	.031	
G breaker	**QOGT0830R-G1**	ϕ.625, .672	G	E*	●				●	★		●		.287	.173	.287	.120	.016	
	QOGT0934R-G1	ϕ.750, .797	G	E*	●				●			●		.358	.220	.350	.134	.016	
	QOGT1443R-G1	ϕ1.000, 1.047	G	E*	●				●			●		.484	.307	.465	.169	.016	
	QOGT1651R-G1	ϕ1.250, 1.297	G	E*	●				●	★		●		.606	.390	.575	.200	.016	
	QOGT1959R-G1	ϕ1.500	G	E*	●				●			●		.728	.472	.681	.232	.016	

* Grade HTi10 has “F” honing.

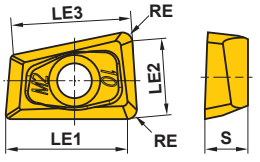
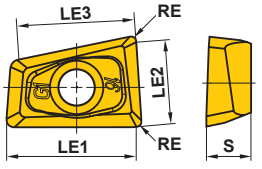
INSERTS

For Metric Standard

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Materials

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✠ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp Edge

Shape	Order Number	End Mill Dia.	Class	Edge Preparation	Coated MP6120	MP6130	MP7130	MP7140	MP9120	VP15TF	VP30RT	Carbide HTi10		LE1	LE2	LE3	S	RE	Geometry
M breaker	**QOMT0830R-M2**	ϕ16,17	M	E	●	●	●	●	●	●	●			7.3	4.4	7.3	3	0.8	
	QOMT1035R-M2	ϕ20,21	M	E	★	★	★	★	★	★	★			9.5	5.9	9.3	3.5	0.8	
	QOMT1342R-M2	ϕ25,26	M	E	★	★	★	★	★	★	★			12	7.6	11.6	4.2	0.8	
	QOMT1651R-M2	ϕ32,33	M	E	●	●	●	●	●	●	●			15.4	9.9	14.6	5.1	0.8	
	QOMT1856R-M2	ϕ35	M	E	★	★	★	★	★	★	★			16.9	10.9	16	5.6	0.8	
	QOMT2062R-M2	ϕ40	M	E	★	★	★	★	★	★	★			19.4	12.6	18.1	6.2	0.8	
	QOMT2576R-M2	ϕ50	M	E	★	★	★	★	★	★	★			24.8	16.1	23.1	7.6	0.8	
G breaker	**QOGT0830R-G1**	ϕ16,17	G	E*	●				●	★		●		7.7	4.9	7.3	3	0.4	
	QOGT1035R-G1	ϕ20,21	G	E*	★				★	★		★		9.9	6.4	9.3	3.5	0.4	
	QOGT1342R-G1	ϕ25,26	G	E*	★				★	★		★		12.4	8.1	11.6	4.2	0.4	
	QOGT1651R-G1	ϕ32,33	G	E*	●				●	★		●		15.8	10.4	14.6	5.1	0.4	
	QOGT1856R-G1	ϕ35	G	E*	★				★	★		★		17.3	11.4	16	5.6	0.4	
	QOGT2062R-G1	ϕ40	G	E*	★				★	★		★		19.8	13.1	18.1	6.2	0.4	
	QOGT2576R-G1	ϕ50	G	E*	★				★	★		★		25.2	16.6	23.1	7.6	0.4	

* Grade HTi10 has “F” honing.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

(inch)

Workpiece Material		No.	Hardness	Breaker	Cutting Speed for Different Grades **vc** (SFM)		
P					**MP6120**	**VP15TF**	**MP6130**
	Mild Steel	1	≤180HB	**M2/G1**	655 (560—785)	590 (490—720)	525 (425—655)
	Carbon Steel Alloy Steel	2	180—350HB	**M2**	590 (460—720)	525 (395—655)	460 (330—590)
M					**MP7130**	**MP7140**	**VP30RT (VP15TF)**
	Austenitic Stainless Steel	1	≤200HB	**M2/G1**	560 (395—655)	525 (330—590)	490 (395—590)
	Austenitic Stainless Steel	2	>200HB	**M2**			
	Ferritic and Martensitic Stainless Steel	3	≤200HB	**M2**			
	Ferritic and Martensitic Stainless Steel	4	>200HB	**M2**			
K					**VP15TF**		
	Gray Cast Iron	1	≤350MPa	**M2**	590 (490—720)	—	—
	Ductile Cast Iron	2	≤450MPa	**M2**	590 (490—720)	—	—
N					**HTi10**		
	Aluminum Alloys	1	Si<5%	**G1**	1640 (655—2625)	—	—
	Aluminum Alloys	2	5%≤Si≤10%	**G1**	330 (165—985)	—	—
	Aluminum Alloys	3	Si>5%	**G1**	330 (165—985)	—	—
S					**MP9120**		
	Titanium Alloys	1	—	**M2**	165 (100—230)	—	—
H					**VP15TF**		
	Hardened Steel	1	40—55HRC	**M2**	260 (165—395)	—	—

* Wet cutting is recommended for Titanium alloy.

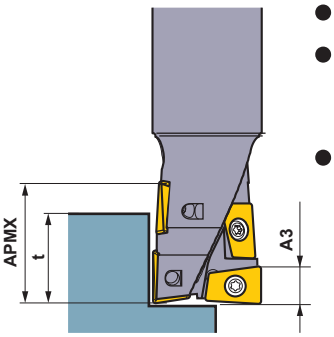
■ Cutting Conditions for Shoulder Milling

(inch)

	Workpiece Material	No.	Hardness	ϕ.625", .672" ϕ16 mm , 17 mm			ϕ.750", .797" ϕ20 mm , 21 mm			ϕ1.000", 1.047" ϕ25 mm , 26 mm		
				ap	ae	fr (IPR)	ap	ae	fr (IPR)	ap	ae	fr (IPR)
P	Mild Steel	1	≤180HB	≤.177	≤.315	.010	≤.236	≤ .394	.012	≤.295	≤ .492	.014
				.177—.472	≤.197	.006	.236—.551	≤ .276	.010	.295— .669	≤ .315	.011
				.472—.669	≤.118	.004	.551—.866	≤ .157	.007	.669—1.063	≤ .197	.008
	Carbon Steel Alloy Steel	2	180—350HB	≤.177	≤.315	.008	≤.236	≤ .394	.010	≤.295	≤ .492	.012
				.177—.472	≤.157	.006	.236—.551	≤ .236	.008	.295— .669	≤ .276	.010
				.472—.669	≤.079	.003	.551—.866	≤ .118	.006	.669—1.063	≤ .157	.007
M	Stainless Steel	1,2,3,4	≤270HB	≤.177	≤.315	.008	≤.236	≤ .394	.010	≤.295	≤ .492	.012
				.177—.472	≤.157	.006	.236—.551	≤ .236	.008	.295— .669	≤ .276	.010
				.472—.669	≤.079	.003	.551—.866	≤ .118	.006	.669—1.063	≤ .157	.007
K	Cast Iron	1,2	≤350MPa	≤.177	≤.315	.010	≤.236	≤ .394	.012	≤.295	≤ .492	.014
				.177—.472	≤.197	.006	.236—.551	≤ .276	.010	.295— .669	≤ .315	.011
				.472—.669	≤.118	.004	.551—.866	≤ .157	.007	.669—1.063	≤ .197	.008
N	Aluminum Alloys	1,2,3	—	≤.177	≤.433	.012	≤.236	≤ .551	.014	≤.295	≤ .492	.016
				.177—.472	≤.315	.008	.236—.551	≤ .394	.012	.295— .669	≤ .276	.013
				.472—.669	≤.197	.006	.551—.866	≤ .236	.009	.669—1.063	≤ .157	.010
S	Titanium Alloys	1	—	≤.177	≤.315	.006	≤.236	≤ .394	.007	≤.295	≤ .689	.008
				.177—.472	≤.157	.004	.236—.551	≤ .236	.006	.295— .669	≤ .492	.007
				.472—.669	≤.079	.002	.551—.866	≤ .118	.004	.669—1.063	≤ .295	.005
H	Hardened Steel	1	40—55HRC	≤.177	≤.197	.006	≤.236	≤ .236	.008	≤.295	≤ .276	.009
				.177—.472	≤.118	.004	.236—.551	≤ .157	.006	.295— .669	≤ .157	.007
				.472—.669	≤.039	.002	.551—.866	≤ .079	.005	.669—1.063	≤ .079	.006

	Workpiece Material	No.	Hardness	ϕ1.250", 1.297" ϕ32 mm , 33mm			ϕ1.500" ϕ40 mm		
				ap	ae	fr (IPR)	ap	ae	fr (IPR)
P	Mild Steel	1	≤180HB	≤ .374	≤.630	.016	≤ .472	≤.787	.020
				.374— .866	≤.433	.013	.472—1.102	≤.512	.016
				.866—1.378	≤.236	.010	1.102—1.732	≤.276	.012
	Carbon Steel Alloy Steel	2	180—350HB	≤ .374	≤.630	.014	≤ .472	≤.787	.016
				.374— .866	≤.394	.011	.472—1.102	≤.472	.013
				.866—1.378	≤.197	.008	1.102—1.732	≤.236	.010
M	Stainless Steel	1,2,3,4	≤270HB	≤ .374	≤.630	.014	≤ .472	≤.787	.016
				.374— .866	≤.394	.011	.472—1.102	≤.472	.013
				.866—1.378	≤.197	.008	1.102—1.732	≤.236	.010
K	Cast Iron	1,2	≤350MPa	≤ .374	≤.630	.016	≤ .472	≤.787	.020
				.374— .866	≤.433	.013	.472—1.102	≤.512	.016
				.866—1.378	≤.236	.010	1.102—1.732	≤.276	.012
N	Aluminum Alloys	1,2,3	—	≤ .374	≤.630	.018	≤ .472	≤.787	.022
				.374— .866	≤.394	.015	.472—1.102	≤.472	.018
				.866—1.378	≤.197	.012	1.102—1.732	≤.236	.014
S	Titanium Alloys	1	—	≤ .374	≤.906	.010	≤ .472	≤1.102	.011
				.374— .866	≤.630	.008	.472—1.102	≤.787	.009
				.866—1.378	≤.394	.006	1.102—1.732	≤.472	.007
H	Hardened Steel	1	40—55HRC	≤ .374	≤.315	.010	≤ .472	≤.394	.012
				.374— .866	≤.197	.008	.472—1.102	≤.236	.009
				.866—1.378	≤.079	.006	1.102—1.732	≤.079	.007

Note 1) Please pay special attention on the depth of cut when using the short edge type.
Note 2) When using the G1-breaker wiht coated grades VP15TF, MP6120 or MP9120, reduce the feed rate by 20%.
Note 3) For more information on "No.", please refer to page K281 for cutting speed.

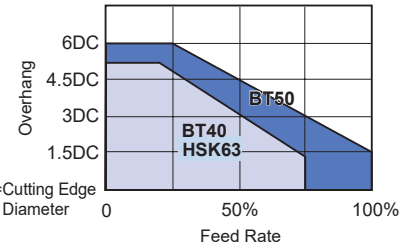


*Figures for A3 and APMX are shown in the table of holder standard.

- A3 is the depth of cut for the full dual blade portion at the end of the cutting edge.
- Beyond the range of A3 where overlapping occurs, there is an area where the cutting edge becomes single bladed, not forming full dual blade configuration.
  As such, please pay special attention to the relationship between depth of cut and feed.
- In general, the edge at the border of cut tends to suffer from damages. At large depth of cut operations, applying the following depth of cut (**t**), at which the edge is full dual bladed at the border of cut, is recommended to prevent damage to the cutting edge.

(inch)

Tool Diameter	Recommended Depth of Cut **t**
ϕ.625, .672	.472—.551
ϕ.750, .797	.551—.669
ϕ1.000, 1.047	.669—.866
ϕ1.250, 1.297	.866—1.102
ϕ1.500	1.102—1.378



- Chatter vibration and other problems tend to occur at operations where overhang length is large and/or machine rigidity is low, resulting in unstable machining.
- Please reduce feed accordingly, using the above chart as a guideline.

■ Cutting Conditions for Slotting

(inch)

Workpiece Material		No.	Hardness	ϕ.625", .672" ϕ16 mm , 17 mm		ϕ.750", .797" ϕ20 mm , 21 mm		ϕ1.000", 1.047" ϕ25 mm , 26 mm	
				ap	fr (IPR)	ap	fr (IPR)	ap	fr (IPR)
P	Mild Steel	1	≤180HB	≤.177	.006	≤.236	.007	≤ .295	.008
				.177—.472	.004	.236—.551	.006	.295— .669	.006
				.472—.669	.003	.551—.866	.004	.669—1.063	.005
	Carbon Steel Alloy Steel	2	180—350HB	≤.177	.006	≤.236	.006	≤ .295	.007
				.177—.472	.004	.236—.551	.005	.295— .669	.006
				.472—.669	.002	.551—.866	.004	.669—1.063	.004
M	Stainless Steel	1,2,3,4	≤270HB	≤.177	.006	≤.236	.006	≤ .295	.007
				.177—.472	.004	.236—.551	.005	.295— .669	.006
				.472—.669	.002	.551—.866	.004	.669—1.063	.004
K	Cast Iron	1,2	≤350MPa	≤.177	.006	≤.236	.007	≤ .295	.008
				.177—.472	.004	.236—.551	.006	.295— .669	.006
				.472—.669	.003	.551—.866	.004	.669—1.063	.005
N	Aluminum Alloys	1,2,3	—	≤.177	.007	≤.236	.008	≤ .295	.009
				.177—.472	.005	.236—.551	.006	.295— .669	.007
				.472—.669	.004	.551—.866	.005	.669—1.063	.006
S	Titanium Alloys	1	—	≤.177	.004	≤.236	.005	≤ .295	.006
				.177—.472	.002	.236—.551	.003	.295— .669	.004
				.472—.669	.001	.551—.866	.002	.669—1.063	.003
H	Hardened Steel	1	40—55HRC	≤.177	.004	≤.236	.005	≤ .295	.006
				.177—.472	.003	.236—.551	.004	.295— .669	.005

Workpiece Material		No.	Hardness	ϕ1.250", 1.297" ϕ32 mm , 33 mm		ϕ1.500" ϕ40 mm	
				ap	fr (IPR)	ap	fr (IPR)
P	Mild Steel	1	≤180HB	≤ .374	.010	≤ .472	.012
				.374— .866	.008	.472—1.102	.010
				.866—1.378	.006	1.102—1.732	.007
	Carbon Steel Alloy Steel	2	180—350HB	≤ .374	.008	≤ .472	.010
				.374— .866	.006	.472—1.102	.008
				.866—1.378	.005	1.102—1.732	.006
M	Stainless Steel	1,2,3,4	≤270HB	≤ .374	.008	≤ .472	.010
				.374— .866	.006	.472—1.102	.008
				.866—1.378	.005	1.102—1.732	.006
K	Cast Iron	1,2	≤350MPa	≤ .374	.010	≤ .472	.012
				.374— .866	.008	.472—1.102	.010
				.866—1.378	.006	1.102—1.732	.007
N	Aluminum Alloys	1,2,3	—	≤ .374	.011	≤ .472	.013
				.374— .866	.009	.472—1.102	.011
				.866—1.378	.006	1.102—1.732	.008
S	Titanium Alloys	1	—	≤ .374	.007	≤ .472	.009
				.374— .866	.005	.472—1.102	.008
				.866—1.378	.004	1.102—1.732	.006
H	Hardened Steel	1	40—55HRC	≤ .374	.006	≤ .472	.007
				.374— .866	.005	.472—1.102	.006

Note 1) Please pay special attention on the depth of cut when using the short edge type.
Note 2) When using the G1-breaker wiht coated grades VP15TF, MP6120 or MP9120, reduce the feed rate by 20%.
Note 3) For more information on "No.", please refer to page K281 for cutting speed.

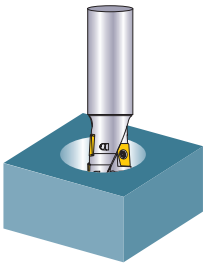
For Helical Milling

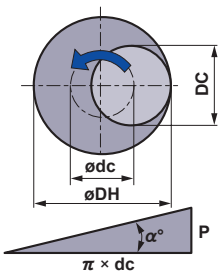
(inch)

Workpiece Material		No.	Hardness	ϕ.625", .672" ϕ16 mm , 17 mm				ϕ.750", .797" ϕ20 mm , 21 mm				ϕ1.000", 1.047" ϕ25 mm , 26 mm			
				DH	APMX	fr (IPR)	P (inch/pass)	DH	APMX	fr (IPR)	P (inch/pass)	DH	APMX	fr (IPR)	P (inch/pass)
P	Mild Steel	1	≤180HB	.787	.315	.006	.017	.945	.394	.007	.017	1.181	.492	.008	.022
				.984	.472	.006	.039	1.181	.591	.006	.043	1.496	.748	.007	.056
				1.142	.630	.005	.056	1.417	.787	.006	.069	1.772	.984	.006	.087
	Carbon Steel Alloy Steel	2	180—350HB	.787	.315	.006	.013	.945	.394	.006	.013	1.181	.492	.007	.016
				.984	.472	.005	.029	1.181	.591	.006	.032	1.496	.748	.006	.042
				1.142	.630	.004	.042	1.417	.787	.005	.052	1.772	.984	.006	.065
M	Stainless Steel	1,2,3,4	≤270HB	.787	.118	.006	.009	.945	.157	.006	.009	1.181	.197	.007	.011
				.984	.197	.005	.019	1.181	.276	.006	.022	1.496	.354	.006	.028
				1.142	.315	.004	.028	1.417	.394	.005	.035	1.772	.492	.006	.043
K	Cast Iron	1,2	≤350MPa	.787	.394	.006	.022	.945	.551	.007	.022	1.181	.709	.008	.027
				.984	.512	.006	.048	1.181	.669	.006	.054	1.496	.827	.007	.070
				1.142	.630	.005	.070	1.417	.787	.006	.086	1.772	.984	.006	.108
N	Aluminum Alloys	1,2,3	—	.787	.394	.007	.017	.945	.551	.008	.017	1.181	.709	.009	.022
				.984	.512	.006	.039	1.181	.669	.007	.043	1.496	.827	.008	.056
				1.142	.630	.006	.056	1.417	.787	.006	.069	1.772	.984	.007	.087
S	Titanium Alloys	1	—	.787	.118	.004	.009	.945	.157	.004	.009	1.181	.197	.005	.011
				.984	.197	.003	.019	1.181	.276	.004	.022	1.496	.354	.004	.028
				1.142	.315	.003	.028	1.417	.394	.003	.035	1.772	.492	.004	.043
H	Hardened Steel	1	40—55HRC	.787	.118	.004	.009	.945	.157	.005	.009	1.181	.197	.006	.011
				.984	.197	.003	.019	1.181	.276	.004	.022	1.496	.354	.005	.028
				1.142	.315	.002	.028	1.417	.394	.003	.035	1.772	.492	.004	.043

Workpiece Material		No.	Hardness	ϕ1.250", 1.297" ϕ32 mm , 33 mm				ϕ1.500" ϕ40 mm			
				DH	APMX	fr (IPR)	P (inch/pass)	DH	APMX	fr (IPR)	P (inch/pass)
P	Mild Steel	1	≤180HB	1.496	.630	.010	.026	1.890	.787	.012	.035
				1.890	.945	.009	.069	2.362	1.181	.010	.086
				2.283	1.260	.008	.112	2.835	1.575	.009	.138
	Carbon Steel Alloy Steel	2	180—350HB	1.496	.630	.008	.019	1.890	.787	.010	.026
				1.890	.945	.007	.052	2.362	1.181	.009	.065
				2.283	1.260	.006	.084	2.835	1.575	.008	.104
M	Stainless Steel	1,2,3,4	≤270HB	1.496	.236	.008	.013	1.890	.315	.010	.017
				1.890	.433	.007	.035	2.362	.551	.009	.043
				2.283	.630	.006	.056	2.835	.787	.008	.069
K	Cast Iron	1,2	≤350MPa	1.496	.866	.010	.032	1.890	1.102	.012	.043
				1.890	1.063	.009	.086	2.362	1.339	.010	.108
				2.283	1.260	.008	.141	2.835	1.575	.009	.173
N	Aluminum Alloys	1,2,3	—	1.496	.866	.011	.026	1.890	1.102	.013	.035
				1.890	1.063	.009	.069	2.362	1.339	.011	.086
				2.283	1.260	.009	.112	2.835	1.575	.009	.138
S	Titanium Alloys	1	—	1.496	.236	.006	.013	1.890	.315	.007	.017
				1.890	.433	.005	.035	2.362	.551	.006	.043
				2.283	.630	.004	.056	2.835	.787	.006	.069
H	Hardened Steel	1	40—55HRC	1.496	.236	.006	.013	1.890	.315	.007	.017
				1.890	.433	.006	.035	2.362	.551	.006	.043
				2.283	.630	.005	.056	2.835	.787	.006	.069

Note 1) Helical grooving is strongly recommended for machining of tempered steel.
Note 2) When using the G1-breaker wiht coated grades VP15TF, MP6120 or MP9120, reduce the feed rate by 20%.
Note 3) For more information on "No.", please refer to page K281 for cutting speed.





● How to calculate the theoretical center of the cutter path.

$$\text{Ø dc (Theoretical center of the tool)} = \text{Ø DH (Desired hole diameter)} - \text{DC (Cutting edge diameter)}$$

● Depth of cut for a pass.

$$P = \pi \times dc \times \tan\alpha^\circ \quad (*\ \alpha^\circ \leq 3^\circ)$$

● Min. machined hole diameter at helical milling : 1.2DC
Max. machined hole diameter at helical milling : 1.8DC

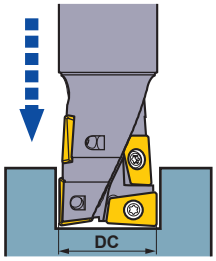
● For chip discharge, please always apply air blow.
(When aluminum cutting, please use coolant.)

● When helical milling, it is recommended to reduce the feed rate by 40%.

● When using the G1-breaker wiht coated grades VP15TF, MP6120 or MP9120, reduce the feed rate by 20%.

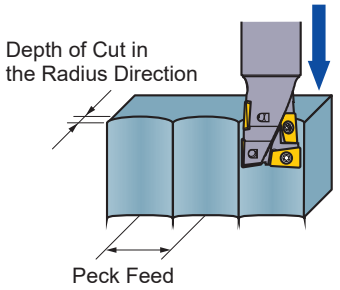
■ For Drilling and Plunging

● Drilling



- The recommended drilling depth is less than .5DC.
- Use step feed when drilling (.010－.020 inch) to ensure that the chips are effectively broken.
- Use internal or external cooling to ensure that the chips disposal is sufficiently achieved.
- The chips generated can discharge in any direction, so ensure that adequate safety precautions are taken.

● Plunging



- The feed for plunging is the same as the feed for drilling.
- No step feed necessary.
- Please refer to the following table for the depth of cut at plunging operations.

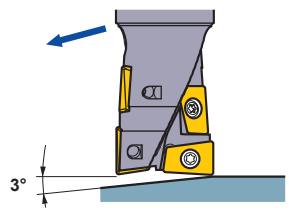
Depth of Cut in the Radius Direction	≤ .4DC
Peck Feed	≤ .5DC

(inch)

Workpiece Material		No.	Hardness	ϕ.625", .672" ϕ16 mm , 17 mm		ϕ.750", .797" ϕ20 mm , 21 mm		ϕ1.000", 1.047" ϕ25 mm , 26 mm		ϕ1.250", 1.297" ϕ32 mm, 33 mm, 35 mm		ϕ1.500" ϕ40 mm	
				fr (IPR)	Step	fr (IPR)	Step	fr (IPR)	Step	fr (IPR)	Step	fr (IPR)	Step
P	Mild Steel	1	≤180HB	.001	.008	.002	.012	.002	.012	.002	.012	.002	.012
	Carbon Steel Alloy Steel	2	180－350HB	.001	.008	.002	.012	.002	.012	.002	.012	.002	.012
M	Stainless Steel	1,2,3,4	≤270HB	.001	.006	.002	.010	.002	.010	.002	.010	.002	.010
K	Gray Cast Iron	1	≤350MPa	.002	.016	.002	.020	.002	.020	.003	.020	.003	.020
N	Aluminum Alloys	1,2,3	–	.002	.008	.002	.012	.002	.012	.003	.012	.003	.012
H	Hardened Steel	1	40－55HRC	.001	.006	.001	.010	.001	.010	.002	.010	.002	.010

Note 1) Helical grooving is strongly recommended for machining of tempered steel.
Note 2) When using the G1-breaker wiht coated grades VP15TF, MP6120 or MP9120, reduce the feed rate by 20%.
Note 3) For more information on "No.", please refer to page K281 for cutting speed.

■ For Ramping



- When machining steel the recommended ramping angle is 3°. If a ramping angle larger than 3° is used, then the chips may not be broken effectively resulting in chips wrapping around the tool.
- When ramping, it is recommended to reduce the feed rate by 40%.

MULTI FUNCTIONAL MILLING

AJX

P M K N S H

Fig.1 **"FA" Flat Shank**

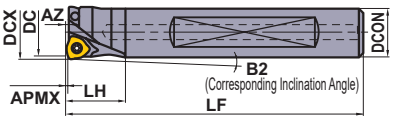


Fig.2

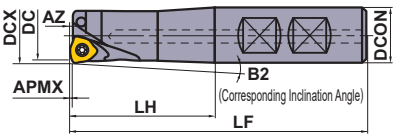


Fig.3

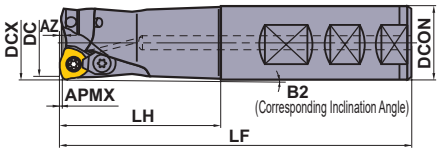
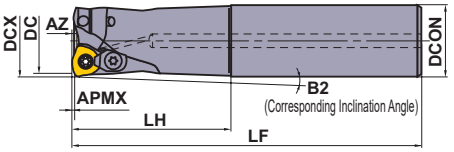


Fig.4



■ SHANK TYPE

Right hand tool holder only.

With Air / coolant through.

(inch)

DCX	Order Number	Stock R	Number of Teeth	LF	DC	LH	DCON	B2	APMX	RMPX	Fig.	Insert Type
.625	**AJXU06R102FA10S**	●	2	3.750	.346	1.250	.625	2.12°	.039	3°	1	JOM□06T2
.625	**AJXU06R102SA10M**	●	2	5.750	.346	1.500	.625	1.75°	.039	3°	4	JOM□06T2
.625	**AJXU06R102SA10L**	●	2	5.750	.346	2.750	.625	0.93°	.039	3°	4	JOM□06T2
.688	**AJXU06R112FA10S**	●	2	3.750	.409	.750	.625	—	.039	2.5°	1	JOM□06T2
.688	**AJXU06R112SA10L**	●	2	5.750	.409	.750	.625	—	.039	2.5°	4	JOM□06T2
.750	**AJXU08R122WA12S**	●	2	4.750	.417	2.000	.750	1.31°	.059	3.5°	2	JOM□0803
.750	**AJXU06R123SA12M**	●	3	7.000	.472	2.375	.750	1.11°	.039	1.7°	4	JOM□06T2
.750	**AJXU08R122SA12L**	●	2	7.000	.417	4.000	.750	0.64°	.059	3.5°	4	JOM□0803
.875	**AJXU08R142FA12S**	●	2	4.750	.535	1.250	.750	—	.059	3°	1	JOM□0803
.875	**AJXU08R142SA12L**	●	2	7.000	.535	1.250	.750	—	.059	3°	4	JOM□0803
1.000	**AJXU09R162WA16S**	●	2	5.625	.602	2.375	1.000	1.1°	.079	4°	3	JDM□09T3
1.000	**AJXU08R163SA16M**	●	3	8.000	.661	2.750	1.000	0.94°	.059	2°	4	JOM□0803
1.000	**AJXU09R162SA16L**	●	2	8.000	.602	4.750	1.000	0.54°	.079	4°	4	JDM□09T3
1.125	**AJXU09R182FA16S**	●	2	5.625	.728	1.625	1.000	—	.079	3°	1	JDM□09T3
1.125	**AJXU09R182SA16L**	●	2	8.000	.728	1.625	1.000	—	.079	3°	4	JDM□09T3
1.250	**AJXU12R202WA20S**	●	2	6.000	.789	2.750	1.250	0.94°	.079	4°	3	JDM□1204
1.250	**AJXU09R203SA20M**	●	3	8.000	.854	3.125	1.250	0.82°	.079	3.3°	4	JDM□09T3
1.250	**AJXU12R202SA20L**	●	2	8.000	.789	4.750	1.250	0.54°	.079	4°	4	JDM□1204
1.500	**AJXU12R243WA20S**	●	3	6.000	1.038	2.000	1.250	—	.079	3°	3	JDM□1204
1.500	**AJXU09R244SA20M**	●	4	10.000	1.114	2.375	1.250	—	.079	2.4°	4	JDM□09T3
1.500	**AJXU12R243SA20L**	●	3	10.000	1.038	2.000	1.250	—	.079	3°	4	JDM□1204
1.500	**AJXU12R243SA24L**	●	3	10.000	1.038	2.750	1.500	0.94°	.079	3°	4	JDM□1204
2.000	**AJXU14R323WA24S**	●	3	6.000	1.534	2.000	1.500	—	.079	4.2°	3	JDM□1405

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).

SPARE PARTS

(inch)

Tool Holder Type	*		*		F D
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJXU06R	TS25	–	–	–	TKY08F
AJXU08R	TS33	–	–	–	TKY08D
AJXU09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJXU12R	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJXU14R	TS54	AMS5	AJS5014T25	ASS3	TKY25D

* Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

Fig.1

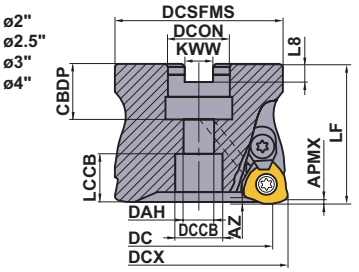
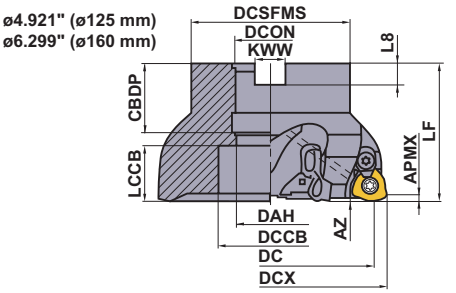


Fig.2



Right hand tool holder only.

(inch)

DCX	Set Bolt	Geometry	
2.000"	HSCU37513H	①	① ② With Air / coolant through.
2.500", 3.000"	HSCU50014H		
4.000"	HSCU75016H		
4.921"	MBAU75016H	②	
6.299"	MBAU100016H		

■ARBOR TYPE

With Air / coolant through.

DCX=inch size, DCON=inch size

(inch)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (lbs)	APMX	RMPX	Fig.	Insert Type
2.000	**AJXU12R0203**	●	3	1.539	2.000	.750	.888	.059	2°	1	JDM□1204
2.000	**AJXU12R0204**	●	4	1.539	2.000	.750	.866	.059	2°	1	JDM□1204
2.000	**AJXU09R0205**	●	5	1.606	2.000	.750	.925	.039	1.1°	1	JDM□09T3
2.500	**AJXU14R2503C**	●	3	2.032	2.000	1.000	1.393	.079	2.8°	1	JDM□1405
2.500	**AJXU14R2504C**	●	4	2.032	2.000	1.000	1.338	.079	2.8°	1	JDM□1405
2.500	**AJXU12R2505C**	●	5	2.039	2.000	1.000	1.427	.059	1.5°	1	JDM□1204
3.000	**AJXU14R0304C**	●	4	2.532	2.000	1.000	2.133	.079	1.8°	1	JDM□1405
3.000	**AJXU14R0305C**	●	5	2.532	2.000	1.000	2.078	.079	1.8°	1	JDM□1405
3.000	**AJXU12R0306C**	●	6	2.543	2.000	1.000	2.274	.059	1.2°	1	JDM□1204
4.000	**AJXU14R0405E**	●	5	3.531	2.500	1.500	4.806	.079	1.2°	1	JDM□1405
4.000	**AJXU14R0406E**	●	6	3.531	2.500	1.500	4.981	.079	1.2°	1	JDM□1405
4.000	**AJXU12R0407E**	●	7	3.539	2.500	1.500	5.283	.059	0.8°	1	JDM□1204
4.921	**AJX14RA12505E**	●	5	4.457	2.480	1.500	7.275	.079	0.8°	2	JDM□1405
4.921	**AJX14RA12507E**	●	7	4.457	2.480	1.500	7.275	.079	0.8°	2	JDM□1405
6.299	**AJX14RA16006F**	●	6	5.835	2.480	2.000	11.023	.079	0.5°	2	JDM□1405
6.299	**AJX14RA16008F**	●	8	5.835	2.480	2.000	11.023	.079	0.5°	2	JDM□1405

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).

MOUNTING DIMENSIONS

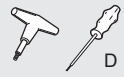
DCX=inch size, DCON=inch size

(inch)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
2.000	**AJXU12R0203**	.750	.748	.415	.600	.633	1.875	.313	.187	1
2.000	**AJXU12R0204**	.750	.748	.415	.600	.633	1.875	.313	.187	1
2.000	**AJXU09R0205**	.750	.748	.415	.600	.634	1.875	.313	.187	1
2.500	**AJXU14R2503C**	1.000	1.024	.539	.787	.628	2.375	.375	.219	1
2.500	**AJXU14R2504C**	1.000	1.024	.539	.787	.628	2.375	.375	.219	1
2.500	**AJXU12R2505C**	1.000	1.024	.539	.787	.633	2.375	.375	.219	1
3.000	**AJXU14R0304C**	1.000	1.024	.539	.787	.628	2.750	.375	.219	1
3.000	**AJXU14R0305C**	1.000	1.024	.539	.787	.628	2.750	.375	.219	1
3.000	**AJXU12R0306C**	1.000	1.024	.539	.787	.630	2.750	.375	.219	1
4.000	**AJXU14R0405E**	1.500	1.181	.787	1.181	.931	3.750	.625	.375	1
4.000	**AJXU14R0406E**	1.500	1.181	.787	1.181	.931	3.750	.625	.375	1
4.000	**AJXU12R0407E**	1.500	1.181	.787	1.181	.936	3.750	.625	.375	1
4.921	**AJX14RA12505E**	1.500	1.575	-	2.205	.872	3.937	.625	.375	2
4.921	**AJX14RA12507E**	1.500	1.575	-	2.205	.872	3.937	.625	.375	2
6.299	**AJX14RA16006F**	2.000	1.693	-	2.835	.754	3.937	.750	.437	2
6.299	**AJX14RA16008F**	2.000	1.693	-	2.835	.754	3.937	.750	.437	2

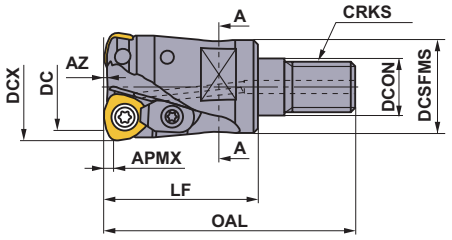
SPARE PARTS

(inch)

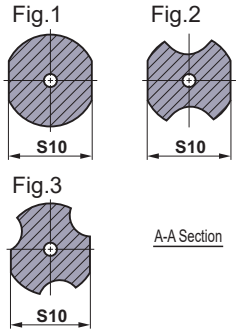
Tool Holder Type	* Clamp Screw	Clamp Bridge	* Clamp Bridge Screw	Spring	 T D Wrench
AJXU09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJXU12R	TS43	AMS4	AJS4012T15	ASS2	TKY15T
AJXU14R	TS54	AMS5	AJS5014T25	ASS3	TKY25T
AJX14R	TS54	AMS5	AJS5014T25	ASS3	TKY25T

* Clamp Torque (lbf-in) : TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Right hand tool holder only.



SCREW-IN TYPE

With Air / coolant through.

(inch)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	OAL	DCON	DCSFMS	S10	CRKS	WT (lbs)	APMX	RMPX	Fig.	Shank Arbor Type	Insert Type
.625	**AJXU06R102AM0830**	●	2	.346	1.181	1.890	.335	.512	.394	M8	.2	.039	3°	1	SCU10M08	JOM□06T2
.750	**AJXU08R122AM1030**	●	2	.417	1.181	1.929	.413	.709	.551	M10	.2	.059	3.5°	2	SCU12M10	JOM□0803
.750	**AJXU06R123AM1030**	●	3	.472	1.181	1.929	.413	.709	.551	M10	.2	.039	1.7°	3	SCU12M10	JOM□06T2
.875	**AJXU08R142AM1030**	●	2	.535	1.181	1.929	.413	.709	.551	M10	.2	.059	3°	2	SCU12M10	JOM□0803
.875	**AJXU06R143AM1030**	●	3	.595	1.181	1.929	.413	.709	.551	M10	.2	.039	0.7°	3	SCU12M10	JOM□06T2
1.000	**AJXU09R162AM1235**	●	2	.602	1.378	2.244	.492	.827	.748	M12	.4	.079	4°	2	SCU16M12	JDM□09T3
1.000	**AJXU08R163AM1235**	●	3	.661	1.378	2.244	.492	.827	.748	M12	.2	.059	2°	1	SCU16M12	JOM□0803
1.125	**AJXU09R182AM1235**	●	2	.728	1.378	2.244	.492	.827	.748	M12	.4	.079	3°	2	SCU16M12	JDM□09T3
1.125	**AJXU08R183AM1235**	●	3	.784	1.378	2.244	.492	.827	.748	M12	.2	.059	0.5°	1	SCU16M12	JOM□0803
1.250	**AJXU09R203AM1645**	●	3	.854	1.772	2.677	.669	1.142	.945	M16	.4	.079	2.5°	1	SCU20M16	JDM□09T3
1.375	**AJXU09R223AM1645**	●	3	.976	1.772	2.677	.669	1.142	.945	M16	.4	.079	2°	1	SCU20M16	JDM□09T3

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).
Note 2) For screw-in type shank arbors, refer to page K382.

SPARE PARTS

(inch)

Tool Holder Type	* Clamp Screw	Clamp Bridge	* Clamp Bridge Screw	Spring	F D Wrench
AJXU06R	TS25	—	—	—	TKY08F
AJXU08R	TS33	—	—	—	TKY08D
AJXU09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D

* Clamp Torque (lbf-in) : TS25=8.9, TS33=8.9, TS351=22, AJS3010T10=22

Fig.1

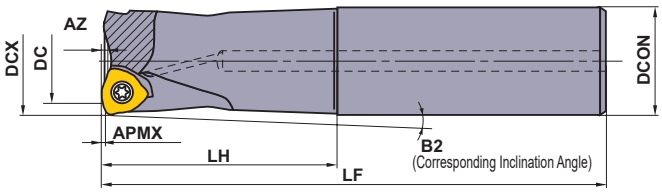


Fig.2

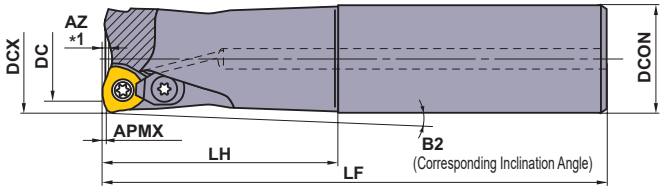
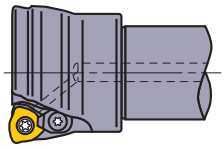


Fig3



Metric Standard

Right hand tool holder only.

■SHANK TYPE

With Air / coolant through.

(mm)

DCX	Order Number	Stock R	Number of Teeth	LF	DC	LH	DCON	B2	APMX	RMPX	Fig.	Insert Type
16	**AJX06R162SA16SS**	★	2	70	8.9	20	16	3.5°	0.6	3°	1	JOM□06T2
16	**AJX06R162SA16S**	★	2	110	8.9	30	16	2.25°	0.6	3°	1	JOM□06T2
16	**AJX06R162SA16L**	★	2	150	8.9	70	16	0.93°	0.6	3°	1	JOM□06T2
16	**AJX06R162SA16EL**	★	2	200	8.9	100	16	0.64°	0.6	3°	1	JOM□06T2
17	**AJX06R172SA16SS**	★	2	70	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
17	**AJX06R172SA16S**	★	2	110	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
17	**AJX06R172SA16L**	★	2	150	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
17	**AJX06R172SA16EL**	★	2	200	9.9	20	16	—	0.6	2.5°	1	JOM□06T2
20	**AJX08R202SA20S**	★	2	130	11.4	50	20	1.34°	0.9	3.5°	1	JOM□0803
20	**AJX06R203SA20S**	★	3	130	12.9	50	20	1.31°	0.6	1.5°	1	JOM□06T2
20	**AJX08R202SA20L**	★	2	180	11.4	100	20	0.65°	0.9	3.5°	1	JOM□0803
20	**AJX06R203SA20L**	★	3	180	12.9	100	20	0.64°	0.6	1.5°	1	JOM□06T2
20	**AJX08R202SA20EL**	★	2	250	11.4	130	20	0.5°	0.9	3.5°	1	JOM□0803
22	**AJX08R222SA20S**	★	2	130	13.4	30	20	—	0.9	3°	1	JOM□0803
22	**AJX06R223SA20S**	★	3	130	14.9	30	20	—	0.6	1°	1	JOM□06T2
22	**AJX08R222SA20L**	★	2	180	13.4	30	20	—	0.9	3°	1	JOM□0803
22	**AJX06R223SA20L**	★	3	180	14.9	30	20	—	0.6	1°	1	JOM□06T2
22	**AJX08R222SA20EL**	★	2	250	13.4	30	20	—	0.9	3°	1	JOM□0803
25	**AJX09R252SA25S**	★	2	140	14.9	60	25	1.1°	1.2	4°	2	JDM□09T3
25	**AJX08R253SA25S**	★	3	140	16.4	60	25	1.1°	0.9	2°	1	JOM□0803
NEW 25	**AJX06R254SA25S**	★	4	140	17.9	60	25	1.11°	0.6	0.8°	1	JOM□06T2
25	**AJX09R252SA25L**	★	2	200	14.9	120	25	0.54°	1.2	4°	2	JDM□09T3
25	**AJX08R253SA25L**	★	3	200	16.4	120	25	0.54°	0.9	2°	1	JOM□0803
NEW 25	**AJX06R254SA25L**	★	4	200	17.9	120	25	0.54°	0.6	0.8°	1	JOM□06T2
25	**AJX09R252SA25EL**	★	2	300	14.9	180	25	0.36°	1.2	4°	2	JDM□09T3
28	**AJX09R282SA25S**	★	2	140	17.9	40	25	—	1.2	3°	2	JDM□09T3
28	**AJX08R283SA25S**	★	3	140	19.4	40	25	—	0.9	1.7°	1	JOM□0803
NEW 28	**AJX06R284SA25S**	★	4	140	20.9	40	25	—	0.6	0.7°	1	JOM□06T2
28	**AJX09R282SA25L**	★	2	200	17.9	40	25	—	1.2	3°	2	JDM□09T3
28	**AJX08R283SA25L**	★	3	200	19.4	40	25	—	0.9	1.7°	1	JOM□0803
NEW 28	**AJX06R284SA25L**	★	4	200	20.9	40	25	—	0.6	0.7°	1	JOM□06T2
28	**AJX09R282SA25EL**	★	2	300	17.9	40	25	—	1.2	3°	2	JDM□09T3
30	**AJX12R302SA32S**	★	2	150	18.3	70	32	1.82°	1.2	4.5°	2	JDM□1204
30	**AJX09R303SA32S**	★	3	150	20.0	70	32	1.79°	1.2	2.7°	2	JDM□09T3
30	**AJX12R302SA32L**	★	2	200	18.3	120	32	1.04°	1.2	4.5°	2	JDM□1204
30	**AJX09R303SA32L**	★	3	200	20.0	120	32	1.03°	1.2	2.7°	2	JDM□09T3
30	**AJX12R302SA32EL**	★	2	300	18.3	180	32	0.69°	1.2	4.5°	2	JDM□1204

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1

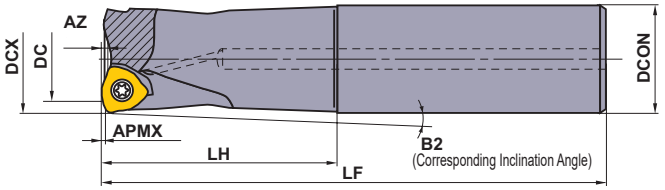


Fig.2

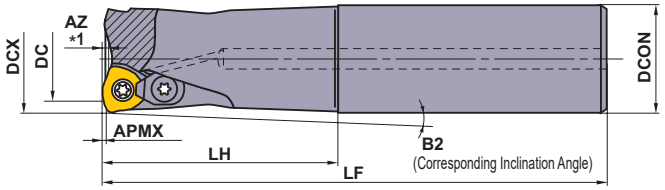
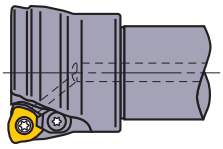


Fig3



Right hand tool holder only.

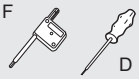
(mm)

	DCX	Order Number	Stock R	Number of Teeth	LF	DC	LH	DCON	B2	APMX	RMPX	Fig.	Insert Type
	32	**AJX12R322SA32S**	★	2	150	20.3	70	32	0.96°	1.2	4°	2	JDM□1204
	32	**AJX09R323SA32S**	★	3	150	21.9	70	32	0.94°	1.2	2.5°	2	JDM□09T3
NEW	32	**AJX08R324SA32S**	★	4	150	23.4	70	32	0.95°	0.9	1.4°	1	JOM□0803
NEW	32	**AJX06R325SA32S**	★	5	150	24.9	70	32	0.94°	0.6	0.5°	1	JOM□06T2
NEW	32	**AJX06R326SA32S**	★	6	150	24.9	70	32	0.94°	0.6	0.5°	1	JOM□06T2
	32	**AJX12R322SA32L**	★	2	200	20.3	120	32	0.55°	1.2	4°	2	JDM□1204
	32	**AJX09R323SA32L**	★	3	200	21.9	120	32	0.54°	1.2	2.5°	2	JDM□09T3
NEW	32	**AJX08R324SA32L**	★	4	200	23.4	120	32	0.55°	0.9	1.4°	1	JOM□0803
NEW	32	**AJX06R325SA32L**	★	5	200	24.9	120	32	0.54°	0.6	0.5°	1	JOM□06T2
	32	**AJX12R322SA32EL**	★	2	300	20.3	180	32	0.36°	1.2	4°	2	JDM□1204
	35	**AJX12R352SA32S**	★	2	150	23.3	50	32	—	1.2	3.5°	2	JDM□1204
	35	**AJX09R353SA32S**	★	3	150	24.9	50	32	—	1.2	2°	2	JDM□09T3
	35	**AJX12R352SA32L**	★	2	200	23.3	50	32	—	1.2	3.5°	2	JDM□1204
	35	**AJX09R353SA32L**	★	3	200	24.9	50	32	—	1.2	2°	2	JDM□09T3
	35	**AJX12R352SA32EL**	★	2	300	23.3	50	32	—	1.2	3.5°	2	JDM□1204
	40	**AJX12R403SA32S**	★	3	150	28.3	50	32	—	1.2	3°	2	JDM□1204
	40	**AJX09R404SA32S**	★	4	150	29.9	50	32	—	1.2	1.5°	2	JDM□09T3
NEW	40	**AJX08R406SA32S**	★	6	150	31.4	50	32	—	0.9	1°	1	JOM□0803
	40	**AJX12R403SA32L**	★	3	250	28.3	50	32	—	1.2	3°	2	JDM□1204
	40	**AJX09R404SA32L**	★	4	250	29.9	50	32	—	1.2	1.5°	2	JDM□09T3
NEW	40	**AJX08R406SA32L**	★	6	250	31.4	50	32	—	0.9	1°	1	JOM□0803
	40	**AJX12R402SA32EL**	★	2	350	28.3	50	32	—	1.2	3°	2	JDM□1204
	40	**AJX12R403SA42S**	★	3	150	28.3	70	42	1.79°	1.2	3°	2	JDM□1204
	40	**AJX09R404SA42S**	★	4	150	29.9	70	42	1.8°	1.2	1.5°	2	JDM□09T3
	40	**AJX12R403SA42L**	★	3	250	28.3	70	42	1.79°	1.2	3°	2	JDM□1204
	40	**AJX09R404SA42L**	★	4	250	29.9	70	42	1.8°	1.2	1.5°	2	JDM□09T3
	40	**AJX12R402SA42EL**	★	2	350	28.3	70	42	1.79°	1.2	3°	2	JDM□1204
	50	**AJX14R503SA42S**	★	3	150	38.2	50	42	—	1.2	4.2°	2	JDM□1405
	50	**AJX14R503SA42L**	★	3	250	38.1	50	42	—	1.2	4.2°	2	JDM□1405
	63	**AJX14R634SA42S**	★	4	150	51.1	50	42	—	1.2	2.8°	3	JDM□1405
	63	**AJX14R634SA42L**	★	4	250	51.1	50	42	—	1.2	2.8°	3	JDM□1405

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).

SPARE PARTS

(mm)

Tool Holder Type	*		*		 F D
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX06R	TS25	–	–	–	TKY08F
AJX08R	TS33	–	–	–	TKY08D
AJX09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12R30	TS407	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R32	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R35	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX12R40	TS43	AMS4	AJS4012T15	ASS2	TKY15D
AJX14R	TS54	AMS5	AJS5014T25	ASS3	TKY25D

* Clamp Torque (lbf-in) : TS25=13, TS33=8.9, TS351=22, TS407=31, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

Fig.1

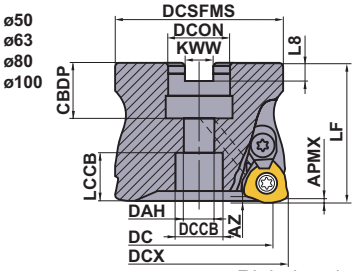
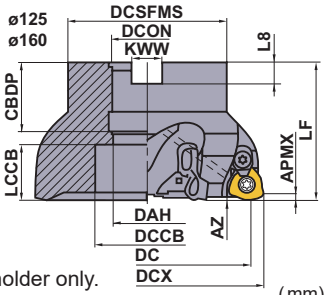


Fig.2



Right hand tool holder only.

(mm)

DCX		Set Bolt	Geometry	
DCON (inch)	DCON (mm)			
ϕ50, ϕ63	ϕ50, ϕ63	HSC10030H	①	① ②
	ϕ80	HSC12035H		
ϕ80, ϕ100	ϕ100	HSC16040H		
ϕ125	ϕ125, ϕ160	MBA20040H	②	With Air / coolant through.
ϕ160		MBA24045H		

Metric Standard

■ARBOR TYPE

With Air / coolant through.

DCX=mm size, DCON=inch size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
50	**AJX12R05003B**	★	3	38.3	50	22.225	0.4	1.2	2°	1	JDM□1204
50	**AJX12R05004B**	★	4	38.3	50	22.225	0.4	1.2	2°	1	JDM□1204
50	**AJX09R05005B**	★	5	40.0	50	22.225	0.5	1.2	1.1°	1	JDM□09T3
63	**AJX14R06303B**	★	3	51.1	50	22.225	0.7	1.2	2.8°	1	JDM□1405
63	**AJX14R06304B**	★	4	51.1	50	22.225	0.7	1.2	2.8°	1	JDM□1405
63	**AJX12R06305B**	★	5	51.3	50	22.225	0.9	1.2	1.5°	1	JDM□1204
80	**AJX14R08004D**	★	4	68.1	63	31.75	1.3	1.2	1.8°	1	JDM□1405
80	**AJX14R08005D**	★	5	68.1	63	31.75	1.3	1.2	1.8°	1	JDM□1405
80	**AJX12R08006D**	★	6	68.3	63	31.75	1.7	1.2	1.1°	1	JDM□1204
100	**AJX14R10005D**	★	5	88.1	63	31.75	2.4	1.2	1.2°	1	JDM□1405
100	**AJX14R10006D**	★	6	88.1	63	31.75	2.4	1.2	1.2°	1	JDM□1405
100	**AJX12R10007D**	★	7	88.3	63	31.75	2.9	1.2	0.8°	1	JDM□1204
125	**AJX14R12505E**	★	5	113.2	63	38.1	3.3	1.2	0.8°	2	JDM□1405
125	**AJX14R12507E**	★	7	113.2	63	38.1	3.3	1.2	0.8°	2	JDM□1405
160	**AJX14R16006F**	★	6	148.2	63	50.8	5.0	1.2	0.5°	2	JDM□1405
160	**AJX14R16008F**	★	8	148.2	63	50.8	5.0	1.2	0.5°	2	JDM□1405

DCX=mm size, DCON=mm size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
50	**AJX12-050A03R**	★	3	38.3	50	22	0.4	1.2	2°	1	JDM□1204
50	**AJX12-050A04R**	★	4	38.3	50	22	0.4	1.2	2°	1	JDM□1204
50	**AJX09-050A05R**	★	5	40.0	50	22	0.5	1.2	1.1°	1	JDM□09T3
63	**AJX14-063A03R**	★	3	51.1	50	22	0.7	1.2	2.8°	1	JDM□1405
63	**AJX14-063A04R**	★	4	51.1	50	22	0.7	1.2	2.8°	1	JDM□1405
63	**AJX12-063A05R**	★	5	51.3	50	22	0.9	1.2	1.5°	1	JDM□1204
NEW 63	**AJX14-063X03R**	★	3	51.1	50	27	0.6	1.2	2.8	1	JDM□1405
NEW 63	**AJX14-063X04R**	★	4	51.1	50	27	0.6	1.2	2.8	1	JDM□1405
NEW 63	**AJX12-063X05R**	★	5	51.3	50	27	0.6	1.2	1.5	1	JDM□1204
NEW 66	**AJX14-066X03R**	★	3	54.1	50	27	0.6	1.2	2.6	1	JDM□1405
NEW 66	**AJX14-066X04R**	★	4	54.1	50	27	0.6	1.2	2.6	1	JDM□1405
NEW 66	**AJX12-066X05R**	★	5	54.3	50	27	0.7	1.2	1.4	1	JDM□1204
80	**AJX14-080A04R**	★	4	68.1	50	27	1.2	1.2	1.8°	1	JDM□1405
80	**AJX14-080A05R**	★	5	68.1	50	27	1.2	1.2	1.8°	1	JDM□1405
80	**AJX12-080A06R**	★	6	68.3	50	27	1.2	1.2	1.1°	1	JDM□1204
100	**AJX14-100A05R**	★	5	88.1	63	32	2.4	1.2	1.2°	1	JDM□1405
100	**AJX14-100A06R**	★	6	88.1	63	32	2.4	1.2	1.2°	1	JDM□1405
100	**AJX12-100A07R**	★	7	88.3	63	32	2.6	1.2	0.8°	1	JDM□1204

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
125	**AJX14-125B05R**	★	5	113.2	63	40	3.3	1.2	0.8°	2	JDM□1405
125	**AJX14-125B07R**	★	7	113.2	63	40	3.3	1.2	0.8°	2	JDM□1405
160	**AJX14-160B06R**	★	6	148.2	63	40	5.0	1.2	0.5°	2	JDM□1405
160	**AJX14-160B08R**	★	8	148.2	63	40	5.0	1.2	0.5°	2	JDM□1405

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).

Fig.3

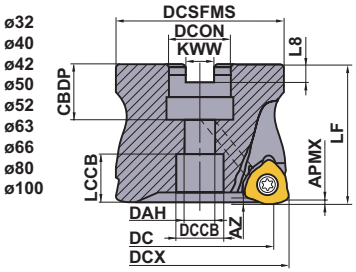
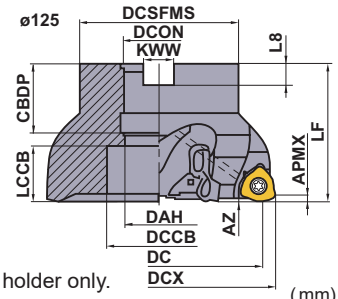
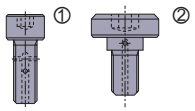


Fig.4



Right hand tool holder only.

(mm)

DCX	Set Bolt	Geometry	
ϕ32, ϕ40, ϕ42	HSC08025H	①	
ϕ50, ϕ52, ϕ63 ϕ66 (DCON=22)	HSC10030H		
ϕ63 ϕ66 (DCON=27), ϕ80	HSC12035H		
ϕ100	HSC16040H		
ϕ125	MBA20040H	②	With Air / coolant through.

■ARBOR TYPE SUPER EXTRA FINE PITCH

With Air / coolant through.
DCX=mm size, DCON=mm size

(mm)

	DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
NEW	32	**AJX06-032A05R**	★	5	24.9	40	16	0.1	0.6	0.5°	3	JOM□06T2
NEW	32	**AJX06-032A06R**	★	6	24.9	40	16	0.1	0.6	0.5°	3	JOM□06T2
NEW	40	**AJX08-040A06R**	★	6	31.4	40	16	0.2	0.9	1°	3	JOM□0803
NEW	42	**AJX08-042A06R**	★	6	33.4	40	16	0.2	0.9	0.9°	3	JOM□0803
NEW	50	**AJX09-050A06R**	★	6	39.3	50	22	0.4	1.2	1.1°	3	JDM□09T3
NEW	50	**AJX08-050A07R**	★	7	41.4	50	22	0.4	0.9	0.7°	3	JOM□0803
NEW	52	**AJX09-052A06R**	★	6	41.9	50	22	0.4	1.2	1°	3	JDM□09T3
NEW	52	**AJX08-052A07R**	★	7	43.4	50	22	0.5	0.9	0.7°	3	JOM□0803
NEW	63	**AJX12-063A06R**	★	6	51.3	50	22	0.7	1.2	1.5°	3	JDM□1204
NEW	63	**AJX09-063A07R**	★	7	52.9	50	22	0.7	1.2	0.8°	3	JDM□09T3
NEW	63	**AJX12-063X06R**	★	6	51.3	50	27	0.6	1.2	1.5°	3	JDM□1204
NEW	63	**AJX09-063X07R**	★	7	52.9	50	27	0.7	1.2	0.8°	3	JDM□09T3
NEW	66	**AJX12-066A06R**	★	6	54.3	50	22	0.7	1.2	1.4°	3	JDM□1204
NEW	66	**AJX09-066A07R**	★	7	55.9	50	22	0.8	1.2	0.8°	3	JDM□09T3
NEW	66	**AJX12-066X06R**	★	6	54.3	50	27	0.7	1.2	1.4°	3	JDM□1204
NEW	66	**AJX09-066X07R**	★	7	55.9	50	27	0.8	1.2	0.8°	3	JDM□09T3
NEW	80	**AJX12-080A08R**	★	8	68.3	50	27	1.1	1.2	1.1°	3	JDM□1204
NEW	100	**AJX12-100A09R**	★	9	88.3	63	32	2.5	1.2	0.8°	3	JDM□1204
NEW	125	**AJX14-125B09R**	★	9	113.2	63	40	3.0	1.2	0.8°	4	JDM□1405

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and maximum drilling depth (**AZ**).

ISO13399	➤ K003
MOUNTING DIMENSIONS	➤ K299
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

MOUNTING DIMENSIONS

Fig.1

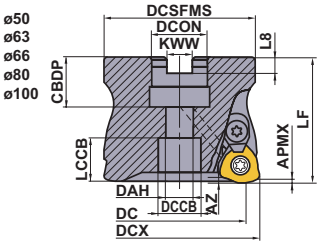


Fig.2

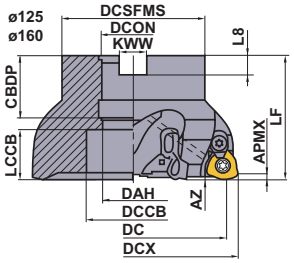


Fig.3

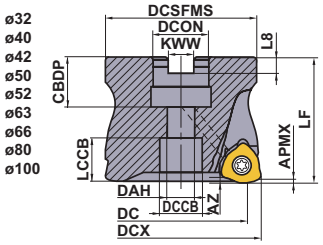
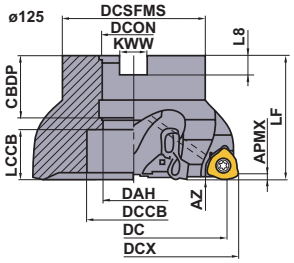


Fig.4



DCX=mm size, DCON=inch size (mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
50	**AJX12R050**	22.225	19	11	17	18.3	47	8.4	5	1
50	**AJX09R050**	22.225	19	11	17	18.3	47	8.4	5	1
63	**AJX14R063**	22.225	19	11	17	18.2	60	8.4	5	1
63	**AJX12R063**	22.225	19	11	17	18.3	60	8.4	5	1
80	**AJX14R080**	31.75	32	17	26	20.2	76	12.7	8	1
80	**AJX12R080**	31.75	32	17	26	20.3	76	12.7	8	1
100	**AJX14R100**	31.75	32	17	26	20.2	96	12.7	8	1
100	**AJX12R100**	31.75	32	17	26	20.3	96	12.7	8	1
125	**AJX14R125**	38.1	40	–	56	22.1	100	15.9	10	2
160	**AJX14R160**	50.8	43	–	72	19.1	100	19.1	11	2

DCX=mm size, DCON=mm size (mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
32	**AJX06-032A**	16	18	9	14	14.5	30	8.4	5.6	3
40	**AJX08-040A**	16	18	9	14	14.3	37	8.4	5.6	3
42	**AJX08-042A**	16	18	9	14	14.3	37	8.4	5.6	3
50	**AJX12-050A**	22	20	11	17	17.3	47	10.4	6.3	1
50	**AJX09-050A**	22	20	11	17	17.3	47	10.4	6.3	1, 3
52	**AJX09-052A**	22	20	11	17	17.3	47	10.4	6.3	3
52	**AJX08-052A**	22	20	11	17	17.4	47	10.4	6.3	3
63	**AJX14-063A**	22	20	11	17	17.2	60	10.4	6.3	1
63	**AJX12-063A**	22	20	11	17	17.3	60	10.4	6.3	1, 3
63	**AJX09-063A**	22	20	11	17	17.3	60	10.4	6.3	3
63	**AJX12-063X**	27	23	13	20	16.3	60	12.4	7.0	3
63	**AJX09-063X**	27	23	13	20	16.3	60	12.4	7.0	3
66	**AJX12-066A**	22	20	11	17	17.3	60	10.4	6.3	3
66	**AJX09-066A**	22	20	11	17	17.3	60	10.4	6.3	3
66	**AJX14-066X**	27	23	13	20	16.2	60	12.4	7.0	1
66	**AJX12-066X**	27	23	13	20	16.3	60	12.4	7.0	1, 3
66	**AJX09-066X**	27	23	13	20	16.3	60	12.4	7.0	3
80	**AJX14-080A**	27	23	13	19	16.2	76	12.4	7.0	1
80	**AJX12-080A**	27	23	13	19	16.3	76	12.4	7.0	1, 3
100	**AJX14-100A**	32	26	17	26	26.2	96	14.4	8.0	1
100	**AJX12-100A**	32	26	17	26	26.3	96	14.4	8.0	1, 3
125	**AJX14-125B**	40	40	–	56	22.1	100	16.4	9.0	2, 4
160	**AJX14-160B**	40	40	–	56	22.1	100	16.4	9.0	2

SPARE PARTS

(mm)

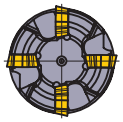
Tool Holder Type	Clamp Screw *	Clamp Bridge	Clamp Bridge Screw *	Spring	Wrench (F, D, T)
AJX06 Super Extra Fine Pitch	TS25	–	–	–	TKY08F
AJX08 Super Extra Fine Pitch	TS33	–	–	–	TKY08D
AJX09	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX09 Super Extra Fine Pitch	TS351	-	–	–	TKY10D
AJX12	TS43	AMS4	AJS4012T15	ASS2	TKY15T
AJX12 Super Extra Fine Pitch	TS43	–	–	–	TKY15T
AJX14	TS54	AMS5	AJS5014T25	ASS3	TKY25T
AJX14 Super Extra Fine Pitch	TS54	–	–	–	TKY25T

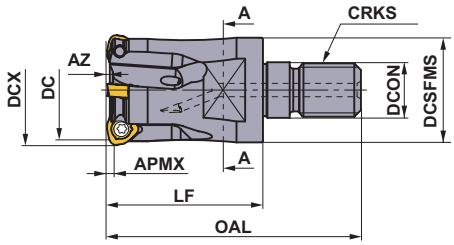
* Clamp Torque (N • m) : TS25=1.0, TS33=1.5, TS351=2.5, TS43=3.5, TS54=7.5, AJS3010T10=2.5, AJS4012T15=3.5, AJS5014T25=7.5

 ★ : Stocked in Japan

Metric Standard

Fig.1





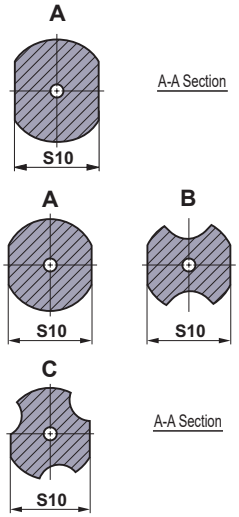
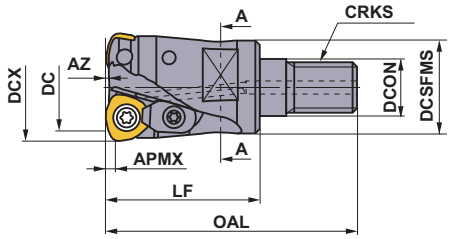


Fig.2



Right hand tool holder only.

■SCREW-IN TYPE

With Air / coolant through.

(mm)

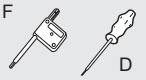
DCX	Order Number	Stock R	Number of Teeth	DC	LF	OAL	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
16	**AJX06R162AM0830**	★	2	8.9	30	48	8.5	0.1	0.6	3°	1	JOM□06T2
17	**AJX06R172AM0830**	★	2	9.9	30	48	8.5	0.1	0.6	2.5°	1	JOM□06T2
20	**AJX08R202AM1030**	★	2	11.4	30	49	10.5	0.1	0.9	3.5°	1	JOM□0803
20	**AJX06R203AM1030**	★	3	12.9	30	49	10.5	0.1	0.6	1.5°	1	JOM□06T2
22	**AJX08R222AM1030**	★	2	13.4	30	49	10.5	0.1	0.9	3°	1	JOM□0803
22	**AJX06R223AM1030**	★	3	14.9	30	49	10.5	0.1	0.6	1°	1	JOM□06T2
25	**AJX09R252AM1235**	★	2	14.9	35	57	12.5	0.2	1.2	4°	2	JDM□09T3
25	**AJX08R253AM1235**	★	3	16.4	35	57	12.5	0.1	0.9	2°	1	JOM□0803
NEW 25	**AJX06R254AM1235**	★	4	17.9	35	57	12.5	0.1	0.6	0.8°	1	JOM□06T2
28	**AJX09R282AM1235**	★	2	17.9	35	57	12.5	0.2	1.2	3°	2	JDM□09T3
28	**AJX08R283AM1235**	★	3	19.4	35	57	12.5	0.1	0.9	1.7°	1	JOM□0803
NEW 28	**AJX06R284AM1235**	★	4	20.9	35	57	12.5	0.1	0.6	0.7°	1	JOM□06T2
30	**AJX12R302AM1645**	★	2	18.3	45	68	17.0	0.3	1.2	4.5°	2	JDM□1204
30	**AJX09R303AM1645**	★	3	20	45	68	17.0	0.2	1.2	2.7°	2	JDM□09T3
32	**AJX12R322AM1645**	★	2	20.3	45	68	17.0	0.3	1.2	4°	2	JDM□1204
32	**AJX09R323AM1645**	★	3	21.9	45	68	17.0	0.2	1.2	2.5°	2	JDM□09T3
NEW 32	**AJX08R324AM1645**	★	4	23.4	45	68	17.0	0.2	0.9	1.4°	1	JOM□0803
35	**AJX12R352AM1645**	★	2	23.3	45	68	17.0	0.3	1.2	3.5°	2	JDM□1204
35	**AJX09R353AM1645**	★	3	24.9	45	68	17.0	0.2	1.2	2°	2	JDM□09T3
NEW 35	**AJX08R354AM1645**	★	4	26.4	45	68	17.0	0.2	0.9	1.2°	1	JOM□0803
40	**AJX12R403AM1645**	★	3	28.3	45	68	17.0	0.3	1.2	3°	2	JDM□1204
40	**AJX09R404AM1645**	★	4	29.9	45	68	17.0	0.2	1.2	1.5°	2	JDM□09T3
NEW 40	**AJX08R406AM1645**	★	6	31.4	45	68	17.0	0.3	0.9	1°	1	JOM□0803

Note 1) Refer to page K306, for the max. depth of cut (**APMX**) and max. drilling depth (**AZ**).
Note 2) For screw-in type shank arbors, refer to page K382.

ISO13399	➤ K003
MOUNTING DIMENSIONS	➤ K299
SCREW-IN HOLDERS	➤ K382
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

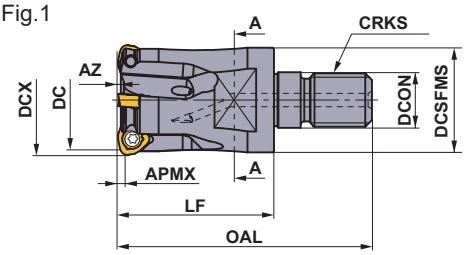
SPARE PARTS

(inch)

Tool Holder Type	*		*		 F D
	Clamp Screw	Clamp Bridge	Clamp Bridge Screw	Spring	Wrench
AJX06R	TS25	–	–	–	TKY08F
AJX08R	TS33	–	–	–	TKY08D
AJX09R	TS351	AMS3	AJS3010T10	ASS2	TKY10D
AJX12	TS43	AMS4	AJS4012T15	ASS2	TKY15T
AJX14	TS54	AMS5	AJS5014T25	ASS3	TKY25T

* Clamp Torque (lbf-in) : TS25=8.9, TS33=13, TS351=22, TS43=31, TS54=66, AJS3010T10=22, AJS4012T15=31, AJS5014T25=66

Fig.1



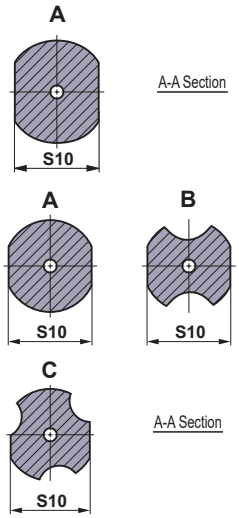
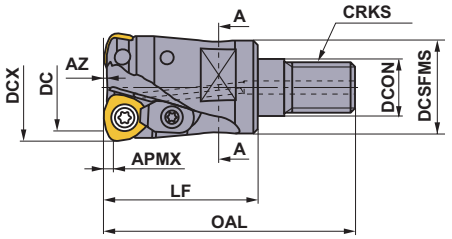


Fig.2



Right hand tool holder only.

MOUNTING DIMENSIONS

(mm)

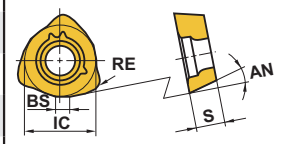
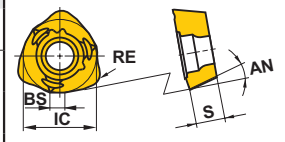
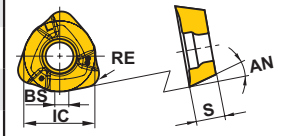
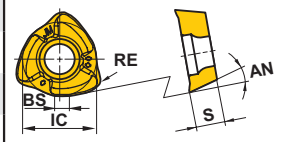
	DCX	Order Number	DCON	DCSFMS	S10	CRKS	Connection Type	Shank Arbor Type
	16	**AJX06R162AM0830**	8.5	13	10	M8	A	SC16M08
	17	**AJX06R172AM0830**	8.5	13	10	M8	A	SC16M08
	20	**AJX08R202AM1030**	10.5	18	14	M10	B	SC20M10
	20	**AJX06R203AM1030**	10.5	18	14	M10	C	SC20M10
	22	**AJX08R222AM1030**	10.5	18	14	M10	B	SC20M10
	22	**AJX06R223AM1030**	10.5	18	14	M10	C	SC20M10
	25	**AJX09R252AM1235**	12.5	21	19	M12	B	SC25M12
	25	**AJX08R253AM1235**	12.5	21	19	M12	A	SC25M12
NEW	25	**AJX06R254AM1235**	12.5	23.5	19	M12	A	SC25M12
	28	**AJX09R282AM1235**	12.5	21	19	M12	B	SC25M12
	28	**AJX08R283AM1235**	12.5	21	19	M12	A	SC25M12
NEW	28	**AJX06R284AM1235**	12.5	23.5	19	M12	A	SC25M12
	30	**AJX12R302AM1645**	17.0	29	24	M16	B	SC32M16
	30	**AJX09R303AM1645**	17.0	29	24	M16	A	SC32M16
	32	**AJX12R322AM1645**	17.0	29	24	M16	B	SC32M16
	32	**AJX09R323AM1645**	17.0	29	24	M16	A	SC32M16
NEW	32	**AJX08R324AM1645**	17.0	29	24	M16	A	SC32M16
	35	**AJX12R352AM1645**	17.0	29	24	M16	B	SC32M16
	35	**AJX09R353AM1645**	17.0	29	24	M16	A	SC32M16
NEW	35	**AJX08R354AM1645**	17.0	29	24	M16	A	SC32M16
	40	**AJX12R403AM1645**	17.0	29	24	M16	B	SC32M16
	40	**AJX09R404AM1645**	17.0	29	24	M16	A	SC32M16
NEW	40	**AJX08R406AM1645**	17.0	29	24	M16	A	SC32M16

■INSERTS

(inch)

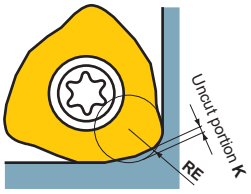
Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Class	Coated										AN	IC	S	BS	RE	Geometry
			FH7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	MP9140	VP15TF	VP30RT						
General Use Type	JOMW06T215ZZSR-FT	M	●	●	●	●	●	●	●		●	●	13°	.250	.109	.047	.059	
	JOMW080320ZZSR-FT	M	●	●	●	●	●	●	●		●	●	13°	.315	.125	.055	.079	
	JDMW09T320ZDSR-FT	M	●	●	●	●	●	●	●		●	●	15°	.375	.156	.071	.079	
	JDMW120420ZDSR-FT	M	●	●	●	●	●	●	●		●	●	15°	.472	.187	.098	.079	
	JDMW140520ZDSR-FT	M	●	●	●	●	●	●	●		●	●	15°	.551	.219	.110	.079	
Strong Cutting Edge Type	JDMT120420ZDSR-ST	M	●	●	●	●	●				●	●	15°	.472	.187	.098	.079	
	JDMT140520ZDSR-ST	M	●	●	●	●	●				●	●	15°	.551	.219	.110	.079	
Sharp Cutting Edge Type (For Difficult-to-cut Materials)	JOMT06T216ZZER-JL	M				●	●	●	●	●			13°	.250	.109	.047	.063	
	JOMT080322ZZER-JL	M				●	●	●	●	●			13°	.315	.125	.055	.087	
	JDMT09T323ZDER-JL	M				●	●	●	●	●			15°	.375	.156	.071	.091	
	JDMT120423ZDER-JL	M				●	●	●	●	●			15°	.472	.187	.098	.091	
	JDMT140523ZDER-JL	M				●	●	●	●	●			15°	.551	.219	.110	.091	
Sharp Cutting Edge Type (For General Use)	JOMT06T215ZZSR-JM	M	●	●	●	●	●	●	●		●	●	13°	.250	.109	.047	.059	
	JOMT080320ZZSR-JM	M	●	●	●	●	●	●	●		●	●	13°	.315	.125	.055	.079	
	JDMT09T320ZDSR-JM	M	●	●	●	●	●	●	●		●	●	15°	.375	.156	.071	.079	
	JDMT120420ZDSR-JM	M	●	●	●	●	●	●	●		●	●	15°	.472	.187	.098	.079	
	JDMT140520ZDSR-JM	M	●	●	●	●	●	●	●		●	●	15°	.551	.219	.110	.079	

Note 1) When using ST breaker, please check the height setting as it differs from other chip breakers.

■NOTE FOR PROGRAMMING



When using the AJX, please program the approximate radius as indicated.
The approximate uncut portions for the program are as in the right table.

(inch)

Insert Size	Breaker	Approx. RE	Uncut Portion K
JOM○06T2○○ZZ○R-○○	FT / JM	.079	.013
	JL	.098	.013
JOM○0803○○ZZ○R-○○	FT / JM	.098	.018
	JL	.079	.016
JOM○09T3○○ZD○R-○○	FT / JM	.118	.019
	JL	.118	.018
JOM○1204○○ZD○R-○○	FT / JM / ST	.118	.025
	JL	.118	.021
JOM○1405○○ZD○R-○○	FT / JM / ST	.118	.025
	JL	.118	.022

Note) The uncut portion may change slightly depending on cutting conditions.

● : USA Stock
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

■ Cutting Speed

Workpiece Material		Properties	Cutting speed **vc** (SFM)			
P			**FH7020**	**MP6120**	**MP6130**	**VP30RT**
	Mild Steel	Hardness ≤180HB	850 (700—1000)	750 (580—910)	685 (515—845)	620 (450—880)
	Carbon Steel Alloy Steel	Hardness 180—280HB	550 (400—700)	480 (320—630)	415 (255—565)	350 (190—500)
	Carbon Steel Alloy Steel	Hardness 280—350HB	450 (300—600)	350 (190—500)	285 (125—435)	220 (60—370)
	Alloy Tool Steel	Hardness ≤350HB (Annealing)	450 (300—600)	350 (190—500)	285 (125—435)	220 (60—370)
	Pre-hardened Steel	Hardness 35—45HRC	—	330 (230—425)	265 (165—360)	200 (100—295)
M			**MP7130**	**MP7140**		
	Stainless Steel	Hardness ≤270HB	450 (300—600)	385 (235—535)	—	—
K			**FH7020**	**VP15TF**		
	Gray Cast Iron	Tensile Strength ≤350MPa	850 (700—1000)	—	—	—
	Ductile Cast Iron	Tensile Strength ≤800MPa	—	500 (400—700)	—	—
S			**MP9120**	**MP9130**	**MP9140**	
	Heat Resistant Alloys	Hardness ≤350HB	100 (65—130)	80 (65—115)	65 (50—100)	—
	Titanium Alloys	—	165 (130—195)	150 (100—180)	130 (100—165)	—
H			**VP15TF**			
	Hardened Steel	Hardness 40—55HRC	230 (165—295)	—	—	—

RECOMMENDED CUTTING CONDITIONS

■ Depth of Cut / Feed per Tooth

	Workpiece Material	Properties	DCX = ϕ.625", ϕ.688" (ϕ16 mm, ϕ17 mm) (Shank type)			DCX = ϕ.750", ϕ.875" (ϕ20 mm, ϕ22 mm) (Shank type)			DCX = ϕ.750" (ϕ20 mm) (Shank type)		
			AJXU06 Type			AJXU08 Type			AJXU06 Type		
			2 (Number of Teeth)			2 (Number of Teeth)			3 (Number of Teeth)		
			Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)
P	Mild Steel	Hardness ≤180HB	5.5	.031	.031	6.3	.039	.039	6.3	.035	.035
			7.0	.024	.024	8.3	.031	.031	8.3	.028	.028
			8.2	.016	.016	9.4	.024	.024	9.4	.020	.020
	Carbon Steel Alloy Steel	Hardness 180—280HB	5.5	.031	.031	6.3	.039	.039	6.3	.035	.035
			7.0	.024	.024	8.3	.031	.031	8.3	.028	.028
			8.2	.016	.016	9.4	.024	.024	9.4	.020	.020
	Carbon Steel Alloy Steel	Hardness 280—350HB	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
			7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
	Alloy Tool Steel	Hardness ≤350HB (Annealing)	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
			7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
	Pre-hardened Steel	Hardness 35—45HRC	5.5	.028	.028	6.3	.031	.031	6.3	.028	.028
			7.0	.020	.020	8.3	.024	.024	8.3	.020	.020
			8.2	.012	.012	9.4	.016	.016	9.4	.016	.012
M	Stainless Steel	Hardness ≤270HB	5.5	.031	.028	6.3	.039	.031	6.3	.035	.028
			7.0	.024	.020	8.3	.031	.024	8.3	.028	.020
			8.2	.016	.012	9.4	.024	.016	9.4	.020	.012
K	Gray Cast Iron	Tensile Strength ≤350MPa	5.5	.031	.039	6.3	.039	.047	6.3	.035	.039
			7.0	.024	.031	8.3	.031	.039	8.3	.028	.031
			8.2	.016	.024	9.4	.024	.031	9.4	.020	.024
	Ductile Cast Iron	Tensile Strength ≤800MPa	5.5	.028	.031	6.3	.031	.039	6.3	.028	.035
			7.0	.020	.024	8.3	.024	.031	8.3	.020	.028
			8.2	.012	.016	9.4	.016	.024	9.4	.016	.020
S	Heat Resistant Alloys	Hardness ≤350HB	5.5	.024	.024	6.3	.031	.024	5.5	.024	.024
			7.0	.016	.016	8.2	.024	.016	7.0	.016	.016
	Titanium Alloys	—	8.2	.012	.012	9.4	.016	.012	8.2	.012	.012
H	Hardened Steel	Hardness 40—55HRC	5.5	.020	.020	6.3	.020	.024	6.3	.020	.020
			7.0	.016	.012	8.3	.016	.016	8.3	.016	.016
			8.2	.012	.008	9.4	.012	.008	9.4	.012	.008

* Depth of cut of JL breaker is up to .024 inch. (06 size)
* Depth of cut of JL breaker is up to .035 inch. (08 size)

(inch)

	DCX = ϕ1.000", ϕ1.125" (ϕ25 mm, ϕ28 mm) (Shank type)			DCX = ϕ1.000" (ϕ25 mm) (Shank type)			DCX = ϕ1.250" (ϕ32 mm) (Shank type)			DCX = ϕ1.250" (ϕ32 mm) (Shank type)			DCX = ϕ1.500" (ϕ40 mm) (ϕ1.250"shank)			DCX = ϕ1.500" (ϕ40 mm) (ϕ1.250"shank)		
	AJXU09 Type			AJXU08 Type			AJXU12 Type			AJXU09 Type			AJXU12 Type			AJXU09 Type		
	2 (Number of Teeth)			3 (Number of Teeth)			2 (Number of Teeth)			3 (Number of Teeth)			3 (Number of Teeth)			4 (Number of Teeth)		
	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)
	6.7	.039	.047	6.7	.035	.039	7.0	.047	.055	7.0	.043	.047	7.0	.047	.055	7.0	.043	.047
	9.0	.031	.039	9.0	.028	.031	9.0	.039	.047	9.0	.035	.039	9.5	.039	.047	9.5	.035	.039
	11.5	.024	.031	11.5	.020	.024	11.0	.031	.039	11.5	.028	.031	12.0	.031	.039	12.0	.028	.031
	6.7	.039	.047	6.7	.035	.039	7.0	.047	.055	7.0	.043	.047	7.0	.047	.055	7.0	.043	.047
	9.0	.031	.039	9.0	.028	.031	9.0	.039	.047	9.0	.035	.039	9.5	.039	.047	9.5	.035	.039
	11.5	.024	.031	11.5	.020	.024	11.0	.031	.039	11.5	.028	.031	12.0	.031	.039	12.0	.028	.031
	6.7	.031	.047	6.7	.028	.039	7.0	.039	.055	7.0	.035	.047	7.0	.039	.055	7.0	.035	.047
	9.0	.024	.039	9.0	.020	.031	9.0	.031	.047	9.0	.028	.039	9.5	.031	.047	9.5	.028	.039
	11.5	.016	.031	11.5	.016	.024	11.0	.024	.039	11.5	.020	.031	12.0	.024	.039	12.0	.020	.031
	6.7	.031	.047	6.7	.028	.039	7.0	.039	.055	7.0	.035	.047	7.0	.039	.055	7.0	.035	.047
	9.0	.024	.039	9.0	.020	.031	9.0	.031	.047	9.0	.028	.039	9.5	.031	.047	9.5	.028	.039
	11.5	.016	.031	11.5	.016	.024	11.0	.024	.039	11.5	.020	.031	12.0	.024	.039	12.0	.020	.031
	6.7	.031	.039	6.7	.028	.035	7.0	.039	.047	7.0	.035	.039	7.0	.039	.047	7.0	.035	.039
	9.0	.024	.031	9.0	.020	.028	9.0	.031	.039	9.0	.028	.031	9.5	.031	.039	9.5	.028	.031
	11.5	.016	.024	11.5	.016	.020	11.0	.024	.031	11.5	.020	.024	12.0	.024	.031	12.0	.020	.024
	6.7	.039	.039	6.7	.035	.035	7.0	.047	.047	7.0	.043	.039	7.0	.047	.047	7.0	.043	.039
	9.0	.031	.031	9.0	.028	.028	9.0	.039	.039	9.0	.035	.031	9.5	.039	.039	9.5	.035	.031
	11.5	.024	.024	11.5	.020	.020	11.0	.031	.031	11.5	.028	.024	12.0	.031	.031	12.0	.028	.024
	6.7	.039	.055	6.7	.035	.047	7.0	.047	.063	7.0	.043	.055	7.0	.047	.063	7.0	.043	.055
	9.0	.031	.047	9.0	.028	.039	9.0	.039	.055	9.0	.035	.047	9.5	.039	.055	9.5	.035	.047
	11.5	.024	.039	11.5	.020	.031	11.0	.031	.047	11.5	.028	.035	12.0	.031	.047	12.0	.028	.035
	6.7	.031	.047	6.7	.028	.039	7.0	.039	.055	7.0	.035	.047	7.0	.039	.055	7.0	.035	.047
	9.0	.024	.039	9.0	.020	.031	9.0	.031	.047	9.0	.028	.039	9.5	.031	.047	9.5	.028	.039
	11.5	.016	.031	11.5	.016	.024	11.0	.024	.039	11.5	.020	.031	12.0	.024	.039	12.0	.020	.031
	6.7	.047	.024	6.3	.031	.024	7.0	.047	.024	7.0	.047	.024	7.0	.047	.024	7.0	.047	.024
	9.0	.039	.016	8.2	.024	.016	9.0	.039	.016	9.0	.039	.016	9.5	.039	.016	9.5	.039	.016
	11.5	.031	.012	9.4	.016	.012	11.0	.031	.012	11.5	.031	.012	12.0	.031	.012	12.0	.031	.012
	6.7	.020	.031	6.7	.020	.028	7.0	.024	.039	7.0	.020	.035	7.0	.024	.039	7.0	.020	.035
	9.0	.016	.024	9.0	.016	.020	9.0	.020	.031	9.0	.016	.028	9.5	.020	.031	9.5	.016	.028
	11.5	.012	.016	11.5	.012	.012	11.0	.016	.024	11.5	.012	.020	12.0	.016	.024	12.0	.012	.020

* Depth of cut of JL breaker is up to .047 inch. (09, 12 sizes)

RECOMMENDED CUTTING CONDITIONS

■ Depth of Cut / Feed per Tooth

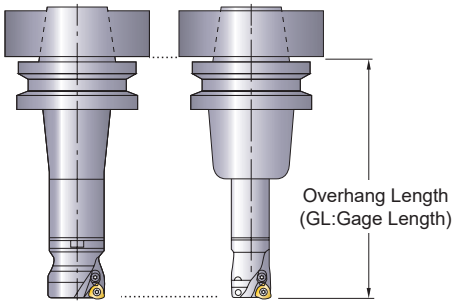
	Workpiece Material	Properties	DCX = ϕ1.500" (ϕ40 mm) (ϕ1.500"shank)			DCX = ϕ2.000" (ϕ50 mm) (Shank type)			DCX = ϕ2.000", ϕ2.500" (ϕ50 mm, ϕ63 mm) (Arbor type)		
			AJXU12 Type			AJXU14 Type			AJXU12 Type (ϕ2.000") AJXU14 Type (ϕ2.500")		
			3 (Number of Teeth)			3 (Number of Teeth)			3 or 4 (Number of Teeth)		
			Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)
P	Mild Steel	Hardness ≤180HB	7.0	.047	.059	7.0	.055	.059	6.0	.059	.059
			9.5	.039	.051	9.5	.047	.051	10.0	.051	.051
			12.0	.031	.043	—	—	—	14.0	.043	.043
	Carbon Steel Alloy Steel	Hardness 180—280HB	7.0	.047	.059	7.0	.055	.059	6.0	.059	.059
			9.5	.039	.051	9.5	.047	.051	10.0	.051	.051
			12.0	.031	.043	—	—	—	14.0	.043	.043
	Carbon Steel Alloy Steel	Hardness 280—350HB	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
			9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
			12.0	.024	.043	—	—	—	14.0	.035	.043
	Alloy Tool Steel	Hardness ≤350HB (Annealing)	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
			9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
			12.0	.024	.043	—	—	—	14.0	.035	.043
	Pre-hardened Steel	Hardness 35—45HRC	7.0	.039	.051	7.0	.047	.051	6.0	.051	.051
			9.5	.031	.043	9.5	.039	.043	10.0	.043	.043
			12.0	.024	.035	—	—	—	14.0	.035	.035
M	Stainless Steel	Hardness ≤270HB	7.0	.047	.051	7.0	.055	.051	6.0	.059	.051
			9.5	.039	.043	9.5	.047	.043	10.0	.051	.043
			12.0	.031	.035	—	—	—	14.0	.043	.035
K	Gray Cast Iron	Tensile Strength ≤350MPa	7.0	.047	.067	7.0	.055	.067	6.0	.059	.067
			9.5	.039	.059	9.5	.047	.059	10.0	.051	.059
			12.0	.031	.051	—	—	—	14.0	.043	.051
	Ductile Cast Iron	Tensile Strength ≤800MPa	7.0	.039	.059	7.0	.047	.059	6.0	.051	.059
			9.5	.031	.051	9.5	.039	.051	10.0	.043	.051
			12.0	.024	.043	—	—	—	14.0	.035	.043
S	Heat Resistant Alloys	Hardness ≤350HB	7.0	.047	.024	7.0	.047	.024	6.0	.047	.024
			9.5	.039	.016	9.5	.039	.016	10.0	.039	.016
	Titanium Alloys	—	12.0	.031	.012	—	—	—	14.0	.031	.012
H	Hardened Steel	Hardness 40—55HRC	7.0	.024	.043	7.0	.031	.043	6.0	.035	.043
			9.5	.020	.035	9.5	.024	.035	10.0	.028	.035
			12.0	.016	.028	—	—	—	—	—	—

(inch)

	DCX = ϕ2.000", ϕ2.500" (ϕ50mm, ϕ63mm, ϕ66mm) (Arbor type)			DCX = ϕ3.000", ϕ4.000", ϕ4.921", ϕ6.299" (ϕ80 mm, ϕ100 mm, ϕ125 mm, ϕ160 mm) (Arbor type)			DCX = ϕ3.000", ϕ4.000" (ϕ80 mm, ϕ100 mm) (Arbor type)		
	AJXU09 Type (ϕ2.000") AJXU12 Type (ϕ2.500")			AJXU14 Type AJX14 Type			AJXU12 Type		
	5 (Number of Teeth)			4 or 5 or 6 or 7 or 8 (Number of Teeth)			6 or 7 (Number of Teeth)		
	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)	Over-hang	Axial Depth of Cut	Feed per Tooth (IPT)
	6.0	.053	.051	7.0	.059	.059	7.0	.053	.051
	10.0	.046	.043	12.0	.051	.051	12.0	.046	.043
	14.0	.039	.035	18.0	.039	.039	18.0	.035	.031
	6.0	.053	.051	7.0	.059	.059	7.0	.053	.051
	10.0	.046	.043	12.0	.051	.051	12.0	.046	.043
	14.0	.039	.035	18.0	.039	.039	18.0	.035	.031
	6.0	.046	.051	7.0	.051	.059	7.0	.046	.051
	10.0	.039	.043	12.0	.043	.051	12.0	.039	.043
	14.0	.032	.035	18.0	.031	.039	18.0	.028	.031
	6.0	.046	.051	7.0	.051	.059	7.0	.046	.051
	10.0	.039	.043	12.0	.043	.051	12.0	.039	.043
	14.0	.032	.035	18.0	.031	.039	18.0	.028	.031
	6.0	.046	.043	7.0	.051	.051	7.0	.046	.043
	10.0	.039	.035	12.0	.043	.043	12.0	.039	.035
	14.0	.032	.028	18.0	.031	.031	18.0	.028	.024
	6.0	.053	.043	7.0	.059	.051	7.0	.053	.043
	10.0	.046	.035	12.0	.051	.043	12.0	.046	.035
	14.0	.039	.028	18.0	.039	.031	18.0	.035	.024
	6.0	.053	.059	7.0	.059	.067	7.0	.053	.059
	10.0	.046	.051	12.0	.051	.059	12.0	.046	.051
	14.0	.039	.039	18.0	.039	.047	18.0	.035	.035
	6.0	.046	.051	7.0	.051	.059	7.0	.046	.051
	10.0	.039	.043	12.0	.043	.051	12.0	.039	.043
	14.0	.032	.035	18.0	.031	.039	18.0	.028	.031
	6.0	.047	.024	7.0	.047	.024	7.0	.047	.024
	10.0	.039	.016	12.0	.039	.016	12.0	.039	.016
	14.0	.031	.012	18.0	.031	.012	18.0	.031	.012
	6.0	.032	.039	7.0	.035	.043	7.0	.032	.039
	10.0	.025	.031	12.0	.028	.035	12.0	.025	.031
	—	—	—	—	—	—	—	—	—

* Depth of cut of JL breaker is up to .047 inch.

①Overhang Length



②Main Spindle Speed
$n(min^{-1})=(Recommended\ Cutting\ Speed \times 12)\div(DCX \times 3.14)$

③Table Feed Rate
vf(IPM)=n x feed per tooth fz x number of teeth

④Recommended width of cut (ae) is more than 60% of cutting edge diameter.

⑤The cutting condition on the left are guide when using a CAT50 size holder. In case of CAT40 and HSK63 machines, a cutter diameter of under 1.5 inch is recommended. In this case, reduce the depth of cut and table feed rate.

⑥Use of ST chip breaker with a tougher cutting edge is recommended for interrupted cutting.

⑦A cutter body with a coarse pitch is recommended for use in unstable conditions such as a long tool overhang.

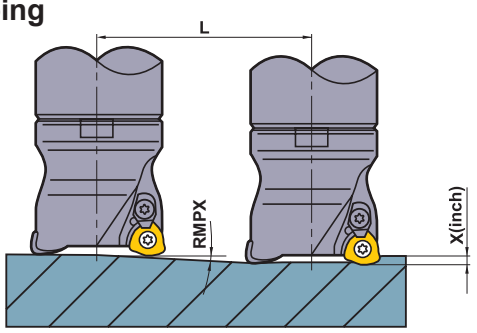
⑧Use “sharp” JM chip breaker to lower cutting forces or when there is a long tool overhang.

⑨Large chips are generated when machining with the AJX. To avoid chip jamming-related problems, machine using an air blow to disperse the chips effectively.

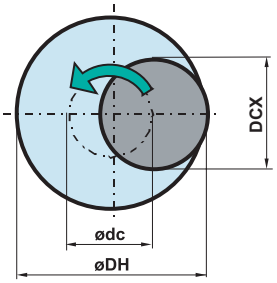
⑩The maximum depth of cut JL chip breaker is different in the insert size. 06 size is up to .024 inch, 08 size is up to .035 inch, and 09, 12, 14 size is up to .047 inch.

MAXIMUM CAPACITIES BY MODE

■ Ramping



■ Helical Milling and Drilling



- How to calculate the theoretical center of the tool path.

ødc = øDH - DCX

ødc	øDH	DCX
Theoretical Center of the Tool	Desired Hole Diameter	Cutting Diameter Max.

- Please set the depth of cut per cycle under max. depth of cut (APMX).
- Please machine in a down cutting direction.

- When ramping and helical milling, it is recommended to reduce the feed rate by 40%.
- When drilling, please set the feed in the axial direction .008 IPR or less.
- The long chips generated can discharge in any direction, so ensure that adequate safety precautions are taken.

(inch)

	Tool Holder Type	DCX	DC	Max. Depth of Cut APMX		Ramping machining					Helical Milling		AZ
				FT/JM/ ST	JL	RMPX	L Required Distance for X Inch Depth				Min. Hole Diameter	Max. Hole Diameter	
							Z=.039	Z=.047	Z=.059	Z=.079			
Shank Type	**AJXU06R102**	.625	.340	.039	.024	3°	.744	—	—	—	.90	1.13	.012
	AJXU06R112	.688	.400	.039	.024	2.5°	.893	—	—	—	1.02	1.26	.012
	AJXU06R123	.750	.472	.039	.024	1.7°	1.314	—	—	—	1.15	1.38	.012
	AJXU06R143	.875	.595	.039	.024	0.7°	3.192	—	—	—	1.40	1.63	.012
	AJXU08R122	.750	.410	.059	.035	3.5°	.638	.768	.965	—	.99	1.34	.020
	AJXU08R142	.875	.530	.059	.035	3°	.744	.897	1.126	—	1.24	1.59	.020
	AJXU08R163	1.000	.661	.059	.035	2°	1.117	1.346	1.690	—	1.49	1.84	.020
	AJXU08R183	1.125	.784	.059	.035	0.5°	4.469	5.386	6.761	—	1.74	2.09	.020
	AJXU09R162	1.000	.590	.079	.047	4°	.558	.672	.844	1.130	1.33	1.84	.039
	AJXU09R182	1.125	.720	.079	.047	3°	.744	.897	1.126	1.507	1.58	2.09	.039
	AJXU09R203	1.250	.854	.079	.047	3.3°	.676	.815	1.023	1.370	1.83	2.34	.039
	AJXU09R223	1.375	.976	.079	.047	2°	1.117	1.346	1.690	2.262	2.08	2.59	.039
	AJXU09R244	1.500	1.114	.079	.047	2.4°	.931	1.121	1.408	1.885	2.33	2.84	.039
	AJXU12R202	1.250	.790	.079	.047	4°	.558	.672	.844	1.130	1.59	2.34	.059
	AJXU12R243	1.500	1.040	.079	.047	3°	.744	.897	1.126	1.507	2.09	2.84	.059
	AJXU14R323	2.000	1.530	.079	.047	4.2°	.531	.640	.803	1.076	2.90	3.84	.079

(inch)

	Tool Holder Type	DCX	DC	Max. Depth of Cut APMX		Ramping machining					Helical Milling		AZ
						RMPX	L Required Distance for X Inch Depth				Min. Hole Diameter	Max. Hole Diameter	
				FT/JM/ ST	JL		Z=.039	Z=.047	Z=.059	Z=.079			
Arbor Type	**AJXU09R02**	2.000	1.606	.079	.047	1.1°	2.031	2.448	3.073	4.114	3.33	3.84	.039
	AJXU12R02	2.000	1.540	.079	.047	2°	1.117	1.346	1.690	2.262	3.09	3.84	.059
	AJXU12R2505	2.500	2.039	.079	.047	1.5°	1.489	1.795	2.253	3.017	4.09	4.84	.059
	AJXU12R0306	3.000	2.543	.079	.047	1.2°	1.862	2.244	2.817	3.771	5.09	5.84	.059
	AJXU12R0407	4.000	3.539	.079	.047	0.8°	2.793	3.366	4.225	5.658	7.09	7.84	.059
	AJXU14R25	2.500	2.030	.079	.047	2.8°	.797	.961	1.206	1.615	3.90	4.84	.079
	AJXU14R03	3.000	2.530	.079	.047	1.8°	1.241	1.496	1.877	2.514	4.90	5.84	.079
	AJXU14R04	4.000	3.530	.079	.047	1.2°	1.862	2.244	2.817	3.771	6.90	7.84	.079
	AJX14RA125	4.920	4.530	.079	.047	0.8°	2.793	3.366	4.225	5.658	8.74	9.68	.079
	AJX14RA160	6.300	5.830	.079	.047	0.5°	4.469	5.386	6.761	9.053	11.50	12.44	.079

MULTI-FUNCTIONAL MILLING

WJX09 NEW

P M K N S H

Fig.1
ø1.500"

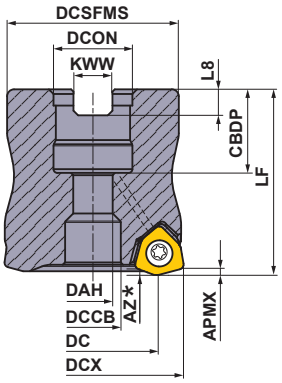
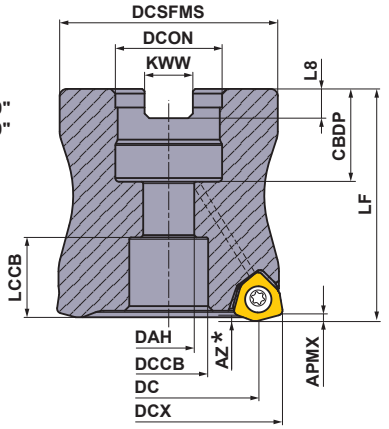


Fig.2
ø2.000"
ø2.500"



Right hand tool holder only.

(mm)

DCON	Set Bolt	Geometry	
.500	HSCU25011H	①	① ②
.750	HSCU37513H	②	
1.000	HSCU50014H		
			With Air / coolant through.

■ARBOR TYPE

With Air / coolant through.

DCON = inch size

(inch)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (lbs)	APMX	RPMX (min^{-1})	Fig.	Insert Type
1.500	**WJX09UR1.5004SA**	●	4	1.060	1.750	.500	0.5	.047	24000	1	JOMU0905
2.000	**WJX09UR2.0004AA**	●	4	1.557	2.000	.750	0.9	.047	19800	2	JOMU0905
2.000	**WJX09UR2.0006AA**	●	6	1.557	2.000	.750	0.9	.047	19800	2	JOMU0905
2.500	**WJX09UR2.5005CA**	●	5	2.057	2.000	1.000	1.7	.047	17200	2	JOMU0905
2.500	**WJX09UR2.5007CA**	●	7	2.057	2.000	1.000	1.7	.047	17200	2	JOMU0905

∗ Refer to page K317, for the maximum drilling depth (**AZ**).

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

MOUNTING DIMENSIONS

(inch)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.500	**WJX09UR1.5004SA**	.500	.630	.276	.433	.695	1.438	.250	.156	1
2.000	**WJX09UR2.0004AA**	.750	.748	.413	.630	.827	1.750	.313	.187	2
2.000	**WJX09UR2.0006AA**	.750	.748	.413	.630	.827	1.750	.313	.187	2
2.500	**WJX09UR2.5005CA**	1.000	.945	.539	.787	.709	2.375	.375	.219	2
2.500	**WJX09UR2.5007CA**	1.000	.945	.539	.787	.709	2.375	.375	.219	2

● : USA Stock

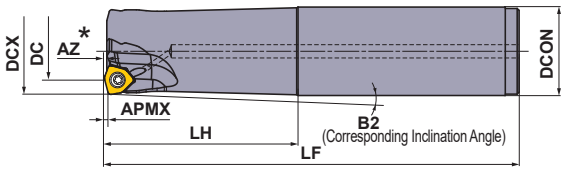


Fig.1

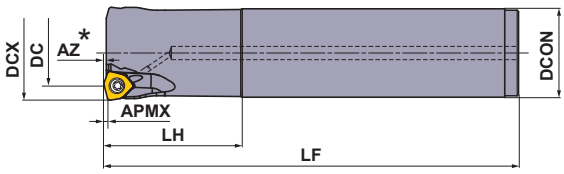


Fig.2

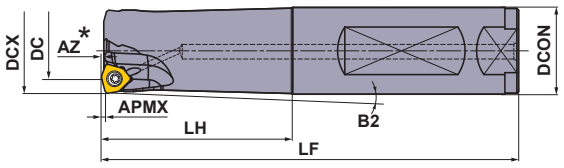


Fig.3

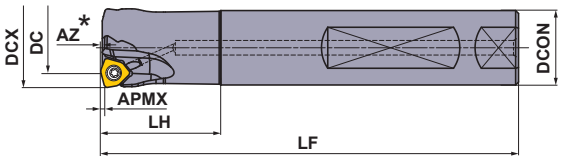


Fig.4

Right hand tool holder only.

■SHANK TYPE

With Air / coolant through.

(inch)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	LH	DCON	B2	APMX	RPMX (min^{-1})	Fig.	Insert Type
1.000	**WJX09UR1602FA16S**	●	2	.565	5.625	2.375	1.000	1.09°	.047	33000	3	JOMU0905
1.000	**WJX09UR1603FA16S**	●	3	.565	5.625	2.375	1.000	1.09°	.047	33000	3	JOMU0905
1.000	**WJX09UR1602SA16L**	●	2	.565	8.000	4.750	1.000	0.53°	.047	33000	1	JOMU0905
1.000	**WJX09UR1603SA16L**	●	3	.565	8.000	4.750	1.000	0.53°	.047	33000	1	JOMU0905
1.125	**WJX09UR1802FA16S**	●	2	.687	5.625	1.625	1.000	—	.047	29800	4	JOMU0905
1.125	**WJX09UR1803FA16S**	●	3	.687	5.625	1.625	1.000	—	.047	29800	4	JOMU0905
1.125	**WJX09UR1802SA16L**	●	2	.687	8.000	1.625	1.000	—	.047	29800	2	JOMU0905
1.125	**WJX09UR1803SA16L**	●	3	.687	8.000	1.625	1.000	—	.047	29800	2	JOMU0905
1.250	**WJX09UR2002FA20S**	●	2	.811	6.000	2.750	1.250	0.93°	.047	27500	3	JOMU0905
1.250	**WJX09UR2003FA20S**	●	3	.811	6.000	2.750	1.250	0.93°	.047	27500	3	JOMU0905
1.250	**WJX09UR2002SA20L**	●	2	.811	8.000	4.750	1.250	0.53°	.047	27500	1	JOMU0905
1.250	**WJX09UR2003SA20L**	●	3	.811	8.000	4.750	1.250	0.53°	.047	27500	1	JOMU0905
1.500	**WJX09UR2403FA20S**	●	3	1.060	6.000	2.000	1.250	—	.047	24000	4	JOMU0905
1.500	**WJX09UR2404FA20S**	●	4	1.060	6.000	2.000	1.250	—	.047	24000	4	JOMU0905
1.500	**WJX09UR2403SA20L**	●	3	1.060	10.000	2.000	1.250	—	.047	24000	2	JOMU0905
1.500	**WJX09UR2404SA20L**	●	4	1.060	10.000	2.000	1.250	—	.047	24000	2	JOMU0905

∗ Refer to page K317, for the maximum drilling depth (**AZ**).

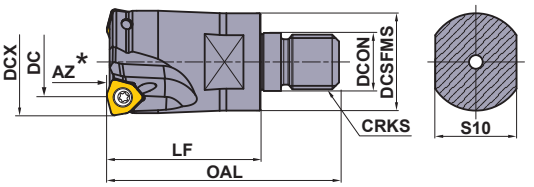
SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX09	TPS3R	TIP10D	MK1KS

∗ Clamp Torque (lbf-in) : TS3R = 17.7

ISO13399	➢ K003
OPERATIONAL GUIDANCE	➢ K327
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001



Right hand tool holder only.

■ SCREW-IN TYPE

With Air / coolant through.

(inch)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	OAL	DCON	DCSFMS	S10	CRKS	WT (lbs)	APMX	RPMX (min^{-1})	Insert Type
1.000	**WJX09UR1602AM1235**	●	2	.565	1.378	2.244	.492	.925	.748	M12	.2	.047	33000	JOMU0905
1.000	**WJX09UR1603AM1235**	●	3	.565	1.378	2.244	.492	.925	.748	M12	.2	.047	33000	JOMU0905
1.125	**WJX09UR1802AM1235**	●	2	.687	1.378	2.244	.492	.925	.748	M12	.3	.047	29800	JOMU0905
1.125	**WJX09UR1803AM1235**	●	3	.687	1.378	2.244	.492	.925	.748	M12	.2	.047	29800	JOMU0905
1.250	**WJX09UR2002AM1645**	●	2	.811	1.772	2.677	.669	1.122	.945	M16	.5	.047	27500	JOMU0905
1.250	**WJX09UR2003AM1645**	●	3	.811	1.772	2.677	.669	1.122	.945	M16	.5	.047	27500	JOMU0905
1.375	**WJX09UR2202AM1645**	●	2	.936	1.772	2.677	.669	1.122	.945	M16	.6	.047	25600	JOMU0905
1.375	**WJX09UR2203AM1645**	●	3	.936	1.772	2.677	.669	1.122	.945	M16	.5	.047	25600	JOMU0905
1.375	**WJX09UR2204AM1645**	●	4	.936	1.772	2.677	.669	1.122	.945	M16	.5	.047	25600	JOMU0905

∗ Refer to page K317, for the maximum drilling depth (**AZ**).

SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX09	TPS3R	TIP10D	MK1KS

∗ Clamp Torque (lbf-in) : TS3R = 17.7

● : USA Stock ★ : Stocked in Japan

Fig.1
ø40

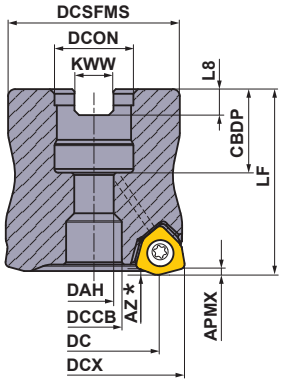
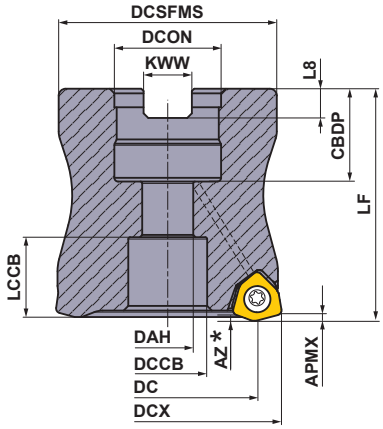
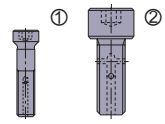


Fig.2
ø50
ø52
ø63
ø66



Right hand tool holder only.

(mm)

DCON		Set Bolt	Geometry	
inch size	mm size			
	ϕ16	HFF08033H	①	
ϕ22.225	ϕ22	HSC10030H	②	
	ϕ27	HSC12035H		

With Air / coolant through.

Metric Standard

■ARBOR TYPE

With Air / coolant through.

DCON = inch size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.	Insert Type
50	**WJX09R05004BA**	★	4	38.8	50	22.225	0.4	1.2	20000	2	JOMU0905
50	**WJX09R05006BA**	★	6	38.8	50	22.225	0.4	1.2	20000	2	JOMU0905
63	**WJX09R06305BA**	★	5	51.8	50	22.225	0.8	1.2	17300	2	JOMU0905
63	**WJX09R06307BA**	★	7	51.8	50	22.225	0.8	1.2	17300	2	JOMU0905

DCON = mm size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.	Insert Type
40	**WJX09-040A04AR**	★	4	28.8	40	16	0.2	1.2	23200	1	JOMU0905
40	**WJX09-040A05AR**	★	5	28.8	40	16	0.2	1.2	23200	1	JOMU0905
50	**WJX09-050A04AR**	★	4	38.8	50	22	0.4	1.2	20000	2	JOMU0905
50	**WJX09-050A06AR**	★	6	38.8	50	22	0.4	1.2	20000	2	JOMU0905
52	**WJX09-052A06AR**	★	6	40.8	50	22	0.5	1.2	19500	2	JOMU0905
63	**WJX09-063A05AR**	★	5	51.8	50	22	0.8	1.2	17300	2	JOMU0905
63	**WJX09-063A07AR**	★	7	51.8	50	22	0.8	1.2	17300	2	JOMU0905
63	**WJX09-063X07AR**	★	7	51.8	50	27	0.7	1.2	17300	2	JOMU0905
66	**WJX09-066X07AR**	★	7	54.8	50	27	0.8	1.2	16800	2	JOMU0905

✱ Refer to page K317, for the maximum drilling depth (**AZ**).

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

ISO13399 ➤ K003
MOUNTING DIMENSION ➤ K312
OPERATIONAL GUIDANCE ➤ K327
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1
ø40

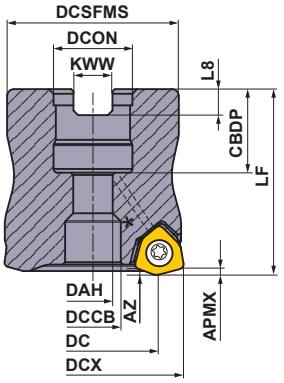
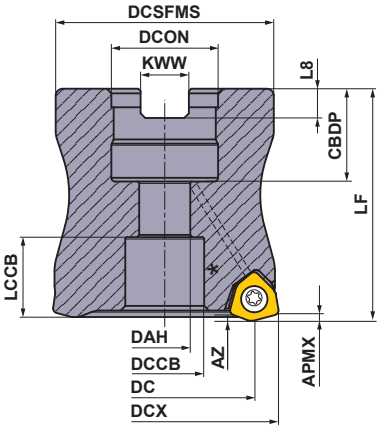


Fig.2
ø50
ø52
ø63
ø66



Right hand tool holder only.

MOUNTING DIMENSIONS

(mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
40	**WJX09-040A04AR**	16	18	8.5	12	—	37	8.4	5.6	1
40	**WJX09-040A05AR**	16	18	8.5	12	—	37	8.4	5.6	1
50	**WJX09-050A04AR**	22	20	11	17	17.2	47	10.4	6.3	2
50	**WJX09-050A06AR**	22	20	11	17	17.2	47	10.4	6.3	2
50	**WJX09R05004BA**	22.225	19	11	17	18.2	47	8.4	5	2
50	**WJX09R05006BA**	22.225	19	11	17	18.2	47	8.4	5	2
52	**WJX09-052A06AR**	22	20	11	17	17.2	47	10.4	6.3	2
63	**WJX09-063A05AR**	22	20	11	17	17.2	60	10.4	6.3	2
63	**WJX09-063A07AR**	22	20	11	17	17.2	60	10.4	6.3	2
63	**WJX09R06305BA**	22.225	19	11	17	18.2	60	8.4	5	2
63	**WJX09R06307BA**	22.225	19	11	17	18.2	60	8.4	5	2
63	**WJX09-063X07AR**	27	23	13	20	16.2	60	12.4	7	2
66	**WJX09-066X07AR**	27	23	13	20	16.2	60	12.4	7	2

SPARE PARTS

(mm)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX09	TPS3R	TIP10D	MK1KS

* Clamp Torque (N • m) : TPS3R = 2.0

★ : **Stocked in Japan**

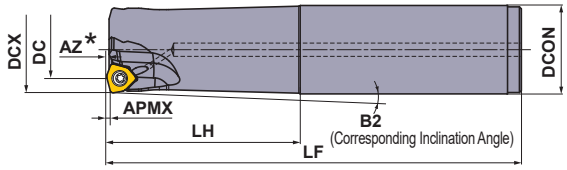


Fig.1

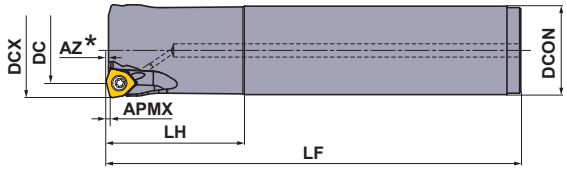


Fig.2

Metric Standard

■SHANK TYPE

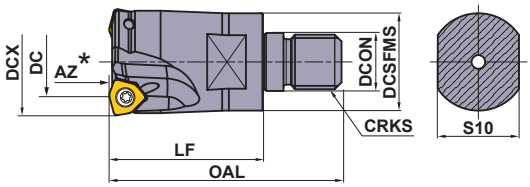
With Air / coolant through.

Right hand tool holder only.

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	LH	DCON	B2	APMX	RPMX (min^{-1})	Fig.	Insert Type
25	**WJX09R2502SA25S**	★	2	14	140	60	25	1.09°	1.2	33500	1	JOMU0905
25	**WJX09R2503SA25S**	★	3	14	140	60	25	1.09°	1.2	33500	1	JOMU0905
25	**WJX09R2502SA25L**	★	2	14	200	120	25	0.54°	1.2	33500	1	JOMU0905
25	**WJX09R2503SA25L**	★	3	14	200	120	25	0.54°	1.2	33500	1	JOMU0905
25	**WJX09R2502SA25EL**	★	2	14	300	180	25	0.35°	1.2	33500	1	JOMU0905
28	**WJX09R2802SA25S**	★	2	16.9	140	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2803SA25S**	★	3	16.9	140	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2802SA25L**	★	2	16.9	200	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2803SA25L**	★	3	16.9	200	40	25	—	1.2	30300	2	JOMU0905
28	**WJX09R2802SA25EL**	★	2	16.9	300	40	25	—	1.2	30300	2	JOMU0905
32	**WJX09R3202SA32S**	★	2	20.9	150	70	32	0.93°	1.2	27300	1	JOMU0905
32	**WJX09R3203SA32S**	★	3	20.9	150	70	32	0.93°	1.2	27300	1	JOMU0905
32	**WJX09R3202SA32L**	★	2	20.9	200	120	32	0.54°	1.2	27300	1	JOMU0905
32	**WJX09R3203SA32L**	★	3	20.9	200	120	32	0.54°	1.2	27300	1	JOMU0905
32	**WJX09R3202SA32EL**	★	2	20.9	300	180	32	0.35°	1.2	27300	1	JOMU0905
35	**WJX09R3503SA32S**	★	3	23.8	150	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3504SA32S**	★	4	23.8	150	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3503SA32L**	★	3	23.8	200	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3504SA32L**	★	4	23.8	200	50	32	—	1.2	25500	2	JOMU0905
35	**WJX09R3502SA32EL**	★	2	23.8	300	50	32	—	1.2	25500	2	JOMU0905
40	**WJX09R4003SA32S**	★	3	28.8	150	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4004SA32S**	★	4	28.8	150	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4003SA32L**	★	3	28.8	250	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4004SA32L**	★	4	28.8	250	50	32	—	1.2	23200	2	JOMU0905
40	**WJX09R4003SA32EL**	★	3	28.8	300	50	32	—	1.2	23200	2	JOMU0905

∗ Refer to page K317, for the maximum drilling depth (**AZ**).



Metric Standard

■SCREW-IN TYPE

With Air / coolant through.

Right hand tool holder only.

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	OAL	DCON	DCSFMS	S10	CRKS	WT (kg)	APMX	RPMX (min^{-1})	Insert Type
25	**WJX09R2502AM1235**	★	2	14	35	57	12.5	23.5	19	M12	0.1	1.2	33500	JOMU0905
25	**WJX09R2503AM1235**	★	3	14	35	57	12.5	23.5	19	M12	0.1	1.2	33500	JOMU0905
28	**WJX09R2802AM1235**	★	2	16.9	35	57	12.5	23.5	19	M12	0.1	1.2	30300	JOMU0905
28	**WJX09R2803AM1235**	★	3	16.9	35	57	12.5	23.5	19	M12	0.1	1.2	30300	JOMU0905
32	**WJX09R3202AM1645**	★	2	20.9	45	68	17.0	28.5	24	M16	0.2	1.2	27300	JOMU0905
32	**WJX09R3203AM1645**	★	3	20.9	45	68	17.0	28.5	24	M16	0.2	1.2	27300	JOMU0905
35	**WJX09R3502AM1645**	★	2	23.8	45	68	17.0	28.5	24	M16	0.3	1.2	25500	JOMU0905
35	**WJX09R3503AM1645**	★	3	23.8	45	68	17.0	28.5	24	M16	0.2	1.2	25500	JOMU0905
35	**WJX09R3504AM1645**	★	4	23.8	35	68	17.0	28.5	24	M16	0.2	1.2	25500	JOMU0905
40	**WJX09R4003AM1645**	★	3	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905
40	**WJX09R4004AM1645**	★	4	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905
40	**WJX09R4005AM1645**	★	5	28.8	45	68	17.0	28.5	24	M16	0.3	1.2	23200	JOMU0905

∗ Refer to page K317, for the maximum drilling depth (**AZ**).

ISO13399	➤ K003
OPERATIONAL GUIDANCE	➤ K327
SCREW-IN HOLDERS	➤ K382
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

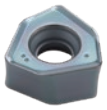
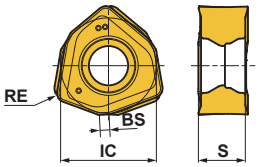
INSERTS

(mm)

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated									IC	S	BS	RE	Geometry
				MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT					
	JOMU090512ZZER-L	M	E	●	●	●	●	●	●	●	●	●	.375	.186	.035	.047	 Right hand insert only.
	JOMU090512ZZER-M	M	E	●	●	●	●	●	●	●	●	●	.375	.187	.035	.047	
	JOMU090512ZZER-R	M	E	●	●	●					●	●	.375	.190	.035	.047	

■Cutter Diameter and Flat Surface Milling

The maximum cutting diameter (DCX) shown in the WJX items table is not the same as the possible dimensions for plane cutting.
The possible dimensions for plane cutting are given as the cutting axle DC value. Please note that this is smaller than the DCX value.

● : USA Stock
<10 inserts in one case>

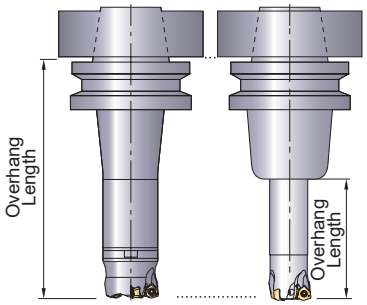
RECOMMENDED CUTTING CONDITIONS

CORRECTION VALUE ACCORDING TO OVERHANG LENGTH

Multiply the recommended cutting conditions by the corrections factor x overhang length.

(inch)

Type	Cutting Dia. Max. **DCX**	Overhang Length	Correction Value According		
			Cutting Speed **vc** (SFM)	Depth of Cut **ap**	Feed **fz**(IPT)
Shank Type Screw-in Type	.984-1.575	< 2.5×DCON	100%	100%	100%
		3.0×DCON	90%	100%	90%
		4.0×DCON	85%	90%	85%
		5.0×DCON	80%	85%	80%
		7.5×DCON	70%	75%	75%
Arbor Type	1.500-2.598	< 2.5×DCX	100%	100%	100%
		3.0×DCX	85%	100%	90%
		4.0×DCX	80%	80%	80%
		5.0×DCX	75%	75%	60%
		6.0×DCX	70%	70%	40%



DCON=Connection Dia.

CUTTING SPEED (Dry Cutting)

(inch)

	Workpiece Material	Properties	Cutting Speed **vc** (SFM)				
P			MP6130	MP6120	VP15TF	MC7020	VP30RT
	Mild Steel	≤180HB	525(360—655)	560(395—720)	560(395—720)	755(590—920)	460(330—590)
	Carbon Steel Alloy Steel	180—280HB	460(295—655)	525(330—720)	525(330—720)	720(560—885)	395(260—560)
	Carbon Steel Alloy Steel	280—350HB	460(295—655)	525(330—720)	525(330—720)	720(560—885)	395(260—560)
	Alloy Tool Steel	≤350HB (Annealing)	460(295—655)	525(330—720)	525(330—720)	720(560—885)	395(260—560)
	Pre-hardened Steel	35—45HRC	330(195—460)	395(260—525)	395(260—525)	—	295(165—425)
M			MP7130	MP7140	MC7020	VP30RT	
	Austenitic Stainless Steel	≤200HB	525(425—655)	490(395—590)	720(560—885)	490(395—590)	
	Austenitic Stainless Steel	>200HB	460(330—655)	425(260—590)	620(460—785)	425(260—590)	
	Ferritic and Martensitic Stainless Steel	≤200HB	490(330—655)	425(260—590)	720(560—885)	425(260—590)	
	Duplex Stainless Steel	≤280HB	425(260—590)	360(195—525)	590(425—755)	360(195—525)	
	Precipitation Hardening Stainless Steel	<450HB	360(195—525)	295(165—425)	560(395—720)	295(165—425)	
K			VP15TF				
	Gray Cast Iron	≤350MPa	590(460—720)				
	Ductile Cast Iron	≤450MPa	525(395—690)				
	Ductile Cast Iron	≤800MPa	425(295—560)				
S			MP9130	MP9120	VP15TF		
	Titanium Alloys	—	130(100—195)	165(100—210)	165(100—210)		
	Heat Resistant Alloys	—	100(65—130)	130(65—165)	130(65—165)		
H			VP15TF				
	Hardened Steel	40—55HRC	230(130—330)				

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
Note 2) When wet cutting, tool life may become shorter than dry cutting. When carrying out wet cutting for the applications recommended with dry cutting, reduce the cutting speed by 25%.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

DEPTH OF CUT / FEED PER TOOTH

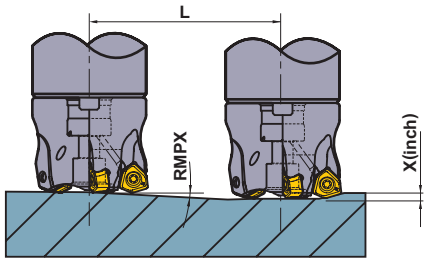
(inch)

	Workpiece Material	Properties	Depth of Cut **ap**	Breaker	DCX=1.000", 1.125", 25mm, 28mm Number of Teeth=2 Feed **fz**(IPT)	DCX=1.000", 1.125", 25mm, 28mm Number of Teeth=3 Feed **fz**(IPT)	DCX≥1.250", 32mm Feed **fz**(IPT)	Cutting Mode
P	Mild Steel	Hardness ≤180HB	≤.020	M,R	.051(.016–.079)	.051(.016–.079)	.059(.020–.079)	Dry
				L	.047(.016–.063)	.047(.016–.063)	.047(.016–.063)	
			≤.039	M,R	.039(.012–.051)	.031(.012–.039)	.047(.016–.059)	
				L	.031(.012–.047)	.031(.012–.039)	.031(.012–.047)	
			≤.059	M,R	.024(.012–.039)	–	.031(.016–.047)	
	Carbon Steel Alloy Steel	Hardness 180–280HB	≤.020	M,R	.051(.016–.067)	.051(.016–.067)	.059(.016–.079)	Dry
				L	.047(.012–.059)	.047(.012–.059)	.047(.012–.059)	
			≤.039	M,R	.031(.012–.039)	.028(.012–.035)	.039(.012–.051)	
				L	.028(.008–.039)	.028(.008–.035)	.028(.008–.039)	
			≤.059	M,R	.020(.012–.028)	–	.028(.012–.039)	
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280–350HB ≤350HB (Annealing)	≤.020	M,R	.051(.016–.067)	.051(.016–.067)	.059(.016–.079)	Dry
				L	.047(.012–.059)	.047(.012–.059)	.047(.012–.059)	
			≤.039	M,R	.031(.012–.039)	.028(.012–.035)	.039(.012–.051)	
				L	.028(.008–.039)	.028(.008–.035)	.028(.008–.039)	
			≤.059	M,R	.020(.012–.028)	–	.028(.012–.039)	
	Pre-hardened Steel	Hardness 35–45HRC	≤.020	M,R	.039(.012–.051)	.039(.012–.051)	.047(.012–.059)	Dry
				L	.031(.012–.047)	.031(.012–.047)	.031(.012–.047)	
			≤.039	M,R	.024(.008–.031)	.024(.008–.031)	.031(.008–.039)	
				L	.020(.008–.031)	.020(.008–.031)	.020(.008–.031)	
M	Austenitic Stainless Steel	–	≤.020	L	.031(.012–.039)	.031(.012–.039)	.031(.012–.039)	Dry
				M	.039(.016–.047)	.039(.016–.047)	.039(.016–.047)	
			≤.039	L	.024(.008–.031)	.024(.008–.031)	.024(.008–.031)	
				M	.031(.012–.039)	.031(.012–.039)	.031(.012–.039)	
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	≤.020	L	.031(.012–.039)	.031(.012–.039)	.031(.012–.039)	Dry
				M	.039(.016–.047)	.039(.016–.047)	.039(.016–.047)	
			≤.039	L	.024(.008–.031)	.024(.008–.031)	.024(.008–.031)	
				M	.031(.012–.039)	.031(.012–.039)	.031(.012–.039)	
	Duplex Stainless Steel	Hardness ≤280HB	≤.020	L	.024(.012–.031)	.024(.012–.031)	.024(.012–.031)	Dry
				M	.028(.012–.039)	.028(.012–.039)	.028(.012–.039)	
			≤.039	L	.020(.008–.028)	.020(.008–.028)	.020(.008–.028)	
				M	.024(.012–.028)	.024(.012–.028)	.024(.012–.028)	
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.020	L	.024(.012–.031)	.024(.012–.031)	.024(.012–.031)	Dry
				M	.028(.012–.039)	.028(.012–.039)	.028(.012–.039)	
			≤.039	L	.020(.008–.028)	.020(.008–.028)	.020(.008–.028)	
				M	.024(.012–.028)	.024(.012–.028)	.024(.012–.028)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.020	M,R	.051(.016–.079)	.051(.016–.079)	.059(.020–.079)	Dry
				L	.047(.016–.063)	.047(.016–.063)	.047(.016–.063)	
			≤.039	M,R	.039(.012–.051)	.031(.012–.039)	.047(.016–.059)	
				L	.039(.012–.051)	.031(.012–.039)	.039(.012–.051)	
			≤.059	M,R	.024(.012–.039)	–	.031(.016–.047)	
	Ductile Cast Iron	Tensile Strength ≤450MPa	≤.020	M,R	.051(.016–.067)	.051(.016–.067)	.059(.016–.079)	Dry
				L	.039(.012–.051)	.039(.012–.051)	.039(.012–.051)	
			≤.039	M,R	.031(.012–.039)	.028(.012–.035)	.039(.012–.051)	
				L	.031(.008–.039)	.028(.008–.035)	.031(.008–.047)	
			≤.059	M,R	.020(.012–.028)	–	.028(.012–.039)	
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.020	M,R	.039(.008–.059)	.039(.008–.059)	.051(.012–.067)	Dry
				L	.031(.012–.047)	.031(.012–.047)	.031(.012–.047)	
			≤.039	M,R	.031(.008–.039)	.024(.008–.031)	.039(.012–.047)	
				L	.020(.008–.031)	.020(.008–.031)	.020(.008–.031)	
S	Titanium Alloys	–	≤.020	L	.012(.008–.024)	.012(.008–.024)	.012(.008–.024)	Wet
			≤.039	L	.012(.008–.016)	.012(.008–.016)	.012(.008–.016)	
	Heat Resistant Alloys	–	≤.020	L,M,R	.031(.012–.047)	.031(.012–.047)	.031(.012–.047)	Wet
			≤.039	L,M,R	.028(.012–.039)	.028(.012–.039)	.028(.012–.039)	
H	Hardened Steel	Hardness 40–55HRC	≤.020	R,M	.024(.012–.039)	.024(.012–.039)	.024(.012–.039)	Dry
			≤.039	R,M	.020(.012–.031)	.016(.012–.024)	.020(.012–.031)	

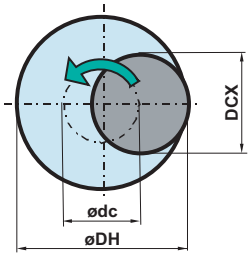
Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
Note 2) When large vibration occurs, reduce the cutting conditions.
Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.
Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

MAXIMUM CAPACITIES BY MODE

■Ramping



■Helical Milling



● How to derive a locus of the center of the tool.

ødc = øDH - DCX

Locus of the Center of the Tool | Desired Hole Diameter | Cutting Diameter Maximum

(inch)

Tool Holder Type	DCX	DC	APMX	Ramping		Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)		AZ
				RMPX	L (inch) Required Distance for X inch Depth	DH		DH	P max.	
					x=.039	Min.	Max.	Min.		
WJX09UR16	1.000	.565	.047	4.5	.496	1.510	1.914	1.343	.047	.035
WJX09UR18	1.125	.687	.047	5.3	.420	1.756	2.164	1.516	.047	.047
WJX09UR20	1.250	.811	.047	4.3	.519	2.005	2.413	1.760	.047	.047
WJX09UR22	1.375	.936	.047	3.6	.620	2.255	2.664	2.006	.047	.047
WJX09UR24	1.500	1.060	.047	3.1	.720	2.504	2.913	2.254	.047	.047
WJX09UR1.50	1.500	1.060	.047	3.1	.720	2.504	2.913	2.254	.047	.047
WJX09UR2.00	2.000	1.557	.047	2	1.117	3.501	3.913	3.244	.047	.047
WJX09UR2.50	2.500	2.057	.047	1.4	1.596	4.500	4.913	4.243	.047	.047
WJX09R25	.984	.551	.047	4.7	.474	1.496	1.850	1.339	.047	.047
WJX09R28	1.102	.665	.047	5.6	.398	1.732	2.087	1.496	.047	.047
WJX09R32	1.260	.823	.047	4.2	.531	2.047	2.402	1.811	.047	.047
WJX09R35	1.378	.937	.047	3.6	.620	2.283	2.638	2.047	.047	.047
WJX09R40	1.575	1.134	.047	2.9	.770	2.677	3.031	2.402	.047	.047
WJX09-040	1.575	1.134	.047	2.9	.770	2.677	3.031	2.402	.047	.047
WJX09-050	1.969	1.528	.047	2	1.117	3.465	3.819	3.189	.047	.047
WJX09R050	1.969	1.528	.047	2	1.117	3.465	3.819	3.189	.047	.047
WJX09-052	2.047	1.606	.047	1.9	1.176	3.622	3.976	3.346	.047	.047
WJX09-063	2.480	2.039	.047	1.4	1.596	4.488	4.843	4.213	.047	.047
WJX09R063	2.480	2.039	.047	1.4	1.596	4.488	4.843	4.213	.047	.047
WJX09-066	2.598	2.157	.047	1.4	1.596	4.724	5.079	4.449	.047	.047

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove “the uncut part” in the center of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (APMX).
<Drilling>
When drilling, set the axial feed per revolution at .008 IPR or less.

MULTI-FUNCTIONAL MILLING

WJX14

P M K N S H

Fig.1
ø2.000"

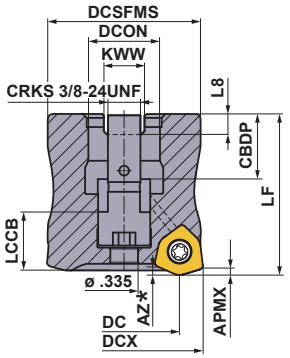


Fig.2
ø2.500"
ø3.000"
ø4.000"

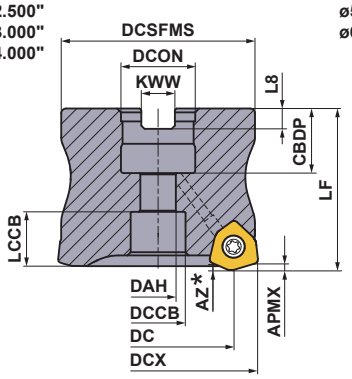
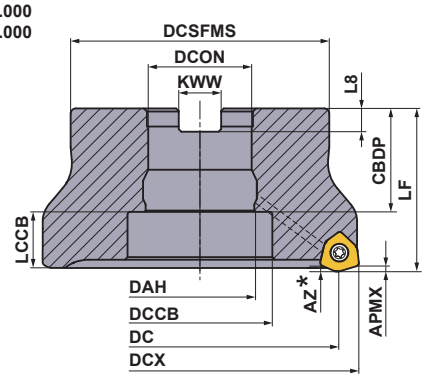


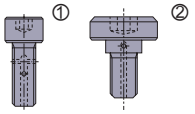
Fig.3
ø5.000
ø6.000



Right hand tool holder only.

(inch)

DCX	DCON	Set Bolt	Geometry
ϕ2.500", ϕ3.000"	ϕ1.000"	HSCU50014H	①
ϕ3.000"	ϕ1.250"	HSCU62516H	
ϕ4.000"	ϕ1.500"	HSCU75016H	
ϕ5.000"	ϕ1.500"	MBAU75016H	②
ϕ6.000"	ϕ2.000"	MBAU100016H	



With Air / coolant through.

Note 1) The milling cutter with cutting diameter maximum DCX = 2.000 inch has a built in set bolt.
Please use ϕ.276 Allen wrench to tighten/loosen the set bolt.

■ARBOR TYPE

With Air / coolant through.
DCX=inch size, DCON=inch size

(inch)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})	Fig.
2.000	**WJX14UR2.0003AA**	●	3	1.388	2.000	.750	.882	.079	4.3°	5000	1
2.000	**WJX14UR2.0004AA**	●	4	1.388	2.000	.750	.882	.079	4.3°	5000	1
2.500	**WJX14UR2.5004CA**	●	4	1.887	2.000	1.000	1.5	.079	3°	18100	2
2.500	**WJX14UR2.5005CA**	●	5	1.887	2.000	1.000	1.5	.079	3°	18100	2
3.000	**WJX14UR3.0005CA**	●	5	2.387	2.000	1.000	2.3	.079	2.2°	16100	2
3.000	**WJX14UR3.0006CA**	●	6	2.387	2.000	1.000	2.3	.079	2.2°	16100	2
3.000	**WJX14UR3.0005DA**	●	5	2.387	2.500	1.250	2.7	.079	2.2°	16100	2
3.000	**WJX14UR3.0006DA**	●	6	2.387	2.500	1.250	2.7	.079	2.2°	16100	2
4.000	**WJX14UR4.0006EA**	●	6	3.386	2.500	1.500	5.4	.079	1.5°	13300	2
4.000	**WJX14UR4.0007EA**	●	7	3.386	2.500	1.500	5.5	.079	1.5°	13300	2
5.000	**WJX14UR5.0007EA**	●	7	4.386	2.500	1.500	7.0	.079	1.1°	11500	3
5.000	**WJX14UR5.0009EA**	●	9	4.386	2.500	1.500	7.0	.079	1.1°	11500	3
6.000	**WJX14UR6.0009FA**	●	9	5.386	2.500	2.000	10.3	.079	0.9°	9900	3

∗ Refer to page K326, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

MOUNTING DIMENSIONS

(inch)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
2.000	**WJX14UR2.0003AA**	.750	.858	—	—	.689	1.750	.313	.187	1
2.000	**WJX14UR2.0004AA**	.750	.858	—	—	.689	1.750	.313	.187	1
2.500	**WJX14UR2.5004CA**	1.000	.945	.539	.787	.689	2.375	.375	.219	2
2.500	**WJX14UR2.5005CA**	1.000	.945	.539	.787	.689	2.375	.375	.219	2
3.000	**WJX14UR3.0005CA**	1.000	.945	.539	.787	.689	2.750	.375	.219	2
3.000	**WJX14UR3.0006CA**	1.000	.945	.539	.787	.689	2.750	.375	.219	2
3.000	**WJX14UR3.0005DA**	1.250	1.260	.669	1.024	.874	2.875	.500	.281	2
3.000	**WJX14UR3.0006DA**	1.250	1.260	.669	1.024	.874	2.875	.500	.281	2
4.000	**WJX14UR4.0006EA**	1.500	1.181	.787	1.181	.953	3.813	.625	.375	2
4.000	**WJX14UR4.0007EA**	1.500	1.181	.787	1.181	.953	3.813	.625	.375	2
5.000	**WJX14UR5.0007EA**	1.500	1.654	1.575	2.205	.795	3.813	.625	.375	3
5.000	**WJX14UR5.0009EA**	1.500	1.654	1.575	2.205	.795	3.813	.625	.375	3
6.000	**WJX14UR6.0009FA**	2.000	1.693	2.087	3.228	.756	4.875	.750	.437	3

SPARE PARTS

(inch)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

ISO13399 ➤ K003
OPERATIONAL GUIDANCE ➤ K327
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Fig.1
ø50
ø52

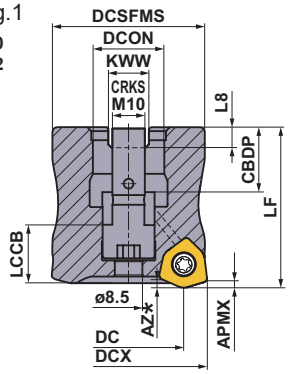


Fig.2
ø63
ø66
ø80
ø100

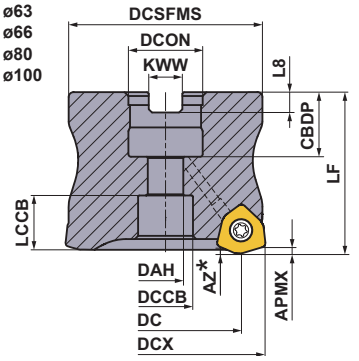
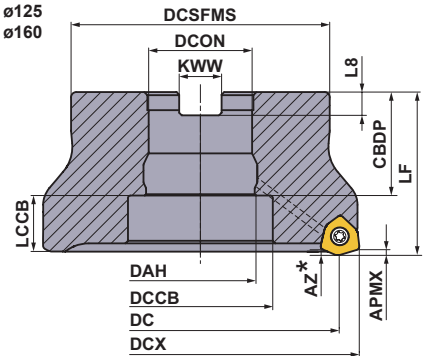


Fig.3
ø125
ø160



Right hand tool holder only.

(mm)

DCON		Set Bolt	Geometry	
inch size	mm size			
ϕ22.225	ϕ22	HSC10030H	①	① ②
ϕ31.75	ϕ27	HSC12035H		
ϕ38.1	ϕ32	HSC16040H		
ϕ50.8	ϕ40	MBA20040H	②	
		MBA24045H		With Air / coolant through.

Note 1) The milling cutter with cutting diameter maximum DCX = 50mm and 52mm has a built in set bolt.
Please use 7mm Allen wrench to tighten/loosen the set bolt.

■ARBOR TYPE

With Air / coolant through.

DCX=mm size, DCON=inch size, DCON=mm size

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.	Insert Type
50	**WJX14R05003BA**	★	3	34.5	50	22.225	0.4	2	5000	1	JOMU1407
50	**WJX14R05004BA**	★	4	34.5	50	22.225	0.4	2	5000	1	JOMU1407
63	**WJX14R06304BA**	★	4	47.5	50	22.225	0.7	2	18200	2	JOMU1407
63	**WJX14R06305BA**	★	5	47.5	50	22.225	0.7	2	18200	2	JOMU1407
80	**WJX14R08005DA**	★	5	64.4	63	31.75	1.4	2	15600	2	JOMU1407
80	**WJX14R08006DA**	★	6	64.4	63	31.75	1.4	2	15600	2	JOMU1407
100	**WJX14R10006DA**	★	6	84.4	63	31.75	2.5	2	13500	2	JOMU1407
100	**WJX14R10007DA**	★	7	84.4	63	31.75	2.5	2	13500	2	JOMU1407
125	**WJX14R12507EA**	★	7	109.4	63	38.1	3.2	2	11600	3	JOMU1407
125	**WJX14R12509EA**	★	9	109.4	63	38.1	3.1	2	11600	3	JOMU1407
160	**WJX14R16009FA**	★	9	144.4	63	50.8	4.5	2	9900	3	JOMU1407

DCX=mm, DCON=mm

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	DCON	WT (kg)	APMX	RPMX (min^{-1})	Fig.	Insert Type
50	**WJX14-050A03AR**	★	3	34.5	50	22	0.4	2	5000	1	JOMU1407
50	**WJX14-050A04AR**	★	4	34.5	50	22	0.4	2	5000	1	JOMU1407
52	**WJX14-052A04AR**	★	4	36.5	50	22	0.4	2	5000	1	JOMU1407
63	**WJX14-063A04AR**	★	4	47.5	50	22	0.7	2	18200	2	JOMU1407
63	**WJX14-063A05AR**	★	5	47.5	50	22	0.7	2	18200	2	JOMU1407
63	**WJX14-063X05AR**	★	5	47.5	50	27	0.6	2	18200	2	JOMU1407
66	**WJX14-066X05AR**	★	5	50.4	50	27	0.7	2	17700	2	JOMU1407
80	**WJX14-080A05AR**	★	5	64.4	50	27	1.2	2	15600	2	JOMU1407
80	**WJX14-080A06AR**	★	6	64.4	50	27	1.2	2	15600	2	JOMU1407
100	**WJX14-100A06AR**	★	6	84.4	63	32	2.5	2	13500	2	JOMU1407
100	**WJX14-100A07AR**	★	7	84.4	63	32	2.5	2	13500	2	JOMU1407
125	**WJX14-125B07AR**	★	7	109.4	63	40	3.2	2	11600	3	JOMU1407
125	**WJX14-125B09AR**	★	9	109.4	63	40	3.1	2	11600	3	JOMU1407
160	**WJX14-160B09AR**	★	9	144.4	63	40	4.9	2	9900	3	JOMU1407

⋆ Refer to page K326, for the maximum drilling depth (**AZ**).
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.

MOUNTING DIMENSIONS

(mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
50	**WJX14-050A03AR**	22	20	—	—	18.3	47	10.4	6.3	1
50	**WJX14-050A04AR**	22	20	—	—	18.3	47	10.4	6.3	1
50	**WJX14R05003BA**	22.225	20	—	—	18.3	47	8.4	5	1
50	**WJX14R05004BA**	22.225	20	—	—	18.3	47	8.4	5	1
52	**WJX14-052A04AR**	22	20	—	—	18.3	47	10.4	6.3	1
63	**WJX14-063A04AR**	22	20	11	17	16.7	60	10.4	6.3	2
63	**WJX14-063A05AR**	22	20	11	17	16.7	60	10.4	6.3	2
63	**WJX14R06304BA**	22.225	19	11	17	17.7	60	8.4	5	2
63	**WJX14R06305BA**	22.225	19	11	17	17.7	60	8.4	5	2
63	**WJX14-063X05AR**	27	23	13	20	15.7	60	12.4	7	2
66	**WJX14-066X05AR**	27	23	13	20	15.7	60	12.4	7	2
80	**WJX14-080A05AR**	27	23	13	20	15.7	76	12.4	7	2
80	**WJX14-080A06AR**	27	23	13	20	15.7	76	12.4	7	2
80	**WJX14R08005DA**	31.75	32	17	26	19.7	76	12.7	8	2
80	**WJX14R08006DA**	31.75	32	17	26	19.7	76	12.7	8	2
100	**WJX14R10006DA**	31.75	32	17	26	19.7	96	12.7	8	2
100	**WJX14R10007DA**	31.75	32	17	26	19.7	96	12.7	8	2
100	**WJX14-100A06AR**	32	26	17	26	25.7	96	14.4	8	2
100	**WJX14-100A07AR**	32	26	17	26	25.7	96	14.4	8	2
125	**WJX14R12507EA**	38.1	40	40	56	21.7	100	15.9	10	3
125	**WJX14R12509EA**	38.1	40	40	56	21.7	100	15.9	10	3
125	**WJX14-125B07AR**	40	40	42	56	21.7	100	16.4	9	3
125	**WJX14-125B09AR**	40	40	42	56	21.7	100	16.4	9	3
160	**WJX14-160B09AR**	40	40	42	56	21.7	100	16.4	9	3
160	**WJX14R16009FA**	50.8	43	53	72	18.7	100	19.1	11	3

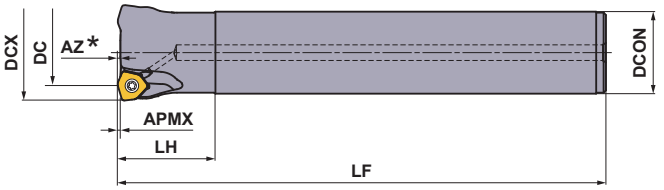
SPARE PARTS

(mm)

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20T	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

ISO13399 ➤ K003
OPERATIONAL GUIDANCE ➤ K327
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Right hand tool holder only.

■SHANK TYPE

With Air / coolant through.

(mm)

DCX	Order Number	Stock R	Number of Teeth	DC	LF	LH	DCON	APMX	RPMX (min^{-1})	Insert Type
50	**WJX14R5003SA42S**	★	3	34.5	150	50	42	2	21200	JOMU1407
50	**WJX14R5003SA42L**	★	3	34.5	250	50	42	2	21200	JOMU1407

* Refer to page K326, for the maximum drilling depth (**AZ**).

SPARE PARTS

Tool Holder Type	*		
	Clamp Screw	Wrench (Insert)	Anti-seize Lubricant
WJX14	TS5R	TKY20D	MK1KS

* Clamp Torque (lbf-in) : TS5R = 44

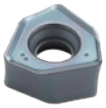
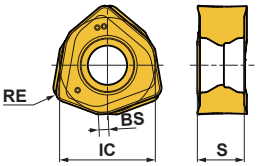
INSERTS

(inch)

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Edge Preparation :
E : Round

Shape	Order Number	Class	Edge Preparation	Coated									IC	S	BS	RE	Geometry
				MC7020	MP6120	MP6130	MP7130	MP7140	MP9120	MP9130	VP15TF	VP30RT					
	**JOMU140715ZZER-L**	M	E	●	●	●	●	●	●	●	●	●	.551	.259	.051	.059	
	JOMU140715ZZER-M	M	E	●	●	●	●	●	●	●	●	●	.551	.261	.051	.059	
	JOMU140715ZZER-R	M	E	●	●	●					●	●	.551	.266	.051	.059	

Right hand insert only.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

ISO13399 ➤ K003
OPERATIONAL GUIDANCE ➤ K327
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

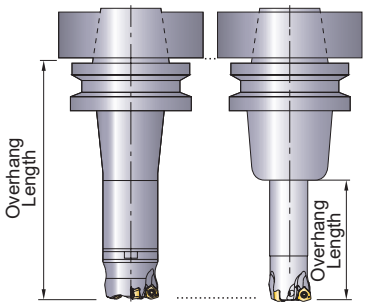
RECOMMENDED CUTTING CONDITIONS

■ Correction Value According to Overhang Length

Multiply the recommended cutting conditions on pages K323—K325 by the corrections factor x overhang length.

(inch)

Type	Cutting Dia. Max. **DCX**	Overhang Length	Correction Value According		
			Cutting Speed **vc** (SFM)	Depth of Cut **ap**	Feed **fz** (IPT)
Shank Type	1.969	< 2.5×DCON	100%	100%	100%
		3.0×DCON	90%	100%	90%
		4.0×DCON	80%	80%	90%
Arbor Type	2.000—3.150	< 2.5×DCX	100%	100%	100%
		3.0×DCX	85%	100%	90%
		4.0×DCX	80%	80%	80%
		5.0×DCX	75%	75%	60%
		6.0×DCX	70%	70%	40%
	≥3.937	8.0	100%	100%	100%
		12.0	85%	100%	90%
		16.0	80%	80%	80%



DCON=Connection Dia.

■ CUTTING SPEED (Dry Cutting)

(inch)

Workpiece Material		Properties	Cutting Speed **vc** (SFM)				
P			MP6130	MP6120	MC7020	VP15TF	VP30RT
	Mild Steel	Hardness ≤180HB	460 (295—590)	490 (330—655)	720 (560—885)	490 (330—655)	395 (260—525)
	Carbon Steel Alloy Steel	Hardness 180—280HB	395 (230—590)	460 (260—655)	655 (490—820)	460 (260—655)	330 (195—490)
	Carbon Steel Alloy Steel	Hardness 280—350HB	395 (230—590)	460 (260—655)	655 (490—820)	460 (260—655)	330 (195—490)
	Alloy Tool Steel	Hardness ≤350HB (Annealing)	395 (230—590)	460 (260—655)	655 (490—820)	460 (260—655)	330 (195—490)
	Pre-hardened Steel	Hardness 35—45HRC	295 (165—425)	360 (230—490)	—	360 (230—490)	260 (130—395)
M			MP7130	MP7140	MC7020	VP30RT	
	Austenitic Stainless Steel	Hardness ≤200HB	525 (425—655)	490 (395—590)	720 (560—885)	490 (395—590)	
	Austenitic Stainless Steel	Hardness >200HB	460 (330—655)	425 (260—590)	620 (460—785)	425 (260—590)	
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	490 (330—655)	425 (260—590)	720 (560—885)	425 (260—590)	
	Duplex Stainless Steel	Hardness ≤280HB	425 (260—590)	360 (195—525)	590 (425—755)	360 (195—525)	
	Precipitation Hardening Stainless Steel	Hardness <450HB	360 (195—525)	295 (165—425)	560 (395—720)	295 (165—425)	
K			VP15TF				
	Gray Cast Iron	Tensile Strength ≤350MPa	525 (395—655)				
	Ductile Cast Iron	Tensile Strength ≤450MPa	490 (330—655)				
	Ductile Cast Iron	Tensile Strength ≤800MPa	395 (260—525)				
S			MP9130	MP9120	VP15TF		
	Titanium Alloys	—	130 (100—195)	165 (100—210)	165 (100—210)		
	Heat Resistant Alloys	—	100 (65—130)	130 (65—165)	130 (65—165)		
H			VP15TF				
	Hardened Steel	Hardness 40—55HRC	230 (130—330)				

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.
Note 2) When wet cutting, tool life may become shorter than dry cutting. When carrying out wet cutting for the applications recommended with dry cutting, reduce the cutting speed by 25%.
Note 3) When large vibration occurs, reduce the cutting conditions.
Note 4) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Depth of Cut **ap**	Breaker	Cutting Dia. Max. DCX=2.000", 50 mm, 52 mm Feed **fz** (IPT)	Cutting Dia. Max. DCX≥2.500", 63 mm Feed **fz** (IPT)	Cutting Mode
P	Mild Steel	Hardness ≤180HB	≤.040	M,R *	.059(.024—.098)	.067(.024—.110)	Dry
				L	.047(.016—.079)	.047(.016—.079)	Dry
			≤.060	M,R *	.051(.024—.079)	.059(.024—.098)	Dry
				L	.039(.016—.071)	.039(.016—.071)	Dry
			≤.080	M,R *	.047(.024—.079)	.051(.024—.098)	Dry
				L	.031(.016—.067)	.031(.016—.067)	Dry
			≤.100	M,R	.031(.012—.059)	.039(.012—.063)	Dry
			≤.120	M,R	.016(.008—.039)	.020(.008—.047)	Dry
	Carbon Steel Alloy Steel	Hardness 180-280HB	≤.040	M,R *	.059(.020—.079)	.067(.020—.098)	Dry
				L	.039(.012—.067)	.039(.012—.067)	Dry
			≤.060	M,R *	.047(.020—.067)	.051(.020—.098)	Dry
				L	.031(.012—.059)	.031(.012—.059)	Dry
			≤.080	M,R *	.039(.020—.059)	.047(.020—.079)	Dry
				L	.028(.012—.047)	.028(.012—.047)	Dry
			≤.100	M,R	.028(.012—.047)	.035(.012—.059)	Dry
			≤.120	M,R	.012(.008—.031)	.016(.008—.039)	Dry
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 280-350HB ≤350HB (Annealing)	≤.040	M,R *	.059(.020—.079)	.067(.020—.098)	Dry
				L	.039(.012—.067)	.039(.012—.067)	Dry
			≤.060	M,R *	.047(.020—.067)	.051(.020—.087)	Dry
				L	.031(.012—.059)	.031(.012—.059)	Dry
			≤.080	M,R *	.039(.020—.059)	.047(.020—.079)	Dry
				L	.028(.012—.047)	.028(.012—.047)	Dry
			≤.100	M,R	.028(.012—.047)	.035(.012—.059)	Dry
			≤.120	M,R	.012(.008—.031)	.016(.008—.039)	Dry
	Pre-hardened Steel	Hardness 35-45HRC	≤.040	M,R *	.051(.016—.067)	.059(.016—.079)	Dry
				L	.028(.012—.047)	.028(.012—.047)	Dry
			≤.060	M,R *	.039(.016—.059)	.047(.016—.059)	Dry
				L	.024(.012—.039)	.024(.012—.039)	Dry
			≤.080	M,R *	.031(.016—.047)	.039(.016—.051)	Dry
				L	.020(.012—.031)	.020(.012—.031)	Dry
M	Austenitic Stainless Steel	—	≤.040	L *	.031(.012—.047)	.031(.012—.047)	Dry
				M	.039(.020—.047)	.039(.020—.047)	Dry
			≤.060	L *	.031(.012—.039)	.031(.012—.039)	Dry
				M	.039(.020—.039)	.039(.020—.039)	Dry
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	≤.040	L *	.031(.012—.047)	.031(.012—.047)	Dry
				M	.039(.020—.047)	.039(.020—.047)	Dry
			≤.060	L *	.031(.012—.039)	.031(.012—.039)	Dry
				M	.039(.020—.039)	.039(.020—.039)	Dry
	Duplex Stainless Steel	Hardness ≤280HB	≤.040	L *	.024(.012—.039)	.024(.012—.039)	Dry
				M	.031(.016—.039)	.031(.016—.039)	Dry
			≤.060	L *	.024(.012—.031)	.024(.012—.031)	Dry
				M	.031(.016—.031)	.031(.016—.031)	Dry
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.040	L *	.024(.012—.039)	.024(.012—.039)	Dry
				M	.031(.016—.039)	.031(.016—.039)	Dry
			≤.060	L *	.024(.012—.031)	.024(.012—.031)	Dry
				M	.031(.016—.031)	.031(.016—.031)	Dry

* The 1st recommend chip breaker for each depth of cut (**ap**).

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.

Note 2) When large vibration occurs, reduce the cutting conditions.

Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

(inch)

	Workpiece Material	Properties	Depth of Cut **ap**	Breaker	Cutting Dia. Max. DCX=2.000", 50 mm, 52 mm Feed **fz** (IPT)	Cutting Dia. Max. DCX≥2.500", 63 mm Feed **fz** (IPT)	Cutting Mode
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.040	M,R *	.067(.024—.098)	.071(.024—.110)	Dry
				L	.051(.016—.079)	.051(.016—.079)	Dry
			≤.060	M,R *	.059(.024—.079)	.067(.024—.098)	Dry
				L	.047(.016—.071)	.047(.016—.071)	Dry
			≤.080	M,R *	.051(.024—.079)	.059(.024—.098)	Dry
				L	.039(.016—.059)	.039(.016—.059)	Dry
			≤.100	M,R	.031(.012—.059)	.039(.012—.063)	Dry
			≤.120	M,R	.016(.008—.039)	.020(.008—.047)	Dry
	Ductile Cast Iron	Tensile Strength ≤450MPa	≤.040	M,R *	.059(.020—.079)	.067(.020—.098)	Dry
				L	.047(.012—.079)	.047(.012—.079)	Dry
			≤.060	M,R *	.051(.020—.071)	.059(.020—.079)	Dry
				L	.039(.012—.067)	.039(.012—.067)	Dry
			≤.080	M,R *	.047(.020—.071)	.051(.020—.079)	Dry
				L	.031(.012—.059)	.031(.012—.059)	Dry
			≤.100	M,R	.028(.012—.047)	.035(.012—.059)	Dry
			≤.120	M,R	.012(.008—.031)	.016(.008—.039)	Dry
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.040	M,R *	.051(.016—.071)	.059(.016—.079)	Dry
				L	.039(.012—.067)	.039(.012—.067)	Dry
			≤.060	M,R *	.047(.016—.059)	.051(.016—.071)	Dry
				L	.031(.012—.059)	.031(.012—.059)	Dry
			≤.080	M,R *	.039(.016—.059)	.047(.016—.071)	Dry
				L	.028(.012—.047)	.028(.012—.047)	Dry
S	Titanium Alloys	—	≤.040	L	.012(.008—.024)	.012(.008—.024)	Wet
			≤.060	L	.012(.008—.020)	.012(.008—.020)	Wet
			≤.080	L	.012(.008—.016)	.012(.008—.016)	Wet
	Heat Resistant Alloys	—	≤.040	L,M,R	.039(.012—.051)	.039(.012—.051)	Wet
			≤.060	L,M,R	.031(.012—.047)	.031(.012—.047)	Wet
			≤.080	L,M,R	.028(.012—.047)	.028(.012—.047)	Wet
H	Hardened Steel	Hardness 40-55HRC	≤.040	R,M	.031(.012—.047)	.031(.012—.047)	Dry
			≤.060	R,M	.024(.012—.039)	.024(.012—.039)	Dry
			≤.080	R,M	.020(.012—.031)	.020(.012—.031)	Dry

* The 1st recommend chip breaker for each depth of cut (**ap**).

Note 1) To discharge chips effectively, use an air blow when machining. When the air blow is less effective at discharging chips, we recommend wet cutting.

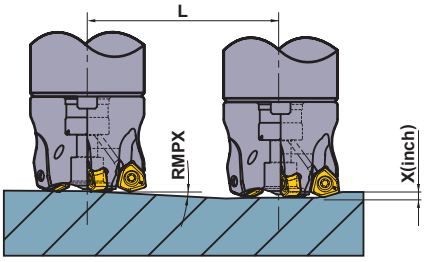
Note 2) When large vibration occurs, reduce the cutting conditions.

Note 3) For interrupted cutting, reduce the cutting speed and feed rate by 20%.

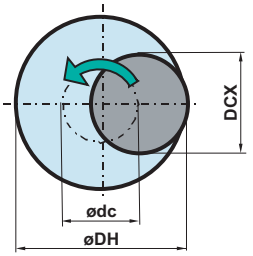
Note 4) If ap is set at .079" or more, avoid machining on the walls or ramping.

MAXIMUM CAPACITIES BY MODE

■ Ramping



■ Helical Milling



● How to derive a locus of the center of the tool.

ødc = øDH - DCX

ødc: Locus of the Center of the Tool
øDH: Desired Hole Diameter
DCX: Cutting Diameter Maximum

(inch)

Tool Holder Type	DCX	DC	APMX	Ramping			Helical Milling (Blind Hole, Flat Bottom)		Helical Milling (Through Hole)	AZ
				RMPX	L (inch) Required Distance for X inch Depth		DH		DH	
					x=.039	x=.079	Min.	Max.	Min.	
WJX14UR2.000	2.000	1.338	.079	4.3	.524	1.048	3.285	3.901	2.919	.082
WJX14UR2.500	2.500	1.887	.079	3°	.752	1.503	4.283	4.901	3.912	.082
WJX14UR3.000	3.000	2.387	.079	2.2°	1.025	2.050	5.283	5.901	4.909	.082
WJX14UR4.000	4.000	3.386	.079	1.5°	1.504	3.007	7.282	7.901	6.906	.082
WJX14UR5.000	5.000	4.386	.079	1.1°	2.051	4.101	9.281	9.901	8.904	.082
WJX14UR6.000	6.000	5.386	.079	0.9°	2.507	5.013	11.281	11.901	10.903	.082
WJX14R50	1.969	1.358	.079	4.4°	.512	1.024	3.228	3.819	2.874	.082
WJX14-050	1.969	1.358	.079	4.4	.512	1.024	3.228	3.819	2.874	.082
WJX14R050	1.969	1.358	.079	4.4	.512	1.024	3.228	3.819	2.874	.082
WJX14-052	2.047	1.437	.079	4.1	.551	1.102	3.386	3.976	3.031	.082
WJX14-063	2.480	1.870	.079	3°	.752	1.504	4.252	4.843	3.898	.082
WJX14R063	2.480	1.870	.079	3°	.752	1.504	4.252	4.843	3.898	.082
WJX14-066	2.598	1.984	.079	2.8°	.807	1.610	4.488	5.079	4.134	.082
WJX14-080	3.150	2.535	.079	2.1°	1.075	2.150	5.591	6.181	5.236	.082
WJX14R080	3.150	2.535	.079	2.1°	1.075	2.150	5.591	6.181	5.236	.082
WJX14-100	3.937	3.323	.079	1.5°	1.504	3.008	7.165	7.756	6.811	.082
WJX14R100	3.937	3.323	.079	1.5°	1.504	3.008	7.165	7.756	6.811	.082
WJX14-125	4.921	4.307	.079	1.2°	1.882	3.760	9.134	9.724	8.780	.082
WJX14R125	4.921	4.307	.079	1.2°	1.882	3.760	9.134	9.724	8.780	.082
WJX14-160	6.299	5.685	.079	0.8°	2.823	5.642	11.890	12.480	11.535	.082
WJX14R160	6.299	5.685	.079	0.8°	2.823	5.642	11.890	12.480	11.535	.082

Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping, helical milling and drilling, long continuous chips may be scattered so please be careful.

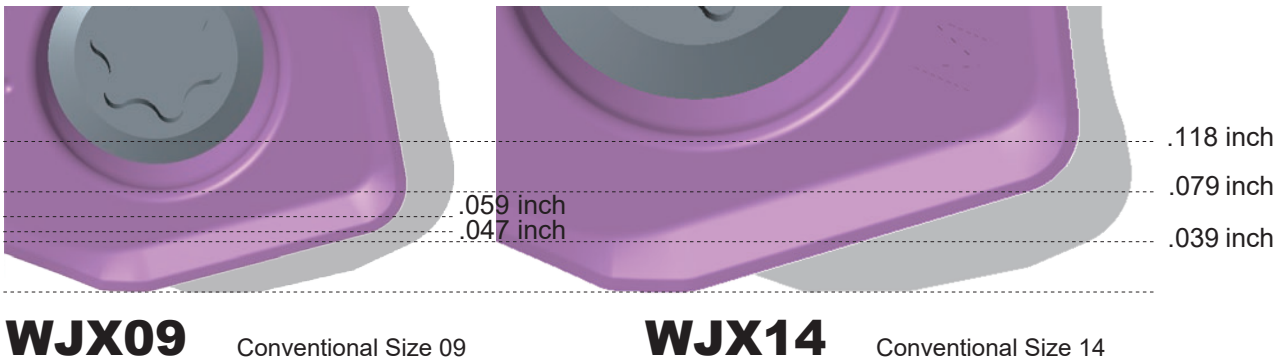
<Helical Milling>
To obtain a flat bottom surface when helical milling, it requires to remove “the uncut part” in the center of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (APMX).
<Drilling>
When drilling, set the axial feed per revolution at .008 IPR or less.

OPERATIONAL GUIDANCE

■ Depth of Cut

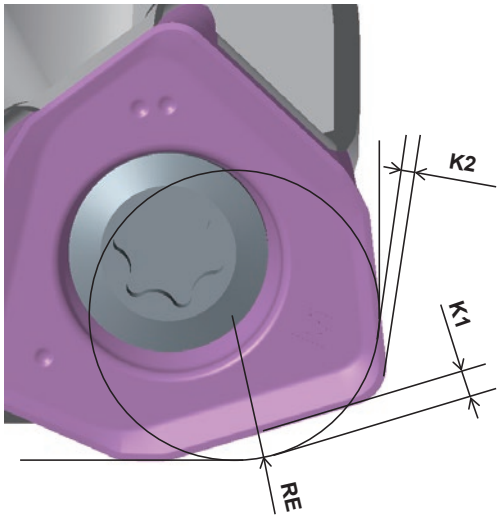
Refer to the following table for the maximum depth of cut of the WJX.
The straight cutting edge extending to the maximum depth of cut (APMX) allows for stable machining even at high depths of cut.
For face milling, lowering the feed rate will allow to exceed the APMX, up to depths of cut shown in the following table (when using the corner R).
For details on the feed rate, refer to the recommended cutting conditions on K315 and K323.

	WJX09	WJX14
High feed and multi-function machining (APMX)	ap=.047 inch	ap=.079 inch
Low feed and Face machining	ap=.059 inch	ap=.118 inch



■ Remaining Stock

For CAM, use CAD data (from online catalogs), or use a definition as a radius milling cutter with reference to the following table.
The approximate radius RE, remaining stock K1, and over cutting amount K2 are as shown in the following table.



WJX09

RE	Remaining Stock K1	Over Cut K2
R.079 (Recommendation)	.037	.000
R.091	.034	.000
R.118	.028	.005

WJX14

RE	Remaining Stock K1	Over Cut K2
R.118 (Recommendation)	.056	.000
R.126	.054	.000
R.157	.046	.004
R.197	.036	.015

(mm)

Depth of Cut ap	Remaining Stock H	
	WJX09	WJX14
.020	.001	–
.039	.003	.002
.059	–	.003
.079	–	.005

MULTI FUNCTIONAL MILLING

ARP

P | M | K | N | S | H

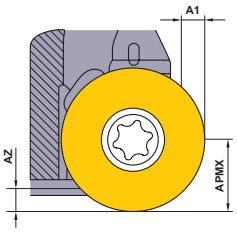


Fig.1

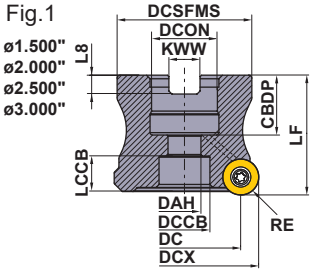
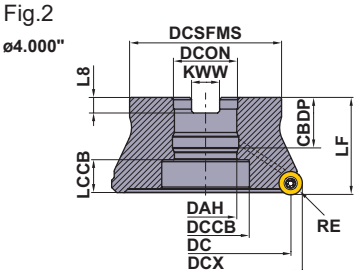


Fig.2



Right hand tool holder only.

DCX	Set Bolt	Geometry	
ϕ1.500"	HSC08025H	①	① ②
ϕ2.000"	HSC10030H		
ϕ2.500", ϕ3.000"	HSC12035H		
ϕ4.000"	MBA16033H	②	With Air / coolant through.

■ ARBOR TYPE

DCON = inch size, With Air / coolant through. (inch)

DCX	Order Number	Stock R	RE	Number of Teeth	Pitch	DC	LF	DCON	WT (lbs)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Fig.	Insert Type
1.500	**ARP5UPR1504SA**	●	.197	4	Fine	1.104	1.500	.500	.3	.079	.047	2.8°	1	RP◌T1040
1.500	**ARP5UPR1505SA**	●	.197	5	Extra Fine	1.104	1.500	.500	.3	.079	.047	2.8°	1	RP◌T1040
1.500	**ARP6UPR1504SA**	●	.236	4	Fine	1.026	1.500	.500	.3	.079	.041	2.7°	1	RP◌T1248
2.000	**ARP5UPR0206AA**	●	.197	6	Fine	1.604	1.750	.750	.8	.079	.073	2.9°	1	RP◌T1040
2.000	**ARP5UPR0207AA**	●	.197	7	Extra Fine	1.604	1.750	.750	.8	.079	.073	2.9°	1	RP◌T1040
2.000	**ARP6UPR0205AA**	●	.236	5	Fine	1.526	1.750	.750	.7	.079	.067	2.8°	1	RP◌T1248
2.000	**ARP6UPR0206AA**	●	.236	6	Extra Fine	1.526	1.750	.750	.7	.079	.067	2.8°	1	RP◌T1248
2.500	**ARP5UPR2507CA**	●	.197	7	Fine	2.104	2.000	1.000	1.4	.098	.098	2.9°	1	RP◌T1040
2.500	**ARP5UPR2508CA**	●	.197	8	Extra Fine	2.104	2.000	1.000	1.4	.098	.098	2.9°	1	RP◌T1040
2.500	**ARP6UPR2506CA**	●	.236	6	Fine	2.026	2.000	1.000	1.4	.098	.098	3.1°	1	RP◌T1248
2.500	**ARP6UPR2507CA**	●	.236	7	Extra Fine	2.026	2.000	1.000	1.4	.098	.098	3.1°	1	RP◌T1248
3.000	**ARP6UPR0308CA**	●	.236	8	Fine	2.526	2.000	1.000	1.8	.098	.098	2.4°	1	RP◌T1248
3.000	**ARP6UPR0309CA**	●	.236	9	Extra Fine	2.526	2.000	1.000	1.8	.098	.098	2.4°	1	RP◌T1248
4.000	**ARP6UPR0409EA**	●	.236	9	Fine	3.526	2.500	1.500	4.5	.098	.098	1.7°	2	RP◌T1248
4.000	**ARP6UPR0411EA**	●	.236	11	Extra Fine	3.526	2.500	1.500	4.5	.098	.098	1.7°	2	RP◌T1248

RMPX = Max. Ramping Angle

Note 1) For the maximum width of cut (APMX), Please refer to page K335.

MOUNTING DIMENSIONS

(inch)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.500	**ARP5UPR15**	.500	.630	.433	.276	.359	1.250	.250	.156	1
1.500	**ARP6UPR15**	.500	.630	.433	.276	.354	1.250	.250	.156	1
2.000	**ARP5UPR02**	.750	.748	.630	.413	.649	1.750	.313	.187	1
2.000	**ARP6UPR02**	.750	.748	.630	.413	.643	1.750	.313	.187	1
2.500	**ARP5UPR25**	1.000	.945	.787	.539	.702	2.190	.375	.219	1
2.500	**ARP6UPR25**	1.000	.945	.787	.539	.696	2.190	.375	.219	1
3.000	**ARP6UPR03**	1.000	.945	.787	.539	.696	2.190	.375	.219	1
4.000	**ARP6UPR04**	1.500	1.417	1.500	2.205	.802	3.500	.625	.375	2

Fig.1

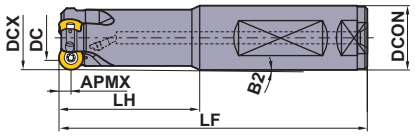


Fig.2

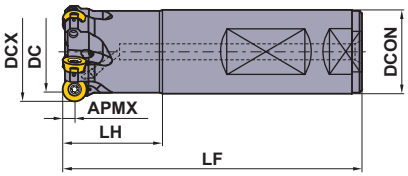


Fig.3

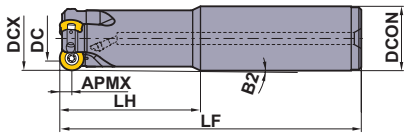
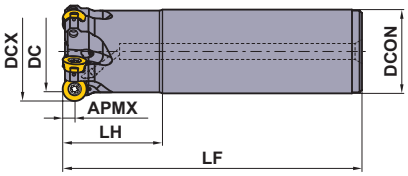


Fig.4



■ SHANK TYPE

DCON = inch size, With Air / coolant through.

(inch)

DCX	Order Number	Stock R	RE	Number of Teeth	DC	LF	LF	DCON	B2	WT (lbs)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Fig.	Insert Type
1.000	**ARP5UPR1603FA16M**	●	.197	3	.608	5.500	2.250	1.000	1.170°	.9	.039	.018	1.9°	1	RP◌T1040
1.000	**ARP5UPR1602SA16L**	●	.197	2	.608	7.000	3.000	1.000	.570°	1.3	.039	.018	1.9°	3	RP◌T1040
1.250	**ARP5UPR2004FA20M**	●	.197	4	.858	6.000	2.750	1.250	.760°	1.7	.039	.026	1.9°	1	RP◌T1040
1.250	**ARP5UPR2003SA20L**	●	.197	3	.858	8.000	4.750	1.250	1.010°	2.2	.039	.026	1.9°	3	RP◌T1040
1.250	**ARP6UPR2003FA20M**	●	.236	3	.781	6.000	2.750	1.250	.950°	1.7	.039	.024	2.0°	1	RP◌T1248
1.250	**ARP6UPR2002SA20L**	●	.236	2	.781	8.000	4.750	1.250	.510°	2.2	.039	.024	2.0°	3	RP◌T1248
1.500	**ARP6UPR2404FA20M**	●	.236	4	1.028	6.000	2.000	1.250	-	1.8	.098	.041	2.7°	2	RP◌T1248
1.500	**ARP6UPR2403SA20L**	●	.236	3	1.028	10.000	2.000	1.250	-	3.2	.098	.041	2.7°	4	RP◌T1248
2.000	**ARP6UPR3205FA24M**	●	.236	5	1.528	6.000	2.000	1.500	-	2.7	.098	.067	2.8°	2	RP◌T1248
2.000	**ARP6UPR3204SA24L**	●	.236	4	1.528	10.000	2.000	1.500	-	4.7	.098	.067	2.8°	4	RP◌T1248

Note 1) For the maximum width of cut (APMX), Please refer to page K335.

SPARE PARTS

Tool Holder Type	* Insert Screw	Wrench	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

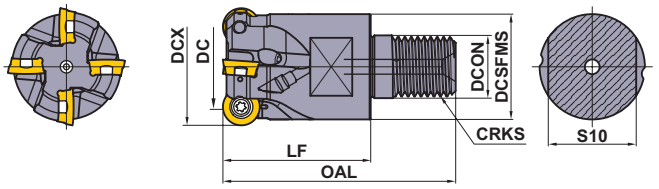
* Clamp Torque (lbf-in) : TPS351B = 22, TPS4 = 31

	≤140 PSI (≤5.3 gal/min)	←Standard→ (140 PSI-720 PSI)	≥720 PSI (≥7.9 gal/min)	≥1000 PSI (≥13.2 gal/min)	To Plug a Coolant Hole
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"	-
Order Number	**HSD04004H06***	**HSD04004H08***	**HSD04004H12***	**HSD04004H16***	**HSS04004**

* Clamp Torque (lbf-in) : HSD04004H◌◌= 13, HSS04004= 13

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select nozzles as required by the specification.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Right hand tool holder only.

■ SCREW-IN TYPE

With Air / coolant through.

DCX	Order Number	Stock R	RE	Number of Teeth	DC	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (lbs)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Insert Type
1.000	**ARP5UPR1603AM1235**	●	.197	3	.606	.492	.925	2.244	1.378	.748	M12	.2	—	.016	1.9°	RP◌T1040
1.250	**ARP5UPR2004AM1640**	●	.197	4	.856	.669	1.122	2.480	1.575	.945	M16	.4	.039	.026	1.9°	RP◌T1040
1.250	**ARP6UPR2003AM1640**	●	.236	3	.778	.669	1.122	2.480	1.575	.945	M16	.4	.039	.024	2.0°	RP◌T1248
1.500	**ARP6UPR2404AM1640**	●	.236	4	1.028	.669	1.122	2.480	1.575	.945	M16	.4	.098	.045	2.7°	RP◌T1248

Note 1) For the maximum width of cut (APMX), Please refer to page K335.

SPARE PARTS

Tool Holder Type	* Insert Screw	Wrench	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

* Clamp Torque (lbf-in) : TPS351B = 22, TPS4 = 31

	≤140 PSI (≤5.3 gal/min)	←Standard→ (140 PSI-720 PSI)	≥720 PSI (≥7.9 gal/min)	≥1000 PSI (≥13.2 gal/min)	To Plug a Coolant Hole
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"	-
Order Number	**HSD04004H06***	**HSD04004H08***	**HSD04004H12***	**HSD04004H16***	**HSS04004**

* Clamp Torque (lbf-in) : HSD04004H◌◌= 13, HSS04004= 13

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select nozzles as required by the specification.

Metric Standard

Fig.1

ø40
ø50
ø63
ø80

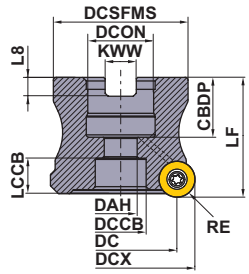
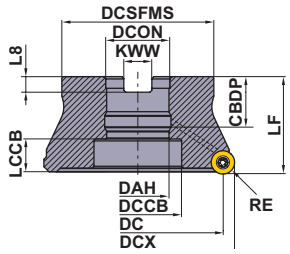
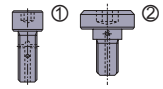


Fig.2

ø100



Right hand tool holder only.

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
–	ϕ40	HSC08025H	①	
–	ϕ50, ϕ63	HSC10030H		
ϕ80	ϕ80	HSC12035H		
ϕ100	ϕ100	MBA16033H	②	With Air / coolant through.

■ ARBOR TYPE

DCON = inch size, With Air / coolant through.

(mm)

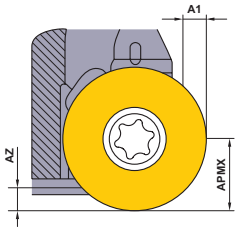
DCX	Order Number	Stock R	RE	Number of Teeth	DC	LF	DCON	WT (kg)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Fig.	Insert Type
80	**ARP6PR08008CA**	★	6	8	68	50	25.4	0.9	2.5	2.5	2.3°	1	RP◌T1248
80	**ARP6PR08009CA**	★	6	9	68	50	25.4	0.9	2.5	2.5	2.3°	1	RP◌T1248
100	**ARP6PR10009DA**	★	6	9	88	50	31.75	1.4	2.5	2.5	1.7°	2	RP◌T1248
100	**ARP6PR10011DA**	★	6	11	88	50	31.75	1.4	2.5	2.5	1.7°	2	RP◌T1248

DCON = mm size, With Air / coolant through.

(mm)

DCX	Order Number	Stock R	RE	Number of Teeth	DC	LF	DCON	WT (kg)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Fig.	Insert Type
40	**ARP5P-040A05AR**	★	5	5	29.9	40	16	0.2	2.0	1.3	2.8°	1	RP◌T1040
40	**ARP6P-040A04AR**	★	6	4	28	40	16	0.2	2.0	1.1	2.7°	1	RP◌T1248
50	**ARP5P-050A06AR**	★	5	6	39.9	40	22	0.3	2.0	1.8	2.9°	1	RP◌T1040
50	**ARP5P-050A07AR**	★	5	7	39.9	40	22	0.3	2.0	1.8	2.9°	1	RP◌T1040
50	**ARP6P-050A05AR**	★	6	5	38	40	22	0.3	2.0	1.7	2.9°	1	RP◌T1248
50	**ARP6P-050A06AR**	★	6	6	38	40	22	0.3	2.0	1.7	2.9°	1	RP◌T1248
63	**ARP5P-063A07AR**	★	5	7	52.9	40	22	0.5	2.5	2.5	3.0°	1	RP◌T1040
63	**ARP5P-063A08AR**	★	5	8	52.9	40	22	0.5	2.5	2.5	3.0°	1	RP◌T1040
63	**ARP6P-063A06AR**	★	6	6	51	40	22	0.4	2.5	2.5	3.1°	1	RP◌T1248
63	**ARR6P-063A07AR**	★	6	7	51	40	22	0.4	2.5	2.5	3.1°	1	RP◌T1248
80	**ARP6P-080A08AR**	★	6	8	68	50	27	0.9	2.5	2.5	2.3°	1	RP◌T1248
80	**ARP6P-080A09AR**	★	6	9	68	50	27	0.9	2.5	2.5	2.3°	1	RP◌T1248
100	**ARP6P-100B09AR**	★	6	9	88	50	32	1.5	2.5	2.5	1.7°	2	RP◌T1248
100	**ARP6P-100B11AR**	★	6	11	88	50	32	1.5	2.5	2.5	1.7°	2	RP◌T1248

Note 1) For the maximum width of cut (APMX), Please refer to page K335.



ISO13399	➢ K003
MOUNTING DIMENSION	➢ K332
SCREW-IN HOLDERS	➢ K382
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001

★ : Stocked in Japan

Fig.1

ø40
ø50
ø63
ø80

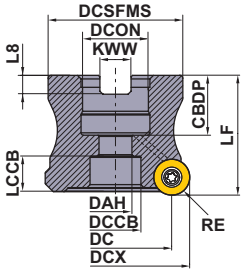
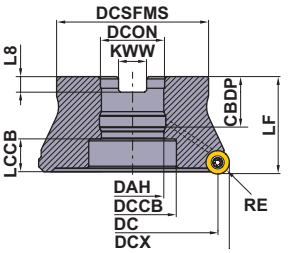
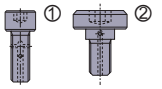


Fig.2

ø100



Right hand tool holder only.

DCX		Set Bolt	Geometry	
DCON inch size	DCON mm size			
–	ϕ40	HSC08025H	①	 With Air / coolant through.
–	ϕ50, ϕ63	HSC10030H		
ϕ80	ϕ80	HSC12035H		
ϕ100	ϕ100	MBA16033H	②	

MOUNTING DIMENSIONS

(mm)

DCX	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
40	**ARP5P-040A05AR**	16	18	9	14	14.0	34	8.4	5.6	1
40	**ARP6P-040A04AR**	16	18	9	13.4	13.9	34	8.4	5.6	1
50	**ARP5P-050A06AR**	22	20	11	17	12.0	45	10.4	6.3	1
50	**ARP5P-050A07AR**	22	20	11	17	12.0	45	10.4	6.3	1
50	**ARP6P-050A05AR**	22	20	11	17	11.9	45	10.4	6.3	1
50	**ARP6P-050A06AR**	22	20	11	17	11.9	45	10.4	6.3	1
63	**ARP5P-063A07AR**	22	20	11	17	12.0	50	10.4	6.3	1
63	**ARP5P-063A08AR**	22	20	11	17	12.0	50	10.4	6.3	1
63	**ARP6P-063A06AR**	22	20	11	17	11.9	50	10.4	6.3	1
63	**ARR6P-063A07AR**	22	20	11	17	11.9	50	10.4	6.3	1
80	**ARP6PR08008CA**	25.4	26	20	13	14.9	56	9.5	6.0	1
80	**ARP6PR08009CA**	25.4	26	20	13	14.9	56	9.5	6.0	1
80	**ARP6P-080A08AR**	27	23	13	20	14.9	56	12.4	7.0	1
80	**ARP6P-080A09AR**	27	23	13	20	14.9	56	12.4	7.0	1
100	**ARP6PR10009DA**	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	**ARP6PR10011DA**	31.75	32	31.75	45	11.9	70	12.7	8.0	2
100	**ARP6P-100B09AR**	32	26	45	32	16.9	78	14.4	8.0	2
100	**ARP6P-100B11AR**	32	26	45	32	16.9	78	14.4	8.0	2

SPARE PARTS

Tool Holder Type	*		
	Insert Screw	Wrench	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

* Clamp Torque (lbf-in) : TPS351B = 22, TPS4 = 31

	≤140 PSI (≤5.3 gal/min)	←Standard→ (140 PSI-720 PSI)	≥720 PSI (≥7.9 gal/min)	≥1000 PSI (≥13.2 gal/min)	To Plug a Coolant Hole
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"	-
Order Number	**HSD04004H06***	**HSD04004H08***	**HSD04004H12***	**HSD04004H16***	**HSS04004**

* Clamp Torque (lbf-in) : HSD04004H○○= 13, HSS04004= 13

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select nozzles as required by the specification.

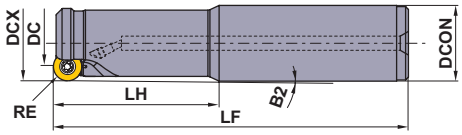


Fig.1

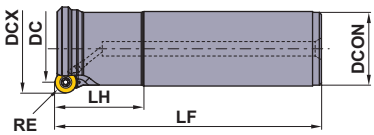


Fig.2

Metric Standard

■ SHANK TYPE

With Air / coolant through.

(mm)

DCX	Order Number	Stock R	RE	Number of Teeth	DC	LF	LH	DCON	B2	WT (kg)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Fig.	Insert Type
25	**ARP5PR2503SA25M**	★	5	3	15	140	60	25	1.10°	0.4	1.0	0.40	1.8°	1	RP◌T1040
25	**ARP5PR2502SA25L**	★	5	2	15	180	80	25	0.80°	0.6	1.0	0.40	1.8°	1	RP◌T1040
32	**ARP5PR3204SA32M**	★	5	4	22	150	70	32	0.92°	0.8	1.0	0.65	1.9°	1	RP◌T1040
32	**ARP6PR3203SA32M**	★	6	3	20	150	70	32	0.51°	0.8	1.0	0.60	2.0°	1	RP◌T1248
32	**ARP5PR3203SA32L**	★	5	3	22	200	120	32	0.94°	1.0	1.0	0.65	1.9°	1	RP◌T1040
32	**ARP6PR3202SA32L**	★	6	2	20	200	120	32	0.52°	1.0	1.0	0.60	2.0°	1	RP◌T1248
40	**ARP6PR4004SA32M**	★	6	4	28	150	50	32	–	0.9	2.5	1.15	2.7°	2	RP◌T1248
40	**ARP6PR4003SA32L**	★	6	3	28	250	50	32	–	1.5	2.5	1.15	2.7°	2	RP◌T1248
50	**ARP6PR5005SA42M**	★	6	5	38	150	50	42	–	1.5	2.5	1.70	2.9°	2	RP◌T1248
50	**ARP6PR5004SA42L**	★	6	4	38	250	50	42	–	2.5	2.5	1.70	2.9°	2	RP◌T1248

Note 1) For the maximum width of cut (APMX), Please refer to page K335.

SPARE PARTS

Tool Holder Type	* Insert Screw	Wrench	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

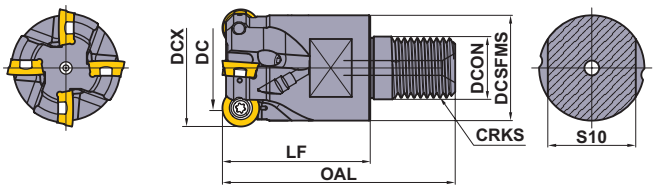
* Clamp Torque (lbf-in) : TPS351B = 22, TPS4 = 31

	≤140 PSI (≤5.3 gal/min)	←Standard→ (140 PSI-720 PSI)	≥720 PSI (≥7.9 gal/min)	≥1000 PSI (≥13.2 gal/min)	To Plug a Coolant Hole
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"	-
Order Number	**HSD04004H06***	**HSD04004H08***	**HSD04004H12***	**HSD04004H16***	**HSS04004**

* Clamp Torque (lbf-in) : HSD04004H◌◌= 13, HSS04004= 13

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select nozzles as required by the specification.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001



Metric Standard

■ SCREW-IN TYPE

With Air / coolant through.

(mm)

DCX	Order Number	Stock R	RE	Number of Teeth	DC	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	Max. Depth of Cut A1	Max. Depth of Cut AZ	RMPX	Insert Type
25	**ARP5PR2502AM1235**	★	5	2	15	12.5	23.5	57	35	19	M12	0.1	–	0.40	1.8°	RP◌T1040
25	**ARP5PR2503AM1235**	★	5	3	15	12.5	23.5	57	35	19	M12	0.1	–	0.40	1.8°	RP◌T1040
32	**ARP5PR3203AM1640**	★	5	3	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RP◌T1040
32	**ARP5PR3204AM1640**	★	5	4	22	17.0	28.5	63	40	24	M16	0.2	1.0	0.65	1.9°	RP◌T1040
32	**ARP6PR3202AM1640**	★	6	2	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RP◌T1248
32	**ARP6PR3203AM1640**	★	6	3	20	17.0	28.5	63	40	24	M16	0.2	1.0	0.60	2.0°	RP◌T1248
40	**ARP6PR4003AM1640**	★	6	3	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RP◌T1248
40	**ARP6PR4004AM1640**	★	6	4	28	17.0	28.5	63	40	24	M16	0.2	2.5	1.15	2.7°	RP◌T1248

Note 1) For the maximum width of cut (APMX), Please refer to page K335.

SPARE PARTS

Tool Holder Type	* Insert Screw	Wrench	Anti-seize Lubricant
ARP5	TPS351B	TIP10D	MK1KS
ARP6	TPS4	TIP15D	MK1KS

* Clamp Torque (lbf-in) : TPS351B = 22, TPS4 = 31

	≤140 PSI (≤5.3 gal/min)	←Standard→ (140 PSI-720 PSI)	≥720 PSI (≥7.9 gal/min)	≥1000 PSI (≥13.2 gal/min)	To Plug a Coolant Hole
Nozzle Dia.	ø.024"	ø.031"	ø.047"	ø.063"	-
Order Number	**HSD04004H06***	**HSD04004H08***	**HSD04004H12***	**HSD04004H16***	**HSS04004**

* Clamp Torque (lbf-in) : HSD04004H◌◌= 13, HSS04004= 13

Note 1) Coolant nozzles are available with varying diameters for adjusting coolant pressure.
Select nozzles as required by the specification.

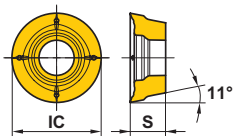
INSERTS

(mm)

Workpiece Material		
M	Stainless Steel	
S	Heat resistant Alloys, Titanium Alloys	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting
✠ : Unstable Cutting

Edge Preparation :
E : Round

Shape	Holder	Order Number	Type	Class	Edge Preparation	Coated MC7020	Coated MP7130	Coated MP9130	Coated MP9140	IC	S	APMX 4 Seats	APMX 8 Seats	Geometry
	ARP5	RPHT1040M0E4-L	Low Resistance, High Precision	H	E	●	●	●		.394	.156	.197	–	
		RPMT1040M0E4-L	Low Resistance	M	E	●	●	●		.394	.156	.197	–	
		NEW RPMT1040M0E8-L1	Low Resistance, 8 Seats	M	E	●	●	●	●	.394	.156	.197	.055	
		NEW RPMT1040M0E4-L2	Low Resistance, High Rigidity	M	E				●	.394	.156	.197	–	
		RPHT1040M0E4-M	General, High Precision	H	E	●	●	●		.394	.156	.197	–	
		RPMT1040M0E4-M	General Purpose	M	E	●	●	●		.394	.156	.197	–	
		NEW RPMT1040M0E8-M1	General, 8 Seats	M	E	●	●	●	●	.394	.156	.197	.055	
		NEW RPMT1040M0E4-M2	General, High Rigidity	M	E				●	.394	.156	.197	–	
		RPHT1040M0E4-R	Reinforced Edge, High Precision	H	E	●	●	●		.394	.156	.197	–	
		RPMT1040M0E4-R	Reinforced Edge	M	E	●	●	●		.394	.156	.197	–	
		NEW RPMT1040M0E8-R1	Reinforced Edge, 8 Seats	M	E	●	●	●		.394	.156	.197	.055	
	ARP6	RPHT1248M0E4-L	Low Resistance, High Precision	H	E	●	●	●		.472	.187	.236	–	
		RPMT1248M0E4-L	Low Resistance	M	E	●	●	●		.472	.187	.236	–	
		NEW RPMT1248M0E8-L1	Low Resistance, 8 Seats	M	E	●	●	●	●	.472	.187	.236	.067	
		NEW RPMT1248M0E4-L2	Low Resistance, High Rigidity	M	E				●	.472	.187	.236	–	
		RPHT1248M0E4-M	General, High Precision	H	E	●	●	●		.472	.187	.236	–	
		RPMT1248M0E4-M	General Purpose	M	E	●	●	●		.472	.187	.236	–	
		NEW RPMT1248M0E8-M1	General, 8 Seats	M	E	●	●	●	●	.472	.187	.236	.067	
		NEW RPMT1248M0E4-M2	General, High Rigidity	M	E				●	.472	.187	.236	–	
		RPHT1248M0E4-R	Reinforced Edge, High Precision	H	E	●	●	●		.472	.187	.236	–	
		RPMT1248M0E4-R	Reinforced Edge	M	E	●	●	●		.472	.187	.236	–	
		NEW RPMT1248M0E8-R1	Reinforced Edge, 8 Seats	M	E	●	●	●		.472	.187	.236	.067	

● = NEW

ISO13399 ➤ K003
SCREW-IN HOLDERS ➤ K382
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

RECOMMENDED CUTTING CONDITIONS

Dry Cutting

(inch)

	Workpiece Material	Hardness	Grade	vc (SFM)	fz (IPT)
M	Austenitic Stainless Steel	≤200HB	**MC7020**	720 (560–885)	.008 (.004–.014)
			MP7130	655 (490–820)	.008 (.004–.014)
	Austenitic Stainless Steel	>200HB	**MC7020**	620 (460–785)	.008 (.004–.014)
			MP7130	560 (395–720)	.008 (.004–.014)
	Duplex Stainless Steel	≤280HB	**MC7020**	590 (425–755)	.008 (.004–.014)
			MP7130	525 (360–690)	.008 (.004–.014)
	Ferritic and Martensitic Stainless Steel	≤200MPa	**MC7020**	785 (620–950)	.008 (.004–.014)
			MP7130	655 (490–820)	.008 (.004–.014)
	Ferritic and Martensitic Stainless Steel	>200HB	**MC7020**	785 (620–950)	.008 (.004–.014)
			MP7130	655 (490–820)	.008 (.004–.014)
	Precipitation Hardening Stainless Steel	<450HB	**MC7020**	560 (395–720)	.008 (.004–.014)
			MP7130	490 (330–655)	.008 (.004–.014)

Wet Cutting

(inch)

	Workpiece Material	Hardness	Grade	vc (SFM)	fz (IPT)
M	Austenitic Stainless Steel	≤200HB	**MC7020**	490 (330–655)	.008 (.004–.014)
			MP7130	425 (260–590)	.008 (.004–.014)
	Austenitic Stainless Steel	>200HB	**MC7020**	395 (230–560)	.008 (.004–.014)
			MP7130	330 (260–490)	.008 (.004–.014)
	Duplex Stainless Steel	≤280HB	**MC7020**	395 (230–560)	.008 (.004–.014)
			MP7130	330 (260–490)	.008 (.004–.014)
	Ferritic and Martensitic Stainless Steel	≤200MPa	**MC7020**	560 (395–720)	.008 (.004–.014)
			MP7130	425 (260–590)	.008 (.004–.014)
	Ferritic and Martensitic Stainless Steel	>200HB	**MC7020**	560 (395–720)	.008 (.004–.014)
			MP7130	425 (260–590)	.008 (.004–.014)
	Precipitation Hardening Stainless Steel	<450HB	**MC7020**	360 (195–525)	.008 (.004–.014)
			MP7130	295 (165–460)	.008 (.004–.014)
S	Titanium Alloys	–	**MP9130**	150 (100–180)	.004 (.002–.006)
			MP9140	130 (100–165)	.004 (.002–.006)
	Heat Resistant Alloys	–	**MP9130**	115 (50–150)	.004 (.002–.006)
			MP9140	100 (50–130)	.004 (.002–.006)

Note 1) Actual cutting conditions are estimated to avoid chatter vibration with high rigidity of a machine or workpiece material.
Make appropriate adjustments when chatter and/or insert chipping occurs during cutting.
Use with lowered conditions when there is a big overhang and/or when pocket-cutting.

Note 2) Feed rate for recommended cutting conditions table above based when axial depth of cut is ap=.098" with ARP5, and when depth of cut is ap=.118" with ARP6.
Due to the chip thinning effect when the axial depth of cut fluctuates, feed rate compensation table below shows (correction values "F") to help calculate correct feed.
Example: Feed recommended for ARP5, 304 Stainless steel, MP7130, ap=.039" is .008IPTx1.5(correction values "F")=.012IPT.

Note 3) For slotting, use 70% of the recommended feed rate listed above. For ramping, helical cutting, and plunging, use 50% of the recommended feed rate listed above.

Note 4) Internal coolant is recommended in titanium alloy and heat resistant alloy machining.

Feed rate compensation table, (correction values "F") based on axial depth of cut "ap" fluctuation.

Holder	ap = .020"	ap = .039"	ap = .059"	ap = .079"	ap = .098"	ap = .118"	ap = .138"	ap = .157"	ap = .197"	ap = .236"
ARP5	2.3	1.5	1.2	1.1	1.0	.9	.8	.8	.8	–
ARP6	2.5	1.7	1.3	1.1	1.0	1.0	.9	.9	.8	.8

* Tool body durability may weaken, when the amount of axial cutting exceeds ARP5=.197" and ARP6=.236".

MAXIMUM CAPACITIES BY EACH CUTTER

(inch)

APMX	DCX	Order Number	Install	Type	Depth of Cut (4Seats)		Ramping	Helical Cutting		Plunging Depth	Plunging
					ap	ae	RMPX(deg)	DH min.	DH max.	AZ max.	A1
.197" 5 mm	.984" 25 mm	ARP5PR2502AM1235	Screw-in	Standard	≤ .098	≤1.00DCX	1.8°	1.575	1.890	.016	—
		ARP5PR2503AM1235	Screw-in	Fine Pitch	≤ .059	≤1.00DCX	1.8°	1.575	1.890	.016	—
		ARP5PR2503SA25M	Shank	Standard	≤ .059	≤1.00DCX	1.8°	1.575	1.890	.016	.039
		ARP5PR2502SA25L	Shank	Long	≤ .059	≤1.00DCX	1.8°	1.575	1.890	.016	.039
	1.000"	ARP5UPR1603AM1235	Screw-in	Fine Pitch	≤ .059	≤1.00DCX	1.9°	1.606	1.921	.018	.039
		ARP5UPR1603FA16M	Shank	Standard	≤ .059	≤1.00DCX	1.9°	1.606	1.921	.018	.039
		ARP5UPR1602SA16L	Shank	Long	≤ .098	≤1.00DCX	1.9°	1.606	1.921	.018	.039
	1.250"	ARP5UPR2004AM1640	Screw-in	Fine Pitch	≤ .098	≤1.00DCX	1.9°	2.106	2.421	.026	.039
		ARP5UPR2004FA20M	Shank	Standard	≤ .098	≤1.00DCX	1.9°	2.106	2.421	.026	.039
		ARP5UPR2003SA20L	Shank	Long	≤ .098	≤1.00DCX	1.9°	2.106	2.421	.026	.039
	1.260" 32 mm	ARP5PR3203AM1640	Screw-in	Standard	≤ .098	≤1.00DCX	1.9°	2.126	2.441	.026	.039
		ARP5PR3204AM1640	Screw-in	Fine Pitch	≤ .098	≤1.00DCX	1.9°	2.126	2.441	.026	.039
		ARP5PR3204SA32M	Shank	Standard	≤ .098	≤1.00DCX	1.9°	2.126	2.441	.026	.039
		ARP5PR3203SA32L	Shank	Long	≤ .098	≤1.00DCX	1.9°	2.126	2.441	.026	.039
	1.500"	ARP5UPR1504SA	Arbor	Fine Pitch	≤ .098	≤1.00DCX	2.8°	2.606	2.921	.047	.079
		ARP5UPR1505SA	Arbor	Ex.-Fine	≤ .098	≤1.00DCX	2.8°	2.606	2.921	.047	.079
	1.575" 40 mm	ARP5P-040A05AR	Arbor	Fine Pitch	≤ .098	≤1.00DCX	2.8°	2.756	3.071	.051	.079
	1.969" 50 mm	ARP5P-050A06AR	Arbor	Fine Pitch	≤ .098	≤1.00DCX	2.9°	3.543	3.858	.073	.079
		ARP5P-050A07AR	Arbor	Ex.-Fine	≤ .059	≤1.00DCX	2.9°	3.543	3.858	.073	.079
	2.000"	ARP5UPR0206AA	Arbor	Fine Pitch	≤ .098	≤ .95DCX	2.9°	3.606	3.921	.007	.079
		ARP5UPR0207AA	Arbor	Ex.-Fine	≤ .059	≤ .95DCX	2.9°	3.606	3.921	.007	.079
	2.48" 63 mm	ARP5P-063A07AR	Arbor	Fine Pitch	≤ .098	≤ .75DCX	3.0°	4.567	4.882	.098	.098
		ARP5P-063A08AR	Arbor	Ex.-Fine	≤ .059	≤ .75DCX	3.0°	4.567	4.882	.098	.098
	2.500"	ARP5UPR2507CA	Arbor	Fine Pitch	≤ .098	≤ .75DCX	2.9°	4.606	4.921	.098	.098
		ARP5UPR2508CA	Arbor	Ex.-Fine	≤ .059	≤ .75DCX	2.9°	4.606	4.921	.098	.098

Note 1) When drilling long chips may be generated.
Note 2) When cutting helical holes, do not exceed the largest APMX cutting depth per rotation.
Note 3) Calculate using the following formula for center tool tracks and ϕdc when cutting helical holes: Center tool tracks ϕdc=desired hole diameter ϕDH tool diameter ϕDCX
Note 4) Use of air blow to disperse chips effectively is strongly recommended.
Note 5) Insert pockets are small in fine pitch and small diameter cutters therefore care should be taken to avoid chip jamming. Regulate thefeed and speed accordingly.
Note 6) When machining with a large diameter cutter at high feed rates, chip jamming may occur. Regulate the feed and speed accordingly.

MAXIMUM CAPACITIES BY EACH CUTTER

(inch)

APMX	DCX	Order Number	Install	Type	Depth of Cut (4Seats)		Ramping	Helical Cutting		Plunging Depth	Plunging
					ap	ae	RMPX(deg)	DH min.	DH max.	AZ max.	A1
.236" 6 mm	1.250"	ARP6UPR2003AM1640	Screw-in	Fine Pitch	≤ .138	≤1.00DCX	2.0°	2.028	2.421	.024	.039
		ARP6UPR2003FA20M	Shank	Standard	≤ .138	≤1.00DCX	2.0°	2.028	2.421	.024	.039
		ARP6UPR2002SA20L	Shank	Long	≤ .138	≤1.00DCX	2.0°	2.028	2.421	.024	.039
	1.260" 32 mm	ARP6PR3202AM1640	Screw-in	Standard	≤ .138	≤1.00DCX	2.0°	2.047	2.441	.024	.039
		ARP6PR3203AM1640	Screw-in	Fine Pitch	≤ .138	≤1.00DCX	2.0°	2.047	2.441	.024	.039
		ARP6PR3203SA32M	Shank	Standard	≤ .138	≤1.00DCX	2.0°	2.047	2.441	.024	.039
		ARP6PR3202SA32L	Shank	Long	≤ .138	≤1.00DCX	2.0°	2.047	2.441	.024	.039
	1.575" 40 mm	ARP6PR4003AM1640	Screw-in	Standard	≤ .138	≤1.00DCX	2.7°	2.677	3.071	.045	.098
		ARP6PR4004AM1640	Screw-in	Fine Pitch	≤ .138	≤1.00DCX	2.7°	2.677	3.071	.045	.098
		ARP6PR4004SA32M	Shank	Standard	≤ .138	≤1.00DCX	2.7°	2.677	3.071	.045	.098
		ARP6PR4003SA32L	Shank	Long	≤ .138	≤1.00DCX	2.7°	2.677	3.071	.045	.098
		ARP6P-040A04AR	Arbor	Fine Pitch	≤ .138	≤1.00DCX	2.7°	2.677	3.071	.045	.079
	1.500"	ARP6UPR2404AM1640	Screw-in	Fine Pitch	≤ .138	≤1.00DCX	2.7°	2.528	2.921	.041	.079
		ARP6UPR2404FA20M	Shank	Standard	≤ .138	≤1.00DCX	2.7°	2.528	2.921	.041	.079
		ARP6UPR2403SA20L	Shank	Long	≤ .138	≤1.00DCX	2.7°	2.528	2.921	.041	.079
		ARP6UPR1504SA	Arbor	Fine Pitch	≤ .138	≤1.00DCX	2.7°	2.528	2.921	.041	.079
	1.969" 50 mm	ARP6PR5005SA42M	Shank	Standard	≤ .138	≤1.00DCX	2.9°	3.465	3.858	.067	.098
		ARP6PR5004SA42L	Shank	Long	≤ .138	≤1.00DCX	2.9°	3.465	3.858	.067	.098
		ARP6P-050A05AR	Arbor	Fine Pitch	≤ .138	≤1.00DCX	2.9°	3.465	3.858	.067	.079
		ARP6P-050A06AR	Arbor	Ex.-Fine	≤ .098	≤1.00DCX	2.9°	3.465	3.858	.067	.079
	2.000"	ARP6UPR3205FA24M	Shank	Standard	≤ .138	≤1.00DCX	2.8°	3.528	3.921	.067	.098
		ARP6UPR3204SA24L	Shank	Long	≤ .138	≤1.00DCX	2.8°	3.528	3.921	.067	.098
		ARP6UPR0205AA	Arbor	Fine Pitch	≤ .138	≤ .95DCX	2.8°	3.528	3.921	.067	.079
		ARP6UPR0206AA	Arbor	Ex.-Fine	≤ .098	≤ .95DCX	2.8°	3.528	3.921	.067	.079
	2.48" 63 mm	ARP6P-063A06AR	Arbor	Fine Pitch	≤ .138	≤ .75DCX	3.1°	4.488	4.882	.098	.098
		ARP6P-063A07AR	Arbor	Ex.-Fine	≤ .098	≤ .75DCX	3.1°	4.488	4.882	.098	.098
	2.500"	ARP6UPR2506CA	Arbor	Fine Pitch	≤ .138	≤ .75DCX	3.1°	4.528	4.921	.098	.098
		ARP6UPR2507CA	Arbor	Ex.-Fine	≤ .098	≤ .75DCX	3.1°	4.528	4.921	.098	.098
	3.000"	ARP6UPR0308CA	Arbor	Fine Pitch	≤ .138	≤ .65DCX	2.4°	5.528	5.921	.098	.098
		ARP6UPR0309CA	Arbor	Ex.-Fine	≤ .098	≤ .65DCX	2.4°	5.528	5.921	.098	.098
	3.150" 80 mm	ARP6PR08008CA	Arbor	Fine Pitch	≤ .138	≤ .60DCX	2.3°	5.827	6.220	.098	.098
		ARP6PR08009CA	Arbor	Ex.-Fine	≤ .098	≤ .60DCX	2.3°	5.827	6.220	.098	.098
		ARP6P-080A08AR	Arbor	Fine Pitch	≤ .138	≤ .60DCX	2.3°	5.827	6.220	.098	.098
		ARP6P-080A09AR	Arbor	Ex.-Fine	≤ .098	≤ .60DCX	2.3°	5.827	6.220	.098	.098
	3.937" 100 mm	ARP6PR10009DA	Arbor	Fine Pitch	≤ .138	≤ .50DCX	1.7°	7.402	7.795	.098	.098
		ARP6PR10011DA	Arbor	Ex.-Fine	≤ .098	≤ .50DCX	1.7°	7.402	7.795	.098	.098
		ARP6P-100B09AR	Arbor	Fine Pitch	≤ .138	≤ .50DCX	1.7°	7.402	7.795	.098	.098
		ARP6P-100B11AR	Arbor	Ex.-Fine	≤ .098	≤ .50DCX	1.7°	7.402	7.795	.098	.098
	4.000"	ARP6UPR0409EA	Arbor	Fine Pitch	≤ .138	≤ .45DCX	1.7°	7.528	7.921	.098	.098
		ARP6UPR0411EA	Arbor	Ex.-Fine	≤ .098	≤ .45DCX	1.7°	7.528	7.921	.098	.098

Note 1) When drilling long chips may be generated.
Note 2) When cutting helical holes, do not exceed the largest APMX cutting depth per rotation.
Note 3) Calculate using the following formula for center tool tracks and ϕdc when cutting helical holes: Center tool tracks ϕdc=desired hole diameter ϕDH tool diameter ϕDCX
Note 4) Use of air blow to disperse chips effectively is strongly recommended.
Note 5) Insert pockets are small in fine pitch and small diameter cutters therefore care should be taken to avoid chip jamming. Regulate thefeed and speed accordingly.
Note 6) When machining with a large diameter cutter at high feed rates, chip jamming may occur. Regulate the feed and speed accordingly.

Memo

MULTI FUNCTIONAL MILLING

ARX

P M K N S H

Metric Standard

Fig.1 (Type with the center cutting edge)

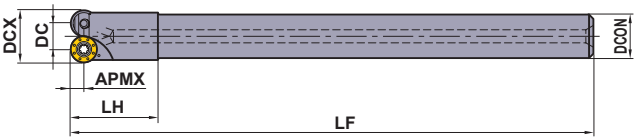
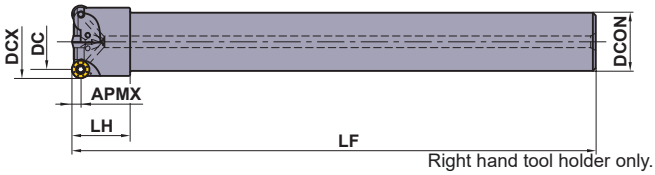


Fig.2 (Type without the center cutting edge (multi-tooth))



Right hand tool holder only.

■ STEEL SHANK TYPE

Type	Order Number	Stock	Coolant Thru *1	Number of Teeth	Dimensions (mm)					APMX (mm)	Fig.	*2		
		R			DCX	DCON	DC	LF	LH			Insert Screw	Wrench	Insert
With the Center Cutting Edge	**ARX25R102SA10S**	★	Y	2	10	10	5	120	20	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10S	★	Y	2	12	10	6	120	20	3.0	1	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12S	★	Y	2	14	12	7	140	20	3.5	1	TPS22	TIP07FS	RDMW0724M0E
Without the Center Cutting Edge (Multi-tooth)	**ARX25R122SA10S**	★	Y	2	12	10	7	120	20	2.5	2	TPS20	TIP06F	RDMW0517M0E
	ARX25R163SA16S	★	Y	3	16	16	11	180	20	2.5	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R163SA16S	★	Y	3	16	16	10	180	20	3.0	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R173SA16S	★	Y	3	17	16	12	180	20	2.5	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R173SA16S	★	Y	3	17	16	11	180	20	3.0	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R204SA20S	★	Y	4	20	20	15	180	20	2.5	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R203SA20S	★	Y	3	20	20	14	180	20	3.0	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R224SA20S	★	Y	4	22	20	17	180	20	2.5	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R224SA20S	★	Y	4	22	20	16	180	20	3.0	2	TPS22	TIP07FS	RDMW0620M0E
	ARX25R255SA20S	★	Y	5	25	20	20	180	20	2.5	2	TPS20	TIP06F	RDMW0517M0E
	ARX30R254SA20S	★	Y	4	25	20	19	180	20	3.0	2	TPS22	TIP07FS	RDMW0620M0E

*1 Y=Yes

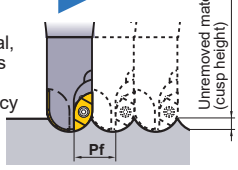
*2 Clamp Torque (lbf-in) : TPS20=4.5, TPS22=4.5, TPS22S=4.5

Using the ARX Effectively (Reducing Unremoved Material)

●When Milling Even Surfaces

Ball nose end milling

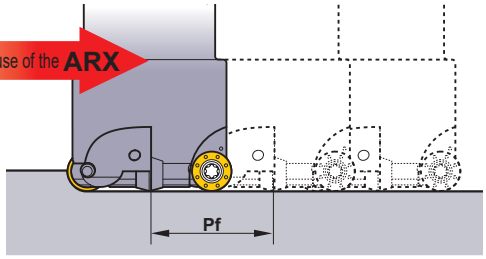
To reduce unremoved material, the pick feed needs to be reduced. (Machining efficiency will decrease.)



With the use of the ARX

Higher machining efficiency

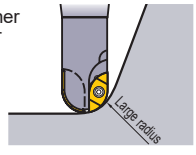
Even with a large pick feed, no unremoved material will remain.



●When Milling Corner Radius

Ball nose end milling

To machine small corner radii, the tool diameter needs to be reduced. (Tool rigidity will decrease.)



With the use of the ARX

A large shank diameter offering high rigidity can also machine small corner radii. (The cutting load of a subsequent finishing tool will be decreased thereby lengthening its' tool life. Surface finish quality will be improved.)

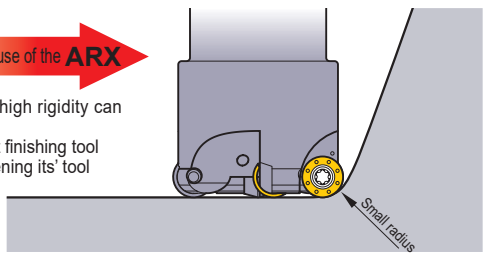


Fig.1

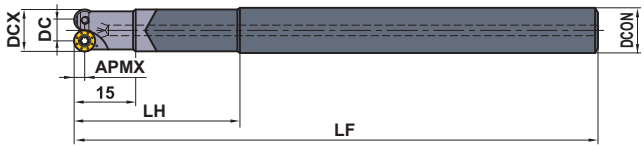


Fig.2

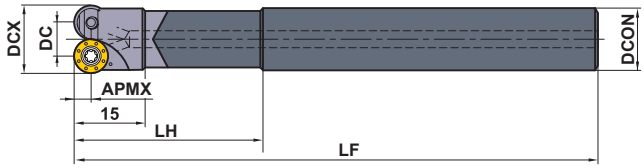
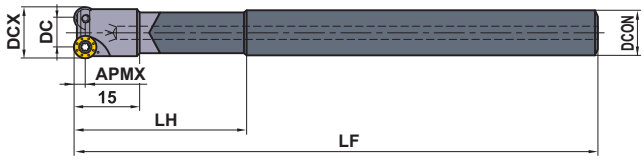


Fig.3



Metric Standard

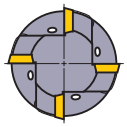
■ CARBIDE SHANK TYPE

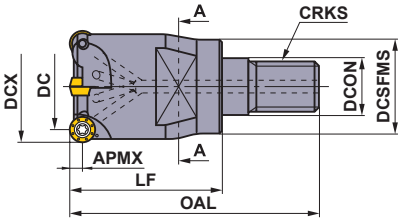
Right hand tool holder only.

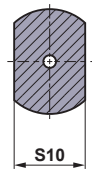
Type	Order Number	Stock	Coolant Thru *1	Number of Teeth	Dimensions (mm)					APMX (mm)	Fig.	*2		
		R			DCX	DCON	DC	LF	LH			Insert Screw	Wrench	Insert
With the Center Cutting Edge	**ARX25R102SA10LW**	★	Y	2	10	10	5	150	40	2.5	1	TPS20	TIP06F	RDMW0517M0E
	ARX30R122SA10LW	★	Y	2	12	10	6	150	40	3.0	1	TPS22S	TIP07FS	RDMW0620M0E
	ARX35R142SA12LW	★	Y	2	14	12	7	170	40	3.5	2	TPS22	TIP07FS	RDMW0724M0E
Without the Center Cutting Edge (Multi-tooth)	**ARX25R122SA10LW**	★	Y	2	12	10	7	150	40	2.5	3	TPS20	TIP06F	RDMW0517M0E

*1 Y=Yes

*2 Clamp Torque (lbf-in) : TPS20=4.5, TPS22=4.5, TPS22S=4.5







Section **A-A**

Metric Standard

■ SCREW-IN TYPE

Right hand tool holder only.

Order Number	Stock	Coolant Thru *3	Number of Teeth	Dimensions (mm)							*2	APMX (mm)	WT	*1		
	R			DCX	DCON	DC	DCSFMS	OAL	LF	S10	CRKS		(kg)	Insert Screw	Wrench	Insert
ARX25R163M08A30	★	Y	3	16	8.5	11	14.7	48	30	10	M8	2.5	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R173M08A30	★	Y	3	17	8.5	12	14.5	48	30	10	M8	2.5	0.1	TPS20	TIP06F	RDMW0517M0E
ARX25R204M10A30	★	Y	4	20	10.5	15	18.6	49	30	14	M10	2.5	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R224M10A30	★	Y	4	22	10.5	17	18.5	49	30	14	M10	2.5	0.2	TPS20	TIP06F	RDMW0517M0E
ARX25R255M12A35	★	Y	5	25	12.5	20	23.6	57	35	19	M12	2.5	0.2	TPS20	TIP06F	RDMW0517M0E
ARX30R163M08A30	★	Y	3	16	8.5	11	14.6	48	30	10	M8	3.0	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R173M08A30	★	Y	3	17	8.5	12	14.5	48	30	10	M8	3.0	0.1	TPS22	TIP07FS	RDMW0620M0E
ARX30R203M10A30	★	Y	3	20	10.5	15	18.5	49	30	14	M10	3.0	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R224M10A30	★	Y	4	22	10.5	17	18.5	49	30	14	M10	3.0	0.2	TPS22	TIP07FS	RDMW0620M0E
ARX30R254M12A35	★	Y	4	25	12.5	20	23.4	57	35	19	M12	3.0	0.2	TPS22	TIP07FS	RDMW0620M0E

*1 Clamp Torque (lbf-in) : TPS20=4.5, TPS22=4.5

*2 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2

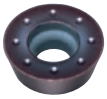
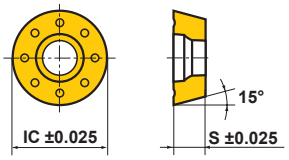
*3 Y=Yes

ISO13399	➤ K003
SCREW-IN HOLDERS	➤ K382
SPARE PARTS	➤ M001
TECHNICAL DATA	➤ N001

INSERTS

Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✠ : Unstable Cutting

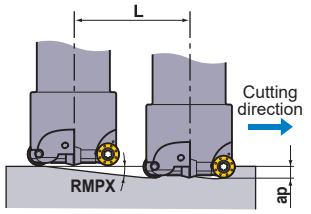
Shape	Order Number	Coated MP8010	Coated VP15TF	Dimensions (mm) IC	Dimensions (mm) S	Geometry
	**RDMW0517M0E**	★	★	5.0	1.70	
	RDMW0620M0E	★	★	6.0	1.99	
	RDMW0724M0E	★	★	7.0	2.38	

CUTTING MODE MAXIMUM CAPACITIES

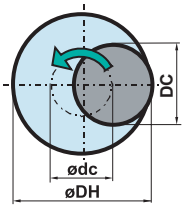
■ Ramping

Finding a cutters' distance moved **"L"** when depth of cut reaches **"ap"** at a ramping angle of **"α°"**.

L=ap/tan α (mm)



■ Helical Milling



●Setting a tool's center excursion

ødc = øDH - DC

Tool's center excursion | Required bore diameter | Tool's cutting diameter

●For the depth of cut per pass, refer to the cutting conditions on page K343 for helical milling.

●Set the machine spindle revolution so that the tool is rotating and cutting in a down cut direction.

Type	Order Number	DC (mm)	RE (mm)	Number of Teeth	Ramping RMPX *1	Ramping APMX (mm) *2	Ramping L (mm)	Helical Milling DH min. (mm)	Helical Milling DH max. (mm)
With the Center Cutting Edge	**ARX25R102SA10S**	10	2.5	2	90°	2.5	0	15	19
	ARX25R102SA10LW	10	2.5	2	90°	2.5	0	15	19
	ARX30R122SA10S	12	3.0	2	90°	3.0	0	18	23
	ARX30R122SA10LW	12	3.0	2	90°	3.0	0	18	23
	ARX35R142SA12S	14	3.5	2	90°	3.5	0	21	27
	ARX35R142SA12LW	14	3.5	2	90°	3.5	0	21	27
Without the Center Cutting Edge (Multi-tooth)	**ARX25R122SA10S**	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX25R122SA10LW	12	2.5	2	27.17°	2.5	4.87	19	23
	ARX30R163SA16S	16	3.0	3	21.25°	3.0	7.71	26	31
	ARX25R163SA16S	16	2.5	3	13.70°	2.5	10.26	27	31
	ARX30R173SA16S	17	3.0	3	18.42°	3.0	9.01	28	33
	ARX25R173SA16S	17	2.5	3	12.22°	2.5	11.54	29	33
	ARX30R203SA20S	20	3.0	3	13.21°	3.0	12.78	34	39
	ARX25R204SA20S	20	2.5	4	9.23°	2.5	15.38	35	39
	ARX30R224SA20S	22	3.0	4	11.13°	3.0	15.25	38	43
	ARX25R224SA20S	22	2.5	4	7.94°	2.5	17.92	39	43
	ARX30R254SA20S	25	3.0	4	9.01°	3.0	18.92	44	49
	ARX25R255SA20S	25	2.5	5	6.57°	2.5	21.71	45	49

*1 RMPX : Max. Ramping Angle
*2 APMX : Max. Depth of Cut

★ : Stocked in Japan
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

Note 1) The cutting conditions below are a guide only.
Please make adjustments according to the machining conditions.

■ Shoulder / Pocket / Ramping / Copying

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	VP15TF	590 (490—720)	≤.039	≤.020	≤.047	≤.020	≤.059	≤.020
	Carbon Steel, Alloy Steel	180—350HB	VP15TF	525 (395—655)	≤.028	≤.012	≤.035	≤.012	≤.047	≤.012
M	Stainless Steel	≤270HB	VP15TF	490 (395—590)	≤.028	≤.012	≤.035	≤.012	≤.047	≤.012
K	Cast Iron	Tensile strength≤450MPa	VP15TF	590 (490—720)	≤.039	≤.020	≤.047	≤.020	≤.059	≤.020
H	Hardened Steel	45—55HRC	VP15TF	260 (165—395)	≤.020	≤.008	≤.028	≤.008	≤.039	≤.008

Note 1) When ramping, refer to the machining limits on page K342.

■ Slotting

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut **ap** (inch)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	VP15TF	590 (490—720)	≤.039	≤.016	≤.047	≤.016	≤.059	≤.016
	Carbon Steel, Alloy Steel	180—350HB	VP15TF	525 (395—655)	≤.028	≤.008	≤.035	≤.008	≤.047	≤.008
M	Stainless Steel	≤270HB	VP15TF	490 (395—590)	≤.028	≤.008	≤.035	≤.008	≤.047	≤.008
K	Cast Iron	Tensile strength≤450MPa	VP15TF	590 (490—720)	≤.039	≤.016	≤.047	≤.016	≤.059	≤.016
H	Hardened Steel	45—55HRC	VP15TF	260 (165—395)	≤.020	≤.004	≤.028	≤.004	≤.039	≤.004

■ Plunging

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Width of Cut **ae** (inch)	Feed per Tooth **fz** (inch/tooth)	Width of Cut **ae** (inch)	Feed per Tooth **fz** (inch/tooth)	Width of Cut **ae** (inch)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	VP15TF	590 (490—720)	≤.098	≤.012	≤.118	≤.012	≤.138	≤.012
	Carbon Steel, Alloy Steel	180—350HB	VP15TF	525 (395—655)	≤.098	≤.008	≤.118	≤.008	≤.138	≤.008
M	Stainless Steel	≤270HB	VP15TF	490 (395—590)	≤.098	≤.008	≤.118	≤.008	≤.138	≤.008
K	Cast Iron	Tensile strength≤450MPa	VP15TF	590 (490—720)	≤.098	≤.012	≤.118	≤.012	≤.138	≤.012
H	Hardened Steel	45—55HRC	VP15TF	260 (165—395)	≤.098	≤.004	≤.118	≤.004	≤.138	≤.004

■ Helical Milling

	Workpiece Material	Hardness	Grade	Cutting Speed **vc** (SFM)	ARX25R□□□SA□□S		ARX30R□□□SA□□S		ARX35R□□□SA□□S	
					Depth of Cut Per Pass **ap** (inch/pass)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut Per Pass **ap** (inch/pass)	Feed per Tooth **fz** (inch/tooth)	Depth of Cut Per Pass **ap** (inch/pass)	Feed per Tooth **fz** (inch/tooth)
P	Mild Steel	≤180HB	VP15TF	590 (490—720)	≤.039	≤.012	≤.039	≤.012	≤.039	≤.012
	Carbon Steel, Alloy Steel	180—350HB	VP15TF	525 (395—655)	≤.028	≤.008	≤.035	≤.008	≤.039	≤.008
M	Stainless Steel	≤270HB	VP15TF	490 (395—590)	≤.028	≤.008	≤.035	≤.008	≤.039	≤.008
K	Cast Iron	Tensile strength≤450MPa	VP15TF	590 (490—720)	≤.039	≤.012	≤.039	≤.012	≤.039	≤.012
H	Hardened Steel	45—55HRC	VP15TF	260 (165—395)	≤.020	≤.004	≤.028	≤.004	≤.039	≤.004

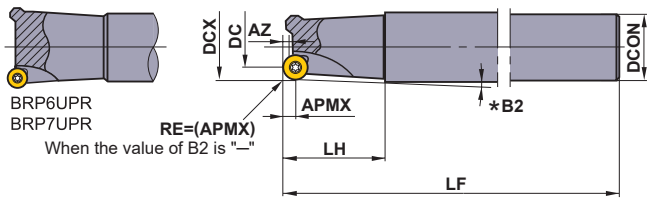
Note 1) When helical milling, refer to the machining limits on page K342.

MULTI FUNCTIONAL MILLING

BRP

P M K N S H

Fig.1



*Please allow for an inclination angle of B2+1°

Fig.2

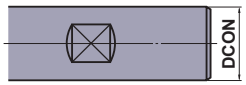


Fig.3

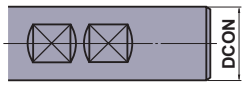
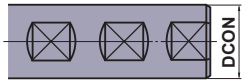


Fig.4



SHANK TYPE

Right hand tool holder only.

Corner Radius	Type *1	Order Number	Stock R	Number of Teeth	Dimensions (inch) DCX	DC	LF	DCON	LH	AZ	APMX	B2	Fig.	*2 Insert Screw	F D Wrench	① ② Insert
.156	R	BRP3UNR081W08	●	1	.500	.177	2.781	.500	1.000	.007	.146	2.93°	2	CS250560T	TKY08F	①RPMW07T200E ②RPMT07T200E-JS
		BRP3UNR101W10	●	1	.625	.303	3.500	.625	1.000	.039	.146	2.93°	3	CS250560T	TKY08F	
		BRP3UNR122W12	●	2	.750	.429	4.000	.750	1.250	.066	.146	2.27°	3	CS250560T	TKY08F	
		BRP3UNR163W16	●	3	1.000	.681	4.500	1.000	1.250	.078	.146	2.27°	4	CS250560T	TKY08F	
	L	BRP3UNR081LW08	●	1	.500	.177	6.000	.500	2.800	.007	.146	0.93°	1	CS250560T	TKY08F	
		BRP3UNR101LW10	●	1	.625	.303	6.000	.625	2.800	.039	.146	0.93°	1	CS250560T	TKY08F	
	EL	BRP3UNR122ELW12	●	2	.750	.429	10.000	.750	5.100	.066	.146	0.5°	1	CS250560T	TKY08F	
		BRP3UNR163ELW16	●	3	1.000	.681	10.000	1.000	5.100	.078	.146	0.5°	1	CS250560T	TKY08F	
.187	R	BRP4UNR101W10	●	1	.625	.244	3.500	.625	1.000	.011	.177	3.05°	3	CS350760T	TKY15F	①RPMW09T300E ②RPMT09T300E-JS
		BRP4UNR121W12	●	1	.750	.366	4.000	.750	1.250	.035	.177	2.33°	3	CS350760T	TKY15F	
		BRP4UNR162W16	●	2	1.000	.618	4.500	1.000	1.250	.098	.177	2.33°	4	CS350760T	TKY15F	
		BRP4UNR203W20	●	3	1.250	.866	5.000	1.250	1.750	.098	.177	1.58°	4	CS350760T	TKY15F	
	L	BRP4UNR101LW10	●	1	.625	.244	6.000	.625	2.800	.011	.177	0.95°	1	CS350760T	TKY15F	
		BRP4UNR121LW12	●	1	.750	.366	7.000	.750	3.900	.035	.177	0.67°	1	CS350760T	TKY15F	
	EL	BRP4UNR162ELW16	●	2	1.000	.618	10.000	1.000	5.100	.098	.177	0.5°	1	CS350760T	TKY15F	
		BRP4UNR203ELW20	●	3	1.250	.866	12.000	1.250	7.100	.098	.177	0.37°	1	CS350760T	TKY15F	
.250	R	BRP6UPR202W20	●	2	1.250	.744	5.000	1.250	1.750	.157	.240	—	4	TS43	TKY15D	①RPMW120400E ②RPMT120400E-JS
		BRP6UPR243W20	●	3	1.500	.976	5.000	1.250	1.750	.157	.240	—	4	TS43	TKY15D	
		BRP6UPR324W20	●	4	2.000	1.492	5.000	1.250	1.750	.157	.240	—	4	TS43	TKY15D	
		BRP6UPR405W20	●	5	2.500	1.999	5.000	1.250	1.750	.157	.240	—	4	TS43	TKY15D	
	EL	BRP6UPR202ELS20	●	2	1.250	.744	12.000	1.250	1.750	.157	.240	—	1	TS43	TKY15D	
		BRP6UPR243ELS20	●	3	1.500	.996	12.000	1.250	1.750	.157	.240	—	1	TS43	TKY15D	
		BRP6UPR324ELS20	●	4	2.000	1.492	12.000	1.250	1.750	.157	.240	—	1	TS43	TKY15D	
.312	R	BRP7UPR323W20	●	3	2.000	1.370	5.000	1.250	1.750	.217	.302	—	4	TS54	TKY25D	①RPMW150600E ②RPMT150600E-JS
		BRP7UPR404W20	●	4	2.500	1.866	5.000	1.250	1.750	.217	.302	—	4	TS54	TKY25D	
	EL	BRP7UPR323ELS20	●	3	2.000	1.370	12.000	1.250	1.750	.217	.302	—	1	TS54	TKY25D	

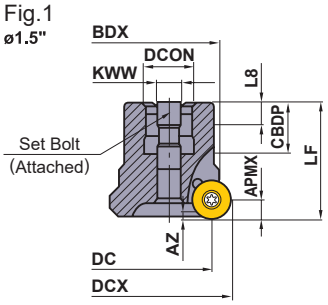
*1 Type R : Standard shank, L : Long shank, EL : Extra Long shank

*2 Clamp Torque (lbf-in) : CS250560T=8.9, CS350760T=31, TS43=31, TS54=66

● : USA Stock

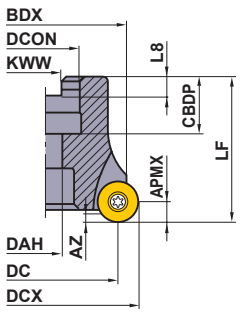
<10 inserts in one case>

Fig.1
ø1.5"



Use the attached set bolt.

Fig.2
ø2"
ø2.5"
ø3"
ø4"



■ ARBOR TYPE

Right hand tool holder only.

Corner Radius	Order Number	Stock R	Number of Teeth	Dimensions (inch) DCX	DC	BDX	LF	DCON	CBDP	DAH	KWW	L8	Max. Depth of cut AZ	APMX	Fig.	Insert
.250	**BRP6UPR1503X**	●	3	1.500	.996	1.228	2.000	.750	.748	—	.313	.187	.157	.240	1	RPMW120400E RPMT120400E-JS
	BRP6UPR0204	●	4	2.000	1.492	1.715	2.000	.750	.748	.415	.313	.187	.157	.240	2	
	BRP6UPR2505	●	5	2.500	1.992	2.214	2.000	.750	.748	.415	.313	.187	.157	.240	2	
	BRP6UPR0306C	●	6	3.000	2.492	2.706	2.000	1.000	1.024	.539	.375	.219	.157	.240	2	
	BRP6UPR0407E	●	7	4.000	3.492	3.696	2.500	1.500	1.181	.787	.625	.375	.157	.240	2	
.312	**BRP7UPR2504**	●	4	2.500	1.866	2.165	2.000	.750	.748	.415	.313	.187	.217	.302	2	RPMW150600E RPMT150600E-JS
	BRP7UPR0305C	●	5	3.000	2.366	2.649	2.000	1.000	.969	.539	.375	.219	.217	.302	2	
	BRP7UPR0406E	●	6	4.000	3.366	3.631	2.500	1.500	1.122	.787	.625	.375	.217	.302	2	

SPARE PARTS

Tool Holder Number	Insert Screw *	Wrench	Set Screw
BRP6UPR1503X	TS43	TKY15D	HDSU37513
BRP6UPR0204 ~ BRP6UPR0407E	TS43	TKY15D	—
BRP7UPR2504 ~ BRP7UPR0406E	TS54	TKY25D	—

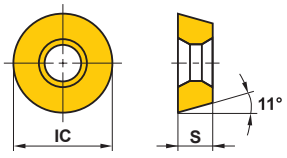
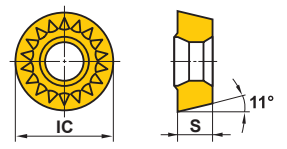
* Clamp Torque (lbf-in) : TS43=31, TS54=66

Note 1) Set bolt not included.

INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Materials

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✠ : Unstable Cutting

Shape	Order Number	Class	Coated F7010	Coated VP15TF	Dimensions (inch) IC	S	Geometry
	RPMW120400E	M	●	●	.500	.188	
	RPMW150600E	M		●	.625	.250	
JS breaker	**RPMT07T200E-JS**	M		●	.313	.109	
	RPMT09T300E-JS	M		●	.375	.156	
	RPMT120400E-JS	M		●	.500	.188	
	RPMT150600E-JS	M		●	.625	.250	

RECOMMENDED CUTTING CONDITIONS

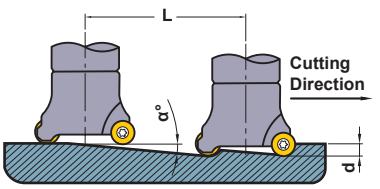
Workpiece Material			Cutting Speed (SFM)	
			CVD	PVD
	Material	Hardness	F7010 / F7030 / F620	VP15TF / AP20M
P	Mild Steel	≤180HB	820 (660—980)	820 (660—980)
	Carbon Steel	180—280HB	590 (425—720)	590 (425—720)
	Alloy Steel	280—380HB	525 (360—620)	525 (360—620)
	Prehardened Steel	35—45HB	390 (260—460)	390 (260—460)
	High Alloy Steel	≤300HB	425 (295—525)	425 (295—525)
	Sintered Steel	45—60HRC	—	215 (155—275)
M	Stainless Steel	≤260HB	590 (425—720)	590 (425—720)
K	Gray Cast Iron	Tensile Strength≤350MPa	—	570 (425—720)
	Ductile Cast Iron	Tensile Strength 360—500MPa	—	470 (340—600)
		Tensile Strength 500—800MPa	—	360 (260—460)

■ Feed per Tooth (IPT) for Straight Line (Non-ramping) Cutting Only

Type	Depth of Cut (inch)								
	.040	.080	.120	.150	.180	.200	.240	.280	.320
BRP3U	.012	.009	.008	.006	—	—	—	—	—
BRP4U	.014	.012	.010	.010	.007	—	—	—	—
BRP6U	.020	.016	.012	.012	.011	.009	.008	—	—
BRP7U	.024	.020	.018	.016	.012	.013	.012	.010	.008

■ Ramping

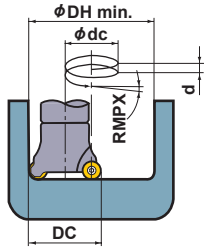
Type	Tool Diameter (inch)	Max. Ramping Angle RMPX	Tan α per inch	Min. Cutting Length According to Max. Ramping Angle **L** min. (inch)						
				d= .094"	d= .125"	d= .156"	d= .188"	d= .250"	d= .281"	d= .312"
BRP3U	.500	3.71°	.065°	1.446	1.923	2.400	—	—	—	—
	.625	12.34°	.219°	.429	.571	.712	—	—	—	—
	.750	13.50°	.240°	.392	.521	.650	—	—	—	—
	1.000	8.48°	.149°	.631	.839	1.047	—	—	—	—
BRP4U	.625	4.07°	.071°	1.324	1.761	2.197	2.648	—	—	—
	.750	8.41°	.148°	.635	.845	1.054	1.270	—	—	—
	1.000	12.98°	.231°	.407	.541	.675	.814	—	—	—
	1.250	8.18°	.144°	.653	.868	1.083	1.306	—	—	—
BRP6U	1.250	17.3°	.312°	.301	.401	.500	.603	.801	—	—
	1.500	11.78°	.209°	.450	.598	.746	.900	1.196	—	—
	2.000	7.15°	.125°	.752	1.000	1.248	1.504	2.000	—	—
	2.500	5.13°	.090°	1.044	1.389	1.733	2.089	2.778	—	—
	3.000	3.99°	.070°	1.343	1.786	2.229	2.686	3.571	—	—
	4.000	2.77°	.048°	1.958	2.604	3.250	3.917	5.208	—	—
BRP7U	2.000	11.49°	.203°	.463	.616	.768	.926	1.232	1.384	1.537
	2.500	7.88°	.138°	.681	.906	1.130	1.362	1.812	2.036	2.261
	3.000	5.99°	.105°	.895	1.190	1.486	1.790	2.381	2.676	2.971
	4.000	4.04°	.071°	1.324	1.761	2.197	2.648	3.521	3.958	4.394



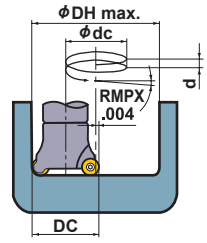
Helical Milling

Relationship Between Hole Diameter and Depth of Cut

Minimum Cutting Diameter



Maximum Cutting Diameter



Type	DC (inch)	*1 ϕDH min.	*2 ϕdc	Inclination Angle RMPX d=.094"	d=.156"	d=.188"	d=.250"	d=.312"	*1 ϕDH max.	*2 ϕdc	Inclination Angle RMPX d=.094"	d=.156"	d=.188"	d=.250"	d=.312"
BRP3U	.500	.688	.188	d=.039 → RMPX=3.778°					.922	.422	d=.078 → RMPX= 3.367°				
	.625	.938	.313	5.461°	9.015°	—	—	—	1.172	.547	3.131°	5.187°	—	—	—
	.750	1.188	.438	3.908°	6.468°	—	—	—	1.422	.672	2.549°	4.226°	—	—	—
	1.000	1.688	.688	2.490°	4.128°	—	—	—	1.922	.922	1.859°	3.083°	—	—	—
BRP4U	.625	.874	.249	d=.039 → RMPX=2.854°					1.172	.547	3.131°	5.187°	6.243°	—	—
	.750	1.124	.374	4.574°	7.563°	9.091°	—	—	1.422	.672	2.549°	4.226°	5.089°	—	—
	1.000	1.624	.624	2.745°	4.550°	5.478°	—	—	1.922	.922	1.859°	3.083°	3.714°	—	—
	1.250	2.124	.874	1.961°	3.252°	3.917°	—	—	2.422	1.172	1.462°	2.426°	2.923°	—	—
BRP6U	1.250	2.000	.750	2.285°	3.788°	4.562°	6.057°	—	2.422	1.172	1.462°	2.426°	2.923°	3.884°	—
	1.500	2.500	1.000	1.714°	2.843°	3.425°	4.550°	—	2.922	1.422	1.205°	2.000°	2.410°	3.203°	—
	2.000	3.500	1.500	1.143°	1.896°	2.285°	3.037°	—	3.922	1.922	.892°	1.480°	1.783°	2.371°	—
	2.500	4.500	2.000	.857°	1.422°	1.714°	2.279°	—	4.922	2.422	.708°	1.175°	1.415°	1.882°	—
	3.000	5.500	2.500	.686°	1.138°	1.371°	1.823°	—	5.922	2.922	.587°	.974°	1.173°	1.560°	—
	4.000	7.500	3.500	.490°	.813°	.980°	1.302°	—	7.922	3.922	.437°	.725°	.874°	1.162°	—
BRP7U	2.000	3.376	1.376	1.246°	2.067°	2.490°	3.310°	4.128°	3.922	1.922	.892°	1.480°	1.783°	2.371°	2.958°
	2.500	4.376	1.876	.914°	1.516°	1.827°	2.429°	3.030°	4.922	2.422	.708°	1.175°	1.415°	1.882°	2.348°
	3.000	5.376	2.376	.721°	1.197°	1.443°	1.918°	2.393°	5.922	2.922	.587°	.974°	1.173°	1.560°	1.947°
	4.000	7.376	3.376	.508°	.842°	1.016°	1.350°	1.685°	7.922	3.922	.437°	.725°	.874°	1.162°	1.451°

*1 DH = Cutting Hole Diameter : ϕ (inch)
*2 dc = Tool Pass Diameter : ϕ (inch)

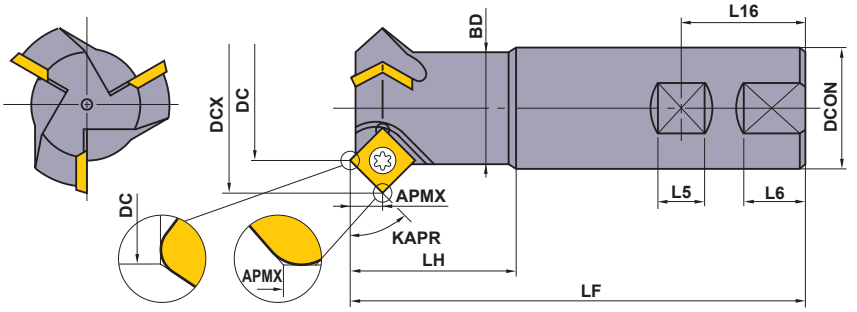
BRP3U type DH min. = (DC-.156) X 2, DH max. = (DC-.039) X 2, d max. =.156 (inch)
BRP4U type DH min. = (DC-.188) X 2, DH max. = (DC-.039) X 2, d max. =.188 (inch)
BRP6U type DH min. = (DC-.250) X 2, DH max. = (DC-.039) X 2, d max. =.250 (inch)
BRP7U type DH min. = (DC-.312) X 2, DH max. = (DC-.039) X 2, d max. =.312 (inch)
dc = DH-D
*DH min. (Minimum Cutting Diameter) DH max.(Maximum Cutting Diameter) d (Maximum Depth of Cut)

CHAMFER MILLING

45° KAPR

CFSP

P | M | K | N | S | H



Right hand tool holder only.

Order Number	Stock	Number of Teeth	Dimensions (inch)										*		
	R		DC	DCX	LF	DCON	BD	LH	L16	L5	L6	APMX	Insert Screw	Wrench	Insert
CFSPR051W16	●	1	.313	.964	4.000	1.000	.768	1.719	1.141	.515	.500	.327	TS52	TKY25R	SPMW42◌
CFSPR101W16	●	1	.625	1.280	4.000	1.000	.768	1.719	1.141	.515	.500	.327	TS5	TKY25R	SPMW42◌
CFSPR203W20	●	3	1.250	1.905	4.125	1.250	1.220	1.844	1.141	.515	.500	.327	TS5	TKY25R	SPMW42◌

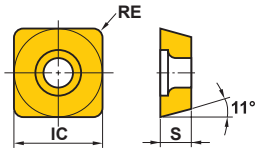
* Clamp Torque (lbf-in) : TS52=66, TS5=66

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

INSERTS

Workpiece Material		
P	Steel	
K	Cast Iron	

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✠ : Unstable Cutting

Shape	Order Number	ISO Number	Class	Coated			Cermet		Carbide		Dimensions (inch)			Geometry
				VP15TF	UP20M		NX2525	NX4545	UTi20T	HTi10	IC	S	RE	
	SPMW421	**SPMW120304**	M	●	●		★	★	●	●	.500	.125	.016	
	SPMW422	**SPMW120308**	M	●	●		★	★	●	●	.500	.125	.031	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	
					Chamfer Milling	Face Milling
P	Carbon Steel Alloy Steel	180—280HB	**UTi20T**	590 (425—720)	.016	.006
			VP15TF / UP20M	590 (425—720)	.016	.008
			NX2525 / NX4545	590 (425—720)	.016	.008
		280—350HB	**UTi20T**	330 (230—395)	.012	.006
K	Cast Iron	Tensile Strength ≤450MPa	**VP15TF / UTi20T**	460 (330—560)	.020	.004
			HTi10 / NX2525 / NX4545	460 (330—560)	.020	.004

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

BALL NOSE AND RADIUS END MILL

SRF/SUF

P M K N S H

Fig. 1

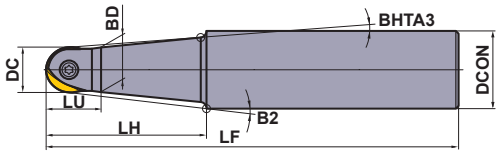


Fig. 2

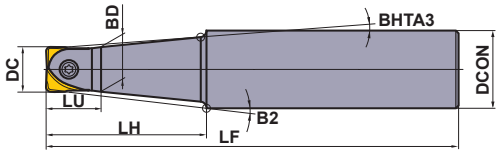


Fig. 3

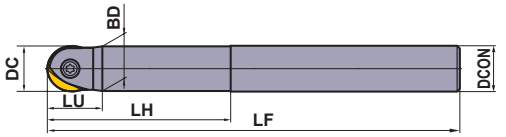


Fig. 4

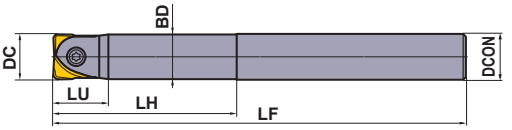


Fig. 5

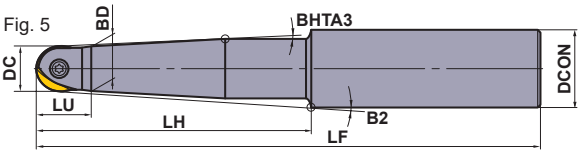
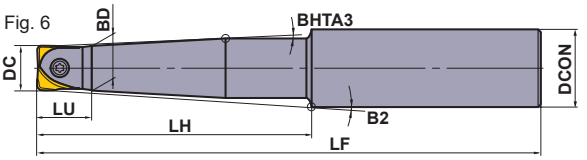


Fig. 6



Right hand tool holder only.
Refer to page K358 for APMX, PRFRAD&RE.

■STEEL SHANK

Type	Order Number	Stock R	Inserts	Dimensions (inch) RE*2	DC	DCON	LF	BD	LH	LU	B2	BHTA3	Fig.	*1 Clamp Screw	D T Wrench	Anti-seize Lubricant
Standard	**SRFU06S08M**	●	SRFT0375	.1875	.375	.500	4.375	.354	1.625	.512	2.5°	1.5°	1	RS3008TS	TKY08D	MK1KS
			SRFT10	.1969	.394						2.13°	1.5°	1			
			SUFT10R○○	—	.394						2.13°	1.5°	2			
	SRFU08S10M	●	SRFT0500	.2500	.500	.625	4.750	.453	2.000	.591	2.05°	1.5°	1	RS3510T	TKY10D	MK1KS
			SRFT12	.2362	.472						2.48°	1.5°	1			
			SUFT12R○○	—	.472						2.48°	1.5°	2			
	SRFU10S12M	●	SRFT0625	.3125	.625	.750	5.125	.606	2.000	.787	2.12°	1.5°	1	RS4015T	TKY15T	MK1KS
			SRFT16	.3150	.630						2.03°	1.5°	1			
			SUFT16R○○	—	.630						2.03°	1.5°	2			
	SRFU12S16M	●	SRFT0750	.3750	.750	1.000	6.000	.732	2.875	.945	2.87°	1.5°	1	RS5020T	TKY20T	MK1KS
			SRFT20	.3937	.787						2.45°	1.5°	1			
			SUFT20R○○	—	.787						2.45°	1.5°	2			
	SRFU16S20M	●	SRFT1000	.5000	1.000	1.250	7.125	.965	3.250	1.181	2.6°	1.5°	1	RS6025T	TKY25T	MK1KS
			SRFT25	.4921	.984						2.77°	1.5°	1			
			SUFT25R○○	—	.984						2.77°	1.5°	2			
	SRFU20S20M	●	SRFT1250	.6250	1.250	1.250	8.039	1.161	4.164	1.417	—	—	3	RS8030T	TKY30T	MK1KS
			SRFT30	.5906	1.181		8.000		4.125	1.378			3			
			SRFT32	.6299	1.260		8.039		4.164	1.417			3			
			SUFT30R○○	—	1.181		8.000		4.125	1.378			4			
Long	**SRFU06S08L**	●	SRFT0375	.1875	.375	.500	6.000	.354	2.500	.512	1.55°	1.5°	1	RS3008TS	TKY08D	MK1KS
			SRFT10	.1969	.394						1.32°	1.5°	1			
			SUFT10R○○	—	.394						1.32°	1.5°	2			
	SRFU08S10L	●	SRFT0500	.2500	.500	.625	6.375	.453	2.875	.591	1.36°	1.5°	1	RS3510T	TKY10D	MK1KS
			SRFT12	.2362	.472						1.65°	1.5°	1			
			SUFT12R○○	—	.472						1.65°	1.5°	2			
	SRFU10S12L	●	SRFT0625	.3125	.625	.750	7.125	.606	3.625	.787	1.08°	1.5°	5	RS4015T	TKY15T	MK1KS
			SRFT16	.3150	.630						1.03°	1.5°	5			
			SUFT16R○○	—	.630						1.03°	1.5°	6			
	SRFU12S16L	●	SRFT0750	.3750	.750	1.000	8.500	.732	4.625	.945	1.68°	1.5°	1	RS5020T	TKY20T	MK1KS
			SRFT20	.3937	.787						1.42°	1.5°	1			
			SUFT20R○○	—	.787						1.42°	1.5°	2			
	SRFU16S20L	●	SRFT1000	.5000	1.000	1.250	9.625	.965	5.750	1.181	1.37°	1.5°	1	RS6025T	TKY25T	MK1KS
			SRFT25	.4921	.984						1.45°	1.5°	1			
			SUFT25○○	—	.984						1.45°	1.5°	2			
	SRFU20S20L	●	SRFT1250	.6250	1.250	1.250	10.539	1.161	6.664	1.417	—	—	3	RS8030T	TKY30T	MK1KS
			SRFT30	.5906	1.181		10.500		6.625	1.378			3			
			SRFT32	.6299	1.260		10.539		6.664	1.417			3			
			SUFT30○○	—	1.181		10.500		6.625	1.378			4			

*1 Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88
*2 RE is shown for insert corner R.
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)

● : USA Stock

Fig. 1

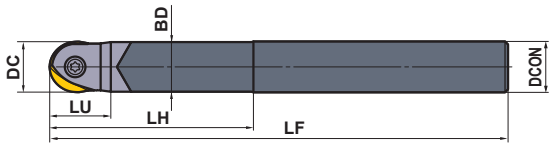
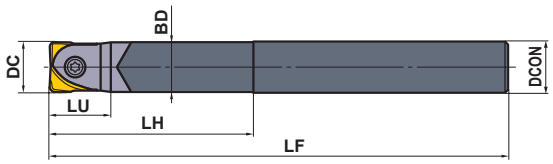


Fig. 2



■ CARBIDE SHANK

Right hand tool holder only.
Refer to page K358 for APMX, PRFRAD&RE.

Type	Order Number	Stock	Inserts	Dimensions (inch)							Fig.	✶1 Clamp Screw	D T Wrench	Anti-seize Lubricant
		R		RE✶2	DC	DCON	LF	BD	LH	LU				
Standard	SRFU06S06MW	●	SRFT0375	.1875	.375	.375	4.375	.354	1.625	0.512	1	RS3008TS	TKY08D	MK1KS
			SRFT10	.1969	.394						1			
			SUFT10R○○	—	.394						2			
	SRFU08S08MW	●	SRFT0500	.2500	.500	.500	4.750	.453	2.000	0.591	1	RS3510T	TKY10D	MK1KS
			SRFT12	.2362	.472						1			
			SUFT12R○○	—	.472						2			
	SRFU10S10MW	●	SRFT0625	.3125	.625	.625	5.250	.606	2.125	0.787	1	RS4015T	TKY15T	MK1KS
			SRFT16	.3150	.630						1			
			SUFT16R○○	—	.630						2			
	SRFU12S12MW	●	SRFT0750	.3750	.750	.750	7.125	.732	4.000	0.945	1	RS5020T	TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	SRFU16S16MW	●	SRFT1000	.5000	1.000	1.000	8.000	.965	4.125	1.181	1	RS6025T	TKY25T	MK1KS
			SRFT25	.4921	.984						1			
			SUFT25R○○	—	.984						2			
Long	SRFU06S06LW	●	SRFT0375	.1875	.375	.375	6.625	.354	3.125	.512	1	RS3008TS	TKY08D	MK1KS
			SRFT10	.1969	.394						1			
			SUFT10R○○	—	.394						2			
	SRFU08S08LW	●	SRFT0500	.2500	.500	.500	6.625	.453	3.125	.591	1	RS3510T	TKY10D	MK1KS
			SRFT12	.2362	.472						1			
			SUFT12R○○	—	.472						2			
	SRFU10S10LW	●	SRFT0625	.3125	.625	.625	8.000	.606	4.500	.787	1	RS4015T	TKY15T	MK1KS
			SRFT16	.3150	.630						1			
			SUFT16R○○	—	.630						2			
	SRFU12S12LW	●	SRFT0750	.3750	.750	.750	10.000	.732	6.125	.945	1	RS5020T	TKY20T	MK1KS
			SRFT20	.3937	.787						1			
			SUFT20R○○	—	.787						2			
	SRFU16S16LW	●	SRFT1000	.5000	1.000	1.000	12.000	.965	8.125	1.181	1	RS6025T	TKY25T	MK1KS
			SRFT25	.4921	.984						1			
			SUFT25R○○	—	.984						2			

✶1 Clamp Torque (lbf-in) : RS3008TS=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66
✶2 RE is shown for insert corner R.
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)

Fig. 1

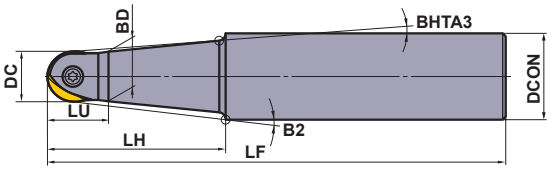


Fig. 2

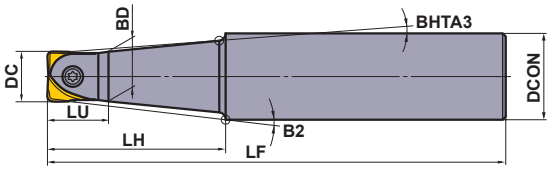


Fig. 3

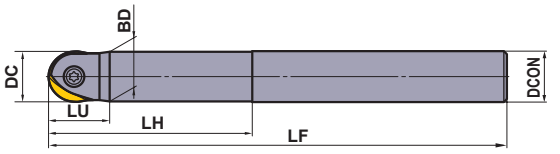


Fig. 4

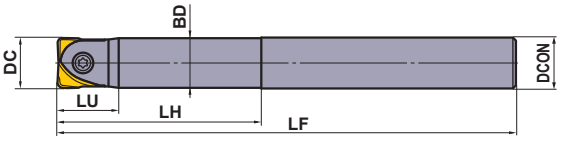


Fig. 5

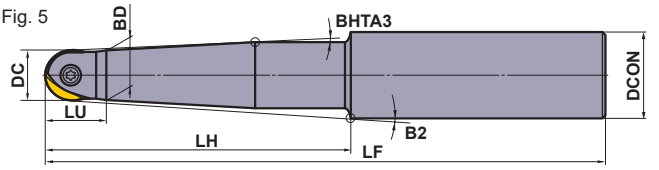
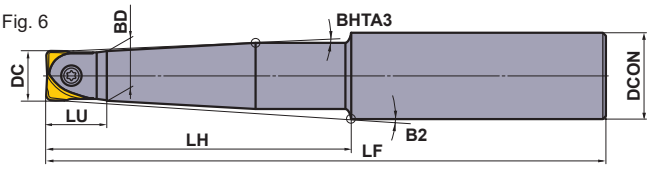


Fig. 6



Metric Standard

■STEEL SHANK

Right hand tool holder only.
Refer to page K358 for APMX, PRFRAD&RE.

Type	Order Number	Stock R	Inserts	Dimensions (mm) RE*2	DC	DCON	LF	BD	LH	LU	B2	BHTA3	Fig.	*1 Clamp Screw	D T Wrench	Anti-seize Lubricant
Standard	**SRFH10S12M**	★	SRFT10	5	10	12	110	9.5	40	13	1.63°	1.5°	1	RS3008T	TKY08D	MK1KS
			SUFT10R○○	—	10	12	110	9.5	40	13	1.63°	—	2			
	SRFH12S16M	★	SRFT12	6	12	16	120	11.5	50	15	2.6°	1.5°	1	RS3510T	TKY10D	MK1KS
			SUFT12R○○	—	12	16	120	11.5	50	15	2.6°	—	2			
	SRFH16S20M	★	SRFT16	8	16	20	130	15.5	50	20	2.73°	1.5°	1	RS4015T	TKY15T	MK1KS
			SUFT16R○○	—	16	20	130	15.5	50	20	2.73°	—	2			
	SRFH20S25M	★	SRFT20	10	20	25	150	19.5	70	24	2.38°	1.5°	1	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	25	150	19.5	70	24	2.38°	1.5°	2			
	SRFH25S32M	★	SRFT25	12.5	25	32	180	24.5	80	30	2.97°	1.5°	1	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	32	180	24.5	80	30	2.97°	1.5°	2			
	SRFH30S32M	★	SRFT30	15	30	32	200	29.5	100	35	—	—	3	RS8030T	TKY30T	MK1KS
			SUFT30R○○	—	30	32	200	29.5	100	35	—	—	4			
	SRFH32S32M	★	SRFT32	16	32	32	200	31.5	100	35	—	—	3	RS8030T	TKY30T	MK1KS
			SUFT32R○○	—	32	32	200	31.5	100	35	—	—	4			
Semi Long	**SRFH10S12L**	★	SRFT10	5	10	12	150	9.5	60	13	1.5°	1.5°	1	RS3008T	TKY08D	MK1KS
			SUFT10R○○	—	10	12	150	9.5	60	13	1.5°	—	2			
	SRFH12S16L	★	SRFT12	6	12	16	160	11.5	70	15	1.78°	1.5°	1	RS3510T	TKY10D	MK1KS
			SUFT12R○○	—	12	16	160	11.5	70	15	1.78°	—	2			
	SRFH16S20L	★	SRFT16	8	16	20	160	15.5	70	20	1.85°	1.5°	1	RS4015T	TKY15T	MK1KS
			SUFT16R○○	—	16	20	160	15.5	70	20	1.85°	—	2			
	SRFH20S25L	★	SRFT20	10	20	25	180	19.5	80	24	2.05°	1.5°	1	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	25	180	19.5	80	24	2.05°	1.5°	2			
	SRFH20S20L80	★	SRFT20	10	20	20	180	19.5	80	24	—	—	3	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	—	—	4			
	SRFH25S32L	★	SRFT25	12.5	25	32	200	24.5	100	30	2.28°	1.5°	1	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	32	200	24.5	100	30	2.28°	1.5°	2			
	SRFH25S25L100	★	SRFT25	12.5	25	25	200	24.5	100	30	—	—	3	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	—	—	4			
	SRFH30S32L	★	SRFT30	15	30	32	230	29.5	130	35	—	—	3	RS8030T	TKY30T	MK1KS
			SUFT30R○○	—	30	32	230	29.5	130	35	—	—	4			

*1 Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88
*2 RE is shown for insert corner R.
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)
Note 2) Inch type insert can not be installed on the metric holder.

Type	Order Number	Stock	Inserts	Dimensions (mm)									Fig.	*1 Clamp Screw	Wrench	Anti-seize Lubricant
		R		RE *2	DC	DCON	LF	BD	LH	LU	B2	BHTA3				
Long	**SRFH20S25E**	★	SRFT20	10	20	25	220	19.5	120	24	1.5°	1.5°	5	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	25	220	19.5	120	24	1.5°	1.5°	6			
	SRFH20S20E120	★	SRFT20	10	20	20	220	19.5	120	24	—	—	3	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	20	220	19.5	120	24	—	—	4			
	SRFH25S32E	★	SRFT25	12.5	25	32	250	24.5	150	30	1.5°	1.5°	5	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	32	250	24.5	150	30	1.5°	1.5°	6			
	SRFH25S25E150	★	SRFT25	12.5	25	25	250	24.5	150	30	—	—	3	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	25	250	24.5	150	30	—	—	4			
	SRFH30S32E	★	SRFT30	15	30	32	300	29.5	200	35	—	—	3	RS8030T	TKY30T	MK1KS
			SUFT30R○○	—	30	32	300	29.5	200	35	—	—	4			

*1 Clamp Torque (lbf-in) : RS5020T=44, RS6025T=66, RS8030T=88
*2 RE is shown for insert corner R.
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)
Note 2) Inch type insert can not be installed on the metric holder.

Fig. 1

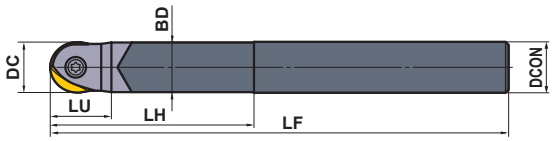
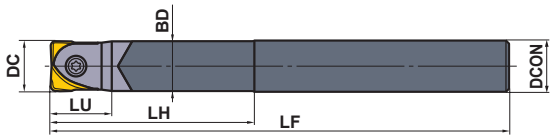


Fig. 2



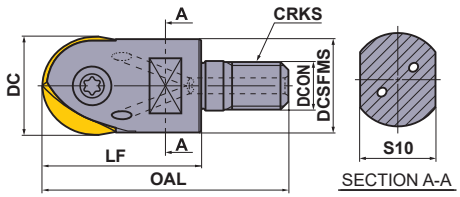
Metric Standard

■ CARBIDE SHANK

Right hand tool holder only.
Refer to page K358 for APMX, PRFRAD&RE.

Type	Order Number	Stock	Inserts	Dimensions (mm)							Fig.	✶1 Clamp Screw	D T Wrench	Anti-seize Lubricant
		R		RE ✶2	DC	DCON	LF	BD	LH	LU				
Standard	**SRFH10S10MW**	★	SRFT10	5	10	10	110	9.5	40	13	1	RS3008T	TKY08D	MK1KS
			SUFT10R○○	—	10	10	110	9.5	40	13	1			
	SRFH12S12MW	★	SRFT12	6	12	12	120	11.5	50	15	1	RS3510T	TKY10D	MK1KS
			SUFT12R○○	—	12	12	120	11.5	50	15	1			
	SRFH16S16MW	★	SRFT16	8	16	16	130	15.5	50	20	1	RS4015T	TKY15T	MK1KS
			SUFT16R○○	—	16	16	130	15.5	50	20	1			
	SRFH20S20MW	★	SRFT20	10	20	20	180	19.5	80	24	1	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	20	180	19.5	80	24	2			
	SRFH25S25MW	★	SRFT25	12.5	25	25	200	24.5	100	30	1	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	25	200	24.5	100	30	2			
	SRFH30S32MW	★	SRFT30	15	30	32	230	29.5	130	35	1	RS8030T	TKY30T	MK1KS
		★	SRFT32	16	32	32	231	29.5	131	36				
			SUFT30R○○	—	32	32	230	29.5	130	35	2			
Long	**SRFH10S10LW**	★	SRFT10	5	10	10	150	9.5	60	13	1	RS3008T	TKY08D	MK1KS
			SUFT10R○○	—	10	10	150	9.5	60	13	1			
	SRFH12S12LW	★	SRFT12	6	12	12	160	11.5	70	15	1	RS3510T	TKY10D	MK1KS
			SUFT12R○○	—	12	12	160	11.5	70	15	1			
	SRFH16S16LW	★	SRFT16	8	16	16	160	15.5	70	20	1	RS4015T	TKY15T	MK1KS
			SUFT16R○○	—	16	16	160	15.5	70	20	1			
	SRFH16S16EW	★	SRFT16	8	16	16	200	15.5	110	20	1	RS4015T	TKY15T	MK1KS
	SRFH20S20LW	★	SRFT20	10	20	20	250	19.5	150	24	1	RS5020T	TKY20T	MK1KS
			SUFT20R○○	—	20	20	250	19.5	150	24	2			
	SRFH25S25LW	★	SRFT25	12.5	25	25	300	24.5	200	30	1	RS6025T	TKY25T	MK1KS
			SUFT25R○○	—	25	25	300	24.5	200	30	2			
	SRFH30S32LW	★	SRFT30	15	30	32	350	29.5	250	35	1	RS8030T	TKY30T	MK1KS
		★	SRFT32	16	32	32	351	29.5	251	36				
			SUFT30R○○	—	30	32	350	29.5	250	35	2			

✶1 Clamp Torque (lbf-in) : RS3008T=13, RS3510T=22, RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88
✶2 RE is shown for insert corner R.
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)
Note 2) Inch type insert can not be installed on the metric holder.



■ SCREW-IN TYPE

Ball nose type only
With Air / coolant through.

Right hand tool holder only.

DC	Insert Type	Order Number	Stock	Number of Teeth	Dimensions (inch)							WT (lbs)
					RE*	LF	OAL	DCON	DCSFMS	S10	CRKS	
.625	**SRFT0625**	**SRFHU10AM0830**	●	1	.3125	1.181	1.890	.335	.587	.394	M8	.2
.750	**SRFT0750**	**SRFHU12AM1035**	●	1	.3750	1.378	2.126	.413	.724	.551	M10	.2

* RE is shown for insert corner R.

Metric Standard

■ SCREW-IN TYPE

Ball nose and corner radius shared holder
The dimensions of the case of using ball nose insert
With Air/coolant though.

Right hand tool holder only.

DC	Insert Type	Order Number	Stock	Number of Teeth	Dimensions (mm)							WT (kg)
					RE*	LF	OAL	DCON	DCSFMS	S10	CRKS	
16	**SRFT16**	**SRFH16AM0830**	★	1	8	30	48	8.5	14.9	10	M8	0.1
20	**SRFT20**	**SRFH20AM1035**	★	1	10	35	54	10.5	18.4	14	M10	0.1
25	**SRFT25**	**SRFH25AM1240**	★	1	12.5	40	62	12.5	23.5	19	M12	0.1
30	**SRFT30**	**SRFH30AM1645**	★	1	15	45	68	17	28.1	24	M16	0.2
32	**SRFT32**	**SRFH30AM1645**	★	1	16	46	69	17	28.1	24	M16	0.2

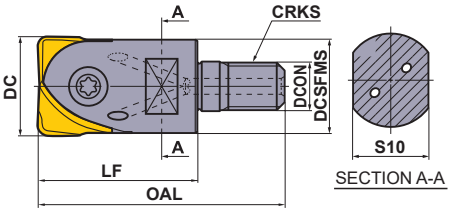
* RE is shown for insert corner R.

SPARE PARTS

Order Number	* Insert Screw	Insert Wrench	Anti-seizure Lubricant
SRFHU10AM0830	RS4015T	TKY15T	MK1KS
SRFHU12AM1035	RS5020T	TKY20T	MK1KS
SRFH25AM1240	RS6025T	TKY25T	MK1KS
SRFH30AM1645	RS8030T	TKY30T	MK1KS

* Clamp Torque (lbf-in) : RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)
Note 2) Inch type insert can not be installed on the metric holder.

ISO13399	➢ K003
SCREW-IN HOLDERS	➢ K382
SPARE PARTS	➢ M001
TECHNICAL DATA	➢ N001



Metric Standard

■ SCREW-IN TYPE

Ball nose and corner radius shared holder
The dimensions of the case of using corner radius insert
With Air/coolant though.

Right hand tool holder only.

DC	Insert Type	Order Number	Stock	Number of Teeth	Dimensions (mm)						WT (kg)
					LF	OAL	DCON	DCSFMS	S10	CRKS	
16	**SUFT16R**	**SRFH16AM0830**	★	1	30	48	8.5	14.9	10	M8	0.1
20	**SUFT20R**	**SRFH20AM1035**	★	1	35	54	10.5	18.4	14	M10	0.1
25	**SUFT25R**	**SRFH25AM1240**	★	1	40	62	12.5	23.5	19	M12	0.1
30	**SUFT30R**	**SRFH30AM1645**	★	1	45	68	17	28.1	24	M16	0.2
32	**SUFT32R**	**SRFH30AM1645**	★	1	46	69	17	28.1	24	M16	0.2

SPARE PARTS

Order Number	* Insert Screw	Insert Wrench	Anti-seizure Lubricant
SRFHU10AM0830	RS4015T	TKY15T	MK1KS
SRFHU12AM1035	RS5020T	TKY20T	MK1KS
SRFH25AM1240	RS6025T	TKY25T	MK1KS
SRFH30AM1645	RS8030T	TKY30T	MK1KS

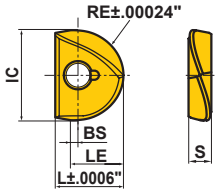
* Clamp Torque (lbf-in) : RS4015T=29, RS5020T=44, RS6025T=66, RS8030T=88
Note 1) Fit inserts in the right direction. (Refer to page K357 & K358)
Note 2) Inch type insert can not be installed on the metric holder.

INSERTS

Inch Standard

Workpiece Material			MP8010	EP6120	VP15TF
	P	Steel		◐	◐
	K	Cast Iron	●		✣
	N	Non-ferrous Metal		◐	
	H	Hardened Steel	○	◐	◐

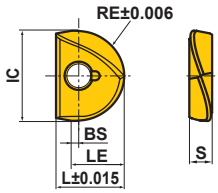
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Coated			Dimensions (inch)							Geometry
		MP8010	EP6120	VP15TF	IC	RE	L	LE	BS	S	APMX	
	SRFT0375	●	●	●	.375	.1875	.335	.216	.020	.102	—	
	SRFT0500	●	●	●	.500	.2500	.394	.256	.020	.118	—	
	SRFT0625	●	●	●	.625	.3125	.472	.354	.039	.158	—	
	SRFT0750	●	●	●	.750	.3750	.591	.433	.039	.197	—	
	SRFT1000	●	●	●	1.000	.5000	.728	.531	.039	.236	—	
	SRFT1250	●	●	●	1.250	.6250	.925	.669	.039	.276	—	

Metric Standard

Workpiece Material			MP8010	EP6120	VP15TF
	P	Steel		◐	◐
	K	Cast Iron	●		✣
	N	Non-ferrous Metal		◐	
	H	Hardened Steel	○	◐	◐

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Coated			Dimensions (mm)							Geometry
		MP8010	EP6120	VP15TF	IC	RE	L	LE	BS	S	APMX	
	SRFT10	★	★	★	10	5 (.1969")	8.5	5.5	0.5	2.6	—	
	SRFT12	★	★	★	12	6 (.2362")	10	6.5	0.5	3	—	
	SRFT16	★	★	★	16	8 (.3150")	12	9	1	4	—	
	SRFT20	★	★	★	20	10 (.3937")	15	11	1	5	—	
	SRFT25	★	★	★	25	12.5 (.4921")	18.5	13.5	1	6	—	
	SRFT30	★	★	★	30	15 (.5906")	22.5	16	1	7	—	
	SRFT32	★	★	★	32	16 (.6299")	23.5	17	1	7	—	

FITTING INSERTS ON HOLDERS

1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

2. Fit the insert

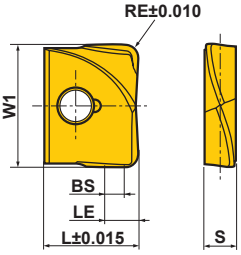
Place the concave mark of the insert into the clamp-screw-fastening part of the holder(only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. You are recommended to use the special lubricant for preventing screw seizing, MK1KS, and to fasten with recommended torque.

ISO13399 ➤ K003
SCREW-IN HOLDERS ➤ K382
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

Workpiece Material					
	P	Steel		●	●
	M	Stainless Steel			◔
	K	Cast Iron	●		✱
	H	Hardened Steel	●	◔	◔

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Coated			Dimensions (mm)							Geometry
		MP8010	EP6120	VP15TF	W1	RE	L	LE	BS	S	APMX	
	SUFT10R05	★	★	★	10	0.5 (.0197")	8.5	1.5	1	2.6	1.5	
	SUFT10R10	★	★	★	10	1 (.0394")	8.5	2	1	2.6	2	
	SUFT10R20	★	★	★	10	2 (.0787")	8.5	3	1	2.6	3	
	SUFT12R05	★	★	★	12	0.5 (.0197")	10	1.7	1.2	3	1.7	
	SUFT12R10	★	★	★	12	1 (.0394")	10	2.2	1.2	3	2.2	
	SUFT12R20	★	★	★	12	2 (.0787")	10	3.2	1.2	3	3.2	
	SUFT12R30	★	★	★	12	3 (.1181")	10	4.2	1.2	3	4.2	
	SUFT16R05	★	★	★	16	0.5 (.0197")	12	2.1	1.6	4	2.1	
	SUFT16R10	★	★	★	16	1 (.0394")	12	2.6	1.6	4	2.6	
	SUFT16R15	★	★	★	16	1.5 (.0591")	12	3.1	1.6	4	3.1	
	SUFT16R20	★	★	★	16	2 (.0787")	12	3.6	1.6	4	3.6	
	SUFT16R30	★	★	★	16	3 (.1181")	12	4.6	1.6	4	4.6	
	SUFT20R05	★	★	★	20	0.5 (.0197")	15	2.5	2	5	2.5	
	SUFT20R10	★	★	★	20	1 (.0394")	15	3	2	5	3	
	SUFT20R15	★	★	★	20	1.5 (.0591")	15	3.5	2	5	3.5	
	SUFT20R20	★	★	★	20	2 (.0787")	15	4	2	5	4	
	SUFT20R30	★	★	★	20	3 (.1181")	15	5	2	5	5	
	SUFT25R05	★	★	★	25	0.5 (.0197")	18.5	3	2.5	6	3	
	SUFT25R10	★	★	★	25	1 (.0394")	18.5	3.5	2.5	6	3.5	
	SUFT25R20	★	★	★	25	2 (.0787")	18.5	4.5	2.5	6	4.5	
	SUFT25R30	★	★	★	25	3 (.1181")	18.5	5.5	2.5	6	5.5	
	SUFT30R05	★	★	★	30	0.5 (.0197")	22.5	3.5	3	7	3.5	
	SUFT30R10	★	★	★	30	1 (.0394")	22.5	4	3	7	4	
	SUFT30R20	★	★	★	30	2 (.0787")	22.5	5	3	7	5	
	SUFT30R30	★	★	★	30	3 (.1181")	22.5	6	3	7	6	
	SUFT32R05	★	★	★	32	0.5 (.0197")	23.5	3.7	3.2	7	3.7	
	SUFT32R10	★	★	★	32	1 (.0394")	23.5	4.2	3.2	7	4.2	
	SUFT32R20	★	★	★	32	2 (.0787")	23.5	5.2	3.2	7	5.2	

FITTING INSERTS ON HOLDERS

1. Clean the insert seat

Clean the insert seat in the holder body by blowing air or using a brush.

2. Fit the insert

Place the concave mark of the insert into the clamp-screw-fastening part of the holder(only SRF type inserts). Fasten the clamp screw while firmly pressing the insert against the insert seat wall. You are recommended to use the special lubricant for preventing screw seizing, MK1KS, and to fasten with recommended torque.

★ : Stocked in Japan
<2 inserts in one case>

RECOMMENDED CUTTING CONDITIONS FOR SRFT BALL-NOSE INSERTS

	Workpiece Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Feed per Tooth **fz** (IPT)	Depth of Cut **ap** (inch)
P	Mild Steel	180HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P	Carbon Steel Alloy Steel	180—280HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P			**VP15TF**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P		280—350HB	**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
P	Pre-hardened Steel	35—45HRC	**EP6120**	490 (260—655)	.008 (.004—.012)	≤0.05DC
P			**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05DC
P	Alloy Tool Steel	350HB	**EP6120**	490 (260—655)	.008 (.004—.012)	≤0.05DC
P			**VP15TF**	490 (260—655)	.008 (.004—.012)	≤0.05DC
K	Gray Cast Iron	350MPa	**MP8010**	820 (260—1475)	.008 (.004—.012)	≤0.05DC
K	Ductile Cast Iron	450MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05DC
K		800MPa	**MP8010**	655 (260—985)	.008 (.004—.012)	≤0.05DC
N	Copper,Copper Alloys		**EP6120**	655 (260—985)	.008 (.004—.012)	≤0.05DC
H	Hardened Steel	45—55HRC	**MP8010**	330 (195—395)	.008 (.004—.012)	≤0.05DC
H		55—65HRC	**MP8010**	260 (195—395)	.008 (.004—.012)	≤0.01DC

Note 1) The values above are for average machining conditions. The optimum values can change slightly according to the condition and rigidity of the machine and work holding. Adjust the values accordingly.
Note 2) For end mills with a carbide shank, up to 20% higher cutting conditions are possible.
Note 3) Please note the following when machining hardened steel with MP8010.
- Please shorten the overhang length as much as possible.
- Use with carbide shank recommended.
- Take special care with the depth of cut to prevent fracture.

RECOMMENDED CUTTING CONDITIONS FOR SUFT CORNER RADIUS INSERT

■Shoulder Milling(When small width of cut.*)

	Workpiece Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Wide of Cut **ae** (inch)	Feed per Tooth **fz** (IPT)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	655 (260—985)	≤0.05DC	≤0.05DC	.008 (≤.016)
	Pre-hardened steel	≤45HRC	**VP15TF**	490 (260—655)	≤0.05DC	≤0.05DC	.006 (≤.012)
	Alloy Tool Steel	180—380HB	**VP15TF**	490 (260—655)	≤0.05DC	≤0.05DC	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330—655)	≤0.05DC	≤0.05DC	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	820 (590—1475)	≤0.05DC	≤0.1DC	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260—985)	≤0.05DC	≤0.1DC	.012 (≤.016)
H	Hardened Steel	45—55HRC	**MP8010**	330 (260—395)	≤0.05DC	≤0.02DC	.004 (≤.008)
	Hardened Steel	55—65HRC	**MP8010**	260 (195—330)	≤0.05DC	≤0.02DC	.004 (≤.008)

* When the pick feed direction is along the axis of the tool such as finish machining at the wall part.

■Slot Milling / Shoulder Milling(When large width of cut.*)

	Workpiece Material	Hardness	Insert Grades	Cutting Speed **vc** (SFM)	Depth of Cut **ap** (inch)	Wide of Cut **ae** (inch)	Feed per Tooth **fz** (IPT)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	655 (260—985)	≤0.02DC	≤DC	.008 (≤.016)
	Pre-hardened steel	≤45HRC	**VP15TF**	490 (260—655)	≤0.02DC	≤DC	.006 (≤.012)
	Alloy Tool Steel	180—380HB	**VP15TF**	490 (260—655)	≤0.02DC	≤DC	.006 (≤.012)
M	Stainless Steel	≤270HB	**VP15TF**	490 (330—655)	≤0.02DC	≤DC	.008 (≤.016)
K	Cast Iron	Tensile Strength ≤350MPa	**MP8010**	835 (590—1475)	≤0.03DC	≤DC	.012 (≤.016)
	Ductile Cast Iron	Tensile Strength ≤800MPa	**MP8010**	655 (260—985)	≤0.03DC	≤DC	.012 (≤.016)
H	Hardened Steel	45—55HRC	**MP8010**	330 (260—395)	≤0.01DC	≤DC	.004 (≤.006)
	Hardened Steel	55—65HRC	**MP8010**	230 (195—330)	≤0.01DC	≤DC	.004 (≤.008)

* When the pick feed direction is along the radius of the tool such as finish face machining.

Note 1) This cutting condition is the standard condition when using the steel standard shank type.
If vibration or chipping on cutting edge occurs, please decrease the cutting condition as width of cut, depth of cut and feed per tooth depending on the situation.

Note 2) Recommended cutting speeds apply to tool outside diameter.
Please calculate the spindle speed of tool in the following expressions.
Spindle speed of cutting tool $n(min^{-1})=12\times$Cutting speed vc ÷ Diameter of cutting tool DC ÷ 3.14

CALCULATING ACTUAL CUTTING SPEED

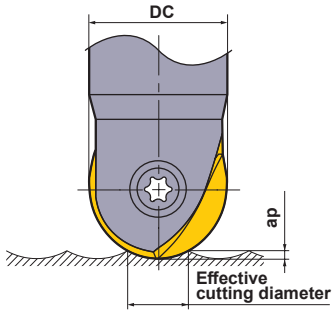
1. Effective cutting diameter = $2\sqrt{ap\,(DC-ap)}$

DC: Tool diameter (inch)
ap : Depth of Cut (inch)

2. Using ap ➡ Calculate cutting speed at the depth of cut line.

$$vc = \frac{2\pi n\sqrt{ap(DC-ap)}}{12}$$

vc : Actual cutting speed (SFM)
n : Revolution (min^{-1})



SELECTING PICK FEED

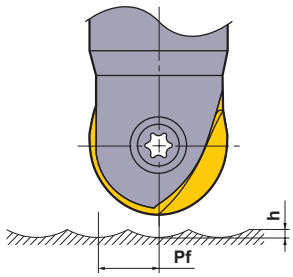
Theoretical

$$h = \frac{(Pf)^2}{8R}$$

h : Cusp height
Pf : Pick feed
PRFRAD : Ball nose or corner radius

Actual surface roughness Rz will be about 3 times worse than theoretical h.
This is because of the effect of a built-up edge.
To determine Pf, use the formula below based on a particular Rz value.

$$Pf = \sqrt{\frac{8xPRFRADxRz}{3}}$$



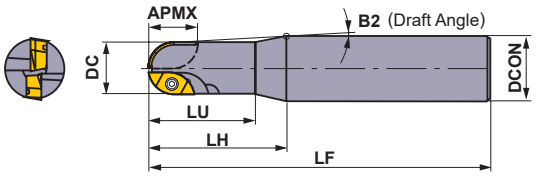
BALL NOSE END MILL

SRM2

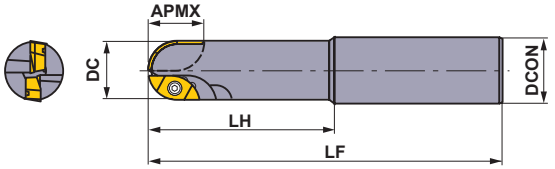
P M K N S H

● Short Type

SRM210SAS2
SRM212SAS2

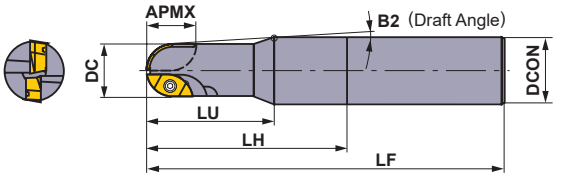


SRM216SAS2
SRM220SAS2

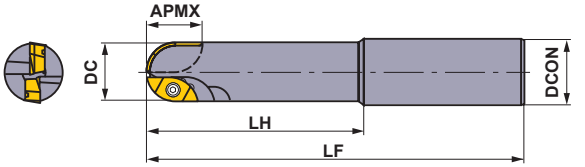


● Medium Type

SRM210SAM2
SRM212SAM2

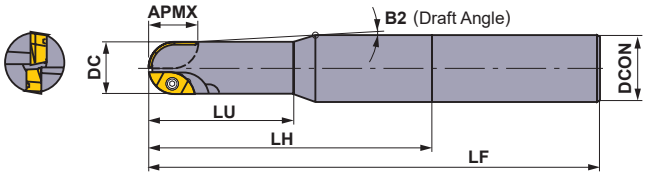


SRM216SAM2
SRM220SAM2

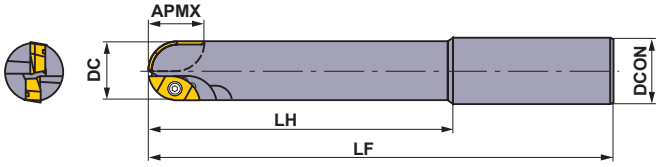


● Long Type

SRM210SAL2
SRM212SAL2
SRM216SAL2

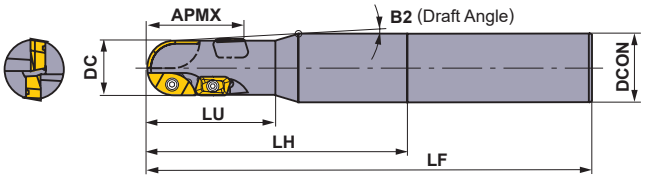


SRM220SAL2

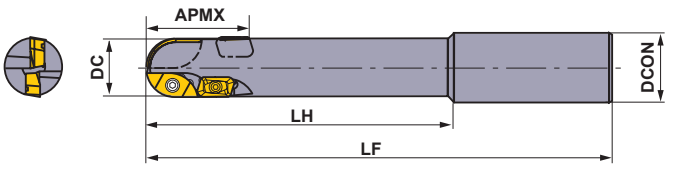


● Long Edge Type

SRM212SAL4
SRM216SAL4



SRM220SAL4



Right hand tool holder only.

■ SHANK TYPE

With Air / coolant through.

Type	Order Number	Stock	Number of Teeth	Dimensions (inch)								*1 Inner, Outer	*1 Peripheral	D T F Inner, Outer	D T F Peripheral	Inner	Outer	Peripheral
		R		RE*2	DC	LF	DCON	LH	LU	APMX	B2	Insert Screw		Wrench		Insert		
Short	**SRM210SAS2**	●	2	.313	.625	4.0	.75	1.5	1.00	.625	3°	TS25H	—	TKY08D	—	SRM210C-M	SRM210E-M	—
	SRM212SAS2	●	2	.375	.750	4.0	1.00	1.5	1.25	.750	6.5°	TS32	—	TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	SRM216SAS2	●	2	.500	1.000	4.5	1.00	2.0	—	.945	—	TS43	—	TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	SRM220SAS2	●	2	.625	1.250	5.0	1.25	2.0	—	1.102	—	TS55	—	TKY25T	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—
Medium	**SRM210SAM2**	●	2	.313	.625	5.0	.75	2.5	1.00	.625	1.5°	TS25H	—	TKY08D	—	SRM210C-M	SRM210E-M	—
	SRM212SAM2	●	2	.375	.750	5.0	1.00	2.5	1.25	.750	1.5°	TS32	—	TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	SRM216SAM2	●	2	.500	1.000	5.5	1.00	3.0	—	.945	—	TS43	—	TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	SRM220SAM2	●	2	.625	1.250	6.5	1.25	3.5	—	1.102	—	TS55	—	TKY25T	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—
Long	**SRM210SAL2**	●	2	.313	.625	6.0	.75	3.5	1.00	.625	1.5°	TS25H	—	TKY08D	—	SRM210C-M	SRM210E-M	—
	SRM212SAL2	●	2	.375	.750	6.0	1.00	3.5	1.50	.750	1.5°	TS32	—	TKY08D	—	SRM212C SRM212C-M	SRM212E SRM212E-M	—
	SRM216SAL2	●	2	.500	1.000	6.5	1.25	4.0	1.75	.945	1.5°	TS43	—	TKY15T	—	SRM216C SRM216C-M	SRM216E SRM216E-M	—
	SRM220SAL2	●	2	.625	1.250	8.0	1.25	5.0	—	1.102	—	TS55	—	TKY25T	—	SRM220C SRM220C-M	SRM220E SRM220E-M	—
Long Edge	**SRM212SAL4**	●	4	.375	.750	6.0	1.00	3.5	1.50	1.180	1.5°	TS32	TS25	TKY08D	TKY08D	SRM212C SRM212C-M	SRM212E SRM212E-M	APMT1135 PDER-□2
	SRM216SAL4	●	4	.500	1.000	6.5	1.25	4.0	1.75	1.457	1.5°	TS43	TS25	TKY15T	TKY08F	SRM216C SRM216C-M	SRM216E SRM216E-M	APMT1135 PDER-□2
	SRM220SAL4	●	4	.625	1.250	8.0	1.25	5.0	—	1.732	—	TS55	TS43	TKY25T	TKY15F	SRM220C SRM220C-M	SRM220E SRM220E-M	APMT1604 PDER-□2

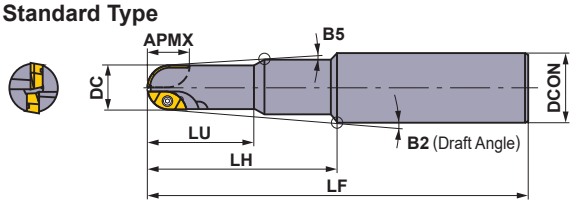
*1 Clamp Torque (lbf-in) : TS25H=15, TS25=8.9, TS32=18, TS43=31, TS55=66

*2 RE is shown for insert corner R.

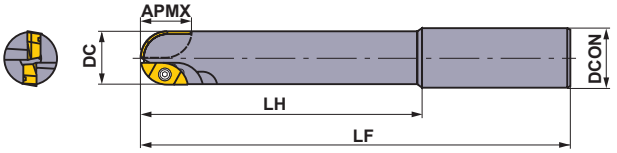
ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

Metric Standard

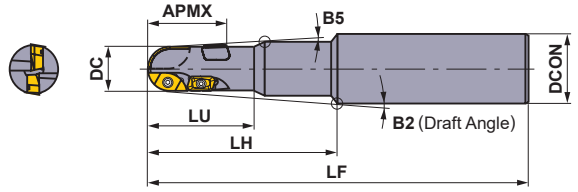
● Standard Type



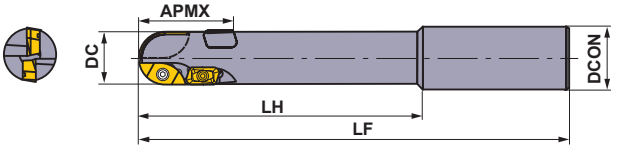
● Long Neck Type



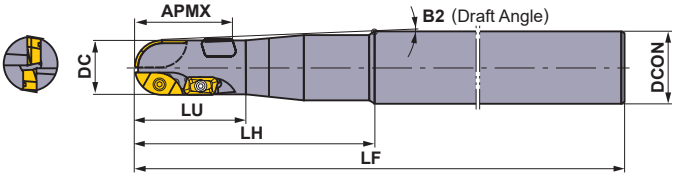
● Long Cutting Edge Type



● Long Neck Cutting Edge Type



● Extra Long Cutting Edge Type



Right hand tool holder only.

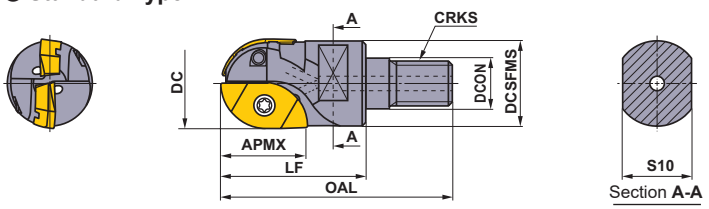
Type	Order Number	Stock R	Coolant Thru ★1	Number of Teeth	Dimensions (mm) RE ★3	DC	DCON	LF	LH	LU	APMX	B2	B5	★2 Inner, Outer Clamp	★2 Peripheral Screw	D Inner, Outer Wrench	T F Peripheral Wrench	Inner Insert	Outer Insert	Peripheral Insert
Standard	**SRM2160SNM**	★	N	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	—	TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2160SAM	★	Y	2	8	16	20	130	50	25	12	2.8°	1.5°	TS25H	—	TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200SNM	★	N	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	—	TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2200SAM	★	Y	2	10	20	25	150	70	35	14	2.45°	1.5°	TS32	—	TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250SNM	★	N	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	—	TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2250SAM	★	Y	2	12.5	25	32	180	80	40	19	3.22°	1.5°	TS43	—	TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300SNM	★	N	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	—	TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2300SAM	★	Y	2	15	30	32	200	100	50	24	0.73°	0.5°	TS55	—	TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
Long Cutting Edge	**SRM2200SNL**	★	N	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2200SAL	★	Y	4	10	20	25	150	70	35	30	2.45°	1.5°	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250SNL	★	N	4	12.5	25	32	180	80	40	37	3.22°	1.5°	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2250SAL	★	Y	4	12.5	25	32	180	80	40	37	3.22°	1.5°	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300SNL	★	N	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2300SAL	★	Y	4	15	30	32	200	100	50	44	0.73°	0.5°	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2

★1 Y=Yes, N=No
★2 Clamp Torque (N • m) : TS25H=1.0, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5
★3 RE is shown for insert corner R.

Type	Order Number	Stock	*1 Coolant Thru	Number of Teeth	Dimensions (mm)									*2 Inner, Outer	*2 Peripheral	D T F Inner, Outer	D T F Peripheral	Inner	Outer	Peripheral
		R			*3 RE	DC	DCON	LF	LH	LU	APMX	B2	B5	Clamp Screw		Wrench		Insert		
Long Neck	**SRM2160SNF**	★	N	2	8	16	16	150	70	—	12	—	—	TS25H	—	TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2160SAF	★	Y	2	8	16	16	150	70	—	12	—	—	TS25H	—	TKY08D	—	SRG16C SRM16C-M	SRG16E SRM16E-M	—
	SRM2200SNF	★	N	2	10	20	20	180	100	—	14	—	—	TS32	—	TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2200SAF	★	Y	2	10	20	20	180	100	—	14	—	—	TS32	—	TKY08D	—	SRG20C SRM20C-M	SRG20E SRM20E-M	—
	SRM2250SNF	★	N	2	12.5	25	25	200	120	—	19	—	—	TS43	—	TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2250SAF	★	Y	2	12.5	25	25	200	120	—	19	—	—	TS43	—	TKY15T	—	SRG25C SRM25C-M	SRG25E SRM25E-M	—
	SRM2300SNF	★	N	2	15	30	32	230	150	—	24	—	—	TS55	—	TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
	SRM2300SAF	★	Y	2	15	30	32	230	150	—	24	—	—	TS55	—	TKY25T	—	SRG30C SRM30C-M	SRG30E SRM30E-M	—
Long Neck Cutting Edge	**SRM2200SNLF**	★	N	4	10	20	20	180	100	—	30	—	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2200SALF	★	Y	4	10	20	20	180	100	—	30	—	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250SNLF	★	N	4	12.5	25	25	200	120	—	37	—	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2250SALF	★	Y	4	12.5	25	25	200	120	—	37	—	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300SNLF	★	N	4	15	30	32	230	150	—	44	—	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2300SALF	★	Y	4	15	30	32	230	150	—	44	—	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
Extra Long Cutting Edge	**SRM2200SNLL**	★	N	4	10	20	25	250	120	35	30	1.5°	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2200SALL	★	Y	4	10	20	25	250	120	35	30	1.5°	—	TS32	TS25	TKY08D	TKY08D	SRG20C SRM20C-M	SRG20E SRM20E-M	APMT1135 PDER-□2
	SRM2250SNLL	★	N	4	12.5	25	32	300	170	37	37	1.5°	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2250SALL	★	Y	4	12.5	25	32	300	170	37	37	1.5°	—	TS43	TS25	TKY15T	TKY08F	SRG25C SRM25C-M	SRG25E SRM25E-M	APMT1135 PDER-□2
	SRM2300SNLL	★	N	4	15	30	32	350	100	50	44	1.5°	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2
	SRM2300SALL	★	Y	4	15	30	32	350	100	50	44	1.5°	—	TS55	TS43	TKY25T	TKY15F	SRG30C SRM30C-M	SRG30E SRM30E-M	APMT1604 PDER-□2

*1 Y=Yes, N=No
*2 Clamp Torque (N • m) : TS25H=1.0, TS25=1.0, TS32=2.0, TS43=3.5, TS55=7.5
*3 RE is shown for insert corner R.

● Standard Type



■ SCREW-IN TYPE

With Air / coolant through.

Right hand tool holder only.

DC	Order Number	Stock	Dimensions (inch)								WT (lbs)
			RE*2	LF	OAL	DCON	DCSFMS	S10	CRKS*1	APMX	
.750	**SRM212AM10S35**	●	.375	1.378	2.126	.413	.701	.551	M10	.551	.2
1.000	**SRM216AM12S40**	●	.500	1.575	2.441	.492	.933	.748	M12	.748	.4
1.250	**SRM220AM16S45**	●	.625	1.772	2.677	.669	1.169	.945	M16	1.102	.4

*1 Clamp Torque of the Head (lbf-ft) : M10=33.8, M12=59.2, M16=66.7
*2 RE is shown for insert corner R.

SPARE PARTS

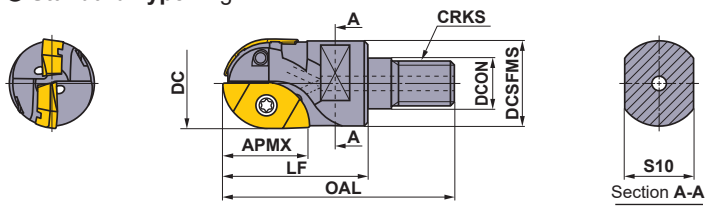
DC	Order Number	*1	*1					
		Insert Screw Inner,Outer	Insert Screw Peripheral	Insert Wrench	Insert Wrench	Insert Inner	Insert Outer	Insert Peripheral
.750	**SRM212AM10S35**	TS32	—	TKY08D	—	SRM212C	SRM212E	—
1.000	**SRM216AM12S40**	TS43	TS25	TKY15T	—	SRM216C	SRM216E	—
1.250	**SRM220AM16S45**	TS55	TS43	TKY25T	TKY15F	SRM220C	SRM220E	—

*1 Clamp Torque (lbf-in) : TS32=18, TS43=31, TS55=66

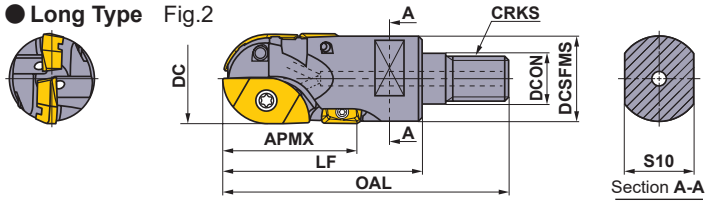
Metric Standard

With Air / coolant through.

● **Standard Type** Fig.1



● **Long Type** Fig.2



Right hand tool holder only.

DC	Order Number	Stock	Dimensions (mm)								WT (kg)	Fig.
			RE*2	LF	OAL	DCON	DCSFMS	S10	CRKS *1	APMX		
16	**SRM2160AM08S30**	★	8	30	48	8.5	14.6	10	M8	12	0.1	1
20	**SRM2200AM10L45**	★	10	45	64	10.5	18.6	14	M10	30	0.2	2
20	**SRM2200AM10S35**	★	10	35	54	10.5	18.6	14	M10	14	0.1	1
25	**SRM2250AM12L55**	★	12.5	55	77	12.5	23.5	19	M12	37	0.3	2
25	**SRM2250AM12S40**	★	12.5	40	62	12.5	23.5	19	M12	19	0.2	1
30	**SRM2300AM16L60**	★	15	60	83	17	28.3	24	M16	44	0.3	2
30	**SRM2300AM16S45**	★	15	45	68	17	28.3	24	M16	24	0.2	1
32	**SRM2320AM16L60**	★	16	60	83	17	29	24	M16	44	0.3	2
32	**SRM2320AM16S45**	★	16	45	68	17	30	24	M16	24	0.2	1

*1 Clamp Torque of the Head (lbf-ft) : M8=17.1, M10=33.8, M12=59.2, M16=66.7
*2 RE is shown for insert corner R.

SPARE PARTS

DC	Order Number	*1 Insert Screw Inner,Outer	*1 Insert Screw Peripheral	D T Insert Wrench	Insert Wrench	Insert Inner	Insert Outer	Insert Peripheral
16	**SRM2160AM08S30**	TS25H	–	TKY08D	–	SR○16C	SR○16E	–
20	**SRM2200AM10L45**	TS32	TS25	TKY08D	–	SR○20C	SR○20E	APMT1135
20	**SRM2200AM10S35**	TS32	–	TKY08D	–	SR○20C	SR○20E	–
25	**SRM2250AM12L55**	TS43	TS25	TKY15T	TKY08F	SR○25C	SR○25E	APMT1135
25	**SRM2250AM12S40**	TS43	TS25	TKY15T	–	SR○25C	SR○25E	–
30	**SRM2300AM16L60**	TS55	TS43	TKY25T	TKY15F	SR○30C	SR○30E	APMT1604
30	**SRM2300AM16S45**	TS55	–	TKY15T	TKY08F	SR○30C	SR○30E	–
32	**SRM2320AM16L60**	TS55	TS43	TKY25T	TKY15F	SR○32C	SR○32E	APMT1604
32	**SRM2320AM16S45**	TS55	TS43	TKY25T	TKY15F	SR○32C	SR○32E	–

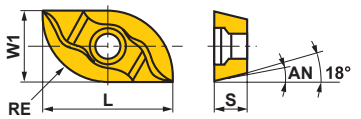
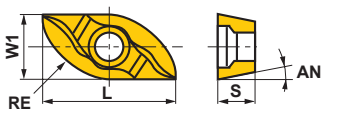
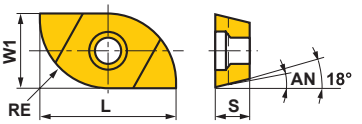
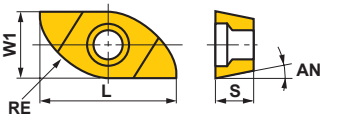
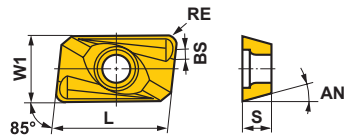
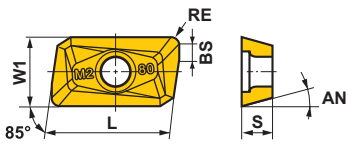
*1 Clamp Torque (lbf-in) : TS25H=15, TS25=8.9, TS32=18, TS43=31, TS55=66

ISO13399 ➤ K003
SCREW-IN HOLDERS ➤ K382
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

INSERTS

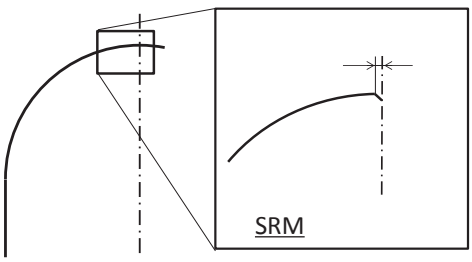
Workpiece Material		
P	Steel	
M	Stainless Steel	
K	Cast Iron	
S	Heat resistant Alloys, Titanium Alloys	
H	Hardened Steel	

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

Type	Shape	Order Number	Class	Coated				Dimensions (inch)						Geometry
				F7030	MP6120	MP9120	VP15TF	RE	L	W1	S	BS	AN	
Inner		**SRM210C-M**	M		●	●	●	.313	.630	.323	.138	—	11°	
		SRM212C-M	M		●	●	●	.375	.748	.385	.169	—	11°	
		SRM216C-M	M		●	●	●	.500	.945	.512	.216	—	11°	
		SRM220C-M	M		●	●	●	.625	1.102	.638	.275	—	11°	
Outer		**SRM210E-M**	M		●	●	●	.313	.531	.258	.138	—	11°	
		SRM212E-M	M		●	●	●	.375	.610	.315	.169	—	11°	
		SRM216E-M	M		●	●	●	.500	.807	.409	.216	—	11°	
		SRM220E-M	M		●	●	●	.625	.964	.520	.275	—	11°	
Inner	Strong Cutting Edge Type	**SRM212C**	M		●	●	●	.375	.748	.385	.169	—	11°	
		SRM216C	M		●	●	●	.500	.945	.512	.216	—	11°	
		SRM220C	M		●	●	●	.625	1.102	.638	.275	—	11°	
Outer	Strong Cutting Edge Type	**SRM212E**	M		●	●	●	.375	.610	.315	.169	—	11°	
		SRM216E	M		●	●	●	.500	.807	.409	.216	—	11°	
		SRM220E	M		●	●	●	.625	.964	.520	.275	—	11°	
Peripheral	Strong Cutting Edge Type	**APMT1135PDER-H2**	M	●			●	.031	.433	.250	.138	.047	11°	
		APMT1604PDER-H2	M	●			●	.031	.650	.375	.187	.055	11°	
	Low Resistance Type	**APMT1135PDER-M2**	M	●			●	.031	.433	.250	.138	.047	11°	
		APMT1604PDER-M2	M	●			●	.031	.650	.375	.187	.055	11°	

Note 1) The **M** type breaker (APMT....PDER-M2) is the first recommendation for its excellent cutting performance.
Please use **H** type breakers (APMT....PDER-H2) due to cutting edge strength.

Note 2) SRM tooling is designed for rough machining applications.
*Programming Note: If you choose to use SRM tooling for semi-finishing applications, care must be taken when setting the tool height. The SRM insert includes a chamfer flat at the tip as illustrated. To assist with SRM programming needs, please download our CAD data from our web site; http://www.mmus-carbide.com



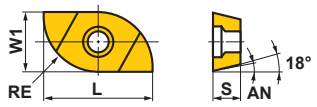
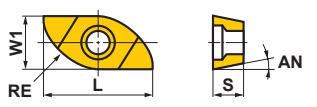
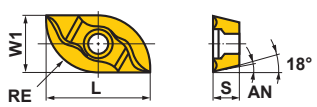
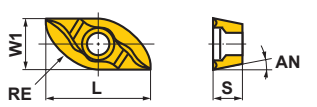
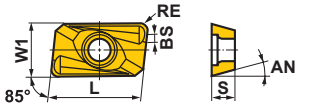
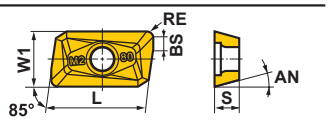
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

INSERTS

For Metric Standard

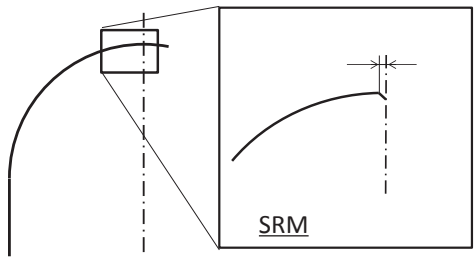
Workpiece Material			F7030	MP6120	MP9120	VP15TF
	P	Steel	●	●		●
	M	Stainless Steel	◔			◔
	K	Cast Iron				✱
	S	Heat resistant Alloys, Titanium Alloys			●	●
	H	Hardened Steel				◔

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✱ : Unstable Cutting

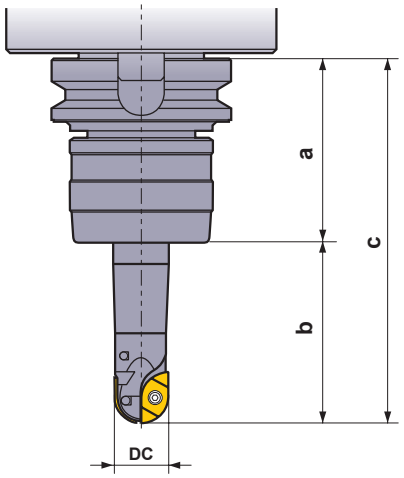
Type	Shape	Order Number	Class	Coated F7030	Coated MP6120	Coated MP9120	Coated VP15TF	RE	L	W1	S	BS	AN	Geometry
Inner	Strong Cutting Edge Type	**SRG16C**	G		★	★	★	8	16	8.2	3.5	—	11°	
		SRG20C	G		★	★	★	10	19	10.2	4.6	—	10°	
		SRG25C	G		★	★	★	12.5	24	12.8	5.5	—	10°	
		SRG30C	G		★	★	★	15	28	15.3	7	—	10°	
		SRG32C	G		★	★	★	16	28	16.3	7	—	10°	
Outer	Strong Cutting Edge Type	**SRG16E**	G		★	★	★	8	13.5	6.7	3.5	—	11°	
		SRG20E	G		★	★	★	10	15.5	8.5	4.6	—	9°	
		SRG25E	G		★	★	★	12.5	20.5	10.2	5.5	—	9°	
		SRG30E	G		★	★	★	15	25.2	12.2	7	—	9°	
		SRG32E	G		★	★	★	16	26.1	13.1	7	—	9°	
Inner	Low Resistance Type	**SRM16C-M**	M		★	★	★	8	16	8.2	3.5	—	11°	
		SRM20C-M	M		★	★	★	10	19	10.2	4.6	—	10°	
		SRM25C-M	M		★	★	★	12.5	24	12.8	5.5	—	10°	
		SRM30C-M	M		★	★	★	15	28	15.3	7	—	10°	
		SRM32C-M	M		★	★	★	16	28	16.3	7	—	10°	
Outer	Low Resistance Type	**SRM16E-M**	M		★	★	★	8	13.5	6.7	3.5	—	11°	
		SRM20E-M	M		★	★	★	10	15.5	8.5	4.6	—	9°	
		SRM25E-M	M		★	★	★	12.5	20.5	10.2	5.5	—	9°	
		SRM30E-M	M		★	★	★	15	25.2	12.2	7	—	9°	
		SRM32E-M	M		★	★	★	16	26.1	13.1	7	—	9°	
Peripheral *	Strong Cutting Edge Type	**APMT1135PDER-H2**	M	●			●	0.8	11	6.35	3.5	1.2	11°	
		APMT1604PDER-H2	M	●			●	0.8	16.5	9.525	4.76	1.4	11°	
	Low Resistance Type	**APMT1135PDER-M2**	M	●			●	0.8	11	6.35	3.5	1.2	11°	
		APMT1604PDER-M2	M	●			●	0.8	16.5	9.525	4.76	1.4	11°	

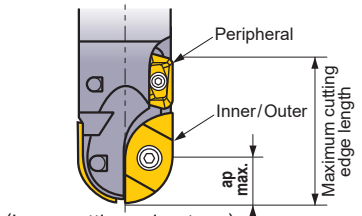
(Low-resistance inner or outer inserts are precision M class type.)
* Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

Note 1) SRM tooling is designed for rough machining applications.
*Programming Note: If you choose to use SRM tooling for semi-finishing applications, care must be taken when setting the tool height. The SRM insert includes a chamfer flat at the tip as illustrated. To assist with SRM programming needs, please download our CAD data from our web site; http://www.mmus-carbide.com



RECOMMENDED CUTTING CONDITIONS





(Long cutting edge type)

Tool Overhang

Recommended cutting conditions on this literature are chosen based on deflection, vibration and machined surface when using a CAT50 arbor. Conditions-**"a"** is the length from a gage line to the arbor end face, and **"b"** is the neck length (tool overhang from the arbor).

(Inch)

Cutting Diameter : DC	Type	a	b	c
.625"	Short	4	1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
.750"	Short		1.5	5.5
	Medium		2.5	6.5
	Long		3.5	7.5
1.000"	Short		2.0	6.0
	Medium		3.0	7.0
	Long		4.0	8.0
1.250"	Short		2.0	6.0
	Medium		3.5	7.5
	Long		5.0	9.0

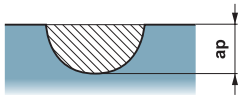
Recommended Depth of Cut for Long Cutting Edge Type

The maximum cutting edge length of the long cutting edge type with a peripheral insert is 1.4-1.5DC. The peripheral insert is for light machining only.

Please refer the recommended cutting condition or page K373.

■Slot Milling

Cutting Mode

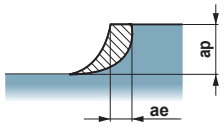


N: Spindle Speed (min^{-1})
F: Table Feed (IPM)

	Workpiece Material	Hardness	Cutting Speed (SFM)	Insert Grade, Type	Type	ϕ.625"			ϕ.750"			ϕ1.000"			ϕ1.250"		
						min^{-1}	IPM	ap	min^{-1}	IPM	ap	min^{-1}	IPM	ap	min^{-1}	IPM	ap
P	Carbon Steel Alloy Steel	180-280HB	525	MP6120 VP15TF Low Resistance Type	Short	3183	15	.236	2546	12	.315	2037	19	.492	1698	16	.591
			395		Medium	3183	15	.236	2546	12	.315	2037	19	.492	1698	16	.591
			655		Long	3183	15	.157	2546	12	.157	2037	19	.236	1698	16	.295
		280-350HB	460	MP6120 VP15TF Low Resistance Type	Short	2785	13	.236	2228	11	.315	1783	17	.492	1485	14	.591
			395		Medium	2785	13	.236	2228	11	.315	1783	17	.492	1485	14	.591
			525		Long	2785	13	.157	2228	11	.157	1783	17	.236	1485	14	.295
	Pre-Hardened Steel	35-45HRC	395	MP6120 VP15TF Low Resistance Type	Short	2387	11	.236	1910	9	.315	1528	14	.492	1273	12	.472
			330		Medium	2387	11	.236	1910	9	.315	1528	14	.492	1273	12	.472
			525		Long	2387	11	.157	1910	9	.157	1528	14	.236	1273	12	.177
	Alloy Tool Steel	≤350HB	460	MP6120 VP15TF Low Resistance Type	Short	2785	13	.236	2228	11	.315	1783	21	.394	1485	23	.295
			395		Medium	2785	13	.236	2228	11	.315	1783	21	.394	1485	23	.295
			525		Long	2785	13	.157	2228	11	.157	1783	21	.197	1485	23	.177
M	Stainless Steel	≤270HB	655	VP15TF Low Resistance Type	Short	3979	19	.157	3183	15	.197	2546	30	.236	2122	33	.591
			330		Medium	3979	19	.157	3183	15	.197	2546	30	.236	2122	33	.591
			820		Long	3979	19	.118	3183	15	.118	2546	24	.157	2122	25	.177
K	Gray Cast Iron	≤350MPa	655	VP15TF Low Resistance Type	Short	3979	31	.236	3183	25	.315	2546	40	.492	2122	33	.591
			490		Medium	3979	31	.236	3183	25	.315	2546	40	.492	2122	33	.591
			985		Long	3979	31	.157	3183	25	.157	2546	40	.295	2122	33	.177
	Ductile Cast Iron	≤500MPa	590	VP15TF Low Resistance Type	Short	3581	28	.236	2865	23	.315	2292	36	.492	1910	30	.591
			490		Medium	3581	28	.236	2865	23	.315	2292	36	.492	1910	30	.591
			785		Long	3581	28	.157	2865	23	.157	2292	36	.295	1910	30	.177
		≤800MPa	525	VP15TF Low Resistance Type	Short	3183	25	.236	2546	20	.315	2037	32	.492	1698	27	.591
			490		Medium	3183	25	.236	2546	20	.315	2037	32	.492	1698	27	.591
			820		Long	3183	25	.157	2546	20	.157	2037	32	.295	1698	27	.177
S	Titanium Alloys	≤350HB	165	MP9120	Short	995	4	.157	796	3	.157	637	3	.236	531	2	.295
			100		Medium	995	4	.157	796	3	.157	637	3	.236	531	2	.295
			195		Long	995	4	.079	796	3	.079	637	3	.157	531	2	.118
	Heat resistant Alloys	–	165	MP9120	Short	995	4	.157	796	3	.157	637	3	.236	531	2	.295
			100		Medium	995	4	.157	796	3	.157	637	3	.236	531	2	.295
			195		Long	995	4	.079	796	3	.079	637	3	.157	531	2	.118
H	Hardened Steel	45-50HRC	330	VP15TF Strong Cutting Edge Type	Short	1989	9	.157	1591	8	.157	1273	10	.236	1061	8	.295
			195		Medium	1989	9	.157	1591	8	.157	1273	10	.236	1061	8	.295
			395		Long	1989	9	.079	1591	8	.079	1273	10	.157	1061	8	.118
		50-60HRC	195	VP15TF Strong Cutting Edge Type	Short	1194	6	.157	955	5	.157	764	6	.236	637	5	.295
			130		Medium	1194	6	.157	955	5	.157	764	6	.236	637	5	.295
			330		Long	1194	6	.079	955	5	.079	764	6	.157	637	5	.118

■Shoulder Milling (Cutting Depth : Small)

Cutting Mode

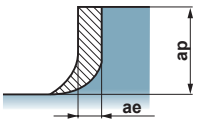


N : Spindle Speed (min^{-1})
F : Table Feed (IPM)

	Workpiece Material	Hardness	Cutting Speed (SFM)	Insert Grade, Type	Type	ϕ.625"				ϕ.750"				ϕ1.000"				ϕ1.250"			
						min^{-1}	IPM	ap	ae	min^{-1}	IPM	ap	ae	min^{-1}	IPM	ap	ae	min^{-1}	IPM	ap	ae
P	Carbon Steel Alloy Steel	180-280HB	655	MP6120 VP15TF Low Resistance Type	Short	3979	31	.157	.236	3183	38	.197	.315	2546	50	.236	.394	2122	50	.295	.394
			525		Medium	3979	31	.157	.236	3183	38	.197	.315	2546	50	.236	.394	2122	50	.295	.394
			820		Long	3979	25	.157	.157	3183	25	.197	.236	2546	50	.236	.295	2122	50	.295	.295
		280-350HB	525	MP6120 VP15TF Low Resistance Type	Short	3183	20	.157	.236	2546	20	.197	.315	2037	32	.236	.394	1698	33	.295	.394
			395		Medium	3183	20	.157	.236	2546	20	.197	.315	2037	32	.236	.394	1698	33	.295	.394
			655		Long	3183	15	.157	.157	2546	16	.197	.236	2037	24	.236	.295	1698	20	.295	.295
	Pre-Hardened Steel	35-45HRC	525	MP6120 VP15TF Low Resistance Type	Short	3183	20	.157	.236	2546	20	.197	.315	2037	32	.236	.394	1698	33	.295	.394
			395		Medium	3183	20	.157	.236	2546	20	.197	.315	2037	32	.236	.394	1698	33	.295	.394
			655		Long	3183	15	.157	.157	2546	16	.197	.236	2037	24	.236	.295	1698	27	.295	.295
	Alloy Tool Steel	≤350HB	525	MP6120 VP15TF Low Resistance Type	Short	3183	20	.157	.236	2546	20	.197	.315	2037	32	.236	.394	1698	33	.295	.394
			395		Medium	3183	20	.157	.236	2546	20	.197	.315	2037	32	.236	.394	1698	33	.295	.394
			655		Long	3183	15	.157	.157	2546	16	.197	.236	2037	24	.236	.295	1698	20	.295	.295
M	Stainless Steel	≤270HB	655	VP15TF Low Resistance Type	Short	3979	19	.157	.236	3183	20	.197	.315	2546	30	.236	.394	2122	33	.295	.394
			330		Medium	3979	19	.157	.236	3183	20	.197	.315	2546	30	.236	.394	2122	33	.295	.394
			820		Long	3979	19	.157	.157	3183	15	.197	.236	2546	24	.236	.295	2122	33	.295	.295
K	Gray Cast Iron	≤350MPa	655	VP15TF Low Resistance Type	Short	3979	63	.157	.315	3183	63	.197	.394	2546	60	.236	.394	2122	58	.295	.394
			490		Medium	3979	63	.157	.315	3183	63	.197	.394	2546	60	.236	.394	2122	58	.295	.394
			985		Long	3979	47	.157	.236	3183	50	.197	.315	2546	60	.236	.394	2122	58	.295	.236
	Ductile Cast Iron	≤500MPa	655	VP15TF Low Resistance Type	Short	3979	63	.157	.315	3183	63	.197	.394	2546	60	.236	.394	2122	50	.295	.394
			490		Medium	3979	63	.157	.315	3183	63	.197	.394	2546	60	.236	.394	2122	50	.295	.394
			920		Long	3979	47	.157	.236	3183	50	.197	.315	2546	60	.236	.394	2122	50	.295	.236
		≤800MPa	590	VP15TF Low Resistance Type	Short	3581	56	.157	.315	2865	56	.197	.394	2292	54	.236	.394	1910	45	.295	.394
			490		Medium	3581	56	.157	.315	2865	56	.197	.394	2292	54	.236	.394	1910	45	.295	.394
			820		Long	3581	42	.157	.236	2865	45	.197	.315	2292	54	.236	.394	1910	45	.295	.236
S	Titanium Alloys	≤350HB	165	MP9120	Short	995	12	.157	.157	796	9	.157	.197	637	8	.236	.236	531	6	.295	.118
			100		Medium	995	12	.157	.157	796	9	.157	.197	637	8	.236	.236	531	6	.295	.118
			195		Long	995	12	.079	.079	796	9	.079	.118	637	8	.157	.157	531	6	.118	.059
	Heat resistant Alloys	–	165	MP9120	Short	995	12	.157	.157	796	9	.157	.197	637	8	.236	.236	531	6	.295	.118
			100		Medium	995	12	.157	.157	796	9	.157	.197	637	8	.236	.236	531	6	.295	.118
			195		Long	995	12	.079	.079	796	9	.079	.118	637	8	.157	.157	531	6	.118	.059
H	Hardened Steel	45-50HRC	330	VP15TF Strong Cutting Edge Type	Short	1989	9	.157	.157	1591	8	.197	.197	1273	10	.236	.295	1061	8	.295	.118
			195		Medium	1989	9	.157	.157	1591	8	.197	.197	1273	10	.236	.295	1061	8	.295	.118
			395		Long	1989	9	.157	.079	1591	8	.197	.118	1273	10	.236	.157	1061	8	.295	.059
		50-60HRC	195	VP15TF Strong Cutting Edge Type	Short	1194	6	.157	.157	955	5	.197	.197	764	6	.236	.295	637	5	.295	.118
			130		Medium	1194	6	.157	.157	955	5	.197	.197	764	6	.236	.295	637	5	.295	.118
			330		Long	1194	6	.157	.079	955	5	.197	.118	764	6	.236	.157	637	5	.295	.059

■Shoulder Milling (Cutting Depth : Large)

Cutting Mode



N : Spindle Speed (min^{-1})
F : Table Feed (IPM)

✱Machining Stainless Steel

Down cutting is preferred.

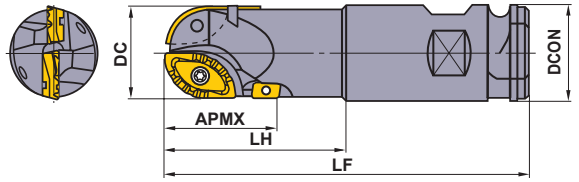
Workpiece Material		Hardness	Cutting Speed (SFM)	Insert Grade, Type	Type	ϕ.625"				ϕ.750"				ϕ1.000"				ϕ1.250"			
						min^{-1}	IPM	ap	ae	min^{-1}	IPM	ap	ae	min^{-1}	IPM	ap	ae	min^{-1}	IPM	ap	ae
P	Carbon Steel Alloy Steel	180-280HB	655	MP6120 VP15TF Low Resistance Type	Short	3979	25	.315	.157	3183	30	.394	.157	2546	50	.492	.197	2122	50	.591	.177
			525		Medium	3979	25	.315	.157	3183	30	.394	.157	2546	50	.492	.197	2122	50	.591	.177
			820		Long	3979	19	.315	.118	3183	20	.394	.118	2546	40	.492	.157	2122	33	.591	.118
		280-350HB	525	MP6120 VP15TF Low Resistance Type	Short	3183	15	.315	.157	2546	20	.394	.157	2037	32	.492	.197	1698	33	.591	.177
			395		Medium	3183	15	.315	.157	2546	20	.394	.157	2037	32	.492	.197	1698	33	.591	.177
			655		Long	3183	15	.315	.118	2546	12	.394	.118	2037	24	.492	.157	1698	20	.591	.118
	Pre-Hardened Steel	35-45HRC	525	MP6120 VP15TF Low Resistance Type	Short	3183	15	.315	.157	2546	20	.394	.157	2037	32	.492	.197	1698	33	.591	.177
			395		Medium	3183	15	.315	.157	2546	20	.394	.157	2037	32	.492	.197	1698	33	.591	.177
			655		Long	3183	15	.315	.118	2546	12	.394	.118	2037	24	.492	.157	1698	20	.591	.118
	Alloy Tool Steel	≤350HB	525	MP6120 VP15TF Low Resistance Type	Short	3183	15	.315	.157	2546	20	.394	.157	2037	32	.492	.197	1698	33	.591	.177
			395		Medium	3183	15	.315	.157	2546	20	.394	.157	2037	32	.492	.197	1698	33	.591	.177
			655		Long	3183	15	.315	.118	2546	12	.394	.118	2037	24	.492	.098	1698	20	.591	.118
M	Stainless Steel	≤270HB	655	VP15TF Low Resistance Type	Short	3979	19	.315	.157	3183	20	.394	.157	2546	30	.492	.394	2122	33	.591	.394
			330		Medium	3979	19	.315	.157	3183	20	.394	.157	2546	30	.492	.394	2122	33	.591	.394
			820		Long	3979	19	.315	.118	3183	15	.394	.118	2546	24	.492	.157	2122	20	.591	.177
K	Gray Cast Iron	≤350MPa	655	VP15TF Low Resistance Type	Short	3979	47	.315	.315	3183	50	.394	.315	2546	50	.492	.394	2122	58	.591	.394
			490		Medium	3979	47	.315	.315	3183	50	.394	.315	2546	50	.492	.394	2122	58	.591	.394
			985		Long	3979	38	.315	.197	3183	38	.394	.157	2546	50	.492	.295	2122	42	.591	.177
	Ductile Cast Iron	≤500MPa	655	VP15TF Low Resistance Type	Short	3979	47	.315	.315	3183	50	.394	.315	2546	50	.492	.394	2122	50	.591	.394
			490		Medium	3979	47	.315	.315	3183	50	.394	.315	2546	50	.492	.394	2122	50	.591	.394
			920		Long	3979	38	.315	.197	3183	38	.394	.157	2546	50	.492	.295	2122	33	.591	.177
		≤800MPa	590	VP15TF Low Resistance Type	Short	3581	42	.315	.315	2865	45	.394	.315	2292	45	.492	.394	1910	45	.591	.394
			490		Medium	3581	42	.315	.315	2865	45	.394	.315	2292	45	.492	.394	1910	45	.591	.394
			820		Long	3581	34	.315	.197	2865	34	.394	.157	2292	45	.492	.295	1910	30	.591	.177
S	Titanium Alloys	≤350HB	165	MP9120	Short	995	8	.157	.079	796	6	.157	.118	637	5	.236	.157	531	4	.295	.118
			100		Medium	995	8	.157	.079	796	6	.157	.118	637	5	.236	.157	531	4	.295	.118
			195		Long	995	8	.079	.039	796	6	.079	.079	637	5	.157	.059	531	4	.118	.059
	Heat resistant Alloys	–	165	MP9120	Short	995	8	.157	.079	796	6	.157	.118	637	5	.236	.157	531	4	.295	.118
			100		Medium	995	8	.157	.079	796	6	.157	.118	637	5	.236	.157	531	4	.295	.118
			195		Long	995	8	.079	.039	796	6	.079	.079	637	5	.157	.059	531	4	.118	.059
H	Hardened Steel	45-50HRC	330	VP15TF Strong Cutting Edge Type	Short	1989	9	.315	.079	1591	8	.394	.118	1273	10	.492	.157	1061	8	.591	.118
			195		Medium	1989	9	.315	.079	1591	8	.394	.118	1273	10	.492	.157	1061	8	.591	.118
			395		Long	1989	9	.315	.039	1591	8	.394	.079	1273	8	.492	.059	1061	4	.591	.059
		50-60HRC	195	VP15TF Strong Cutting Edge Type	Short	1194	6	.315	.079	955	5	.394	.118	764	6	.492	.157	637	5	.591	.118
			130		Medium	1194	6	.315	.079	955	5	.394	.118	764	6	.492	.157	637	5	.591	.118
			330		Long	1194	6	.315	.039	955	5	.394	.079	764	5	.492	.059	637	3	.591	.059

BALL NOSE END MILL

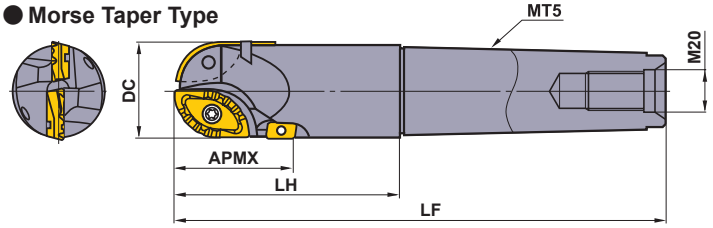
SRM2 Ø40 (1.575") Ø50 (1.969")

P M K N S H

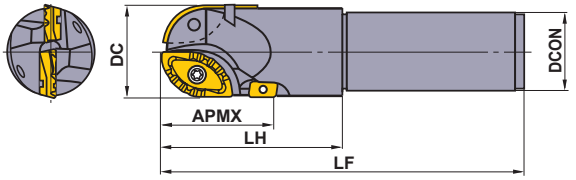
● Combination Type



● Morse Taper Type



● Straight Type



Metric Standard

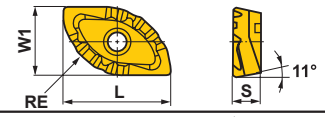
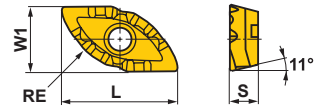
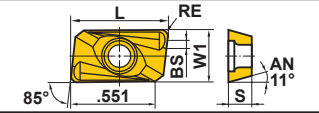
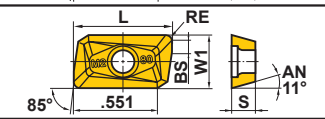
Right hand tool holder only.

Type		Order Number	Stock	Number of Flutes	Dimensions (inch)						✶1	✶1					
			R		✶2 RE	DC	DCON	LF	LH	APMX	Inner, Outer	Peripheral	Inner, Outer	Peripheral	Inner	Outer	Peripheral
											Insert Screw		Wrench		Insert		
Combination	Standard	**SRM2400WNLS**	★	2	.787	1.575	2.000	7.874	4.724	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500WNLS	★	2	.984	1.969	2.000	7.874	4.724	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	**SRM2400WNLM**	★	2	.787	1.575	2.000	9.843	6.693	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500WNLM	★	2	.984	1.969	2.000	9.843	6.693	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Extra Long	**SRM2500WNLL**	★	2	.984	1.969	2.000	11.811	8.661	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
		SRM2500WNLX	★	2	.984	1.969	2.000	13.780	10.630	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
Straight	Standard	**SRM2400SNLS**	★	2	.787	1.575	1.654	7.874	3.937	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500SNLS	★	2	.984	1.969	1.654	7.874	3.937	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	**SRM2400SNLM**	★	2	.787	1.575	1.654	9.843	5.906	2.126	TS6S	TS43	TKY30T	TKY15F	SRG40C	SRG40E	APMT1604 PDER-□2
		SRM2500SNLM	★	2	.984	1.969	1.654	9.843	3.937	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
Morse Taper	Standard	**SRM2500MNLS**	★	2	.984	1.969	—	10.079	4.724	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2
	Long	**SRM2500MNLM**	★	2	.984	1.969	—	11.260	5.906	2.480	TS6	TS43	TKY30T	TKY15F	SRG50C	SRG50E	APMT1604 PDER-□2

✶1 Clamp Torque (lbf-in) : TS43=53, TS6=89, TS6S=89
✶2 RE is shown for insert corner R.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case><Inserts with asterisk (✶2) are available in 2 piece in one case>

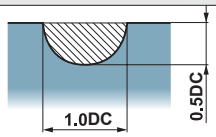
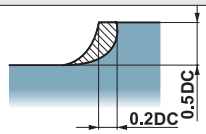
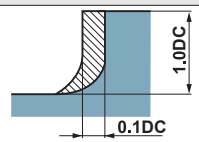
INSERTS

Workpiece Material			Coated				Dimensions (inch)					Geometry
Application	Shape	Order Number	Class	F7030	VP15TF	VP20RT	VP30RT	RE	L	W1	S	BS	
	P	Steel											
	K	Cast Iron											
Inner		*2 **SRG40C**	G		★	★	★	.787	1.417	.807	.315	—	
		*2 **SRG50C**	G		★	★	★	.984	1.575	1.024	.335	—	
Outer		*2 **SRG40E**	G		★	★	★	.787	1.260	.654	.315	—	
		*2 **SRG50E**	G		★	★	★	.984	1.409	.787	.335	—	
*1 Peripheral		**APMT1604PDER-M2**	M	●	●			.031	.650	.375	.187	.055	
	Strong Cutting Edge Type	**APMT1604PDER-H2**	M	●	●			.031	.650	.375	.187	.055	

(Low-resistance inner or outer inserts are precision M class type.)

*1 Selection guide for peripheral cutting edges : The first recommendation is the super sharp M breaker (APMT....PDER-M2).
When cutting edge strength is particularly important, use the H breaker (APMT....PDER-H2).

RECOMMENDED CUTTING CONDITIONS

Cutting Mode	A : Slot Milling	B : Shoulder Milling (Standard Type)	C : Shoulder Milling (Long Cutting Edge Type)
			

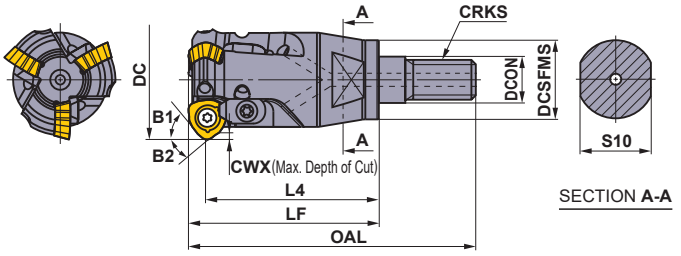
Workpiece Material		Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (IPR)	Cutting Mode
P	Alloy Tool Steel	≤250HB	**VP20RT VP30RT**	655 (525—820)	.008 (.004—.012)	A
					.008 (.004—.016)	B
					.012 (.004—.016)	C
	Cast Tool Steel	≤230HB	**VP15TF VP20RT**	655 (525—985)	.008 (.004—.012)	A
					.012 (.004—.018)	B
					.008 (.004—.016)	C
K	Ductile Cast Iron	Tensile Strength ≤540MPa	**VP15TF VP20RT**	655 (525—985)	.010 (.004—.016)	A
					.010 (.004—.018)	B
					.014 (.004—.018)	C
	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF VP20RT**	655 (525—985)	.010 (.004—.016)	A
					.014 (.004—.018)	B
					.010 (.004—.016)	C

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

VERTICAL FEED MILLING

PMC

P | M | K | N | S | H



SECTION **A-A**

Metric Standard

With Air / coolant through.

Right hand tool holder only.

DC	Order Number	Stock	Number of Teeth	Dimensions (mm)								WT (kg)	B1	B2
				LF	OAL	DCON	DCSFMS	L4	S10	CWX	CRKS*			
25	**PMC08R252AM1035**	★	2	39.7	58.7	10.5	18	35	14	1.5	M10	0.1	40.5°	35°
32	**PMC09R323AM1245**	★	3	50.5	72.5	12.5	21	45	19	3.0	M12	0.2	40.5°	35°
40	**PMC12R403AM1645**	★	3	51.4	74.4	17	29	45	24	3.5	M16	0.3	42°	35°

* Clamp Torque of the Head (lbf-ft) : M10=33.8, M12=59.2, M16=66.7

SPARE PARTS

DC	Order Number	Insert Screw *	Insert Wench	Clamp Bridge	Clamp Bridge Screw *	Clamp Wrench (R D)	Anti-seizure Lubricant	Spring	Insert
25	**PMC08R252AM1035**	AJS3010T10	TKY08D	AMS3	TS33	TKY10R	MK1KS	ASS2	JOM□08
32	**PMC09R323AM1245**	AJS3010T10	TKY10D	AMS3	TS351	TKY10D	MK1KS	ASS2	JOM□09
40	**PMC12R403AM1645**	AJS4012T15	TKY15D	AMS4	TS43	TKY15D	MK1KS	ASS2	JOM□12

* Clamp Torque (lbf-in) : TS33=13, TS351=22, TS43=31, AJS3010T10=22, AJS4012T15=31

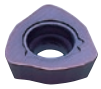
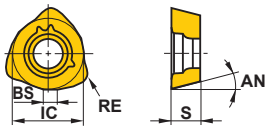
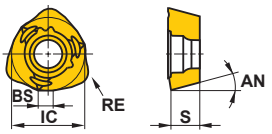
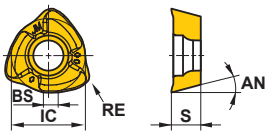
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

ISO13399 ➢ K003

INSERTS

Workpiece Material		
	P	Steel
	K	Cast Iron

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Shape	Order Number	Class	Coated FH7020	Coated VP15TF	Coated VP30RT	AN	IC	S	BS	RE	PMC holder	Geometry
Partial Profile FT Breaker 	**JOMW080320ZZSR-FT**	M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035	
	JDMW09T320ZDSR-FT	M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245	
	JDMW120420ZDSR-FT	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	
Strong Cutting Edge Type ST Breaker	**JDMT120420ZDSR-ST**	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	
JM Breaker	**JOMT080320ZZSR-JM**	M	●	●	●	13°	8	3.18	1.4	2	PMC08R252AM1035	
	JDMT09T320ZDSR-JM	M	●	●	●	15°	9.525	3.97	1.8	2	PMC09R323AM1245	
	JDMT120420ZDSR-JM	M	●	●	●	15°	12	4.76	2.5	2	PMC12R403AM1645	

RECOMMENDED CUTTING CONDITIONS

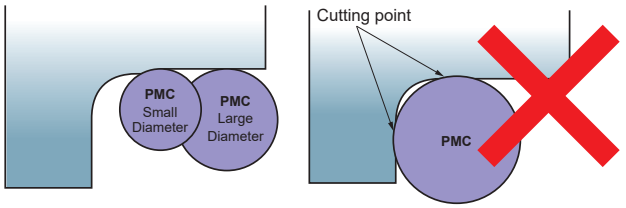
	Workpiece Material	Hardness	Grade	Breaker	Diameter (mm)	Number of Teeth	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	Width of Cut (inch)	Pick Feed (inch)
P	Carbon Steel Alloy Steel	≤180HB	**VP15TF**	**FT**	ø40	3	820 (655—985)	—.024	—.059	—.236
					ø32	3	655 (490—720)	—.022	—.047	—.197
					ø25	2	655 (490—720)	—.022	—.039	—.197
	Alloy Tool Steel Hardening Tool Steel for Cold Work Dies	≤300HB	**VP15TF**	**FT**	ø40	3	820 (655—985)	—.022	—.059	—.197
					ø32	3	590 (490—655)	—.020	—.047	—.118
					ø25	2	590 (490—655)	—.020	—.039	—.118
	Alloy Tool Steel	≤300HB	**VP15TF**	**FT**	ø40	3	655 (330—985)	—.022	—.059	—.197
					ø32	3	490 (260—655)	—.020	—.047	—.118
					ø25	2	490 (260—655)	—.020	—.039	—.118
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	**FT**	ø40	3	820 (655—985)	—.024	—.059	—.236
					ø32	3	655 (490—720)	—.022	—.047	—.197
					ø25	2	655 (490—720)	—.022	—.039	—.197
	Ductile Cast Iron	Tensile Strength ≤800MPa	**VP15TF**	**FT**	ø40	3	820 (655—985)	—.024	—.059	—.236
					ø32	3	655 (490—720)	—.022	—.047	—.197
					ø25	2	655 (490—720)	—.022	—.039	—.197

Note 1) The above cutting conditions are general guide lines. Adjustments maybe necessary depending on machine rigidity, workpiece material geometry and clamping.
Note 2) A carbide shank extension is recommended to prevent vibrations.

NOTES ON MACHINING METHODS

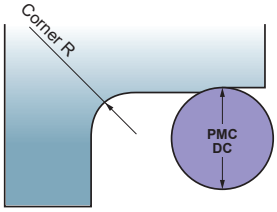
● How to choose an appropriate diameter tool.

Machine plain surfaces with a larger tool and corner radii with smaller diameter cutters.



● Relation of the cutter diameter and corner R size of workpiece material

A guide for the smallest possible workpiece material radius that can be machined is from 0.6—0.7 x diameter of the tool.



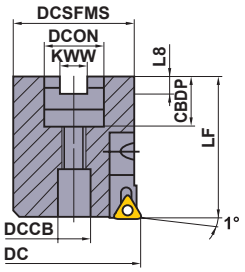
Tool diameter DC(mm)	Corner R (inch)
ϕ25	R ≥ .689
ϕ32	R ≥ .866
ϕ40	R ≥ .945

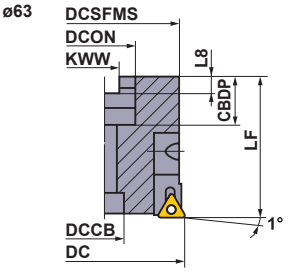
✱Adjust cutting conditions according to the set up.
✱Smaller workpiece material corner radii (only >0.5 x cutter &) may be possible by reducing the width of cut, speed and pick feed.

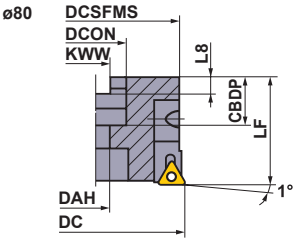
VERTICAL FEED MILLING

PMF

P | M | K | N | S | H







Metric Standard

Right hand tool holder only.

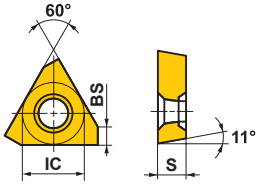
Order Number	Stock	Number of Teeth	Dimensions (mm)									Max. Allowable Revolution (min^{-1})		Cartridge	Insert Screw *2	Radial Screw	Set Bolt (Cartridge) *2	Wrench	Wrench	Set Bolt ①②	Insert
	R		DC	LF	DCON	CBDP	DAH	DCCB	KWW	L8	DCSFMS	Balance Unknown	G40 *1 Balanced								
PMF05004A22R	●	4	50	63	22	20	—	12	10.4	6.3	48	6300	12700	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R HKY50R	①HDS10031	TPEW 1303 ZP□R2
PMF06306A22R	●	6	63	63	22	20	—	18	10.4	6.3	60	5000	10100	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC10050	
PMF08008A27R	●	8	80	50	27	23	13.5	—	12.4	7	75	3900	7900	PMFA13R	TS254	TSS04005	HBH06012	TKY08F	HKY40R	②HSC12035	

*1 You need to balance the tool and holder together so that it confirms to G40 or higher standards.
*2 Clamp Torque (lbf-in) : TS254=8.9, HBH06012=8.5

INSERTS

Workpiece Material		
	P	Steel
	K	Cast Iron

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Class	Coated VP15TF	Coated AP10H	Dimensions (mm) IC	LE	S	BS	Geometry
	TPEW1303ZPER2	E	●	●	7.94	—	3.18	2	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	820 (490—1150)	.004 (.0019—.006)
		280—380HB	**VP15TF**	655 (330—985)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	**AP10H**	1150 (655—1640)	.004 (.0019—.006)

	Workpiece Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)
K	Dactile Cast Iron	Tensile Strength ≤500MPa	**AP10H**	820 (490—1150)	.004 (.002—.006)
		Tensile Strength ≤800MPa	**AP10H**	655 (330—985)	.004 (.002—.006)

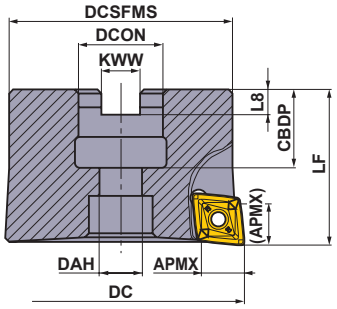
Note 1) Recommended radial depth of cut is .004" to .008"(1—2 mm).
Note 2) Up and down vertical cutting is recommended for efficiency.
Note 3) For crossfeed cutting, feed per tooth should be reduced to less than .002 (inch/tooth).

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

VERTICAL FEED MILLING

PMR

P Steel | M | K Cast Iron | N | S | H



Right hand tool holder only.

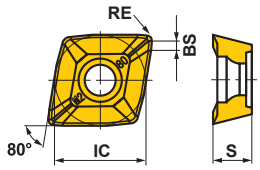
	Order Number	Stock R	Number of Teeth	Dimensions (mm) DC	LF	DCON	CBDP	DAH	DCSFMS	KWW	L8	APMX	Insert
Metric	**PMR405003A22R**	★	3	50	40	22	20	11	45	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR406304A22R	★	4	63	40	22	20	11	57	10.4	6.3	11	CPMT1205ZPEN-M2/3
	PMR408005A27R	★	5	80	50	27	23	13	73	12.4	7	11	CPMT1205ZPEN-M2/3
Inch	**PMR405003BR**	★	3	50	40	22.225	19	11	45	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR406304BR	★	4	63	40	22.225	19	11	57	8.4	5	11	CPMT1205ZPEN-M2/3
	PMR408005DR	★	5	80	63	31.75	32	17	73	12.7	8	11	CPMT1205ZPEN-M2/3

SPARE PARTS

Order Number	Shim	Shim Screw *	Insert Screw *	Wrench (Insert)	Wrench (Shim)	Set Bolt
PMR405003A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304A22R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005A27R	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC12040
PMR405003BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR406304BR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC10035
PMR408005DR	STPMR4N	WCS503507H	TPS35	TIP15T	HKY35R	HSC16040

* Clamp Torque (lbf-in) : WCS503507H=44, TPS35=31

INSERTS

Shape	Order Number	Class	Coated VP15TF	Dimensions (mm) IC	S	BS	RE	Geometry
	CPMT1205ZPEN-M2	M	●	12.7	5.56	1.4	0.8	
	CPMT1205ZPEN-M3	M	★	12.7	5.56	1.4	1.2	

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Hardness	Grade	Cutting Speed (SFM)	Feed per Tooth (inch/tooth)	pf (mm)
P	Carbon Steel Alloy Steel	180—280HB	**VP15TF**	590 (490—655)	.008 (.004—.012)	≤.5DC
		280—380HB				
K	Gray Cast Iron	Tensile Strength ≤350MPa	**VP15TF**	590 (490—655)	.008 (.004—.012)	≤.5DC
	Ductile Cast Iron	Tensile Strength 360—500MPa	**VP15TF**	490 (390—555)	.008 (.004—.012)	≤.5DC
		Tensile Strength 500—800MPa	**VP15TF**	390 (330—490)	.008 (.004—.012)	≤.5DC

Note 1) The above conditions are suitable for general machining purposes, it is possible to use conditions that are different from the above.
Note 2) For horizontal feed machining, please reduce the feed rate by 20—40%.
Note 3) If vibration occurs when machining, please reduce the depth of cut, cutting speed by 20—50%.

ISO13399 ➤ K003
SPARE PARTS ➤ M001
TECHNICAL DATA ➤ N001

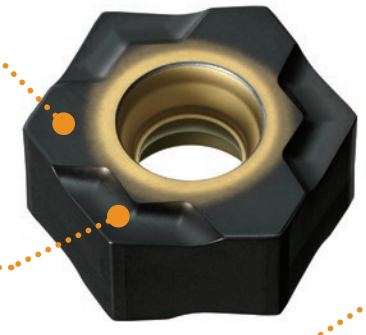
Boring Cutter

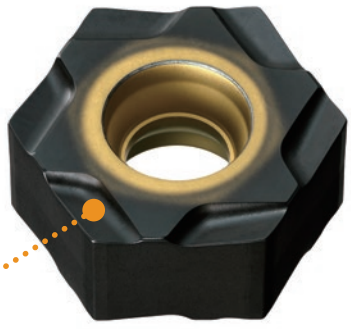
BMR

BMR Engineering Specials

High Clamping Rigidity

High feed processing possible with improved fracture resistance.





Double Positive Breaker

Reduced cutting resistance. Supports open deck work. Effective finished surface due to wiper edge.

12-Corner Type with Right Hand

Economical 12-corner type that preserves comparable insert rigidity of the 6-corner type by securing the seating surface directly below where the cutting force is absorbed.

Highly Rigid 6-corner Type and Economical 12-corner Type Inserts

Body with Peripheral Cutting Edge Run-out Adjustable Mechanism

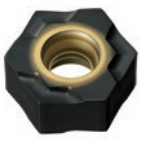
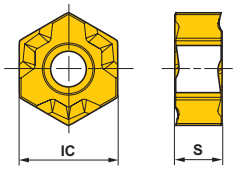
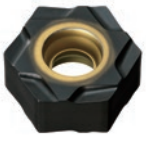
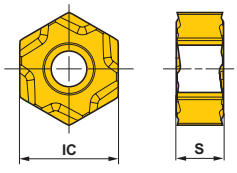
Economical M-class insert can be used since run out is adjustable.

* BMR Cutters - Non stock, engineering specials produced to order only.

INSERT

(inch)

Workpiece Material	K	Cast Iron	◐	Cutting Conditions(Guide) : ● : Stable Cutting ◐ : General Cutting ✱ : Unstable Cutting

Shape	Order Number	Grade	Hand	Cutting Edge	Stock	IC	S	Geometry
	**HNMX1206EN06-R**	**MC5015**	–	6	★	.500	.236	
	**HNMX1206ER12-R**	**MC5015**	R	12	★	.500	.236	

★ : **Stocked in Japan**

RECOMMENDED CUTTING CONDITIONS

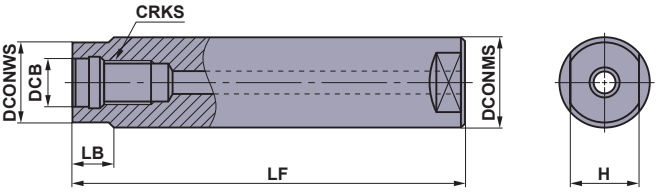
(inch)

Workpiece Material		Tensile Strength	Grade	vc (SFM)	fz (IPT)	ae
K	Gray Cast Iron	≤350MPa	**MC5015**	655 (490—820)	.008 (.004—.010)	≤.118

✱ With feed per cutter, settings are set small for finished surface roughness and large for ideal product life.

SCREW-IN HOLDERS

STRAIGHT SHANK TYPE



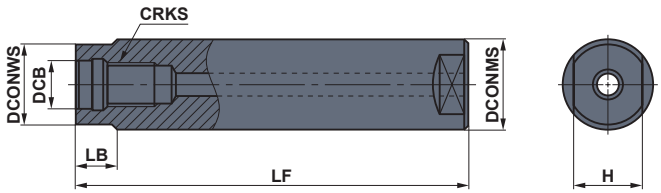
STEEL SHANK TYPE

Through coolant compatible

CRKS	Order Number	Stock	Dimensions (inch)						WT (lbs)
			DCONMS	LF	DCB	DCONWS	LB	H	
M8	**SCU10M08S100S**	●	.625	3.937	.335	.571	.394	.394	.2
M8	**SCU10M08S200L**	●	.625	7.874	.335	.571	.394	.394	.7
M10	**SCU12M10S120S**	●	.750	4.724	.413	.728	.394	.551	.4
M10	**SCU12M10S220L**	●	.750	8.661	.413	.728	.394	.551	.9
M12	**SCU16M12S125S**	●	1.000	4.921	.492	.925	.394	.748	.9
M12	**SCU16M12S245L**	●	1.000	9.646	.492	.925	.394	.748	2.0
M16	**SCU20M16S140S**	●	1.250	5.512	.669	1.122	.591	.945	1.8
M16	**SCU20M16S280L**	●	1.250	11.024	.669	1.122	.591	.945	3.5

Metric Standard

CRKS	Order Number	Stock	Dimensions (mm)						WT (kg)
			DCONMS	LF	DCB	DCONWS	LB	H	
M8	**SC16M08S100S**	★	16	100	8.5	14.5	10	10	0.1
M8	**SC16M08S200L**	★	16	200	8.5	14.5	10	10	0.3
M10	**SC20M10S120S**	★	20	120	10.5	18.5	10	14	0.3
M10	**SC20M10S220L**	★	20	220	10.5	18.5	10	14	0.5
M12	**SC25M12S125S**	★	25	125	12.5	23.5	10	19	0.4
M12	**SC25M12S245L**	★	25	245	12.5	23.5	10	19	0.8
M16	**SC32M16S140S**	★	32	140	17	28.5	15	24	0.8
M16	**SC32M16S280L**	★	32	280	17	28.5	15	24	1.6



CARBIDE SHANK TYPE

Through coolant compatible

CRKS	Order Number	Stock	Dimensions (inch)						WT (lbs)
			DCONMS	LF	DCB	DCONWS	LB	H	
M8	**SCU10M08S100SW**	●	.625	3.937	.335	.571	.394	.394	.4
M8	**SCU10M08S200LW**	●	.625	7.874	.335	.571	.394	.394	1.1
M10	**SCU12M10S120SW**	●	.750	4.724	.413	.728	.394	.551	.9
M10	**SCU12M10S220LW**	●	.750	8.661	.413	.728	.394	.551	1.8
M12	**SCU16M12S125SW**	●	1.000	4.921	.492	.925	.394	.748	1.8
M12	**SCU16M12S245LW**	●	1.000	9.646	.492	.925	.394	.748	3.5
M16	**SCU20M16S140SW**	●	1.250	5.512	.669	1.122	.591	.945	3.1
M16	**SCU20M16S280LW**	●	1.250	11.024	1.250	1.122	.591	.945	6.4

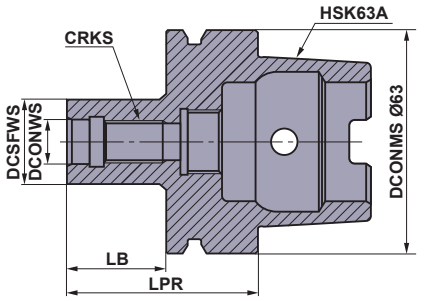
Metric Standard

CRKS	Order Number	Stock	Dimensions (mm)						WT (kg)
			DCONMS	LF	DCB	DCONWS	LB	H	
M8	**SC16M08S100SW**	★	16	100	8.5	14.5	10	10	0.2
M8	**SC16M08S200LW**	★	16	200	8.5	14.5	10	10	0.5
M10	**SC20M10S120SW**	★	20	120	10.5	18.5	10	14	0.5
M10	**SC20M10S220LW**	★	20	220	10.5	18.5	10	14	0.9
M12	**SC25M12S125SW**	★	25	125	12.5	23.5	10	19	0.8
M12	**SC25M12S245LW**	★	25	245	12.5	23.5	10	19	1.5
M16	**SC32M16S140SW**	★	32	140	17	28.5	15	24	1.4
M16	**SC32M16S280LW**	★	32	280	17	28.5	15	24	2.8

SPARE PARTS ➢ M001
TECHNICAL DATA ➢ N001

SCREW-IN HOLDERS

■HSK63A SHANK ARBOR



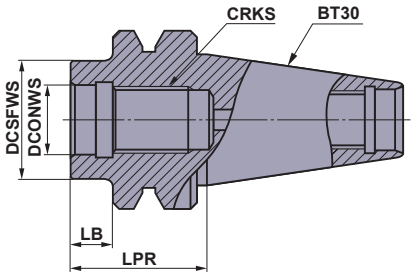
Metric Standard

Through coolant compatible

CRKS	Order Number	Stock	Dimensions (mm)				WT (kg)
			DCONWS	DCSFWS	LPR	LB	
M8	**SC16M08S22-HSK63A**	★	8.5	14.5	48	22	0.7
M10	**SC20M10S24-HSK63A**	★	10.5	18.5	50	24	0.7
M12	**SC25M12S27-HSK63A**	★	12.5	23.5	53	27	0.7
M16	**SC32M16S28-HSK63A**	★	17	28.5	54	28	0.8

Note 1) The HSK63A shank type has a built-in coolant pipe for installation.

■BT30 SHANK ARBOR

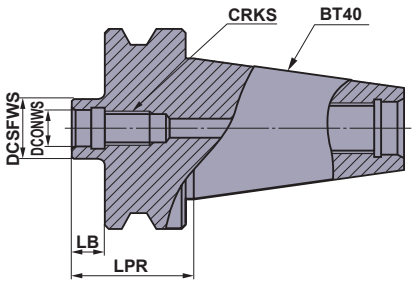


Metric Standard

Through coolant compatible

CRKS	Order Number	Stock	Dimensions (mm)				WT (kg)
			DCONWS	DCSFWS	LPR	LB	
M8	**SC16M08S10-BT30**	★	8.5	14.5	32	10	0.4
M10	**SC20M10S10-BT30**	★	10.5	18.5	32	10	0.4
M12	**SC25M12S10-BT30**	★	12.5	23.5	32	10	0.4
M16	**SC32M16S10-BT30**	★	17	28.5	32	10	0.4

■BT40 SHANK ARBOR



Metric Standard

Through coolant compatible

CRKS	Order Number	Stock	Dimensions (mm)				WT (kg)
			DCONWS	DCSFWS	LPR	LB	
M8	**SC16M08S10-BT40**	★	8.5	14.5	37	10	1
M10	**SC20M10S10-BT40**	★	10.5	18.5	37	10	1
M12	**SC25M12S10-BT40**	★	12.5	23.5	37	10	1
M16	**SC32M16S10-BT40**	★	17	28.5	37	10	1

HOW TO INSTALL THE SCREW-IN HEAD

①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.

②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

Screw Size	Recommended Torque (lbf-ft)	Wrench Size (mm)
M8	17.1	10
M10	33.8	14
M12	59.2	19
M16	66.7	24

- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.
- Do not handle the cutting tools with bare hands as this may cause injuries.

ROTATING INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp

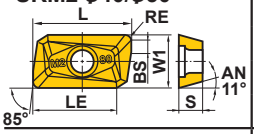
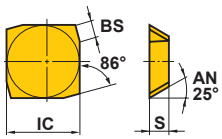
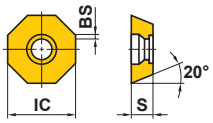
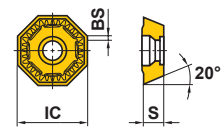
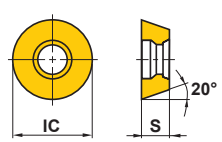
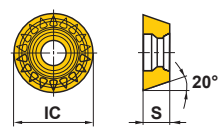
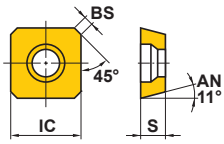
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated F7030	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi10	Dimensions (inch) L	LE	W1	S	BS	RE
BAE500	**AEMW150304ER**	AEMW150304ER	M	E			●	★		●		.657	.598	—	.125	—	.016
	AEMW150308ER	AEMW150308ER	M	E			●	★		●		.654	.583	—	.125	—	.031
BAE600	**AEMW19T304ER**	AEMW19T304ER	M	E			●			●		.793	.724	.500	.156	—	.016
	AEMW19T308ER	AEMW19T308ER	M	E			●			●		.791	.709	.500	.156	—	.031
BAP300	**APGT1135PDFR-G2**	APGT1135PDFR-G2	G	F							●	.445	.382	.250	.138	.047	.031
BAP300 SRM2	**APMT1135PDER-H1**	APMT1135PDER-H1	M	E		●		★				.442	.354	.250	.138	.059	.016
	APMT1135PDER-H2	APMT1135PDER-H2	M	E	●	●		●				.442	.354	.250	.138	.047	.031
	APMT1135PDER-H6	APMT1135PDER-H6	M	E	★							.437	.354	.250	.138	.016	.094
BAP300 SRM2	**APMT1135PDER-M0**	APMT1135PDER-M0	M	E	●							.442	.354	.250	.138	.071	.008
	APMT1135PDER-M1	APMT1135PDER-M1	M	E	●							.442	.354	.250	.138	.059	.016
	APMT1135PDER-M2	APMT1135PDER-M2	M	E	●	●		●				.440	.354	.250	.138	.047	.031
BAP400	**APGT1604PDFR-G2**	APGT1604PDFR-G2	G	F							●	.670	.551	.375	.187	.055	.031
BAP400 SRM2 SRM2 ϕ40/ϕ50	**APMT1604PDER-H1**	APMT1604PDER-H1	M	E	★							.670	.551	.375	.187	.067	.016
	APMT1604PDER-H2	APMT1604PDER-H2	M	E	●	●		●		●		.674	.551	.375	.187	.055	.031
	APMT1604PDER-H4	APMT1604PDER-H4	M	E	★							.672	.551	.375	.187	.016	.063
	APMT1604PDER-H6	APMT1604PDER-H6	M	E	★							.667	.551	.375	.187	.016	.094
	APMT1604PDER-H8	APMT1604PDER-H8	M	E	★							.661	.551	.375	.187	.016	.126

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting
◐ : General Cutting
✠ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp
S : Chamfer + Round **T** : Chamfer

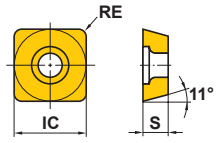
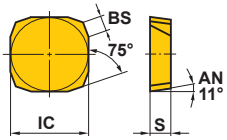
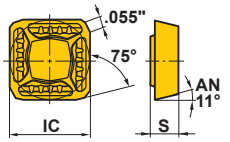
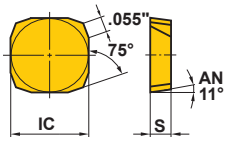
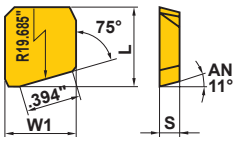
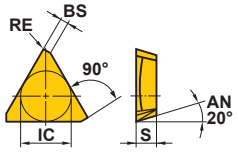
Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated F7010	Coated F7030	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide HTi10	Dimensions (inch) IC	L	LE	W1	S	BS	RE
BAP400 **SRM2** **SRM2 ϕ40/ϕ50** 	**APMT1604PDER-M2**	APMT1604PDER-M2	M	E		●	●			●		–	.673	.551	.375	.187	.055	.031
BF407  Right hand insert shown.	**SFAN42ZFFR2**	SFAN1203ZFFR2	A	F							★	.500	–	–	–	.125	.094	–
	SFAN42ZFFL2	SFAN1203ZFFL2	A	F							★	.500	–	–	–	.125	.094	–
	SFCN42ZFFR2	SFCN1203ZFFR2	A	F							●	.500	–	–	–	.125	.094	–
BOE 	**OEMX12T3ETR1**	OEMX12T3ETR1	M	T					●	●		.500	–	–	–	.156	.039	–
	OEMX12T3ESR1	OEMX12T3ESR1	M	S		●						.500	–	–	–	.156	.039	–
	OEMX1705ETR1	OEMX1705ETR1	M	T	●		●		●	●		.669	–	–	–	.197	.055	–
	OEMX1705ESR1	OEMX1705ESR1	M	S		●						.669	–	–	–	.197	.055	–
BOE 	**OEMX12T3EER1-JS**	OEMX12T3EER1-JS	M	E		★						.500	–	–	–	.156	.039	–
	OEMX12T3ETR1-JS	OEMX12T3ETR1-JS	M	T					●			.500	–	–	–	.156	.039	–
	OEMX1705EER1-JS	OEMX1705EER1-JS	M	E		★						.669	–	–	–	.197	.055	–
	OEMX1705ETR1-JS	OEMX1705ETR1-JS	M	T			●		●			.669	–	–	–	.197	.055	–
BOE 	**REMX1705EN**	REMX1705EN	M	E		●						.679	–	–	–	.205	–	–
	REMX1705SN	REMX1705SN	M	S		★						.679	–	–	–	.205	–	–
BOE 	**REMX12T3EN-JS**	REMX12T3EN-JS	M	E		●						.500	–	–	–	.164	–	–
	REMX1705EN-JS	REMX1705EN-JS	M	E		●						.679	–	–	–	.205	–	–
BSP 	**SPMB1204APT**	SPMB1204APT	M	T				●				.500	–	–	–	.187	.055	–

ROTATING INSERTS

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting
◕ : General Cutting
✲ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp
S : Chamfer + Round **T** : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated F7010	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide UTi20T	Carbide HTi05T	Carbide HTi10	IC	L	W1	S	BS	RE
CFSP 	**SPMW321**	SPMW090304	M	E*			●	★	★	★	★		★	.375	–	–	.125	–	.016
	SPMW322	SPMW090308	M	E*			★	★	★	★	★		★	.375	–	–	.125	–	.031
FBP415  Right hand insert shown.	**SPEN42EEER1**	SPEN1203EEER1	E	E	●	●							★	.500	–	–	.125	.055	–
	SPEN42EEEL1	SPEN1203EEEL1	E	E		●							★	.500	–	–	.125	.055	–
FBP415 	**SPER42EEER-JS**	SPER1203EEER-JS	E	E		●								.500	–	–	.125	–	–
FBP415  Right hand insert shown.	**SPNN42EEER1**	SPNN1203EEER1	N	E		●							★	.500	–	–	.125	–	–
	SPNN42EEEL1	SPNN1203EEEL1	N	E									★	.500	–	–	.125	–	–
FBP415  Right hand insert shown.	**WPC42EEER10C**	WPC42EEER10C	C	E								●		–	.597	.500	.125	–	–
	WPC42EEEL10C	WPC42EEEL10C	C	E								★		–	.597	.500	.125	–	–
NSE300 **For improved wall accuracy** 	**TECN32PEFR1W**	TECN1603PEFR1W	C	F									★	.375	–	–	.125	.055	.016
	TECN32PEER1W	TECN1603PEER1W	C	E									★	.375	–	–	.125	.055	.016
	TECN32PETR1W	TECN1603PETR1W	C	T					★	★	★			.375	–	–	.125	.055	.016

* Grade NX2525 and NX4545 have “T” honing. Grade HTi10 has “F” honing.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

Workpiece Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
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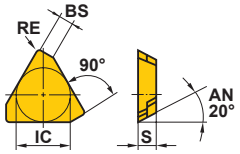
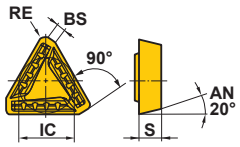
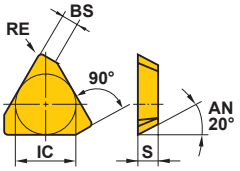
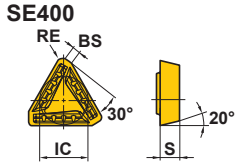
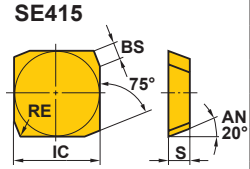
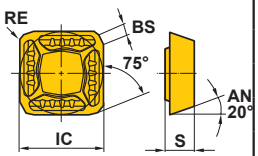
Cutting Conditions (Guide) :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round
T : Chamfer **X** : Round (Small)

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated					Cermet		Carbide		Dimensions (inch)			
					F7010	F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	S	BS	RE
NSE300 	**TEEN32PEFR1**	TEEN1603PEFR1	E	F									●	.375	.125	.055	.016
	TEEN32PEER1	TEEN1603PEER1	E	E				●					●	.375	.125	.055	.016
	TEEN32PETR1	TEEN1603PETR1	E	T					●	★	●	●		.375	.125	.055	.016
	TEEN32PESR1	TEEN1603PESR1	E	S	●	★								.375	.125	.055	.016
NSE300 	**TEER32PEER-JS**	TEER1603PEER-JS	E	E	●							★		.375	.125	.055	.016
NSE400 **SE400** 	**TECN43PEFR1**	TECN2204PEFR1	C	F									●	.500	.187	.055	.039
	TECN43PEER1	TECN2204PEER1	C	E									★	.500	.187	.055	.039
	TECN43PETR1	TECN2204PETR1	C	T						★	★	★		.500	.187	.055	.039
	TEEN43PEFR1	TEEN2204PEFR1	E	F									●	.500	.187	.055	.039
	TEEN43PEER1	TEEN2204PEER1	E	E				●					●	.500	.187	.055	.039
	TEEN43PETR1	TEEN2204PETR1	E	T					●	★	●	●		.500	.187	.055	.039
	TEEN43PESR1	TEEN2204PESR1	E	S	●	★								.500	.187	.055	.039
NSE400 **SE400** 	**TEER43PEER-JS**	TEER2204PEER-JS	E	E	★							★		.500	.187	.055	.039
SE415  Right hand insert shown.	**SEEN42EFFR1**	SEEN1203EFFR1	E	F									●	.500	.125	.055	.039
	SEEN42EFER1	SEEN1203EFER1	E	E	●			●						.500	.125	.055	.039
	SEEN42EFTR1	SEEN1203EFTR1	E	T						●	●			.500	.125	.055	.039
	SEEN42EFSR1	SEEN1203EFSR1	E	S	★	★								.500	.125	.055	.039
SE415 	**SEER42EFER-JS**	SEER1203EFER-JS	E	E	★	★								.500	.125	.055	.039

ROTATING INSERTS

Workpiece Material		
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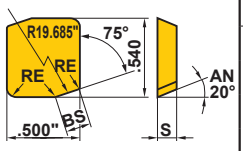
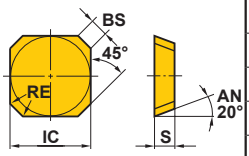
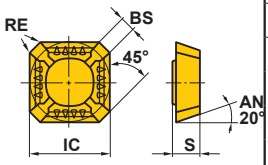
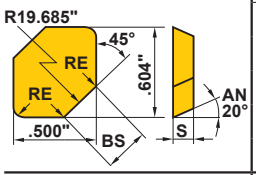
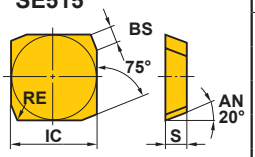
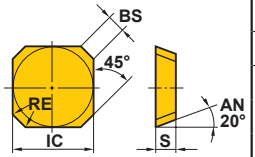
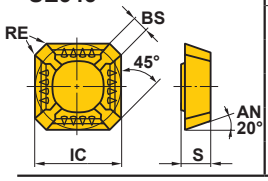
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Edge Preparation :
E : Round **F** : Sharp **S** : Chamfer + Round
T : Chamfer **X** : Round (Small)

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated F7010	Coated F7030	Coated MC5020	Coated VP15TF	Coated UP20M	Cermet NX2525	Cermet NX4545	Carbide HTi05T	Carbide HTi10	Dimensions (inch) IC	S	BS	RE
SE415 	**WEC42EFER5C**	WEC42EFER5C	C	E								★		–	.125	.197	.039
	WEC42EFTR5C	WEC42EFTR5C	C	T						●				–	.125	.197	.039
SE445 	**SECN42AFTN1**	SECN1203AFTN1	C	T							★			.500	.125	.055	.039
	SEEN42AFFN1	SEEN1203AFFN1	E	F									●	.500	.125	.055	.039
	SEEN42AFEN1	SEEN1203AFEN1	E	E				●						.500	.125	.055	.039
	SEEN42AFTN1	SEEN1203AFTN1	E	T	●			●		●	●			.500	.125	.055	.039
	SEEN42AFSN1	SEEN1203AFSN1	E	S		●	●	●						.500	.125	.055	.039
	SEEN42AFXN1	SEEN1203AFXN1	E	X				●						.500	.125	.055	.039
SE445 	**SEER42AFEN-JS**	SEER1203AFEN-JS	E	E	●	●	●	●						.500	.125	.055	.039
	SEER42AFXN-JS	SEER1203AFXN-JS	E	X				●						.500	.125	.055	.039
SE445 	**WEC42AFTR5C**	WEC42AFTR5C	C	T						●				–	.125	.197	.039
SE515  Right hand insert shown.	**SEEN53EFER1**	SEEN1504EFER1	E	E				★						.625	.187	.055	.039
SE545 	**SEEN53AFEN1**	SEEN1504AFEN1	E	E				●						.625	.187	.055	.039
	SEEN53AFTN1	SEEN1504AFTN1	E	T	●					●	●			.625	.187	.055	.039
	SEEN53AFSN1	SEEN1504AFSN1	E	S		●	●							.625	.187	.055	.039
SE545 	**SEER53AFEN-JS**	SEER1504AFEN-JS	E	E		★	★							.625	.187	.055	.039

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<10 inserts in one case>

Workpiece Material		
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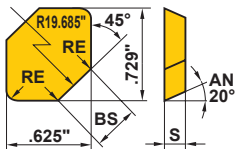
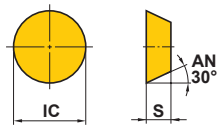
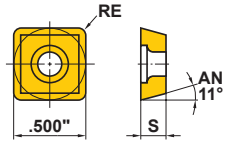
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting
◐ : General Cutting
✲ : Unstable Cutting

Edge Preparation :
E : Round **S** : Chamfer + Round
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated F7030	Coated VP15TF	Coated UP20M	Cermet NX2525	Carbide UTi20T	Carbide HTi05T	Carbide HTi10	Dimensions (inch) IC	S	BS	RE
SE545 	**WEC53AFER5C**	WEC53AFER5C	C	E						●		–	.187	.197	.039
	WEC53AFTR5C	WEC53AFTR5C	C	T				★				–	.187	.197	.039
SG20 	**RGEN2004EN**	RGEN2004M0EN	E	E		★						.787	.187	–	–
	RGEN2004SN	RGEN2004M0SN	E	S	★		★		★		★	.787	.187	–	–
TBE1 	**SPMM432A**	SPMT120408-A	M	E			●		●			–	.187	–	.031

ROTATING INSERTS

Workpiece Material		
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	M	Stainless Steel
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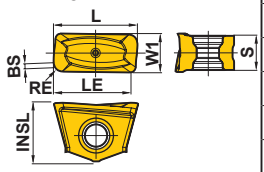
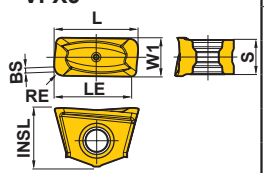
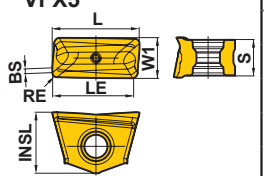
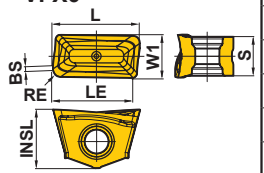
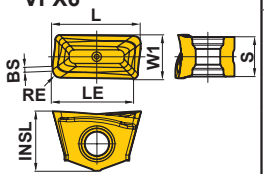
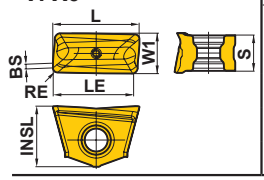
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

Cutting Conditions (Guide) :
● : Stable Cutting
◐ : General Cutting
✱ : Unstable Cutting

Edge Preparation :
E : Round

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated MP9130	Dimensions (inch) L	LE	W1	INSL	S	BS	RE
VFX5 	**XNMU160708R-MS**	XNMU160708R-MS	M	E	●	.630	.528	.276	.437	.256	.039	.031
	XNMU160712R-MS	XNMU160712R-MS	M	E	●	.630	.543	.276	.437	.256	.039	.047
	XNMU160716R-MS	XNMU160716R-MS	M	E	●	.630	.543	.276	.437	.256	.039	.063
	XNMU160724R-MS	XNMU160724R-MS	M	E	●	.630	.543	.276	.437	.256	.039	.094
	XNMU160732R-MS	XNMU160732R-MS	M	E	●	.681	.567	.276	.437	.256	—	.126
	XNMU160740R-MS	XNMU160740R-MS	M	E	●	.744	.598	.276	.437	.256	—	.157
VFX5 	**XNMU160708R-HS**	XNMU160708R-HS	M	E	●	.630	.528	.276	.437	.256	.039	.031
VFX5 	**XNMU160708R-LS**	XNMU160708R-LS	M	E	●	.630	.528	.276	.437	.256	.039	.031
VFX6 	**XNMU190912R-MS**	XNMU190912R-MS	M	E	●	.752	.650	.374	.500	.335	.039	.047
	XNMU190916R-MS	XNMU190916R-MS	M	E	●	.752	.650	.374	.500	.335	.039	.063
	XNMU190924R-MS	XNMU190924R-MS	M	E	●	.752	.654	.374	.500	.335	.039	.094
	XNMU190932R-MS	XNMU190932R-MS	M	E	●	.795	.673	.374	.500	.335	—	.126
	XNMU190940R-MS	XNMU190940R-MS	M	E	●	.858	.701	.374	.500	.335	—	.157
	XNMU190950R-MS	XNMU190950R-MS	M	E	●	.858	.701	.374	.500	.335	—	.197
VFX6 	**XNMU190912R-HS**	XNMU190912R-HS	M	E	●	.752	.650	.374	.500	.335	.039	.047
VFX6 	**XNMU190912R-LS**	XNMU190912R-LS	M	E	●	.752	.650	.374	.500	.335	.039	.047

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	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-Ferrous Metal
	S	Heat resistant Alloys, Titanium Alloys
	H	Hardened Steel

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◐ : General Cutting
✱ : Unstable Cutting

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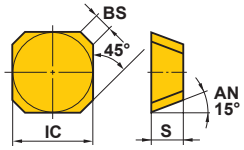
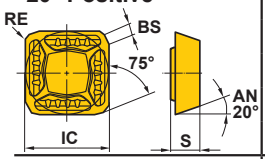
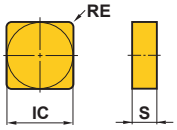
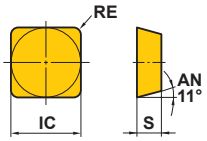
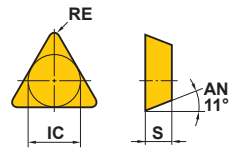
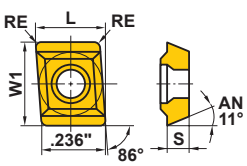
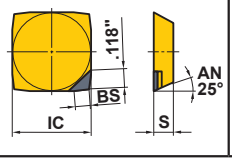
E : Round **F** : Sharp
T : Chamfer

Cutter Type / Insert Geometry	Order Number	(ISO) Number	Class	Edge Preparation	Coated				Cermet	Carbide	Dimensions (inch)					
					F7010	F7030	MC5020	VP15TF	UP20M	NX2525	NX4545	UTi20T	HTi10	IC	L	W1	S	BS	RE
Corner Angle 45° 15° Positive 	**SDEN42AEN**	SDEN1203AEN	E	T						★				.500	—	—	.125	.047	—
Corner Angle 45° 20° Positive 	**SEER43AFEN-JS**	SEER1204AFEN-JS	E	E	●									.500	—	—	.187	.055	.039
Negative 	**SNMN432**	SNMN120408	M	E			★			★		★★		.500	—	—	.187	—	.031
	SNMN433	SNMN120412	M	E			★			★		★		.500	—	—	.187	—	.047
11° Positive 	**SPMN421**	SPMN120304	M	E ✱1				★				★★		.500	—	—	.125	—	.016
	SPMN421T	SPMN120304T	M	T						★				.500	—	—	.125	—	.016
	SPMN422	SPMN120308	M	E ✱1		★		●				●●		.500	—	—	.125	—	.031
	SPMN423	SPMN120312	M	E ✱1		★		★				★★		.500	—	—	.125	—	.047
	SPMN432	SPMN120408	M	E			★					★★		.500	—	—	.187	—	.031
	SPMN433	SPMN120412	M	E			★					●		.500	—	—	.187	—	.047
	SPMN532	SPMN150408	M	E								★		.625	—	—	.187	—	.031
11° Positive  Right hand insert shown.	**TPMN321**	TPMN160304	M	E ✱2		★		●★	★			●●		.375	—	—	.125	—	.016
	TPMN322	TPMN160308	M	E ✱2		★		●★	★			●●		.375	—	—	.125	—	.031
	TPMN323	TPMN160312	M	E ✱1				★					●	.375	—	—	.125	—	.047
	TPMN431	TPMN220404	M	E								●		.500	—	—	.187	—	.031
	TPMN432	TPMN220408	M	E ✱1		★		●★				●★		.500	—	—	.187	—	.031
	TPMN433	TPMN220412	M	E ✱1		★		★				●●		.500	—	—	.187	—	.047
	**JPMT060204-E**	JPMT060204-E	M	E				★★						—	.276	.313	.094	—	.016

✱1 Grade HTi10 has “F” honing.
✱2 Grade HTi10 has “F” honing, grade NX2525 has “T” honing.

CBN AND PCD

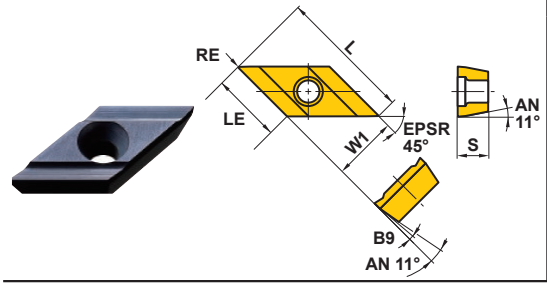
Workpiece Material	N	Non-Ferrous Metal	◐	Cutting Conditions (Guide) : ● : Stable Cutting ◐ : General Cutting ✤ : Unstable Cutting

Cutter Type Insert Geometry	Order Number	(ISO) Number	Class	PCD MD220	Dimensions (inch) IC	S	BS
BF407 	**SFCN42ZFFR2**	SFCN1203ZFFR2	C	●	.500	.125	.094

● : USA Stock ★ : Stocked in Japan
<1 insert in one case, TAWC : 10 inserts in one case>

DRILLING INSERTS

Insert for TAW Drill Chamfering Module

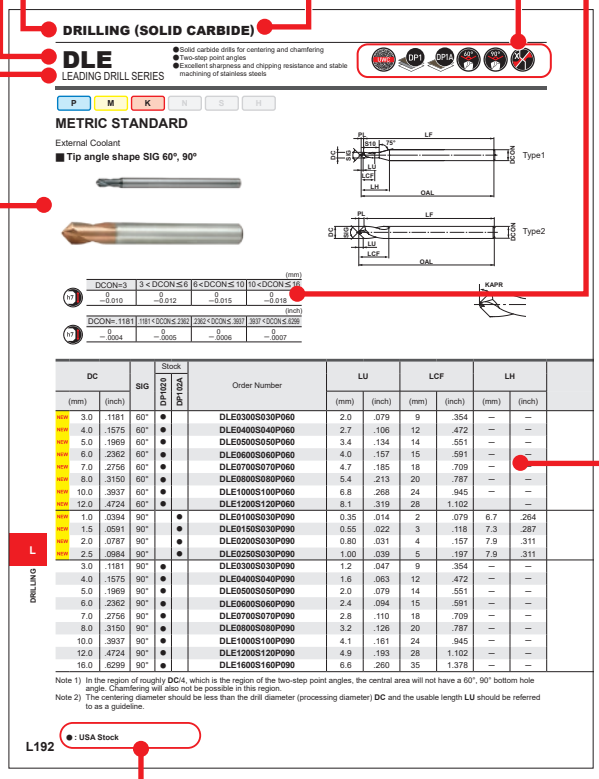
Shape Geometry	Order Number	Coated		Dimensions (mm)					
		VP15TF		L	LE	WI	S	RE	B9
	TAWC12T301-45GM	★		17.4	9.05	8.5	3.97	0.1	5°

HOW TO READ THE STANDARD OF DRILLING TOOLS

●How this section page is organized

①Arranged in order of solid carbide drills, high-speed steel drills, indexable type drills and brazed type drills.

PHOTO OF PRODUCT
PRODUCT TITLE
PRODUCT CODE
PRODUCT SECTION
PRODUCT TYPE
PRODUCT INFORMATION ICONS
DIAMETER TOLERANCE GEOMETRY
SUITABLE WORKPIECE MATERIALS


DRILLING (SOLID CARBIDE)

DLE
LEADING DRILL SERIES

●Solid carbide drills for centering and chamfering
●Two-step point angles
●Excellent sharpness and chipping resistance and stable machining of stainless steels

P M K N S H

METRIC STANDARD

External Coolant

■ Tip angle shape SIG 60°, 90°

Type1

Type2

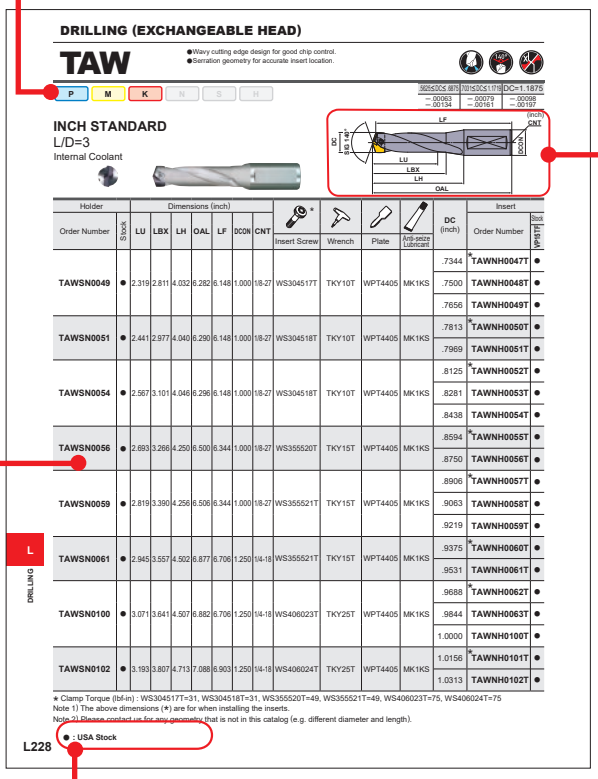
DC		SIG	Stock		Order Number	LU		LCF		LH	
(mm)	(inch)		DP100	DP100A		(mm)	(inch)	(mm)	(inch)	(mm)	(inch)
3.0	.1181	60°	●		DLE0300S030P060	2.0	.079	9	.354	–	–
4.0	.1575	60°	●		DLE0400S040P060	2.7	.106	12	.472	–	–
5.0	.1969	60°	●		DLE0500S050P060	3.4	.134	14	.551	–	–
6.0	.2362	60°	●		DLE0600S060P060	4.0	.157	15	.591	–	–
7.0	.2756	60°	●		DLE0700S070P060	4.7	.185	18	.709	–	–
8.0	.3150	60°	●		DLE0800S080P060	5.4	.213	20	.787	–	–
10.0	.3937	60°	●		DLE1000S100P060	6.8	.268	24	.945	–	–
12.0	.4724	60°	●		DLE1200S120P060	8.1	.319	28	1.102		–
1.0	.0394	90°		●	DLE0100S030P090	0.35	.014	2	.079	6.7	.264
1.5	.0591	90°		●	DLE0150S030P090	0.55	.022	3	.118	7.3	.287
2.0	.0787	90°		●	DLE0200S030P090	0.80	.031	4	.157	7.9	.311
2.5	.0984	90°		●	DLE0250S030P090	1.00	.039	5	.197	7.9	.311
3.0	.1181	90°	●		DLE0300S030P090	1.2	.047	9	.354	–	–
4.0	.1575	90°	●		DLE0400S040P090	1.6	.063	12	.472	–	–
5.0	.1969	90°	●		DLE0500S050P090	2.0	.079	14	.551	–	–
6.0	.2362	90°	●		DLE0600S060P090	2.4	.094	15	.591	–	–
7.0	.2756	90°	●		DLE0700S070P090	2.8	.110	18	.709	–	–
8.0	.3150	90°	●		DLE0800S080P090	3.2	.126	20	.787	–	–
10.0	.3937	90°	●		DLE1000S100P090	4.1	.161	24	.945	–	–
12.0	.4724	90°	●		DLE1200S120P090	4.9	.193	28	1.102	–	–
16.0	.6299	90°	●		DLE1600S160P090	6.6	.260	35	1.378	–	–

Note 1) In the region of roughly DC/4, which is the region of the two-step point angles, the central area will not have a 60°, 90° bottom hole angle. Chamfering will also not be possible in this region.
Note 2) The centering diameter should be less than the drill diameter (processing diameter) DC and the usable length LU should be referred to as a guideline.

● : USA Stock

L192

L
DRILLING


DRILLING (EXCHANGEABLE HEAD)

TAW

●Wavy cutting edge design for good chip control.
●Serration geometry for accurate insert location.

P M K N S H

INCH STANDARD
L/D=3
Internal Coolant

Holder		Dimensions (inch)										Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant	DC (inch)	Order Number	Toss (APMT)
TAWSN0049	●	2.319	2.811	4.032	6.282	6.148	1.000	1/8-27	WS30451?T	TKY10T	WPT4405	MK1KS	.7344	*TAWNH0047T	●
													.7500	TAWNH0048T	●
													.7656	TAWNH0049T	●
TAWSN0051	●	2.441	2.977	4.040	6.290	6.148	1.000	1/8-27	WS30451?T	TKY10T	WPT4405	MK1KS	.7813	*TAWNH0050T	●
													.7969	TAWNH0051T	●
TAWSN0054	●	2.567	3.101	4.046	6.296	6.148	1.000	1/8-27	WS30451?T	TKY10T	WPT4405	MK1KS	.8125	*TAWNH0052T	●
													.8281	TAWNH0053T	●
													.8438	TAWNH0054T	●
TAWSN0056	●	2.693	3.266	4.250	6.500	6.344	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	*TAWNH0055T	●
													.8750	TAWNH0056T	●
TAWSN0059	●	2.819	3.390	4.256	6.506	6.344	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	*TAWNH0057T	●
													.9063	TAWNH0058T	●
													.9219	TAWNH0059T	●
TAWSN0061	●	2.945	3.557	4.502	6.877	6.706	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	*TAWNH0060T	●
													.9531	TAWNH0061T	●
TAWSN0100	●	3.071	3.641	4.507	6.882	6.706	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	*TAWNH0062T	●
													.9844	TAWNH0063T	●
													1.0000	TAWNH0100T	●
TAWSN0102	●	3.193	3.807	4.713	7.088	6.903	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	*TAWNH0101T	●
													1.0313	TAWNH0102T	●

★ Clamp Torque (lbf-in) : WS30451?T=31, WS30451?T=31, WS355520T=49, WS355521T=49, WS406023T=75, WS406024T=75
Note 1) The above dimensions (★) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

● : USA Stock

L228

L
DRILLING

PRODUCT STANDARDS
indicates diameters, order numbers, stock status,numbers of teeth, dimensions, and spare parts for the title product.

LEGEND FOR STOCK STATUS MARK

●To Order : For solid-carbide or brazed drills, please specify order number and grade.
For indexable type drills, please specify order number for the drill.
For indexable type drill inserts, please specify insert number and insert grade.

DRILLING

IDENTIFICATION L002
SYMBOL DESCRIPTIONS L003
DRILLS SELECTION CHART L004

DRILL STANDARD

SOLID CARBIDE

NEW DVAS DRILLS L008
MICRO-MVS DRILLS L016
MVE/MVS DRILLS L022
MICRO-MWS DRILLS L092
MMS DRILLS L108
MHS DRILLS L120
MNS DRILLS L140
MAE/MAS DRILLS L150
MSE DRILLS L158
MSP DRILLS L162
MICRO-MGS DRILLS (SOLID GUN DRILLS) L164
MHE (DRILLS FOR WHEEL HUB) L167
DSAS/DSAE DRILLS L168
NEW DWAE DRILLS L175
MFE DRILLS L183
DLE DRILLS L192

EXCHANGEABLE HEAD

STAW DRILLS L219
TAW DRILLS L228

INDEXABLE TYPE

MVX DRILLS L199

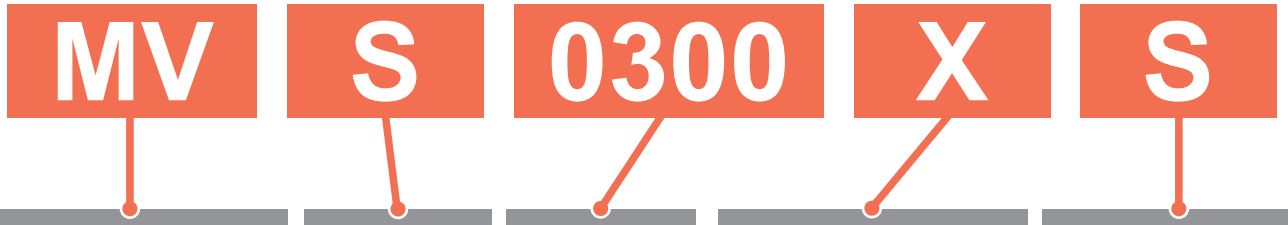
*Arranged by Alphabetical order

L192 **DLE (METRIC)**
L168 **DSAE (METRIC)**
L168 **DSAS (INCH/METRIC)**
L008 **DVAS (Mini, METRIC)**
L175 **DWAE (Mini, METRIC)**
L176 **DWAE (METRIC)**
L152 **MAE (METRIC)**
L150 **MAS (INCH)**
L152 **MAS (METRIC)**
L183 **MFE (INCH/METRIC)**
L165 **MGD (INCH)**
L164 **MGS (MICRO, METRIC)**
L167 **MHE**
L120 **MHS (METRIC)**
L108 **MMS (INCH/METRIC)**
L140 **MNS (METRIC)**
L158 **MSE (METRIC)**
L162 **MSP (METRIC)**
L022 **MVE (INCH/METRIC)**
L022 **MVS (INCH/METRIC)**
L016 **MVS (MICRO, INCH/METRIC)**
L199 **MVX (INCH)**
L204 **MVX (METRIC)**
L092 **MWS (MICRO, INCH/METRIC)**
L219 **STAW (INCH)**
L221 **STAW (METRIC)**
L228 **TAW (INCH)**
L234 **TAW (METRIC)**

IDENTIFICATION

PRODUCT CODE OF DRILLS

SOLID DRILLS



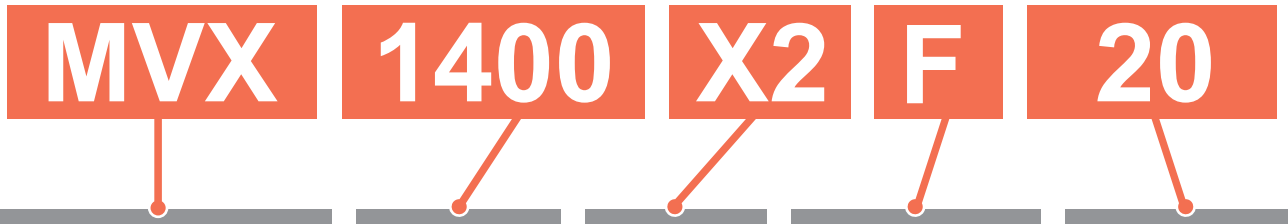
Applications	Coolant	Diameter	L/D	Type of Shank
DVA : General Purpose **DWA** : Swiss-Type Automatic and Small CNC Lathes **DSA** : For Heat Resistant Super Alloys **MV** : General Purpose **MF** : Solid Carbide Flat Bottom **MG** : Micro Solid Carbide Gun Drill **MS** : For Small Diameter Machining **MN** : For Machining of Aluminum Alloys **MH** : For Hardened Steel Alloys **MM** : For Machining of Stainless Steel **DL** : For Centering and Chamfering **MA** : For Aluminum Cast Iron High Precision Hole Machining	**E** : External Coolant **S** : Internal Coolant	**ex.** 0050 → ϕ0.5mm 0300 → ϕ3.0mm	**S** : 2D **M** : 3D **L** : 5D (MAE, MAS : 6D) **X** : 12D **X＊＊D** : ＊＊D	**A** : Straight Shank **B** : Integral Shank **S＊＊＊** : Shank Diameter

＊Other special types can be ordered.

INDEXABLE DRILLS

INCH

METRIC



Product Name	Diameter	L/D	Coolant Type	Shank Size
	ex. 0562 → ϕ.562" 1400 → ϕ14mm	**X2** : 2D **X3** : 3D **X4** : 4D	**C** : Screw Type **F** : General Type	075 → ϕ.750" 20 → ϕ20mm

SYMBOL DESCRIPTIONS

Tool Material

Ultra Micro Grain Carbide
Ultra micro grain carbide is used as the substrate material.

Web Thinning

X Web Thinning
X web thinning is used at the drill point.

Z Web Thinning
Z web thinning is used at the drill point.

XR Web Thinning
XR web thinning is used at the drill point.

N Web Thinning
N web thinning is used at the drill point.

Tolerance

Drill Diameter Tolerance

Shank Diameter Tolerance

Coolant Hole

Coolant Hole

Coating

PVD Coating
DP102A is a PVD coated cemented carbide grade specialized for small diameter drills, with greatly improved wear resistance.

PVD Coating
Exhibits outstanding wear resistance with a wide range of workpiece materials including mild steel, carbon steel, alloy steel, stainless steel, cast iron-based materials, and aluminum alloy.

PVD Coating
An ultra micro-grain cemented carbide optimal for stainless steel, and a PVD coating with outstanding heat resistance and lubricity.

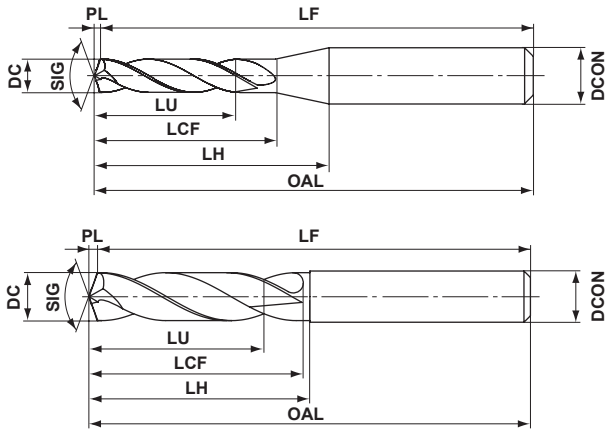
PVD Coating
New grade with increased hardness that exhibits both high wear and fracture resistance, leading to longer tool life when machining heat resistant alloys.

MIRACLE Coating
The original Miracle (Al,Ti)N coating.
Also suitable for dry cutting.

Angle

Point Angle (SIG)
Indicates drill point angle at the tip.
* The icon shown is an example only.

GUIDE FOR ISO13399 SYMBOLS



Symbol	Content
DC	Cutting diameter
SIG	Point angle
LU	Usable length
LCF	Length chip flute
LH	Reduced body diameter length
OAL	Overall length
LF	Functional length
PL	Point length
DCON	Connection diameter

*There are exceptions other than those listed above. For more details, please refer to the technical data (page N002).

DRILLS SELECTION CHART

Drill Structure	Category	Drill Type	Product Code	Coolant	L/D INCH	L/D METRIC	Range of Size	Workpiece Materials P: Carbon Steel Alloy Steel	M: Stainless Steel	K: Cast Iron	N: Light Alloy	S: Heat resistant Alloy	H: Hardened Steel	Page: Dimensions	Page: Cutting Conditions	Shape
Solid Carbide	Micro Size Hole (≤ϕ.1200", ϕ2.95mm)	Small Diameter	NEW **DVAS**	Internal	2 7 12 20 25 30 40 50	2 7 12 20 25 30 40 50	**INCH** ϕ.0394"—ϕ.1142" **METRIC** ϕ1.0—ϕ2.9 mm	◎	◎	○	○	◎		L008	L015	
		New Generation for small diameter	**MVS**	Internal	2 7 12 20 25 30	2 7 12 20 25 30	**INCH** ϕ.0394"—ϕ.1142" **METRIC** ϕ1.0—ϕ2.9 mm	◎	◎	◎	○	○		L016	L085	
		General Use	**MWS**	Internal	1 5 12	1 5 12 20 25 30	**INCH** ϕ.0197"—ϕ.1161" **METRIC** ϕ0.5—ϕ2.95 mm	◎	◎	◎	○	○		L092	L103	
			MSE	External	—	5	**METRIC** ϕ0.1—ϕ0.99 mm	◎	○	◎	○	○		L158	L159	
		Starter Drill for MSE Type	**MSP**	External	—	—	**METRIC** ϕ0.1—ϕ3.0 mm	◎	○	◎	○	○		L162	L162	
	General Size Hole (≥ϕ.1200", ϕ3.0mm)	New Generation	**MVE**	External	2 3	2 3	**INCH** ϕ.1181"—ϕ.7874" **METRIC** ϕ3.0—ϕ20.0 mm	◎	○	◎	○	○	○	L022	L085	
			MVS	Internal	3 5 8 10 15 20 25 30 35 40	3 5 8 10 15 20 25 30 35 40	**INCH** ϕ.1181"—ϕ.7874" **METRIC** ϕ3.0—ϕ20.0 mm	◎	◎	◎	○	○		L022	L085	
	Deep Hole (≥ L/D 10)	Solid Gun Drill	**MGS**	Internal	—	20 I 80	**METRIC** ϕ0.7—ϕ3.0 mm	◎	◎	◎	◎			L164	L165	

Drill Structure	Category	Drill Type	Product Code	Coolant	L/D		Range of Size	Workpiece Materials						Page		Shape
								P	M	K	N	S	H			
					INCH	METRIC		Carbon Steel Alloy Steel	Stainless Steel	Cast Iron	Light Alloy	Heat resistant Alloy	Hardened Steel	Dimensions	Cutting Conditions	
Solid Carbide	Stainless Steel	2 coolant holes	**MMS**	Internal	—	3 5	**INCH** ϕ.1181"—ϕ.7874" **METRIC** ϕ3.0—ϕ20.0 mm		◎					L108	L117	
	Aluminum or Cast Iron	Helix Angle (10°)	**MAE**	External	—	3	**METRIC** ϕ3.0—ϕ16.0 mm			○	◎			L152	L157	
			MAS	Internal	3	3 6	**INCH** ϕ.1250"—ϕ.7812" **METRIC** ϕ3.0—ϕ16.0 mm			○	◎			L150 L152	L151 L157	
	Aluminum	4 coolant holes	**MNS**	Internal	—	5 10 20 30	**METRIC** ϕ3.0—ϕ14.0 mm				◎			L140	L145	
	Hardened Steel	General Use	**MHS**	Internal	—	1 — 30	**METRIC** ϕ0.95—ϕ12.0 mm	○	○			○	◎	L120	L136	
	Wheel Hub	Low Cutting Resistance	**MHE**	External	1	—	**INCH** ϕ.3937"—ϕ.5906"	◎						L167	L167	
	Heat Resistant Alloy	—	**DSAE**	External	3	3	**INCH** ϕ.1181"—ϕ.4724" **METRIC** ϕ3.0—ϕ12.0 mm					◎		L168	L174	
			DSAS	Internal	3	3 5	**INCH** ϕ.1181"—ϕ.5906" **METRIC** ϕ3.0—ϕ15.0 mm					◎		L168	L174	
	Swiss-Type Automatic and Small CNC Lathes	—	NEW Mini Size **DWAE**	External	2 4	2 4	**INCH** ϕ.0394"—ϕ.1142" **METRIC** ϕ1.0—ϕ2.9 mm	◎	◎	◎				L175	L181	
		—	NEW **DWAE**	External	2 4	2 4	**INCH** ϕ.1181"—ϕ.5512" **METRIC** ϕ3.0—ϕ14.0 mm	◎	◎	◎				L176	L181	

Drill Structure	Category	Drill Type	Product Code	Coolant	L/D		Range of Size	Workpiece Materials						Page		Shape
								P	M	K	N	S	H			
					INCH	METRIC		Carbon Steel Alloy Steel	Stainless Steel	Cast Iron	Light Alloy	Heat resistant Alloy	Hardened Steel	Dimensions	Cutting Conditions	
Solid Carbide	—	Flat Bottom	Small Diameter **MFE**	External	2	2	**INCH** ϕ.0295"—ϕ.1161" **METRIC** ϕ0.75—ϕ2.95 mm	◎	◎	◎	○			L183	L189	
			MFE	External	2	2	**INCH** ϕ.1181"—ϕ.7874" **METRIC** ϕ3.0—ϕ20.0 mm	◎	◎	◎	○			L185	L189	
	—	Leading Drills	**DLE**	External	—	—	**INCH** ϕ.1181"—ϕ.6299" **METRIC** ϕ3.0—ϕ16.0 mm	◎	◎	◎				L192	L197	
Exchangeable Head	General Use	Indexable Head	**STAW**	Internal	1.5 3 5 8	1.5 3 5 8	**INCH** ϕ.3906"—ϕ.7188" **METRIC** ϕ10.0—ϕ18.4 mm	◎	○	◎				L219 L201	L226	
			TAW	Internal	3 5 8	3 5 8	**INCH** ϕ.7344"—ϕ1.1875" **METRIC** ϕ18.5—ϕ30.0 mm	◎	○	◎				L228 L234	L236	
Indexable	New Generation	Multi-corner Insert	**MVX**	Internal	2 — 6	2 — 6	**INCH** ϕ.5620"—ϕ2.5000" **METRIC** ϕ14.0—ϕ63.0 mm	◎	○	◎	○		○	L199 L204	L213	

Memo

DVAS Mini Size NEW

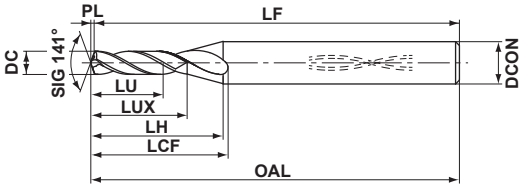
TRISTAR Drills

UWC DP1 141° L/D=2 139° L/D>2 XR

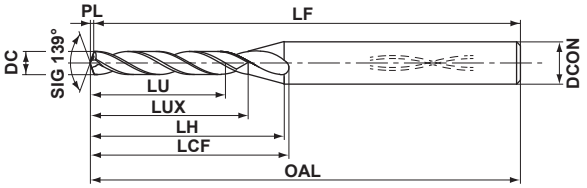
P M K N S H

METRIC STANDARD

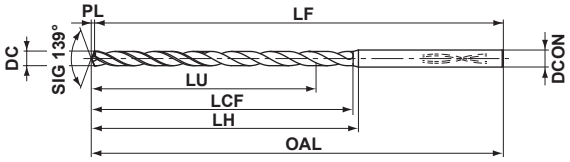
Internal Coolant



Type1



Type2



Type3

L/D=2	L/D>2
.00024 − .00016	0 − .00039
DCON=4	
0 − .00031	

DC Metric (mm)	DC Decimal (inch)	DC Fraction (inch)	Wire / Letter	Thread Size	L/D	Stock DP1120	Order Number	LU mm	LU inch	LUX mm	LUX inch	LCF mm	LCF inch	LH mm	LH inch	OAL mm	OAL inch	LF mm	LF inch	PL mm	PL inch	DCON mm	DCON inch	Type
1.0	.0394				2	●	DVAS0100X02S040	2.2	.087	3.2	.126	8.6	.339	8.8	.346	50	1.969	49.8	1.961	0.2	.008	4	.157	1
					7	●	DVAS0100X07S040	7.2	.283	8.2	.323	13.6	.535	13.8	.543	55	2.165	54.8	2.157	0.2	.008	4	.157	2
					12	●	DVAS0100X12S040	12.2	.480	13.2	.520	18.6	.732	18.8	.740	58	2.283	57.8	2.276	0.2	.008	4	.157	2
					20	●	DVAS0100X20S040	20.2	.795	–	–	23.2	.913	28.8	1.134	67	2.638	66.8	2.630	0.2	.008	4	.157	3
					25	●	DVAS0100X25S040	25.2	.992	–	–	28.2	1.110	33.8	1.331	73	2.874	72.8	2.866	0.2	.008	4	.157	3
					30	●	DVAS0100X30S040	30.2	1.189	–	–	33.2	1.307	38.8	1.528	79	3.110	78.8	3.102	0.2	.008	4	.157	3
					40	●	DVAS0100X40S040	40.2	1.583	–	–	43.2	1.701	48.8	1.921	90	3.543	89.8	3.535	0.2	.008	4	.157	3
					50	●	DVAS0100X50S040	50.2	1.976	–	–	53.2	2.094	58.8	2.315	102	4.016	101.8	4.008	0.2	.008	4	.157	3
1.1	.0433				2	●	DVAS0110X02S040	2.4	.094	3.5	.138	9	.354	8.9	.350	50	1.969	49.8	1.961	0.2	.008	4	.157	1
					7	●	DVAS0110X07S040	7.9	.311	9.1	.358	14.5	.571	14.4	.567	55	2.165	54.8	2.157	0.2	.008	4	.157	2
					12	●	DVAS0110X12S040	13.4	.528	14.6	.575	20	.787	19.9	.783	58	2.283	57.8	2.276	0.2	.008	4	.157	2
					20	●	DVAS0110X20S040	22.2	.874	–	–	25.5	1.004	30.9	1.217	67	2.638	66.8	2.630	0.2	.008	4	.157	3
					25	●	DVAS0110X25S040	27.7	1.091	–	–	31	1.220	36.4	1.433	73	2.874	72.8	2.866	0.2	.008	4	.157	3
					30	●	DVAS0110X30S040	33.2	1.307	–	–	36.5	1.437	41.9	1.650	79	3.110	78.8	3.102	0.2	.008	4	.157	3
					40	★	DVAS0110X40S040	44.2	1.740	–	–	47.5	1.870	52.9	2.083	90	3.543	89.8	3.535	0.2	.008	4	.157	3
1.2	.0472				2	●	DVAS0120X02S040	2.6	.102	3.9	.154	9.4	.370	9	.354	50	1.969	49.8	1.961	0.2	.008	4	.157	1
					7	●	DVAS0120X07S040	8.6	.339	9.9	.390	15.4	.606	15	.591	55	2.165	54.8	2.157	0.2	.008	4	.157	2
					12	●	DVAS0120X12S040	14.6	.575	15.9	.626	21.4	.843	21	.827	60	2.362	59.8	2.354	0.2	.008	4	.157	2
					20	●	DVAS0120X20S040	24.2	.953	–	–	27.8	1.094	33	1.299	71	2.795	70.8	2.787	0.2	.008	4	.157	3
					25	●	DVAS0120X25S040	30.2	1.189	–	–	33.8	1.331	39	1.535	77	3.031	76.8	3.024	0.2	.008	4	.157	3
					30	●	DVAS0120X30S040	36.2	1.425	–	–	39.8	1.567	45	1.772	84	3.307	83.8	3.299	0.2	.008	4	.157	3
					40	●	DVAS0120X40S040	48.2	1.898	–	–	51.8	2.039	57	2.244	97	3.819	96.8	3.811	0.2	.008	4	.157	3
					50	●	DVAS0120X50S040	60.2	2.370	–	–	63.8	2.512	69	2.717	110	4.331	109.8	4.323	0.2	.008	4	.157	3

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	LU		LUX		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1120		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.3	.0512				2	●	DVAS0130X02S040	2.8	.110	4.2	.165	9.9	.390	9.2	.362	50	1.969	49.8	1.961	0.2	.008	4	.157	1
					7	●	DVAS0130X07S040	9.3	.366	10.7	.421	16.4	.646	15.7	.618	55	2.165	54.8	2.157	0.2	.008	4	.157	2
					12	●	DVAS0130X12S040	15.8	.622	17.2	.677	22.9	.902	22.2	.874	60	2.362	59.8	2.354	0.2	.008	4	.157	2
					20	●	DVAS0130X20S040	26.2	1.031	–	–	30.1	1.185	35.2	1.386	71	2.795	70.8	2.787	0.2	.008	4	.157	3
					25	●	DVAS0130X25S040	32.7	1.287	–	–	36.6	1.441	41.7	1.642	77	3.031	76.8	3.024	0.2	.008	4	.157	3
					30	●	DVAS0130X30S040	39.2	1.543	–	–	43.1	1.697	48.2	1.898	84	3.307	83.8	3.299	0.2	.008	4	.157	3
					40	●	DVAS0130X40S040	52.2	2.055	–	–	56.1	2.209	61.2	2.409	97	3.819	96.8	3.811	0.2	.008	4	.157	3
					50	●	DVAS0130X50S040	65.2	2.567	–	–	69.1	2.720	74.2	2.921	110	4.331	109.8	4.323	0.2	.008	4	.157	3
1.4	.0551				2	●	DVAS0140X02S040	3	.118	4.5	.177	10.3	.406	9.3	.366	50	1.969	49.8	1.961	0.2	.008	4	.157	1
					7	●	DVAS0140X07S040	10.1	.398	11.5	.453	17.3	.681	16.3	.642	55	2.165	54.7	2.154	0.3	.012	4	.157	2
					12	●	DVAS0140X12S040	17.1	.673	18.5	.728	24.3	.957	23.3	.917	63	2.480	62.7	2.469	0.3	.012	4	.157	2
					20	●	DVAS0140X20S040	28.3	1.114	–	–	32.5	1.280	37.3	1.469	75	2.953	74.7	2.941	0.3	.012	4	.157	3
					25	●	DVAS0140X25S040	35.3	1.390	–	–	39.5	1.555	44.3	1.744	82	3.228	81.7	3.217	0.3	.012	4	.157	3
					30	●	DVAS0140X30S040	42.3	1.665	–	–	46.5	1.831	51.3	2.020	90	3.543	89.7	3.531	0.3	.012	4	.157	3
					40	★	DVAS0140X40S040	56.3	2.217	–	–	60.5	2.382	65.3	2.571	105	4.134	104.7	4.122	0.3	.012	4	.157	3
1.5	.0591			#1-64	2	●	DVAS0150X02S040	3.3	.130	4.8	.189	10.7	.421	9.4	.370	50	1.969	49.7	1.957	0.3	.012	4	.157	1
					7	●	DVAS0150X07S040	10.8	.425	12.3	.484	18.2	.717	16.9	.665	55	2.165	54.7	2.154	0.3	.012	4	.157	2
					12	●	DVAS0150X12S040	18.3	.720	19.8	.780	25.7	1.012	24.4	.961	63	2.480	62.7	2.469	0.3	.012	4	.157	2
					20	●	DVAS0150X20S040	30.3	1.193	–	–	34.8	1.370	39.4	1.551	75	2.953	74.7	2.941	0.3	.012	4	.157	3
					25	●	DVAS0150X25S040	37.8	1.488	–	–	42.3	1.665	46.9	1.846	82	3.228	81.7	3.217	0.3	.012	4	.157	3
					30	●	DVAS0150X30S040	45.3	1.783	–	–	49.8	1.961	54.4	2.142	90	3.543	89.7	3.531	0.3	.012	4	.157	3
					40	●	DVAS0150X40S040	60.3	2.374	–	–	64.8	2.551	69.4	2.732	105	4.134	104.7	4.122	0.3	.012	4	.157	3
					50	●	DVAS0150X50S040	75.3	2.965	–	–	79.8	3.142	84.4	3.323	120	4.724	119.7	4.713	0.3	.012	4	.157	3
1.6	.0630				2	●	DVAS0160X02S040	3.5	.138	5.1	.201	11.1	.437	9.6	.378	50	1.969	49.7	1.957	0.3	.012	4	.157	1
					7	●	DVAS0160X07S040	11.5	.453	13.1	.516	19.2	.756	17.6	.693	57	2.244	56.7	2.232	0.3	.012	4	.157	2
					12	●	DVAS0160X12S040	19.5	.768	21.1	.831	27.2	1.071	25.6	1.008	66	2.598	65.7	2.587	0.3	.012	4	.157	2
					20	●	DVAS0160X20S040	32.3	1.272	–	–	37.1	1.461	41.6	1.638	79	3.110	78.7	3.098	0.3	.012	4	.157	3
					25	●	DVAS0160X25S040	40.3	1.587	–	–	45.1	1.776	49.6	1.953	88	3.465	87.7	3.453	0.3	.012	4	.157	3
					30	●	DVAS0160X30S040	48.3	1.902	–	–	53.1	2.091	57.6	2.268	99	3.898	98.7	3.886	0.3	.012	4	.157	3
					40	★	DVAS0160X40S040	64.3	2.531	–	–	69.1	2.720	73.6	2.898	113	4.449	112.7	4.437	0.3	.012	4	.157	3
1.7	.0669				2	●	DVAS0170X02S040	3.7	.146	5.5	.217	11.6	.457	9.7	.382	50	1.969	49.7	1.957	0.3	.012	4	.157	1
					7	●	DVAS0170X07S040	12.2	.480	14	.551	20.1	.791	18.2	.717	57	2.244	56.7	2.232	0.3	.012	4	.157	2
					12	●	DVAS0170X12S040	20.7	.815	22.5	.886	28.6	1.126	26.7	1.051	66	2.598	65.7	2.587	0.3	.012	4	.157	2
					20	●	DVAS0170X20S040	34.3	1.350	–	–	39.4	1.551	43.7	1.720	79	3.110	78.7	3.098	0.3	.012	4	.157	3
					25	●	DVAS0170X25S040	42.8	1.685	–	–	47.9	1.886	52.2	2.055	88	3.465	87.7	3.453	0.3	.012	4	.157	3
					30	●	DVAS0170X30S040	51.3	2.020	–	–	56.4	2.220	60.7	2.390	99	3.898	98.7	3.886	0.3	.012	4	.157	3
					40	●	DVAS0170X40S040	68.3	2.689	–	–	73.4	2.890	77.7	3.059	113	4.449	112.7	4.437	0.3	.012	4	.157	3
1.8	.0709				2	●	DVAS0180X02S040	3.9	.154	5.8	.228	12	.472	9.8	.386	50	1.969	49.7	1.957	0.3	.012	4	.157	1
					7	●	DVAS0180X07S040	12.9	.508	14.8	.583	21	.827	18.8	.740	59	2.323	58.7	2.311	0.3	.012	4	.157	2
					12	●	DVAS0180X12S040	21.9	.862	23.8	.937	30	1.181	27.8	1.094	69	2.717	68.7	2.705	0.3	.012	4	.157	2
					20	●	DVAS0180X20S040	36.3	1.429	–	–	41.7	1.642	45.8	1.803	84	3.307	83.7	3.295	0.3	.012	4	.157	3
					25	●	DVAS0180X25S040	45.3	1.783	–	–	50.7	1.996	54.8	2.157	94	3.701	93.7	3.689	0.3	.012	4	.157	3
					30	●	DVAS0180X30S040	54.3	2.138	–	–	59.7	2.350	63.8	2.512	104	4.094	103.7	4.083	0.3	.012	4	.157	3
					40	●	DVAS0180X40S040	72.3	2.846	–	–	77.7	3.059	81.8	3.220	123	4.843	122.7	4.831	0.3	.012	4	.157	3
1.9	.0748				2	●	DVAS0190X02S040	4.1	.161	6.1	.240	12.4	.488	10	.394	50	1.969	49.7	1.957	0.3	.012	4	.157	1
					7	●	DVAS0190X07S040	13.7	.539	15.6	.614	21.9	.862	19.5	.768	59	2.323	58.6	2.307	0.4	.016	4	.157	2
					12	●	DVAS0190X12S040	23.2	.913	25.1	.988	31.4	1.236	29	1.142	69	2.717	68.6	2.701	0.4	.016	4	.157	2
					20	●	DVAS0190X20S040	38.4	1.512	–	–	44.1	1.736	48	1.890	84	3.307	83.6	3.291	0.4	.016	4	.157	3
					25	●	DVAS0190X25S040	47.9	1.886	–	–	53.6	2.110	57.5	2.264	94	3.701	93.6	3.685	0.4	.016	4	.157	3
					30	●	DVAS0190X30S040	57.4	2.260	–	–	63.1	2.484	67	2.638	104	4.094	103.6	4.079	0.4	.016	4	.157	3
					40	●	DVAS0190X40S040	76.4	3.008	–	–	82.1	3.232	86	3.386	123	4.843	122.6	4.827	0.4	.016	4	.157	3

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L012
CUTTING CONDITIONS ➤ L015

DVAS Mini Size

TRISTAR Drills

DC					L/D	Stock	Order Number	LU		LUX		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1120		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.0	.0787			#3-48	2	●	DVAS0200X02S040	4.4	.173	6.4	.252	12.9	.508	10.1	.398	50	1.969	49.6	1.953	0.4	.016	4	.157	1
					7	●	DVAS0200X07S040	14.4	.567	16.4	.646	22.9	.902	20.1	.791	62	2.441	61.6	2.425	0.4	.016	4	.157	2
					12	●	DVAS0200X12S040	24.4	.961	26.4	1.039	32.9	1.295	30.1	1.185	73	2.874	72.6	2.858	0.4	.016	4	.157	2
					20	●	DVAS0200X20S040	40.4	1.591	–	–	46.4	1.827	50.1	1.972	91	3.583	90.6	3.567	0.4	.016	4	.157	3
					25	●	DVAS0200X25S040	50.4	1.984	–	–	56.4	2.220	60.1	2.366	102	4.016	101.6	4.000	0.4	.016	4	.157	3
					30	●	DVAS0200X30S040	60.4	2.378	–	–	66.4	2.614	70.1	2.760	113	4.449	112.6	4.433	0.4	.016	4	.157	3
					40	●	DVAS0200X40S040	80.4	3.165	–	–	86.4	3.402	90.1	3.547	136	5.354	135.6	5.339	0.4	.016	4	.157	3
					50	●	DVAS0200X50S040	100.4	3.953	–	–	106.4	4.189	110.1	4.335	158	6.220	157.6	6.205	0.4	.016	4	.157	3
2.1	.0827				2	●	DVAS0210X02S040	4.6	.181	6.7	.264	13.3	.524	10.2	.402	50	1.969	49.6	1.953	0.4	.016	4	.157	1
					7	●	DVAS0210X07S040	15.1	.594	17.2	.677	23.8	.937	20.7	.815	62	2.441	61.6	2.425	0.4	.016	4	.157	2
					12	●	DVAS0210X12S040	25.6	1.008	27.7	1.091	34.3	1.350	31.2	1.228	73	2.874	72.6	2.858	0.4	.016	4	.157	2
					20	●	DVAS0210X20S040	42.4	1.669	–	–	48.7	1.917	52.2	2.055	91	3.583	90.6	3.567	0.4	.016	4	.157	3
					25	●	DVAS0210X25S040	52.9	2.083	–	–	59.2	2.331	62.7	2.469	102	4.016	101.6	4.000	0.4	.016	4	.157	3
					30	●	DVAS0210X30S040	63.4	2.496	–	–	69.7	2.744	73.2	2.882	113	4.449	112.6	4.433	0.4	.016	4	.157	3
					40	★	DVAS0210X40S040	84.4	3.323	–	–	90.7	3.571	94.2	3.709	136	5.354	135.6	5.339	0.4	.016	4	.157	3
2.2	.0866				2	●	DVAS0220X02S040	4.8	.189	7	.276	13.7	.539	10.3	.406	50	1.969	49.6	1.953	0.4	.016	4	.157	1
					7	●	DVAS0220X07S040	15.8	.622	18.1	.713	24.7	.972	21.4	.843	62	2.441	61.6	2.425	0.4	.016	4	.157	2
					12	●	DVAS0220X12S040	26.8	1.055	29.1	1.146	35.7	1.406	32.4	1.276	73	2.874	72.6	2.858	0.4	.016	4	.157	2
					20	●	DVAS0220X20S040	44.4	1.748	–	–	51	2.008	54.4	2.142	91	3.583	90.6	3.567	0.4	.016	4	.157	3
					25	●	DVAS0220X25S040	55.4	2.181	–	–	62	2.441	65.4	2.575	102	4.016	101.6	4.000	0.4	.016	4	.157	3
					30	●	DVAS0220X30S040	66.4	2.614	–	–	73	2.874	76.4	3.008	113	4.449	112.6	4.433	0.4	.016	4	.157	3
					40	●	DVAS0220X40S040	88.4	3.480	–	–	95	3.740	98.4	3.874	136	5.354	135.6	5.339	0.4	.016	4	.157	3
2.3	.0906				2	●	DVAS0230X02S040	5	.197	7.4	.291	14.1	.555	10.5	.413	55	2.165	54.6	2.150	0.4	.016	4	.157	1
					7	●	DVAS0230X07S040	16.5	.650	18.9	.744	25.7	1.012	22	.866	65	2.559	64.6	2.543	0.4	.016	4	.157	2
					12	●	DVAS0230X12S040	28	1.102	30.4	1.197	37.2	1.465	33.5	1.319	78	3.071	77.6	3.055	0.4	.016	4	.157	2
					20	●	DVAS0230X20S040	46.4	1.827	–	–	53.3	2.098	56.5	2.224	98	3.858	97.6	3.843	0.4	.016	4	.157	3
					25	●	DVAS0230X25S040	57.9	2.280	–	–	64.8	2.551	68	2.677	111	4.370	110.6	4.354	0.4	.016	4	.157	3
					30	●	DVAS0230X30S040	69.4	2.732	–	–	76.3	3.004	79.5	3.130	124	4.882	123.6	4.866	0.4	.016	4	.157	3
					40	★	DVAS0230X40S040	92.4	3.638	–	–	99.3	3.909	102.5	4.035	150	5.906	149.6	5.890	0.4	.016	4	.157	3
2.4	.0945				2	●	DVAS0240X02S040	5.2	.205	7.7	.303	14.6	.575	10.6	.417	55	2.165	54.6	2.150	0.4	.016	4	.157	1
					7	●	DVAS0240X07S040	17.2	.677	19.7	.776	26.6	1.047	22.6	.890	65	2.559	64.6	2.543	0.4	.016	4	.157	2
					12	●	DVAS0240X12S040	29.2	1.150	31.7	1.248	38.6	1.520	34.6	1.362	78	3.071	77.6	3.055	0.4	.016	4	.157	2
					20	●	DVAS0240X20S040	48.4	1.906	–	–	55.6	2.189	58.6	2.307	98	3.858	97.6	3.843	0.4	.016	4	.157	3
					25	●	DVAS0240X25S040	60.4	2.378	–	–	67.6	2.661	70.6	2.780	111	4.370	110.6	4.354	0.4	.016	4	.157	3
					30	●	DVAS0240X30S040	72.4	2.850	–	–	79.6	3.134	82.6	3.252	124	4.882	123.6	4.866	0.4	.016	4	.157	3
					40	★	DVAS0240X40S040	96.4	3.795	–	–	103.6	4.079	106.6	4.197	150	5.906	149.6	5.890	0.4	.016	4	.157	3
2.5	.0984				2	●	DVAS0250X02S040	5.5	.217	8	.315	15	.591	10.7	.421	55	2.165	54.6	2.150	0.4	.016	4	.157	1
					7	●	DVAS0250X07S040	18	.709	20.5	.807	27.5	1.083	23.3	.917	65	2.559	64.5	2.539	0.5	.020	4	.157	2
					12	●	DVAS0250X12S040	30.5	1.201	33	1.299	40	1.575	35.8	1.409	78	3.071	77.5	3.051	0.5	.020	4	.157	2
					20	●	DVAS0250X20S040	50.5	1.988	–	–	58	2.283	60.8	2.394	98	3.858	97.5	3.839	0.5	.020	4	.157	3
					25	●	DVAS0250X25S040	63	2.480	–	–	70.5	2.776	73.3	2.886	111	4.370	110.5	4.350	0.5	.020	4	.157	3
					30	●	DVAS0250X30S040	75.5	2.972	–	–	83	3.268	85.8	3.378	124	4.882	123.5	4.862	0.5	.020	4	.157	3
					40	●	DVAS0250X40S040	100.5	3.957	–	–	108	4.252	110.8	4.362	150	5.906	149.5	5.886	0.5	.020	4	.157	3
					50	★	DVAS0250X50S040	125.5	4.941	–	–	133	5.236	135.8	5.346	176	6.929	175.5	6.909	0.5	.020	4	.157	3

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	LU		LUX		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1120		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.6	.1024				2	●	DVAS0260X02S040	5.7	.224	8.3	.327	15.4	.606	10.9	.429	55	2.165	54.5	2.146	0.5	.020	4	.157	1
					7	●	DVAS0260X07S040	18.7	.736	21.3	.839	28.4	1.118	23.9	.941	65	2.559	64.5	2.539	0.5	.020	4	.157	2
					12	●	DVAS0260X12S040	31.7	1.248	34.3	1.350	41.4	1.630	36.9	1.453	78	3.071	77.5	3.051	0.5	.020	4	.157	2
					20	●	DVAS0260X20S040	52.5	2.067	–	–	60.3	2.374	62.9	2.476	98	3.858	97.5	3.839	0.5	.020	4	.157	3
					25	●	DVAS0260X25S040	65.5	2.579	–	–	73.3	2.886	75.9	2.988	111	4.370	110.5	4.350	0.5	.020	4	.157	3
					30	●	DVAS0260X30S040	78.5	3.091	–	–	86.3	3.398	88.9	3.500	124	4.882	123.5	4.862	0.5	.020	4	.157	3
					40	●	DVAS0260X40S040	104.5	4.114	–	–	112.3	4.421	114.9	4.524	150	5.906	149.5	5.886	0.5	.020	4	.157	3
2.7	.1063		36	#6-32	2	●	DVAS0270X02S040	5.9	.232	8.6	.339	15.8	.622	11	.433	55	2.165	54.5	2.146	0.5	.020	4	.157	1
					7	●	DVAS0270X07S040	19.4	.764	22.2	.874	29.4	1.157	24.5	.965	68	2.677	67.5	2.657	0.5	.020	4	.157	2
					12	●	DVAS0270X12S040	32.9	1.295	35.7	1.406	42.9	1.689	38	1.496	83	3.268	82.5	3.248	0.5	.020	4	.157	2
					20	●	DVAS0270X20S040	54.5	2.146	–	–	62.6	2.465	65	2.559	107	4.213	106.5	4.193	0.5	.020	4	.157	3
					25	●	DVAS0270X25S040	68	2.677	–	–	76.1	2.996	78.5	3.091	122	4.803	121.5	4.783	0.5	.020	4	.157	3
					30	●	DVAS0270X30S040	81.5	3.209	–	–	89.6	3.528	92	3.622	137	5.394	136.5	5.374	0.5	.020	4	.157	3
					40	●	DVAS0270X40S040	108.5	4.272	–	–	116.6	4.591	119	4.685	167	6.575	166.5	6.555	0.5	.020	4	.157	3
2.8	.1102		35		2	●	DVAS0280X02S040	6.1	.240	8.9	.350	16.3	.642	11.1	.437	55	2.165	54.5	2.146	0.5	.020	4	.157	1
					7	●	DVAS0280X07S040	20.1	.791	23	.906	30.3	1.193	25.2	.992	68	2.677	67.5	2.657	0.5	.020	4	.157	2
					12	●	DVAS0280X12S040	34.1	1.343	37	1.457	44.3	1.744	39.2	1.543	83	3.268	82.5	3.248	0.5	.020	4	.157	2
					20	●	DVAS0280X20S040	56.5	2.224	–	–	64.9	2.555	67.2	2.646	107	4.213	106.5	4.193	0.5	.020	4	.157	3
					25	●	DVAS0280X25S040	70.5	2.776	–	–	78.9	3.106	81.2	3.197	122	4.803	121.5	4.783	0.5	.020	4	.157	3
					30	●	DVAS0280X30S040	84.5	3.327	–	–	92.9	3.657	95.2	3.748	137	5.394	136.5	5.374	0.5	.020	4	.157	3
					40	★	DVAS0280X40S040	112.5	4.429	–	–	120.9	4.760	123.2	4.850	167	6.575	166.5	6.555	0.5	.020	4	.157	3
2.9	.1142				2	●	DVAS0290X02S040	6.3	.248	9.3	.366	16.7	.657	11.3	.445	55	2.165	54.5	2.146	0.5	.020	4	.157	1
					7	●	DVAS0290X07S040	20.8	.819	23.8	.937	31.2	1.228	25.8	1.016	68	2.677	67.5	2.657	0.5	.020	4	.157	2
					12	●	DVAS0290X12S040	35.3	1.390	38.3	1.508	45.7	1.799	40.3	1.587	83	3.268	82.5	3.248	0.5	.020	4	.157	2
					20	●	DVAS0290X20S040	58.5	2.303	–	–	67.2	2.646	69.3	2.728	107	4.213	106.5	4.193	0.5	.020	4	.157	3
					25	●	DVAS0290X25S040	73	2.874	–	–	81.7	3.217	83.8	3.299	122	4.803	121.5	4.783	0.5	.020	4	.157	3
					30	●	DVAS0290X30S040	87.5	3.445	–	–	96.2	3.787	98.3	3.870	137	5.394	136.5	5.374	0.5	.020	4	.157	3
					40	●	DVAS0290X40S040	116.5	4.587	–	–	125.2	4.929	127.3	5.012	167	6.575	166.5	6.555	0.5	.020	4	.157	3

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L012
CUTTING CONDITIONS ➤ L015

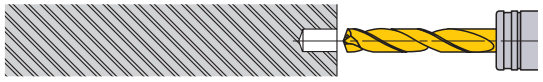
DVAS Mini Size

TRISTAR Drills

■ OPERATIONAL GUIDANCE FOR THE DVAS L/D=2–40

Flat Face Drilling ●Drilling a Blind Hole

1. Drilling a Pilot Hole

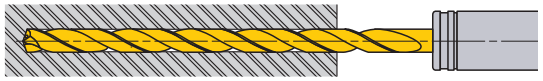


①Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
A DVAS drill with L/D = 2 can be machined up to L/D = 3 when drilling pilot holes.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx DC×3.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial Cutting with the Long Type Drill

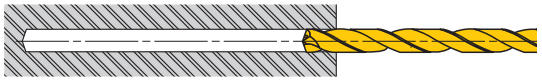
①Penetrate the guide hole at low revolution. (Revolution 500—1000min^{-1}, feed rate 39.37 - 78.74 IPM)
②Stop the long type drill .039- .118 inch short of the guide hole bottom.

3. Drill the Deep Hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

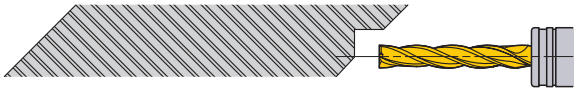
4. Drill Retraction



①After drilling, lower the cutting revolution about .020—.039 inch away from the bottom of the hole. (revolutions around 500—1000min^{-1})
②Next, pull out the drill at a feed rate of 39.37—78.74 IPM.

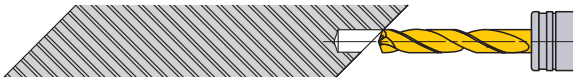
Interruped Drilling ●Drilling and Breaking Through on Irregular Faces or Angles

1. Spot Facing



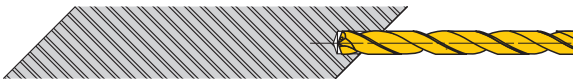
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a Pilot Hole



①Use a drill with a larger (flatter) point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx DC×2.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial Cutting with the Long Type Drill

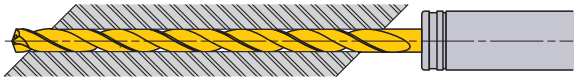


①Penetrate the guide hole at a low revolution. (Revolution 500—1000min^{-1}, feed rate 39.37 - 78.74 IPM)
②Stop the long type drill .0197 - .0394 inch short of the guide hole bottom.

4. Drill the Deep Hole

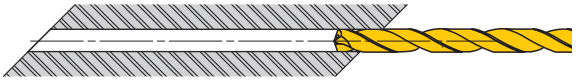
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②Lower the feed rate when penetrating.

6. Drill Retraction

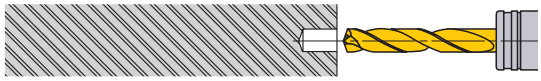


①Finally clear the hole at a feed rate of .0079 - .0118 IPR. (Revolution of around 500—1000min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 39.37 - 78.74 IPM.

■ OPERATIONAL GUIDANCE FOR THE DVAS L/D=50

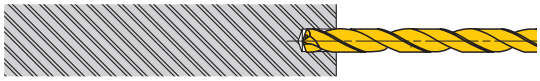
Flat Face Drilling ●Drilling a Blind Hole

1. Drilling a Pilot Hole



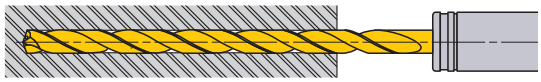
①Use a drill with a larger (flatter) point angle than the super long type. Use a DVAS drill with L/D = 7.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx DC×7.
(Adjust the pilot hole depth according to the length of the long type drill.)

2. Initial Cutting with the Long Type Drill



①Penetrate the guide hole at low revolution. (Revolution 500—1000min^{-1}, feed rate 39.37—78.74 IPM)
②Stop the long type drill .039— .118 inch short of the guide hole bottom.

3. Drill the Deep Hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

4. Drill Retraction

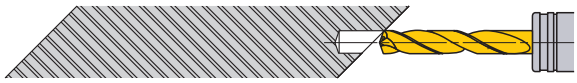
①After drilling, lower the cutting revolution about .020—.039 inch away from the bottom of the hole. (revolutions around 500—1000min^{-1})
②Next, pull out the drill at a feed rate of 39.37—78.74 IPM.

Interruped Drilling ●Drilling and Breaking Through on Irregular Faces or Angles

1. Spot Facing

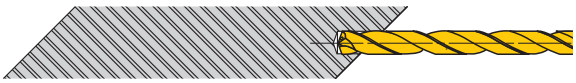
①Machine a flat or the irregular face by using an end mill or slot drill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

2. Drilling a Pilot Hole



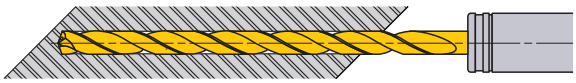
①Use a drill with a larger (flatter) point angle than the super long type. Use a DVAS drill with L/D = 7.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx DC×7.
(Adjust the pilot hole depth according to the length of the long type drill.)

3. Initial Cutting with the Long Type Drill



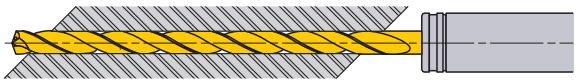
①Penetrate the guide hole at a low revolution. (Revolution 500—1000min^{-1}, feed rate 39.37 - 78.74 IPM)
②Stop the long type drill .0197 - .0394 inch short of the guide hole bottom.

4. Drill the Deep Hole



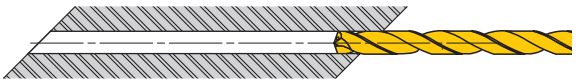
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②Lower the feed rate when penetrating.

6. Drill Retraction



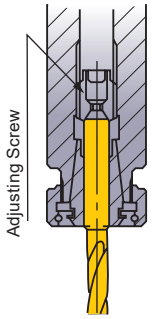
①Finally clear the hole at a feed rate of .0079 - .0118 IPR. (Revolution of around 500—1000min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 39.37 - 78.74 IPM.

DVAS Mini Size

TRISTAR Drills

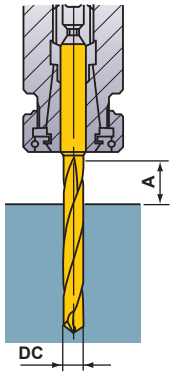
■ OPERATIONAL GUIDANCE FOR THE DVAS DRILL MINI SIZE

Drill Holding



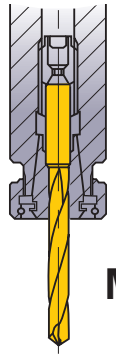
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

Drill Installation



MAL

Do not clamp on the flutes.

Coolant Pressure

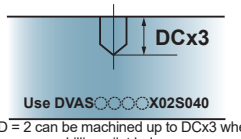
Adjust the coolant pressure according to the type and concentration of coolant.

Drill Dia. **DC**	Water-soluble	Water-insoluble
DC<.0787"	≥ 3MPa	≥ 7MPa
DC<.1181"	≥ 2MPa	≥ 5MPa

Drill Installation

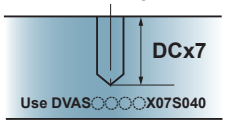
For deep hole drilling, refer to the figure below.

L/D≤40



*L/D = 2 can be machined up to DCx3 when drilling pilot holes.

L/D>40

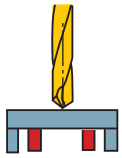


Coolant Handling

Small particles of swarf will jam in the coolant hole of small diameter drills.
Always use a fine mesh filter as a preventive measure.

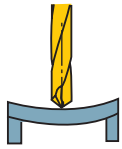
Drill Dia. **DC**	Fine Mesh Filter
DC<.0787"	≤ .394 μ-inch
DC<.1181"	≤ .787 μ-inch

Thin Workpiece



Support if bending occurs

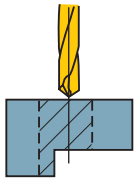
BIEN



Bending occurs

MAL

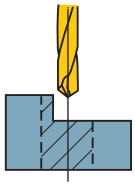
Interrupted Cutting



One Process

BIEN

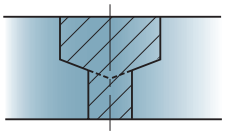
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

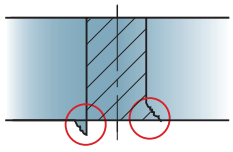
①Spot face with an end mill prior to drilling.

Stepped Holes



①Divide the two processes.
②Drill the larger hole first.
*A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



Decrease the feed rate at the end of through cutting.

RECOMMENDED CUTTING CONDITIONS

(inch)

Workpiece Material			Mild Steels Carbon Steels, Alloy Steels AISI 1010, 1045, 4140 etc.		Austenitic Stainless Steels, Ferritic Stainless Steels Ferritic and Martensitic Stainless Steels Precipitation Hardening Stainless Steels AISI 304, 316, 410 etc.	
DC		**L/D**	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch					
1.0	**.0394**	**2–30**	210(100—330)	.0014(.0008—.0020)	195(65—330)	.0010(.0004—.0016)
1.0	**.0394**	**40, 50**	210(100—330)	.0012(.0008—.0016)	195(65—330)	.0008(.0004—.0012)
1.5	**.0591**	**2–30**	210(100—330)	.0021(.0012—.0030)	195(65—330)	.0015(.0006—.0024)
1.5	**.0591**	**40, 50**	210(100—330)	.0018(.0012—.0024)	195(65—330)	.0012(.0006—.0018)
2.0	**.0787**	**2–30**	230(130—330)	.0028(.0016—.0039)	195(65—330)	.0020(.0008—.0031)
2.0	**.0787**	**40, 50**	230(130—330)	.0024(.0016—.0031)	195(65—330)	.0016(.0008—.0024)
2.5	**.0984**	**2–30**	230(130—330)	.0035(.0020—.0049)	195(65—330)	.0025(.0010—.0039)
2.5	**.0984**	**40, 50**	230(130—330)	.0030(.0020—.0039)	195(65—330)	.0020(.0010—.0030)
2.9	**.1142**	**2–30**	230(130—330)	.0040(.0023—.0057)	195(65—330)	.0029(.0011—.0046)
2.9	**.1142**	**40, 50**	230(130—330)	.0034(.0023—.0046)	195(65—330)	.0023(.0011—.0034)

Workpiece Material			Cast Irons Ductile Cast Irons AISI No 45B, 60-60-8 etc.		Aluminum Alloys ASTM 6061, 7075 etc.	
DC		**L/D**	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch					
1.0	**.0394**	**2–30**	230(130—330)	.0014(.0008—.0020)	460(330—590)	.0016(.0008—.0024)
1.0	**.0394**	**40, 50**	230(130—330)	.0012(.0008—.0016)	460(330—590)	.0014(.0008—.0020)
1.5	**.0591**	**2–30**	230(130—330)	.0021(.0012—.0030)	460(330—590)	.0024(.0012—.0035)
1.5	**.0591**	**40, 50**	230(130—330)	.0018(.0012—.0024)	460(330—590)	.0021(.0012—.0030)
2.0	**.0787**	**2–30**	230(130—330)	.0028(.0016—.0039)	460(330—590)	.0031(.0016—.0047)
2.0	**.0787**	**40, 50**	230(130—330)	.0024(.0016—.0031)	460(330—590)	.0028(.0016—.0039)
2.5	**.0984**	**2–30**	230(130—330)	.0035(.0020—.0049)	460(330—590)	.0039(.0020—.0059)
2.5	**.0984**	**40, 50**	230(130—330)	.0030(.0020—.0039)	460(330—590)	.0035(.0020—.0049)
2.9	**.1142**	**2–30**	230(130—330)	.0040(.0023—.0057)	460(330—590)	.0046(.0023—.0069)
2.9	**.1142**	**40, 50**	230(130—330)	.0034(.0023—.0046)	460(330—590)	.0040(.0023—.0057)

Workpiece Material			Heat Resistant Alloys Inconel718 etc.		Titanium Alloys Ti-6Al-4V etc.	
DC		**L/D**	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch					
1.0	**.0394**	**2–30**	100(30—165)	.0006(.0004—.0008)	100(65—130)	.0008(.0004—.0012)
1.0	**.0394**	**40, 50**	100(30—165)	.0006(.0004—.0008)	100(65—130)	.0008(.0004—.0012)
1.5	**.0591**	**2–30**	100(30—165)	.0009(.0006—.0012)	100(65—130)	.0012(.0006—.0018)
1.5	**.0591**	**40, 50**	100(30—165)	.0009(.0006—.0012)	100(65—130)	.0012(.0006—.0018)
2.0	**.0787**	**2–30**	100(30—165)	.0012(.0008—.0016)	100(65—130)	.0016(.0008—.0024)
2.0	**.0787**	**40, 50**	100(30—165)	.0012(.0008—.0016)	100(65—130)	.0016(.0008—.0024)
2.5	**.0984**	**2–30**	100(30—165)	.0015(.0010—.0020)	100(65—130)	.0020(.0010—.0030)
2.5	**.0984**	**40, 50**	100(30—165)	.0015(.0010—.0020)	100(65—130)	.0020(.0010—.0030)
2.9	**.1142**	**2–30**	100(30—165)	.0017(.0011—.0023)	100(65—130)	.0023(.0011—.0034)
2.9	**.1142**	**40, 50**	100(30—165)	.0017(.0011—.0023)	100(65—130)	.0023(.0011—.0034)

Workpiece Material			Cobalt Chrome Alloys ASTM F1537, F799 etc.	
DC		**L/D**	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch			
1.0	**.0394**	**2–30**	195(100—295)	.0008(.0004—.0012)
1.0	**.0394**	**40, 50**	195(100—295)	.0008(.0004—.0012)
1.5	**.0591**	**2–30**	195(100—295)	.0012(.0006—.0018)
1.5	**.0591**	**40, 50**	195(100—295)	.0012(.0006—.0018)
2.0	**.0787**	**2–30**	195(100—295)	.0016(.0008—.0024)
2.0	**.0787**	**40, 50**	195(100—295)	.0016(.0008—.0024)
2.5	**.0984**	**2–30**	195(100—295)	.0020(.0010—.0030)
2.5	**.0984**	**40, 50**	195(100—295)	.0020(.0010—.0030)
2.9	**.1142**	**2–30**	195(100—295)	.0023(.0011—.0034)
2.9	**.1142**	**40, 50**	195(100—295)	.0023(.0011—.0034)

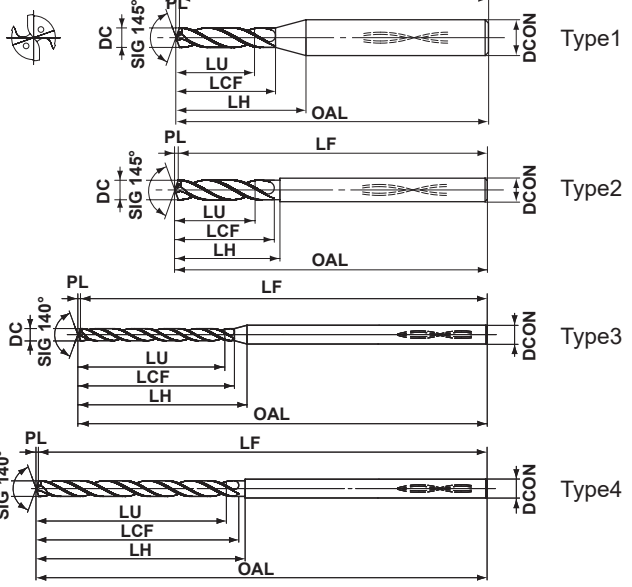
Note 1) This recommended condition is only when using internal coolant.
Note 2) Check the condition of chips and perform step machining if necessary. * Reference of step length: 0.2 to 1.0 DC
Note 3) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
Note 4) Machining depths exceeding flute length (LU) are not recommend.
Note 5) Clamp the drill so that the drill runout is within .00012 inch.
Note 6) Do not clamp the flute part of the drill.

MICRO-MVS

- Straight cutting edge profile improves both chip evacuation and cutting edge strength.
- Double margin offers excellent straightness and high precision.

P M K N S H

Internal Coolant



Type	DC<.1181 (inch)	DC<3 (mm)
Type 1	+.00055 0	+0.014 0
Type2,3,4	0 −.00055	0 −0.014
	DCON<.1181	DCON<3
h6	0 −.00024	0 −0.006

DC Metric (mm)	DC Decimal (inch)	DC Fraction (inch)	Wire / Letter	Thread Size	L/D	Stock DP1020	Order Number	LU mm	LU inch	LCF mm	LCF inch	LH mm	LH inch	OAL mm	OAL inch	LF mm	LF inch	PL mm	PL inch	DCON mm	DCON inch	Type
1.000	.0394				2	●	MVS0100X02S030	2.2	.087	5.2	.205	8.9	.350	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0100X07S030	7.2	.283	10.2	.402	13.9	.547	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0100X12S030	12.2	.480	15.2	.598	18.9	.744	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0100X20S030	20.2	.795	24.2	.953	27.9	1.098	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0100X25S030	25.2	.992	28.2	1.110	31.9	1.256	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0100X30S030	30.2	1.189	33.2	1.307	36.9	1.453	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.016	.0400		60		2	●	MVS0102X02S030	2.2	.087	5.6	.220	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0102X07S030	7.3	.287	11.2	.441	14.9	.587	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0102X12S030	12.4	.488	17.2	.677	20.9	.823	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0102X20S030	20.5	.807	25.2	.992	28.9	1.138	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0102X25S030	25.6	1.008	31.2	1.228	34.9	1.374	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0102X30S030	30.7	1.209	36.2	1.425	39.9	1.571	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.042	.0410		59		2	●	MVS0104X02S030	2.3	.091	5.6	.220	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0104X07S030	7.5	.295	11.2	.441	14.9	.587	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0104X12S030	12.7	.500	17.2	.677	20.9	.823	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0104X20S030	21.0	.827	25.2	.992	28.9	1.138	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0104X25S030	26.2	1.031	31.2	1.228	34.9	1.374	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0104X30S030	31.4	1.236	36.2	1.425	39.9	1.571	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.067	.0420		58		2	●	MVS0107X02S030	2.3	.091	5.6	.220	9.2	.362	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0107X07S030	7.7	.303	11.2	.441	14.8	.583	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0107X12S030	13.0	.512	17.2	.677	20.8	.819	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0107X20S030	21.5	.846	25.2	.992	28.8	1.134	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0107X25S030	26.9	1.059	31.2	1.228	34.8	1.370	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0107X30S030	32.2	1.268	36.2	1.425	39.8	1.567	72.2	2.843	72	2.835	0.2	.008	3	.118	3

Note 1) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.093	.0430		57		2	●	MVS0109X02S030	2.4	.094	5.6	.220	9.2	.362	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0109X07S030	7.8	.307	11.2	.441	14.8	.583	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0109X12S030	13.3	.524	17.2	.677	20.8	.819	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0109X20S030	22.0	.866	25.2	.992	28.8	1.134	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0109X25S030	27.5	1.083	31.2	1.228	34.8	1.370	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0109X30S030	33.0	1.299	36.2	1.425	39.8	1.567	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.100	.0433				2	●	MVS0110X02S030	2.4	.094	5.6	.220	9.1	.358	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0110X07S030	7.9	.311	11.2	.441	14.7	.579	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0110X12S030	13.4	.528	17.2	.677	20.7	.815	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0110X20S030	22.2	.874	25.2	.992	28.7	1.130	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0110X25S030	27.7	1.091	31.2	1.228	34.7	1.366	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0110X30S030	33.2	1.307	36.2	1.425	39.7	1.563	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.182	.0465		56		2	●	MVS0118X02S030	2.5	.098	6.2	.244	9.6	.378	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0118X07S030	8.5	.335	12.2	.480	15.6	.614	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0118X12S030	14.4	.567	18.2	.717	21.6	.850	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0118X20S030	23.8	.937	28.2	1.110	31.6	1.244	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0118X25S030	29.7	1.169	34.2	1.346	37.6	1.480	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0118X30S030	35.6	1.402	40.2	1.583	43.6	1.717	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.200	.0472				2	●	MVS0120X02S030	2.6	.102	6.2	.244	9.6	.378	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0120X07S030	8.6	.339	12.2	.480	15.6	.614	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0120X12S030	14.6	.575	18.2	.717	21.6	.850	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0120X20S030	24.2	.953	28.2	1.110	31.6	1.244	60.2	2.370	60	2.362	0.2	.008	3	.118	3
					25	●	MVS0120X25S030	30.2	1.189	34.2	1.346	37.6	1.480	66.2	2.606	66	2.598	0.2	.008	3	.118	3
					30	●	MVS0120X30S030	36.2	1.425	40.2	1.583	43.6	1.717	72.2	2.843	72	2.835	0.2	.008	3	.118	3
1.300	.0512				2	●	MVS0130X02S030	2.8	.110	6.6	.260	9.8	.386	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0130X07S030	9.3	.366	13.2	.520	16.4	.646	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0130X12S030	15.8	.622	20.2	.795	23.4	.921	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0130X20S030	26.2	1.031	30.2	1.189	33.4	1.315	68.2	2.685	68	2.677	0.2	.008	3	.118	3
					25	●	MVS0130X25S030	32.7	1.287	36.2	1.425	39.4	1.551	74.2	2.921	74	2.913	0.2	.008	3	.118	3
					30	●	MVS0130X30S030	39.2	1.543	43.2	1.701	46.4	1.827	82.2	3.236	82	3.228	0.2	.008	3	.118	3
1.321	.0520		55		2	●	MVS0132X02S030	2.9	.114	7.2	.283	10.3	.406	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0132X07S030	9.5	.374	14.2	.559	17.3	.681	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					12	●	MVS0132X12S030	16.1	.634	21.2	.835	24.3	.957	55.2	2.173	55	2.165	0.2	.008	3	.118	3
					20	●	MVS0132X20S030	26.7	1.051	32.2	1.268	35.3	1.390	68.2	2.685	68	2.677	0.2	.008	3	.118	3
					25	●	MVS0132X25S030	33.3	1.311	39.2	1.543	42.3	1.665	74.2	2.921	74	2.913	0.2	.008	3	.118	3
					30	●	MVS0132X30S030	39.9	1.571	46.2	1.819	49.3	1.941	82.2	3.236	82	3.228	0.2	.008	3	.118	3
1.397	.0550		54		2	●	MVS0139X02S030	3.0	.118	7.2	.283	10.2	.402	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0139X07S030	10.0	.394	14.3	.563	17.3	.681	55.3	2.177	55	2.165	0.3	.012	3	.118	3
					12	●	MVS0139X12S030	17.0	.669	21.3	.839	24.3	.957	55.3	2.177	55	2.165	0.3	.012	3	.118	3
					20	●	MVS0139X20S030	28.2	1.110	32.3	1.272	35.3	1.390	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					25	●	MVS0139X25S030	35.2	1.386	39.3	1.547	42.3	1.665	74.3	2.925	74	2.913	0.3	.012	3	.118	3
					30	●	MVS0139X30S030	42.2	1.661	46.3	1.823	49.3	1.941	82.3	3.240	82	3.228	0.3	.012	3	.118	3
1.400	.0551				2	●	MVS0140X02S030	3.0	.118	7.2	.283	10.2	.402	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0140X07S030	10.1	.398	14.3	.563	17.3	.681	55.3	2.177	55	2.165	0.3	.012	3	.118	3
					12	●	MVS0140X12S030	17.1	.673	21.3	.839	24.3	.957	55.3	2.177	55	2.165	0.3	.012	3	.118	3
					20	●	MVS0140X20S030	28.3	1.114	32.3	1.272	35.3	1.390	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					25	●	MVS0140X25S030	35.3	1.390	39.3	1.547	42.3	1.665	74.3	2.925	74	2.913	0.3	.012	3	.118	3
					30	●	MVS0140X30S030	42.3	1.665	46.3	1.823	49.3	1.941	82.3	3.240	82	3.228	0.3	.012	3	.118	3

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MICRO-MVS

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.500	.0591			#1-64	2	●	MVS0150X02S030	3.2	.126	7.6	.299	10.4	.409	55.2	2.173	55	2.165	0.2	.008	3	.118	1
					7	●	MVS0150X07S030	10.8	.425	15.3	.602	18.1	.713	55.3	2.177	55	2.165	0.3	.012	3	.118	3
					12	●	MVS0150X12S030	18.3	.720	23.3	.917	26.1	1.028	55.3	2.177	55	2.165	0.3	.012	3	.118	3
					20	●	MVS0150X20S030	30.3	1.193	35.3	1.390	38.1	1.500	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					25	●	MVS0150X25S030	37.8	1.488	42.3	1.665	45.1	1.776	74.3	2.925	74	2.913	0.3	.012	3	.118	3
					30	●	MVS0150X30S030	45.3	1.783	50.3	1.980	53.1	2.091	82.3	3.240	82	3.228	0.3	.012	3	.118	3
1.588	.0625	1/16			2	●	MVS0159X02S030	3.4	.134	8.3	.327	10.9	.429	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0159X07S030	11.4	.449	16.3	.642	18.9	.744	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0159X12S030	19.3	.760	24.3	.957	26.9	1.059	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0159X20S030	32.0	1.260	37.3	1.469	39.9	1.571	78.3	3.083	78	3.071	0.3	.012	3	.118	3
					25	●	MVS0159X25S030	40.0	1.575	45.3	1.783	47.9	1.886	86.3	3.398	86	3.386	0.3	.012	3	.118	3
					30	●	MVS0159X30S030	47.0	1.850	53.3	2.098	55.9	2.201	95.3	3.752	95	3.740	0.3	.012	3	.118	3
1.600	.0630				2	●	MVS0160X02S030	3.5	.138	8.3	.327	10.9	.429	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0160X07S030	11.5	.453	16.3	.642	18.9	.744	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0160X12S030	19.5	.768	24.3	.957	26.9	1.059	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0160X20S030	32.3	1.272	37.3	1.469	39.9	1.571	78.3	3.083	78	3.071	0.3	.012	3	.118	3
					25	●	MVS0160X25S030	40.3	1.587	45.3	1.783	47.9	1.886	86.3	3.398	86	3.386	0.3	.012	3	.118	3
					30	●	MVS0160X30S030	48.3	1.902	53.3	2.098	55.9	2.201	95.3	3.752	95	3.740	0.3	.012	3	.118	3
1.613	.0635		52		2	●	MVS0161X02S030	3.5	.138	8.7	.343	11.3	.445	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0161X07S030	11.5	.453	17.3	.681	19.9	.783	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0161X12S030	19.7	.776	26.3	1.035	28.9	1.138	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0161X20S030	32.6	1.283	39.3	1.547	41.9	1.650	78.3	3.083	78	3.071	0.3	.012	3	.118	3
					25	●	MVS0161X25S030	40.6	1.598	48.3	1.902	50.9	2.004	86.3	3.398	86	3.386	0.3	.012	3	.118	3
					30	●	MVS0161X30S030	48.7	1.917	56.3	2.217	58.9	2.319	95.3	3.752	95	3.740	0.3	.012	3	.118	3
1.700	.0669				2	●	MVS0170X02S030	3.7	.146	8.7	.343	11.1	.437	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0170X07S030	12.2	.480	17.3	.681	19.7	.776	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0170X12S030	20.7	.815	26.3	1.035	28.7	1.130	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0170X20S030	34.3	1.350	39.3	1.547	41.7	1.642	78.3	3.083	78	3.071	0.3	.012	3	.118	3
					25	●	MVS0170X25S030	42.8	1.685	48.3	1.902	50.7	1.996	86.3	3.398	86	3.386	0.3	.012	3	.118	3
					30	●	MVS0170X30S030	51.3	2.020	56.3	2.217	58.7	2.311	95.3	3.752	95	3.740	0.3	.012	3	.118	3
1.778	.0700		50	#2-56	2	●	MVS0178X02S030	3.8	.150	9.3	.366	11.6	.457	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0178X07S030	12.8	.504	18.3	.720	20.6	.811	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0178X12S030	21.7	.854	27.3	1.075	29.6	1.165	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0178X20S030	35.9	1.413	41.3	1.626	43.6	1.717	84.3	3.319	84	3.307	0.3	.012	3	.118	3
					25	●	MVS0178X25S030	44.8	1.764	50.3	1.980	52.6	2.071	94.3	3.713	94	3.701	0.3	.012	3	.118	3
					30	●	MVS0178X30S030	53.7	2.114	59.3	2.335	61.6	2.425	102.3	4.028	102	4.016	0.3	.012	3	.118	3
1.800	.0709				2	●	MVS0180X02S030	3.9	.154	9.3	.366	11.5	.453	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0180X07S030	12.9	.508	18.3	.720	20.5	.807	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0180X12S030	21.9	.862	27.3	1.075	29.5	1.161	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0180X20S030	36.3	1.429	41.3	1.626	43.5	1.713	84.3	3.319	84	3.307	0.3	.012	3	.118	3
					25	●	MVS0180X25S030	45.3	1.783	50.3	1.980	52.5	2.067	94.3	3.713	94	3.701	0.3	.012	3	.118	3
					30	●	MVS0180X30S030	54.3	2.138	59.3	2.335	61.5	2.421	102.3	4.028	102	4.016	0.3	.012	3	.118	3
1.855	.0730		49		2	●	MVS0186X02S030	4.0	.157	9.7	.382	11.8	.465	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0186X07S030	13.3	.524	19.3	.760	21.4	.843	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0186X12S030	22.6	.890	29.3	1.154	31.4	1.236	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0186X20S030	37.4	1.472	44.3	1.744	46.4	1.827	84.3	3.319	84	3.307	0.3	.012	3	.118	3
					25	●	MVS0186X25S030	46.7	1.839	53.3	2.098	55.4	2.181	94.3	3.713	94	3.701	0.3	.012	3	.118	3
					30	●	MVS0186X30S030	56.0	2.205	63.3	2.492	65.4	2.575	102.3	4.028	102	4.016	0.3	.012	3	.118	3

Note 1) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.900	.0748				2	●	MVS0190X02S030	4.1	.161	9.7	.382	11.8	.465	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0190X07S030	13.6	.535	19.3	.760	21.4	.843	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					12	●	MVS0190X12S030	23.1	.909	29.3	1.154	31.4	1.236	68.3	2.689	68	2.677	0.3	.012	3	.118	3
					20	●	MVS0190X20S030	38.3	1.508	44.3	1.744	46.4	1.827	84.3	3.319	84	3.307	0.3	.012	3	.118	3
					25	●	MVS0190X25S030	47.8	1.882	53.3	2.098	55.4	2.181	94.3	3.713	94	3.701	0.3	.012	3	.118	3
					30	●	MVS0190X30S030	57.3	2.256	63.3	2.492	65.4	2.575	102.3	4.028	102	4.016	0.3	.012	3	.118	3
1.931	.0760		48		2	●	MVS0193X02S030	4.2	.165	10.3	.406	12.3	.484	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0193X07S030	13.9	.547	20.4	.803	22.4	.882	68.4	2.693	68	2.677	0.4	.016	3	.118	3
					12	●	MVS0193X12S030	23.5	.925	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3	.118	3
					20	●	MVS0193X20S030	39.0	1.535	46.4	1.827	48.4	1.906	84.4	3.323	84	3.307	0.4	.016	3	.118	3
					25	●	MVS0193X25S030	48.6	1.913	56.4	2.220	58.4	2.299	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					30	●	MVS0193X30S030	58.3	2.295	66.4	2.614	68.4	2.693	102.4	4.031	102	4.016	0.4	.016	3	.118	3
1.994	.0785				2	●	MVS0199X02S030	4.3	.169	10.3	.406	12.2	.480	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0199X07S030	14.3	.563	20.4	.803	22.3	.878	68.4	2.693	68	2.677	0.4	.016	3	.118	3
					12	●	MVS0199X12S030	24.3	.957	30.4	1.197	32.3	1.272	68.4	2.693	68	2.677	0.4	.016	3	.118	3
					20	●	MVS0199X20S030	40.2	1.583	46.4	1.827	48.3	1.902	84.4	3.323	84	3.307	0.4	.016	3	.118	3
					25	●	MVS0199X25S030	50.2	1.976	56.4	2.220	58.3	2.295	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					30	●	MVS0199X30S030	60.2	2.370	66.4	2.614	68.3	2.689	102.4	4.031	102	4.016	0.4	.016	3	.118	3
2.000	.0787			#3-48	2	●	MVS0200X02S030	4.3	.169	10.3	.406	12.2	.480	68.3	2.689	68	2.677	0.3	.012	3	.118	1
					7	●	MVS0200X07S030	14.4	.567	20.4	.803	22.3	.878	68.4	2.693	68	2.677	0.4	.016	3	.118	3
					12	●	MVS0200X12S030	24.4	.961	30.4	1.197	32.3	1.272	68.4	2.693	68	2.677	0.4	.016	3	.118	3
					20	●	MVS0200X20S030	40.4	1.591	46.4	1.827	48.3	1.902	84.4	3.323	84	3.307	0.4	.016	3	.118	3
					25	●	MVS0200X25S030	50.4	1.984	56.4	2.220	58.3	2.295	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					30	●	MVS0200X30S030	60.4	2.378	66.4	2.614	68.3	2.689	102.4	4.031	102	4.016	0.4	.016	3	.118	3
2.058	.0810		46		2	●	MVS0206X02S030	4.4	.173	10.7	.421	12.5	.492	74.3	2.925	74	2.913	0.3	.012	3	.118	1
					7	●	MVS0206X07S030	14.8	.583	21.4	.843	23.2	.913	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0206X12S030	25.1	.988	32.4	1.276	34.2	1.346	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0206X20S030	41.5	1.634	48.4	1.906	50.2	1.976	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0206X25S030	51.8	2.039	59.4	2.339	61.2	2.409	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0206X30S030	62.1	2.445	69.4	2.732	71.2	2.803	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.100	.0827				2	●	MVS0210X02S030	4.5	.177	10.7	.421	12.4	.488	74.3	2.925	74	2.913	0.3	.012	3	.118	1
					7	●	MVS0210X07S030	15.1	.594	21.4	.843	23.1	.909	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0210X12S030	25.6	1.008	32.4	1.276	34.1	1.343	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0210X20S030	42.4	1.669	48.4	1.906	50.1	1.972	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0210X25S030	52.9	2.083	59.4	2.339	61.1	2.406	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0210X30S030	63.4	2.496	69.4	2.732	71.1	2.799	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.185	.0860		44		2	●	MVS0218X02S030	4.7	.185	11.3	.445	12.8	.504	74.3	2.925	74	2.913	0.3	.012	3	.118	1
					7	●	MVS0218X07S030	15.7	.618	22.4	.882	23.9	.941	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0218X12S030	26.6	1.047	33.4	1.315	34.9	1.374	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0218X20S030	44.1	1.736	51.4	2.024	52.9	2.083	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0218X25S030	55.0	2.165	62.4	2.457	63.9	2.516	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0218X30S030	65.9	2.594	73.4	2.890	74.9	2.949	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.200	.0866				2	●	MVS0220X02S030	4.7	.185	11.3	.445	12.8	.504	74.3	2.925	74	2.913	0.3	.012	3	.118	1
					7	●	MVS0220X07S030	15.8	.622	22.4	.882	23.9	.941	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0220X12S030	26.8	1.055	33.4	1.315	34.9	1.374	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0220X20S030	44.4	1.748	51.4	2.024	52.9	2.083	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0220X25S030	55.4	2.181	62.4	2.457	63.9	2.516	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0220X30S030	66.4	2.614	73.4	2.890	74.9	2.949	118.4	4.661	118	4.646	0.4	.016	3	.118	3

MICRO-MVS

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.261	.0890		43	#4-40	2	●	MVS0226X02S030	4.9	.193	11.8	.465	13.2	.520	74.4	2.929	74	2.913	0.4	.016	3	.118	1
					7	●	MVS0226X07S030	16.2	.638	23.4	.921	24.8	.976	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0226X12S030	27.5	1.083	35.4	1.394	36.8	1.449	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0226X20S030	45.6	1.795	53.4	2.102	54.8	2.157	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0226X25S030	56.9	2.240	64.4	2.535	65.8	2.591	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0226X30S030	68.2	2.685	76.4	3.008	77.8	3.063	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.300	.0906				2	●	MVS0230X02S030	5.0	.197	11.8	.465	13.1	.516	74.4	2.929	74	2.913	0.4	.016	3	.118	1
					7	●	MVS0230X07S030	16.5	.650	23.4	.921	24.7	.972	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0230X12S030	28.0	1.102	35.4	1.394	36.7	1.445	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0230X20S030	46.4	1.827	53.4	2.102	54.7	2.154	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0230X25S030	57.9	2.280	64.4	2.535	65.7	2.587	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0230X30S030	69.4	2.732	76.4	3.008	77.7	3.059	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.382	.0938	3/32			2	●	MVS0238X02S030	5.1	.201	12.4	.488	13.6	.535	74.4	2.929	74	2.913	0.4	.016	3	.118	1
					7	●	MVS0238X07S030	17.1	.673	24.4	.961	25.6	1.008	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0238X12S030	29.0	1.142	36.4	1.433	37.6	1.480	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0238X20S030	48.1	1.894	55.4	2.181	56.6	2.228	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0238X25S030	60.0	2.362	67.4	2.654	68.6	2.701	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0238X30S030	71.9	2.831	79.4	3.126	80.6	3.173	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.400	.0945				2	●	MVS0240X02S030	5.2	.205	12.4	.488	13.5	.531	74.4	2.929	74	2.913	0.4	.016	3	.118	1
					7	●	MVS0240X07S030	17.2	.677	24.4	.961	25.5	1.004	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0240X12S030	29.2	1.150	36.4	1.433	37.5	1.476	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0240X20S030	48.4	1.906	55.4	2.181	56.5	2.224	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0240X25S030	60.4	2.378	67.4	2.654	68.5	2.697	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0240X30S030	72.4	2.850	79.4	3.126	80.5	3.169	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.439	.0960		41		2	●	MVS0244X02S030	5.3	.209	12.8	.504	13.8	.543	74.4	2.929	74	2.913	0.4	.016	3	.118	1
					7	●	MVS0244X07S030	17.5	.689	25.4	1.000	26.4	1.039	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					12	●	MVS0244X12S030	29.7	1.169	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3	.118	3
					20	●	MVS0244X20S030	49.2	1.937	58.4	2.299	59.4	2.339	94.4	3.717	94	3.701	0.4	.016	3	.118	3
					25	●	MVS0244X25S030	61.4	2.417	70.4	2.772	71.4	2.811	107.4	4.228	107	4.213	0.4	.016	3	.118	3
					30	●	MVS0244X30S030	73.6	2.898	83.4	3.283	84.4	3.323	118.4	4.661	118	4.646	0.4	.016	3	.118	3
2.500	.0984				2	●	MVS0250X02S030	5.4	.213	12.8	.504	13.7	.539	74.4	2.929	74	2.913	0.4	.016	3	.118	1
					7	●	MVS0250X07S030	18.0	.709	25.5	1.004	26.4	1.039	74.5	2.933	74	2.913	0.5	.020	3	.118	3
					12	●	MVS0250X12S030	30.5	1.201	38.5	1.516	39.4	1.551	74.5	2.933	74	2.913	0.5	.020	3	.118	3
					20	●	MVS0250X20S030	50.5	1.988	58.5	2.303	59.4	2.339	94.5	3.720	94	3.701	0.5	.020	3	.118	3
					25	●	MVS0250X25S030	63.0	2.480	70.5	2.776	71.4	2.811	107.5	4.232	107	4.213	0.5	.020	3	.118	3
					30	●	MVS0250X30S030	75.5	2.972	83.5	3.287	84.4	3.323	118.5	4.665	118	4.646	0.5	.020	3	.118	3
2.566	.1010				2	●	MVS0257X02S030	5.5	.217	13.4	.528	13.4	.528	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	MVS0257X07S030	18.4	.724	26.5	1.043	26.5	1.043	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	MVS0257X12S030	31.2	1.228	39.5	1.555	39.5	1.555	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	MVS0257X20S030	51.8	2.039	60.5	2.382	60.5	2.382	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	MVS0257X25S030	64.6	2.543	73.5	2.894	73.5	2.894	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	MVS0257X30S030	77.4	3.047	86.5	3.406	86.5	3.406	132.5	5.217	132	5.197	0.5	.020	3	.118	4
2.600	.1024				2	●	MVS0260X02S030	5.6	.220	13.4	.528	13.4	.528	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	MVS0260X07S030	18.7	.736	26.5	1.043	26.5	1.043	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	MVS0260X12S030	31.7	1.248	39.5	1.555	39.5	1.555	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	MVS0260X20S030	52.5	2.067	60.5	2.382	60.5	2.382	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	MVS0260X25S030	65.5	2.579	73.5	2.894	73.5	2.894	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	MVS0260X30S030	78.5	3.091	86.5	3.406	86.5	3.406	132.5	5.217	132	5.197	0.5	.020	3	.118	4

Note 1) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.642	**.1040**		**37**	**#5-44**	2	●	**MVS0264X02S030**	5.7	.224	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	**MVS0264X07S030**	19.0	.748	27.5	1.083	27.5	1.083	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	**MVS0264X12S030**	32.2	1.268	41.5	1.634	41.5	1.634	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	**MVS0264X20S030**	53.3	2.098	62.5	2.461	62.5	2.461	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	**MVS0264X25S030**	66.5	2.618	76.5	3.012	76.5	3.012	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	**MVS0264X30S030**	79.7	3.138	89.5	3.524	89.5	3.524	132.5	5.217	132	5.197	0.5	.020	3	.118	4
2.693	**.1060**				2	●	**MVS0269X02S030**	5.8	.228	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	**MVS0269X07S030**	19.3	.760	27.5	1.083	27.5	1.083	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	**MVS0269X12S030**	32.8	1.291	41.5	1.634	41.5	1.634	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	**MVS0269X20S030**	54.3	2.138	62.5	2.461	62.5	2.461	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	**MVS0269X25S030**	67.8	2.669	76.5	3.012	76.5	3.012	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	**MVS0269X30S030**	81.2	3.197	89.5	3.524	89.5	3.524	132.5	5.217	132	5.197	0.5	.020	3	.118	4
2.700	**.1063**		**36**	**#6-32**	2	●	**MVS0270X02S030**	5.8	.228	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	**MVS0270X07S030**	19.4	.764	27.5	1.083	27.5	1.083	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	**MVS0270X12S030**	32.9	1.295	41.5	1.634	41.5	1.634	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	**MVS0270X20S030**	54.5	2.146	62.5	2.461	62.5	2.461	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	**MVS0270X25S030**	68.0	2.677	76.5	3.012	76.5	3.012	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	**MVS0270X30S030**	81.5	3.209	89.5	3.524	89.5	3.524	132.5	5.217	132	5.197	0.5	.020	3	.118	4
2.779	**.1094**	**7/64**			2	●	**MVS0278X02S030**	6.0	.236	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	**MVS0278X07S030**	20.0	.787	28.5	1.122	28.5	1.122	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	**MVS0278X12S030**	33.9	1.335	42.5	1.673	42.5	1.673	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	**MVS0278X20S030**	56.1	2.209	64.5	2.539	64.5	2.539	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	**MVS0278X25S030**	70.0	2.756	78.5	3.091	78.5	3.091	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	**MVS0278X30S030**	83.9	3.303	92.5	3.642	92.5	3.642	132.5	5.217	132	5.197	0.5	.020	3	.118	4
2.800	**.1102**		**35**		2	●	**MVS0280X02S030**	6.0	.236	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3	.118	2
					7	●	**MVS0280X07S030**	20.1	.791	28.5	1.122	28.5	1.122	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	**MVS0280X12S030**	34.1	1.343	42.5	1.673	42.5	1.673	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	**MVS0280X20S030**	56.5	2.224	64.5	2.539	64.5	2.539	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	**MVS0280X25S030**	70.5	2.776	78.5	3.091	78.5	3.091	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	**MVS0280X30S030**	84.5	3.327	92.5	3.642	92.5	3.642	132.5	5.217	132	5.197	0.5	.020	3	.118	4
2.900	**.1142**				2	●	**MVS0290X02S030**	6.3	.248	14.9	.587	14.9	.587	81.5	3.209	81	3.189	0.5	.020	3	.118	2
					7	●	**MVS0290X07S030**	20.8	.819	29.5	1.161	29.5	1.161	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					12	●	**MVS0290X12S030**	35.3	1.390	44.5	1.752	44.5	1.752	81.5	3.209	81	3.189	0.5	.020	3	.118	4
					20	●	**MVS0290X20S030**	58.5	2.303	67.5	2.657	67.5	2.657	103.5	4.075	103	4.055	0.5	.020	3	.118	4
					25	●	**MVS0290X25S030**	73.0	2.874	81.5	3.209	81.5	3.209	117.5	4.626	117	4.606	0.5	.020	3	.118	4
					30	●	**MVS0290X30S030**	87.5	3.445	96.5	3.799	96.5	3.799	132.5	5.217	132	5.197	0.5	.020	3	.118	4

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

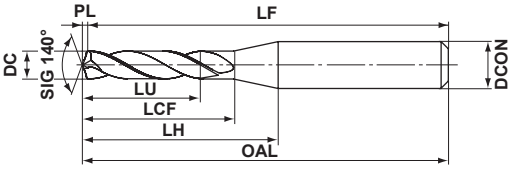
MVE/MVS

- New DP1020 grade provides excellent wear resistance with a unique wavy cutting edge sharpness and "TRI-Cooling technology" coolant holes which provides excellent chip evacuation.
- Double margin available in 10×D, 15×D, 20×D, 25×D, 30×D, 35×D and 40×D for excellent straightness and surface finish.

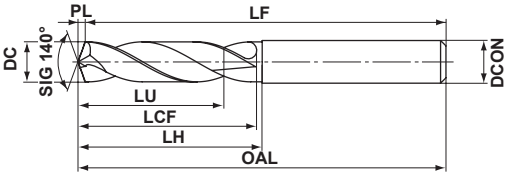
UWC | DP1 | only MVS | 140° | X | Z | only MVS

P | M | K | N | S | H only MVE

MVE (External Coolant)

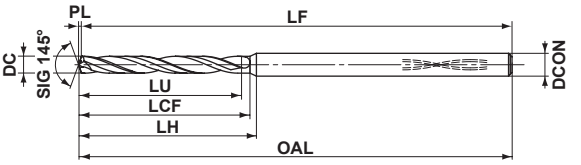


Type1

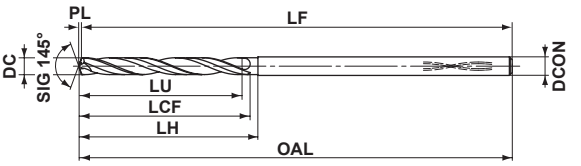


Type2

MVS (Internal Coolant)



Type3



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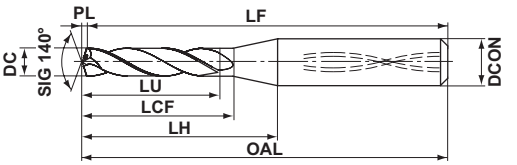
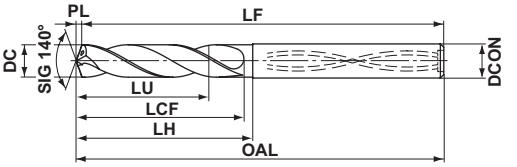
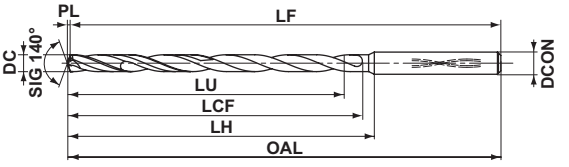


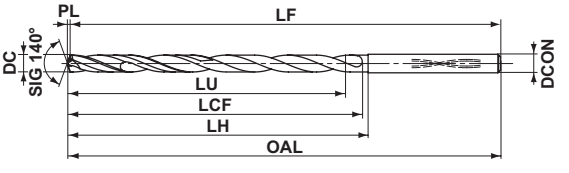
Type5



Type6



Type7



Type8

(inch)

Type	DC=.1181	.1181<DC≤.2362	.2362<DC≤.3937	.3937<DC≤.7087	.7087<DC≤.7874
Type1,2,3,4,5,6	0 −.00055	0 −.00071	0 −.00087	0 −.00106	0 −.00130
Type7,8	−.00067 −.00122	−.00098 −.00169	−.00130 −.00217	−.00161 −.00268	–
	DCON=.1181	.1181<DCON≤.2362	.2362<DCON≤.3937	.3937<DCON≤.7087	.7087<DCON≤.7874
h6	0 −.00024	0 −.00031	0 −.00035	0 −.00043	0 −.00051

(mm)

Type	DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18 <DC≤20
Type1,2,3,4,5,6	0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
Type7,8	−0.017 −0.031	−0.025 −0.043	−0.033 −0.055	−0.041 −0.068	–
	DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤18	18 <DCON≤20
h6	0 −0.006	0 −0.008	0 −0.009	0 −0.011	0 −0.013

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.000	.1181				2	Ext.	★	MVE0300X02S030	6.5	.256	16.5	.650	16.5	.650	55.5	2.185	55	2.165	0.5	.020	3	.118	2
					2	Ext.	●	MVE0300X02S060	6.5	.256	16.5	.650	19.7	.776	55.5	2.185	55	2.165	0.5	.020	6	.236	1
					2	Int.	★	MVS0300X02S030PL	6.5	.256	16.5	.650	16.5	.650	55.5	2.185	55	2.165	0.5	.020	3	.118	4
					2	Int.	●	MVS0300X02S060PL	6.5	.256	16.5	.650	19.7	.776	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Ext.	★	MVE0300X03S030	9.5	.374	21.5	.850	21.5	.850	60.5	2.386	60	2.362	0.5	.024	3	.118	2
					3	Ext.	★	MVE0300X03S060	9.5	.374	21.5	.850	24.7	.976	60.5	2.386	60	2.362	0.5	.024	6	.236	1
					3	Int.	★	MVS0300X03S030	9.5	.374	21.5	.850	21.5	.850	72.5	2.858	72	2.835	0.5	.024	3	.118	6
					3	Int.	●	MVS0300X03S060	9.5	.374	21.5	.850	24.7	.976	72.5	2.858	72	2.835	0.5	.024	6	.236	5
					5	Int.	★	MVS0300X05S030	15.5	.610	28.5	1.126	28.5	1.126	81.5	3.213	81	3.189	0.5	.024	3	.118	6
					5	Int.	●	MVS0300X05S060	15.5	.610	28.5	1.126	31.7	1.252	81.5	3.213	81	3.189	0.5	.024	6	.236	5
					8	Int.	★	MVS0300X08S030	24.5	.965	35.5	1.402	35.5	1.402	81.5	3.213	81	3.189	0.5	.024	3	.118	6
					8	Int.	●	MVS0300X08S060	24.5	.965	35.5	1.402	38.7	1.528	81.5	3.213	81	3.189	0.5	.024	6	.236	5
					10	Int.	★	MVS0300X10S030	30.5	1.201	39.5	1.555	42.5	1.677	90.5	3.563	90	3.543	0.5	.020	3	.118	8
					10	Int.	●	MVS0300X10S060	30.5	1.201	39.5	1.555	45.8	1.803	90.5	3.563	90	3.543	0.5	.020	6	.236	7
					15	Int.	★	MVS0300X15S030	45.5	1.791	54.5	2.146	57.5	2.268	105.5	4.154	105	4.134	0.5	.020	3	.118	8
					15	Int.	●	MVS0300X15S060	45.5	1.791	54.5	2.146	60.8	2.394	105.5	4.154	105	4.134	0.5	.020	6	.236	7
					20	Int.	★	MVS0300X20S030	60.5	2.382	69.5	2.736	72.5	2.858	120.5	4.744	120	4.724	0.5	.020	3	.118	8
					20	Int.	●	MVS0300X20S060	60.5	2.382	69.5	2.736	75.8	2.984	120.5	4.744	120	4.724	0.5	.020	6	.236	7
					25	Int.	★	MVS0300X25S030	75.5	2.972	84.5	3.327	87.5	3.449	135.5	5.335	135	5.315	0.5	.020	3	.118	8
					25	Int.	●	MVS0300X25S060	75.5	2.972	84.5	3.327	90.8	3.575	135.5	5.335	135	5.315	0.5	.020	6	.236	7
					30	Int.	★	MVS0300X30S030	90.5	3.563	99.5	3.917	102.5	4.039	150.5	5.925	150	5.906	0.5	.020	3	.118	8
					30	Int.	●	MVS0300X30S060	90.5	3.563	99.5	3.917	105.8	4.165	150.5	5.925	150	5.906	0.5	.020	6	.236	7
					35	Int.	★	MVS0300X35S030	105.5	4.154	115.5	4.547	118.5	4.669	166.5	6.555	166	6.535	0.5	.020	3	.118	8
					35	Int.	●	MVS0300X35S060	105.5	4.154	115.5	4.547	121.8	4.795	166.5	6.555	166	6.535	0.5	.020	6	.236	7
					40	Int.	★	MVS0300X40S030	120.5	4.744	130.5	5.138	133.5	5.260	181.5	7.146	181	7.126	0.5	.020	3	.118	8
					40	Int.	●	MVS0300X40S060	120.5	4.744	130.5	5.138	136.8	5.386	181.5	7.146	181	7.126	0.5	.020	6	.236	7
3.048	.1200		31		2	Ext.	●	MVE0305X02S060	6.6	.260	18.6	.732	21.8	.858	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	●	MVS0305X02S060PL	6.6	.260	18.5	.728	21.6	.854	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Int.	●	MVS0305X03S060	9.7	.382	21.6	.850	24.8	.976	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	●	MVS0305X05S060	15.8	.622	32.6	1.283	35.8	1.409	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	●	MVS0305X08S060	24.9	.980	41.6	1.638	44.8	1.764	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	●	MVS0305X10S060	31.0	1.220	46.6	1.835	52.7	2.079	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	●	MVS0305X15S060	46.3	1.823	63.6	2.504	69.7	2.748	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	●	MVS0305X20S060	61.5	2.421	81.6	3.213	87.7	3.457	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	●	MVS0305X25S060	76.7	3.020	98.6	3.882	104.7	4.126	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	●	MVS0305X30S060	92.0	3.622	116.6	4.591	119.6	4.835	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	●	MVS0305X35S060	107.2	4.220	134.6	5.299	137.6	5.543	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	●	MVS0305X40S060	122.5	4.823	150.6	5.929	153.6	6.173	201.6	7.937	201	7.913	0.6	.024	6	.236	7

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.100	.1220				2	Ext.	★	MVE0310X02S040	6.8	.268	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0310X02S060	6.8	.268	18.6	.732	21.7	.854	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	★	MVS0310X02S040PL	6.7	.264	18.5	.728	20.5	.807	55.5	2.185	55	2.165	0.5	.020	4	.157	4
					2	Int.	●	MVS0310X02S060PL	6.7	.264	18.5	.728	21.6	.850	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Ext.	★	MVE0310X03S040	9.9	.390	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0310X03S060	9.9	.390	24.6	.969	27.7	1.091	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0310X03S040	9.9	.390	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	6
					3	Int.	●	MVS0310X03S060	9.9	.390	21.6	.850	24.7	.972	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	★	MVS0310X05S040	16.1	.634	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					5	Int.	●	MVS0310X05S060	16.1	.634	32.6	1.283	35.7	1.406	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	★	MVS0310X08S040	25.4	1.000	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					8	Int.	●	MVS0310X08S060	25.4	1.000	41.6	1.638	44.7	1.760	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	★	MVS0310X10S040	31.6	1.244	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4	.157	8
					10	Int.	●	MVS0310X10S060	31.6	1.244	46.6	1.835	52.7	2.075	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	★	MVS0310X15S040	47.1	1.854	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4	.157	8
					15	Int.	●	MVS0310X15S060	47.1	1.854	63.6	2.504	69.7	2.744	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	★	MVS0310X20S040	62.6	2.465	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4	.157	8
					20	Int.	●	MVS0310X20S060	62.6	2.465	81.6	3.213	87.7	3.453	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	★	MVS0310X25S040	78.1	3.075	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4	.157	8
					25	Int.	●	MVS0310X25S060	78.1	3.075	98.6	3.882	104.7	4.122	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	★	MVS0310X30S040	93.6	3.685	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4	.157	8
					30	Int.	●	MVS0310X30S060	93.6	3.685	116.6	4.591	122.7	4.831	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	□	MVS0310X35S040	109.1	4.295	134.6	5.299	137.6	5.417	185.6	7.307	185	7.283	0.6	.024	4	.157	8
					35	Int.	□	MVS0310X35S060	109.1	4.295	134.6	5.299	140.7	5.539	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	□	MVS0310X40S040	124.6	4.906	150.6	5.929	153.6	6.047	201.6	7.937	201	7.913	0.6	.024	4	.157	8
					40	Int.	□	MVS0310X40S060	124.6	4.906	150.6	5.929	156.7	6.169	201.6	7.937	201	7.913	0.6	.024	6	.236	7
3.175	.1250	1/8			2	Ext.	●	MVE0318X02S060	6.9	.272	18.6	.732	21.6	.850	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	●	MVS0318X02S060PL	6.9	.272	18.5	.728	21.5	.846	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Int.	●	MVS0318X03S060	10.1	.398	21.6	.850	24.6	.969	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	●	MVS0318X05S060	16.4	.646	32.6	1.283	35.6	1.402	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	●	MVS0318X08S060	26.0	1.024	41.6	1.638	44.6	1.756	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	●	MVS0318X10S060	32.3	1.272	46.6	1.835	52.6	2.071	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	●	MVS0318X15S060	48.2	1.898	63.6	2.504	69.6	2.740	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	●	MVS0318X20S060	64.1	2.524	81.6	3.213	87.6	3.449	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	●	MVS0318X25S060	79.9	3.146	98.6	3.882	104.6	4.118	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	●	MVS0318X30S060	95.8	3.772	116.6	4.591	119.6	4.827	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	●	MVS0318X35S060	111.7	4.398	134.6	5.299	137.6	5.535	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	●	MVS0318X40S060	127.6	5.024	150.6	5.929	153.6	6.165	201.6	7.937	201	7.913	0.6	.024	6	.236	7

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0320X02S040	7.0	.276	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0320X02S060	7.0	.276	18.6	.732	21.6	.850	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	★	MVS0320X02S040PL	6.9	.272	18.5	.728	20.5	.807	55.5	2.185	55	2.165	0.5	.020	4	.157	4
					2	Int.	●	MVS0320X02S060PL	6.9	.272	18.5	.728	21.5	.846	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Ext.	★	MVE0320X03S040	10.2	.402	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0320X03S060	10.2	.402	24.6	.969	27.6	1.087	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0320X03S040	10.2	.402	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	6
					3	Int.	●	MVS0320X03S060	10.2	.402	21.6	.850	24.6	.969	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	★	MVS0320X05S040	16.6	.654	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					5	Int.	●	MVS0320X05S060	16.6	.654	32.6	1.283	35.6	1.402	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	★	MVS0320X08S040	26.2	1.031	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					8	Int.	●	MVS0320X08S060	26.2	1.031	41.6	1.638	44.6	1.756	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	★	MVS0320X10S040	32.6	1.283	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4	.157	8
3.200	.1260				10	Int.	●	MVS0320X10S060	32.6	1.283	46.6	1.835	52.6	2.071	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	★	MVS0320X15S040	48.6	1.913	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4	.157	8
					15	Int.	●	MVS0320X15S060	48.6	1.913	63.6	2.504	69.6	2.740	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	★	MVS0320X20S040	64.6	2.543	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4	.157	8
					20	Int.	●	MVS0320X20S060	64.6	2.543	81.6	3.213	87.6	3.449	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	★	MVS0320X25S040	80.6	3.173	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4	.157	8
					25	Int.	●	MVS0320X25S060	80.6	3.173	98.6	3.882	104.6	4.118	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	★	MVS0320X30S040	96.6	3.803	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4	.157	8
					30	Int.	●	MVS0320X30S060	96.6	3.803	116.6	4.591	122.6	4.827	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	□	MVS0320X35S040	112.6	4.433	134.6	5.299	137.6	5.417	185.6	7.307	185	7.283	0.6	.024	4	.157	8
					35	Int.	□	MVS0320X35S060	112.6	4.433	134.6	5.299	140.6	5.539	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	□	MVS0320X40S040	128.6	5.063	150.6	5.929	153.6	6.047	201.6	7.937	201	7.913	0.6	.024	4	.157	8
					40	Int.	□	MVS0320X40S060	128.6	5.063	150.6	5.929	156.6	6.165	201.6	7.937	201	7.913	0.6	.024	6	.236	7
					2	Ext.	★	MVE0330X02S040	7.2	.283	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0330X02S060	7.2	.283	18.6	.732	21.5	.846	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	★	MVS0330X02S040PL	7.1	.280	18.5	.728	20.5	.807	55.5	2.185	55	2.165	0.5	.020	4	.157	4
					2	Int.	●	MVS0330X02S060PL	7.1	.280	18.5	.728	21.4	.843	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Ext.	★	MVE0330X03S040	10.5	.413	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0330X03S060	10.5	.413	24.6	.969	27.5	1.083	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0330X03S040	10.5	.413	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	6
					3	Int.	●	MVS0330X03S060	10.5	.413	21.6	.850	24.5	.965	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	★	MVS0330X05S040	17.1	.673	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					5	Int.	●	MVS0330X05S060	17.1	.673	32.6	1.283	35.5	1.398	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	★	MVS0330X08S040	27.0	1.063	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					8	Int.	●	MVS0330X08S060	27.0	1.063	41.6	1.638	44.5	1.752	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	★	MVS0330X10S040	33.6	1.323	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4	.157	8
3.300	.1299			M4x.7	10	Int.	●	MVS0330X10S060	33.6	1.323	46.6	1.835	52.5	2.067	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	★	MVS0330X15S040	50.1	1.972	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4	.157	8
					15	Int.	●	MVS0330X15S060	50.1	1.972	63.6	2.504	69.5	2.736	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	★	MVS0330X20S040	66.6	2.622	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4	.157	8
					20	Int.	●	MVS0330X20S060	66.6	2.622	81.6	3.213	87.5	3.445	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	★	MVS0330X25S040	83.1	3.272	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4	.157	8
					25	Int.	●	MVS0330X25S060	83.1	3.272	98.6	3.882	104.5	4.114	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	★	MVS0330X30S040	99.6	3.921	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4	.157	8
					30	Int.	●	MVS0330X30S060	99.6	3.921	116.6	4.591	122.5	4.823	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	□	MVS0330X35S040	116.1	4.571	134.6	5.299	137.6	5.417	185.6	7.307	185	7.283	0.6	.024	4	.157	8
					35	Int.	□	MVS0330X35S060	116.1	4.571	134.6	5.299	140.5	5.531	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	□	MVS0330X40S040	132.6	5.220	150.6	5.929	153.6	6.047	201.6	7.937	201	7.913	0.6	.024	4	.157	8
					40	Int.	□	MVS0330X40S060	132.6	5.220	150.6	5.929	156.5	6.161	201.6	7.937	201	7.913	0.6	.024	6	.236	7

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.400	.1339				2	Ext.	★	MVE0340X02S040	7.4	.291	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0340X02S060	7.4	.291	18.6	.732	21.4	.843	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	★	MVS0340X02S040PL	7.3	.287	18.5	.728	20.5	.807	55.5	2.185	55	2.165	0.5	.020	4	.157	4
					2	Int.	●	MVS0340X02S060PL	7.3	.287	18.5	.728	21.3	.839	55.5	2.185	55	2.165	0.5	.020	6	.236	3
					3	Ext.	★	MVE0340X03S040	10.8	.425	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0340X03S060	10.8	.425	24.6	.969	27.4	1.079	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0340X03S040	10.8	.425	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	6
					3	Int.	●	MVS0340X03S060	10.8	.425	21.6	.850	24.4	.961	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	★	MVS0340X05S040	17.6	.693	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					5	Int.	●	MVS0340X05S060	17.6	.693	32.6	1.283	35.4	1.394	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	★	MVS0340X08S040	27.8	1.094	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					8	Int.	●	MVS0340X08S060	27.8	1.094	41.6	1.638	44.4	1.748	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	★	MVS0340X10S040	34.6	1.362	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4	.157	8
					10	Int.	●	MVS0340X10S060	34.6	1.362	46.6	1.835	52.4	2.063	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	★	MVS0340X15S040	51.6	2.031	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4	.157	8
					15	Int.	●	MVS0340X15S060	51.6	2.031	63.6	2.504	69.4	2.732	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	★	MVS0340X20S040	68.6	2.701	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4	.157	8
					20	Int.	●	MVS0340X20S060	68.6	2.701	81.6	3.213	87.4	3.441	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	★	MVS0340X25S040	85.6	3.370	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4	.157	8
					25	Int.	●	MVS0340X25S060	85.6	3.370	98.6	3.882	104.4	4.110	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	★	MVS0340X30S040	102.6	4.039	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4	.157	8
					30	Int.	●	MVS0340X30S060	102.6	4.039	116.6	4.591	122.4	4.819	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	□	MVS0340X35S040	119.6	4.709	134.6	5.299	137.6	5.417	185.6	7.307	185	7.283	0.6	.024	4	.157	8
					35	Int.	□	MVS0340X35S060	119.6	4.709	134.6	5.299	140.4	5.528	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	□	MVS0340X40S040	136.6	5.378	150.6	5.929	153.6	6.047	201.6	7.937	201	7.913	0.6	.024	4	.157	8
					40	Int.	□	MVS0340X40S060	136.6	5.378	150.6	5.929	156.4	6.157	201.6	7.937	201	7.913	0.6	.024	6	.236	7
3.500	.1378				2	Ext.	★	MVE0350X02S040	7.6	.299	18.6	.732	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	2
					2	Ext.	●	MVE0350X02S060	7.6	.299	18.6	.732	21.3	.839	55.6	2.189	55	2.165	0.6	.024	6	.236	1
					2	Int.	★	MVS0350X02S040PL	7.6	.299	18.5	.728	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	4
					2	Int.	●	MVS0350X02S060PL	7.6	.299	18.5	.728	21.2	.835	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Ext.	★	MVE0350X03S040	11.1	.437	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	2
					3	Ext.	★	MVE0350X03S060	11.1	.437	24.6	.969	27.3	1.075	60.6	2.386	60	2.362	0.6	.024	6	.236	1
					3	Int.	★	MVS0350X03S040	11.1	.437	21.6	.850	23.6	.929	76.6	3.016	76	2.992	0.6	.024	4	.157	6
					3	Int.	●	MVS0350X03S060	11.1	.437	21.6	.850	24.3	.957	76.6	3.016	76	2.992	0.6	.024	6	.236	5
					5	Int.	★	MVS0350X05S040	18.1	.713	32.6	1.283	32.6	1.283	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					5	Int.	●	MVS0350X05S060	18.1	.713	32.6	1.283	35.3	1.390	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					8	Int.	★	MVS0350X08S040	28.6	1.126	41.6	1.638	41.6	1.638	87.6	3.449	87	3.425	0.6	.024	4	.157	6
					8	Int.	●	MVS0350X08S060	28.6	1.126	41.6	1.638	44.3	1.744	87.6	3.449	87	3.425	0.6	.024	6	.236	5
					10	Int.	★	MVS0350X10S040	35.6	1.402	46.6	1.835	49.6	1.953	97.6	3.843	97	3.819	0.6	.024	4	.157	8
					10	Int.	●	MVS0350X10S060	35.6	1.402	46.6	1.835	52.3	2.059	97.6	3.843	97	3.819	0.6	.024	6	.236	7
					15	Int.	★	MVS0350X15S040	53.1	2.091	63.6	2.504	66.6	2.622	114.6	4.512	114	4.488	0.6	.024	4	.157	8
					15	Int.	●	MVS0350X15S060	53.1	2.091	63.6	2.504	69.3	2.728	114.6	4.512	114	4.488	0.6	.024	6	.236	7
					20	Int.	★	MVS0350X20S040	70.6	2.780	81.6	3.213	84.6	3.331	132.6	5.220	132	5.197	0.6	.024	4	.157	8
					20	Int.	●	MVS0350X20S060	70.6	2.780	81.6	3.213	87.3	3.437	132.6	5.220	132	5.197	0.6	.024	6	.236	7
					25	Int.	★	MVS0350X25S040	88.1	3.469	98.6	3.882	101.6	4.000	149.6	5.890	149	5.866	0.6	.024	4	.157	8
					25	Int.	●	MVS0350X25S060	88.1	3.469	98.6	3.882	104.3	4.106	149.6	5.890	149	5.866	0.6	.024	6	.236	7
					30	Int.	★	MVS0350X30S040	105.6	4.157	116.6	4.591	119.6	4.709	167.6	6.598	167	6.575	0.6	.024	4	.157	8
					30	Int.	●	MVS0350X30S060	105.6	4.157	116.6	4.591	122.3	4.815	167.6	6.598	167	6.575	0.6	.024	6	.236	7
					35	Int.	★	MVS0350X35S040	123.1	4.846	134.6	5.299	137.6	5.417	185.6	7.307	185	7.283	0.6	.024	4	.157	8
					35	Int.	●	MVS0350X35S060	123.1	4.846	134.6	5.299	140.3	5.524	185.6	7.307	185	7.283	0.6	.024	6	.236	7
					40	Int.	★	MVS0350X40S040	140.6	5.535	150.6	5.929	153.6	6.047	201.6	7.937	201	7.913	0.6	.024	4	.157	8
					40	Int.	●	MVS0350X40S060	140.6	5.535	150.6	5.929	156.3	6.154	201.6	7.937	201	7.913	0.6	.024	6	.236	7

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.572	.1407	9/64			2	Ext.	●	MVE0357X02S060	7.7	.303	20.7	.815	23.3	.917	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	●	MVS0357X02S060PL	7.7	.303	20.6	.811	23.2	.913	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Int.	●	MVS0357X03S060	11.4	.449	23.7	.933	26.3	1.035	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	●	MVS0357X05S060	18.5	.728	36.7	1.445	39.3	1.547	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	●	MVS0357X08S060	29.2	1.150	46.7	1.839	49.3	1.941	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	●	MVS0357X10S060	36.4	1.433	52.7	2.075	58.3	2.295	103.7	4.083	103	4.055	0.7	.028	6	.236	7
					15	Int.	●	MVS0357X15S060	54.2	2.134	72.7	2.862	78.3	3.083	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	●	MVS0357X20S060	72.1	2.839	92.7	3.650	98.3	3.870	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	●	MVS0357X25S060	89.9	3.539	112.7	4.437	118.3	4.657	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	●	MVS0357X30S060	107.8	4.244	132.7	5.224	135.7	5.445	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	●	MVS0357X35S060	125.6	4.945	152.7	6.012	155.7	6.232	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	●	MVS0357X40S060	143.5	5.650	172.7	6.799	175.7	7.020	223.7	8.807	223	8.780	0.7	.028	6	.236	7
3.600	.1417				2	Ext.	★	MVE0360X02S040	7.9	.311	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0360X02S060	7.9	.311	20.7	.815	23.3	.917	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	★	MVS0360X02S040PL	7.8	.307	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	4
					2	Int.	●	MVS0360X02S060PL	7.8	.307	20.6	.811	23.1	.909	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Ext.	★	MVE0360X03S040	11.5	.453	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0360X03S060	11.5	.453	27.7	1.091	30.3	1.193	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0360X03S040	11.5	.453	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	6
					3	Int.	●	MVS0360X03S060	11.5	.453	23.7	.933	26.3	1.035	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	★	MVS0360X05S040	18.7	.736	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					5	Int.	●	MVS0360X05S060	18.7	.736	36.7	1.445	39.3	1.547	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	★	MVS0360X08S040	29.5	1.161	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					8	Int.	●	MVS0360X08S060	29.5	1.161	46.7	1.839	49.3	1.941	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	★	MVS0360X10S040	36.7	1.445	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4	.157	8
					10	Int.	●	MVS0360X10S060	36.7	1.445	52.7	2.075	58.2	2.291	103.7	4.083	103	4.055	0.7	.028	6	.236	7
					15	Int.	★	MVS0360X15S040	54.7	2.154	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4	.157	8
					15	Int.	●	MVS0360X15S060	54.7	2.154	72.7	2.862	78.2	3.079	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	★	MVS0360X20S040	72.7	2.862	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4	.157	8
					20	Int.	●	MVS0360X20S060	72.7	2.862	92.7	3.650	98.2	3.866	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	★	MVS0360X25S040	90.7	3.571	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4	.157	8
					25	Int.	●	MVS0360X25S060	90.7	3.571	112.7	4.437	118.2	4.654	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	★	MVS0360X30S040	108.7	4.280	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4	.157	8
					30	Int.	●	MVS0360X30S060	108.7	4.280	132.7	5.224	138.2	5.441	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	□	MVS0360X35S040	126.7	4.988	152.7	6.012	155.7	6.130	203.7	8.020	203	7.992	0.7	.028	4	.157	8
					35	Int.	□	MVS0360X35S060	126.7	4.988	152.7	6.012	158.2	6.232	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	□	MVS0360X40S040	144.7	5.697	172.7	6.799	175.7	6.917	223.7	8.807	223	8.780	0.7	.028	4	.157	8
					40	Int.	□	MVS0360X40S060	144.7	5.697	172.7	6.799	178.2	7.020	223.7	8.807	223	8.780	0.7	.028	6	.236	7

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0370X02S040	8.1	.319	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0370X02S060	8.1	.319	20.7	.815	23.2	.913	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	★	MVS0370X02S040PL	8.0	.315	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	4
					2	Int.	●	MVS0370X02S060PL	8.0	.315	20.6	.811	23.0	.906	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Ext.	★	MVE0370X03S040	11.8	.465	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0370X03S060	11.8	.465	27.7	1.091	30.2	1.189	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0370X03S040	11.8	.465	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	6
					3	Int.	●	MVS0370X03S060	11.8	.465	23.7	.933	26.2	1.031	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	★	MVS0370X05S040	19.2	.756	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					5	Int.	●	MVS0370X05S060	19.2	.756	36.7	1.445	39.2	1.543	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	★	MVS0370X08S040	30.3	1.193	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					8	Int.	●	MVS0370X08S060	30.3	1.193	46.7	1.839	49.2	1.937	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	★	MVS0370X10S040	37.7	1.484	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4	.157	8
3.700	.1457			M4.5x.75	10	Int.	●	MVS0370X10S060	37.7	1.484	52.7	2.075	58.1	2.287	103.7	4.083	103	4.055	0.7	.028	6	.236	7
					15	Int.	★	MVS0370X15S040	56.2	2.213	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4	.157	8
					15	Int.	●	MVS0370X15S060	56.2	2.213	72.7	2.862	78.1	3.075	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	★	MVS0370X20S040	74.7	2.941	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4	.157	8
					20	Int.	●	MVS0370X20S060	74.7	2.941	92.7	3.650	98.1	3.862	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	★	MVS0370X25S040	93.2	3.669	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4	.157	8
					25	Int.	●	MVS0370X25S060	93.2	3.669	112.7	4.437	118.1	4.650	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	★	MVS0370X30S040	111.7	4.398	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4	.157	8
					30	Int.	●	MVS0370X30S060	111.7	4.398	132.7	5.224	138.1	5.437	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	□	MVS0370X35S040	130.2	5.126	152.7	6.012	155.7	6.130	203.7	8.020	203	7.992	0.7	.028	4	.157	8
					35	Int.	□	MVS0370X35S060	130.2	5.126	152.7	6.012	158.1	6.228	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	□	MVS0370X40S040	148.7	5.854	172.7	6.799	175.7	6.917	223.7	8.807	223	8.780	0.7	.028	4	.157	8
					40	Int.	□	MVS0370X40S060	148.7	5.854	172.7	6.799	178.1	7.016	223.7	8.807	223	8.780	0.7	.028	6	.236	7
					2	Ext.	★	MVE0380X02S040	8.3	.327	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0380X02S060	8.3	.327	20.7	.815	23.1	.909	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	★	MVS0380X02S040PL	8.2	.323	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	4
					2	Int.	●	MVS0380X02S060PL	8.2	.323	20.6	.811	23.0	.906	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Ext.	★	MVE0380X03S040	12.1	.476	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0380X03S060	12.1	.476	27.7	1.091	30.1	1.185	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0380X03S040	12.1	.476	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	6
					3	Int.	●	MVS0380X03S060	12.1	.476	23.7	.933	26.1	1.028	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	★	MVS0380X05S040	19.7	.776	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					5	Int.	●	MVS0380X05S060	19.7	.776	36.7	1.445	39.1	1.539	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	★	MVS0380X08S040	31.1	1.224	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					8	Int.	●	MVS0380X08S060	31.1	1.224	46.7	1.839	49.1	1.933	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	★	MVS0380X10S040	38.7	1.524	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4	.157	8
3.800	.1496		25	#10-24	10	Int.	●	MVS0380X10S060	38.7	1.524	52.7	2.075	58.1	2.287	103.7	4.083	103	4.055	0.7	.028	6	.236	7
					15	Int.	★	MVS0380X15S040	57.7	2.272	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4	.157	8
					15	Int.	●	MVS0380X15S060	57.7	2.272	72.7	2.862	78.1	3.075	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	★	MVS0380X20S040	76.7	3.020	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4	.157	8
					20	Int.	●	MVS0380X20S060	76.7	3.020	92.7	3.650	98.1	3.862	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	★	MVS0380X25S040	95.7	3.768	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4	.157	8
					25	Int.	●	MVS0380X25S060	95.7	3.768	112.7	4.437	118.1	4.650	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	★	MVS0380X30S040	114.7	4.516	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4	.157	8
					30	Int.	●	MVS0380X30S060	114.7	4.516	132.7	5.224	138.1	5.437	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	□	MVS0380X35S040	133.7	5.264	152.7	6.012	155.7	6.130	203.7	8.020	203	7.992	0.7	.028	4	.157	8
					35	Int.	□	MVS0380X35S060	133.7	5.264	152.7	6.012	158.1	6.224	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	□	MVS0380X40S040	152.7	6.012	172.7	6.799	175.7	6.917	223.7	8.807	223	8.780	0.7	.028	4	.157	8
					40	Int.	□	MVS0380X40S060	152.7	6.012	172.7	6.799	178.1	7.012	223.7	8.807	223	8.780	0.7	.028	6	.236	7

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	**MVE0390X02S040**	8.5	.335	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	**MVE0390X02S060**	8.5	.335	20.7	.815	23.0	.906	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	★	**MVS0390X02S040PL**	8.4	.331	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	4
					2	Int.	●	**MVS0390X02S060PL**	8.4	.331	20.6	.811	22.9	.902	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Ext.	★	**MVE0390X03S040**	12.4	.488	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	**MVE0390X03S060**	12.4	.488	27.7	1.091	30.0	1.181	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	**MVS0390X03S040**	12.4	.488	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	6
					3	Int.	●	**MVS0390X03S060**	12.4	.488	23.7	.933	26.0	1.024	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	★	**MVS0390X05S040**	20.2	.795	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					5	Int.	●	**MVS0390X05S060**	20.2	.795	36.7	1.445	39.0	1.535	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	★	**MVS0390X08S040**	31.9	1.256	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					8	Int.	●	**MVS0390X08S060**	31.9	1.256	46.7	1.839	49.0	1.929	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	★	**MVS0390X10S040**	39.7	1.563	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4	.157	8
3.900	**.1535**				10	Int.	●	**MVS0390X10S060**	39.7	1.563	52.7	2.075	58.0	2.283	103.7	4.083	103	4.055	0.7	.028	6	.236	7
					15	Int.	★	**MVS0390X15S040**	59.2	2.331	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4	.157	8
					15	Int.	●	**MVS0390X15S060**	59.2	2.331	72.7	2.862	78.0	3.071	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	★	**MVS0390X20S040**	78.7	3.098	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4	.157	8
					20	Int.	●	**MVS0390X20S060**	78.7	3.098	92.7	3.650	98.0	3.858	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	★	**MVS0390X25S040**	98.2	3.866	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4	.157	8
					25	Int.	●	**MVS0390X25S060**	98.2	3.866	112.7	4.437	118.0	4.646	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	★	**MVS0390X30S040**	117.7	4.634	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4	.157	8
					30	Int.	●	**MVS0390X30S060**	117.7	4.634	132.7	5.224	138.0	5.433	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	□	**MVS0390X35S040**	137.2	5.402	152.7	6.012	155.7	6.130	203.7	8.020	203	7.992	0.7	.028	4	.157	8
					35	Int.	□	**MVS0390X35S060**	137.2	5.402	152.7	6.012	158.0	6.220	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	□	**MVS0390X40S040**	156.7	6.169	172.7	6.799	175.7	6.917	223.7	8.807	223	8.780	0.7	.028	4	.157	8
					40	Int.	□	**MVS0390X40S060**	156.7	6.169	172.7	6.799	178.0	7.008	223.7	8.807	223	8.780	0.7	.028	6	.236	7
					2	Ext.	●	**MVE0397X02S060**	8.6	.339	20.7	.815	22.9	.902	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	●	**MVS0397X02S060PL**	8.6	.339	20.6	.811	22.8	.898	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Int.	●	**MVS0397X03S060**	12.6	.496	23.7	.933	25.9	1.020	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	●	**MVS0397X05S060**	20.5	.807	36.7	1.445	38.9	1.531	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	●	**MVS0397X08S060**	32.5	1.280	46.7	1.839	48.9	1.925	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	●	**MVS0397X10S060**	40.4	1.591	52.7	2.075	57.9	2.280	103.7	4.083	103	4.055	0.7	.028	6	.236	7
3.969	**.1563**	**5/32**			15	Int.	●	**MVS0397X15S060**	60.2	2.370	72.7	2.862	77.9	3.067	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	●	**MVS0397X20S060**	80.1	3.154	92.7	3.650	97.9	3.854	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	●	**MVS0397X25S060**	99.9	3.933	112.7	4.437	117.9	4.642	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	●	**MVS0397X30S060**	119.7	4.713	132.7	5.224	135.7	5.429	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	●	**MVS0397X35S060**	139.6	5.496	152.7	6.012	155.7	6.217	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	●	**MVS0397X40S060**	159.4	6.276	172.7	6.799	175.7	7.004	223.7	8.807	223	8.780	0.7	.028	6	.236	7

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0400X02S040	8.7	.343	20.7	.815	20.7	.815	55.7	2.193	55	2.165	0.7	.028	4	.157	2
					2	Ext.	●	MVE0400X02S060	8.7	.343	20.7	.815	22.8	.898	55.7	2.193	55	2.165	0.7	.028	6	.236	1
					2	Int.	★	MVS0400X02S040PL	8.6	.339	20.6	.811	20.6	.811	55.6	2.189	55	2.165	0.6	.024	4	.157	4
					2	Int.	●	MVS0400X02S060PL	8.6	.339	20.6	.811	22.8	.898	55.6	2.189	55	2.165	0.6	.024	6	.236	3
					3	Ext.	★	MVE0400X03S040	12.7	.500	27.7	1.091	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	2
					3	Ext.	★	MVE0400X03S060	12.7	.500	27.7	1.091	29.8	1.173	60.7	2.390	60	2.362	0.7	.028	6	.236	1
					3	Int.	★	MVS0400X03S040	12.7	.500	23.7	.933	23.7	.933	80.7	3.177	80	3.150	0.7	.028	4	.157	6
					3	Int.	●	MVS0400X03S060	12.7	.500	23.7	.933	25.8	1.016	80.7	3.177	80	3.150	0.7	.028	6	.236	5
					5	Int.	★	MVS0400X05S040	20.7	.815	36.7	1.445	36.7	1.445	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					5	Int.	●	MVS0400X05S060	20.7	.815	36.7	1.445	38.8	1.528	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					8	Int.	★	MVS0400X08S040	32.7	1.287	46.7	1.839	46.7	1.839	92.7	3.650	92	3.622	0.7	.028	4	.157	6
					8	Int.	●	MVS0400X08S060	32.7	1.287	46.7	1.839	48.8	1.921	92.7	3.650	92	3.622	0.7	.028	6	.236	5
					10	Int.	★	MVS0400X10S040	40.7	1.602	52.7	2.075	55.7	2.193	103.7	4.083	103	4.055	0.7	.028	4	.157	8
4.000	.1575				10	Int.	●	MVS0400X10S060	40.7	1.602	52.7	2.075	57.9	2.280	103.7	4.083	103	4.055	0.7	.028	6	.236	7
					15	Int.	★	MVS0400X15S040	60.7	2.390	72.7	2.862	75.7	2.980	123.7	4.870	123	4.843	0.7	.028	4	.157	8
					15	Int.	●	MVS0400X15S060	60.7	2.390	72.7	2.862	77.9	3.067	123.7	4.870	123	4.843	0.7	.028	6	.236	7
					20	Int.	★	MVS0400X20S040	80.7	3.177	92.7	3.650	95.7	3.768	143.7	5.657	143	5.630	0.7	.028	4	.157	8
					20	Int.	●	MVS0400X20S060	80.7	3.177	92.7	3.650	97.9	3.854	143.7	5.657	143	5.630	0.7	.028	6	.236	7
					25	Int.	★	MVS0400X25S040	100.7	3.965	112.7	4.437	115.7	4.555	163.7	6.445	163	6.417	0.7	.028	4	.157	8
					25	Int.	●	MVS0400X25S060	100.7	3.965	112.7	4.437	117.9	4.642	163.7	6.445	163	6.417	0.7	.028	6	.236	7
					30	Int.	★	MVS0400X30S040	120.7	4.752	132.7	5.224	135.7	5.343	183.7	7.232	183	7.205	0.7	.028	4	.157	8
					30	Int.	●	MVS0400X30S060	120.7	4.752	132.7	5.224	137.9	5.429	183.7	7.232	183	7.205	0.7	.028	6	.236	7
					35	Int.	★	MVS0400X35S040	140.7	5.539	152.7	6.012	155.7	6.130	203.7	8.020	203	7.992	0.7	.028	4	.157	8
					35	Int.	●	MVS0400X35S060	140.7	5.539	152.7	6.012	157.9	6.217	203.7	8.020	203	7.992	0.7	.028	6	.236	7
					40	Int.	★	MVS0400X40S040	160.7	6.327	172.7	6.799	175.7	6.917	223.7	8.807	223	8.780	0.7	.028	4	.157	8
					40	Int.	●	MVS0400X40S060	160.7	6.327	172.7	6.799	177.9	7.004	223.7	8.807	223	8.780	0.7	.028	6	.236	7
					2	Ext.	●	MVE0404X02S060	8.8	.346	22.7	.894	24.8	.976	62.7	2.469	62	2.441	0.7	.028	6	.236	1
					2	Int.	●	MVS0404X02S060PL	8.8	.346	22.6	.890	24.7	.972	62.6	2.465	62	2.441	0.6	.024	6	.236	3
					3	Int.	●	MVS0404X03S060	12.8	.504	25.7	1.012	27.8	1.094	86.7	3.413	86	3.386	0.7	.028	6	.236	5
					5	Int.	●	MVS0404X05S060	20.9	.823	40.7	1.602	42.8	1.685	100.7	3.965	100	3.937	0.7	.028	6	.236	5
					8	Int.	●	MVS0404X08S060	33.0	1.299	52.7	2.075	54.8	2.157	100.7	3.965	100	3.937	0.7	.028	6	.236	5
					10	Int.	●	MVS0404X10S060	41.1	1.618	59.7	2.350	64.8	2.551	112.7	4.437	112	4.409	0.7	.028	6	.236	7
4.039	.1590		21	#10-32	15	Int.	●	MVS0404X15S060	61.3	2.413	81.7	3.217	86.8	3.417	134.7	5.303	134	5.276	0.7	.028	6	.236	7
					20	Int.	●	MVS0404X20S060	81.5	3.209	104.7	4.122	109.8	4.323	157.7	6.209	157	6.181	0.7	.028	6	.236	7
					25	Int.	●	MVS0404X25S060	101.7	4.004	126.7	4.988	131.8	5.189	179.7	7.075	179	7.047	0.7	.028	6	.236	7
					30	Int.	●	MVS0404X30S060	121.9	4.799	149.7	5.894	152.7	6.094	202.7	7.980	202	7.953	0.7	.028	6	.236	7
					35	Int.	●	MVS0404X35S060	142.1	5.594	171.7	6.760	174.7	6.961	224.7	8.846	224	8.819	0.7	.028	6	.236	7
					40	Int.	●	MVS0404X40S060	162.3	6.390	195.7	7.705	198.7	7.906	248.7	9.791	248	9.764	0.7	.028	6	.236	7

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0410X02S050	8.9	.350	22.7	.894	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	2
					2	Ext.	●	MVE0410X02S060	8.9	.350	22.7	.894	24.7	.972	62.7	2.469	62	2.441	0.7	.028	6	.236	1
					2	Int.	★	MVS0410X02S050PL	8.8	.346	22.6	.890	24.6	.969	62.6	2.465	62	2.441	0.6	.024	5	.197	4
					2	Int.	●	MVS0410X02S060PL	8.8	.346	22.6	.890	24.7	.972	62.6	2.465	62	2.441	0.6	.024	6	.236	3
					3	Ext.	★	MVE0410X03S050	13.0	.512	29.7	1.169	31.7	1.248	68.7	2.705	68	2.677	0.7	.028	5	.197	2
					3	Ext.	★	MVE0410X03S060	13.0	.512	29.7	1.169	31.7	1.248	68.7	2.705	68	2.677	0.7	.028	6	.236	1
					3	Int.	★	MVS0410X03S050	13.0	.512	25.7	1.012	25.7	1.012	86.7	3.413	86	3.386	0.7	.028	5	.197	6
					3	Int.	●	MVS0410X03S060	13.0	.512	25.7	1.012	27.7	1.091	86.7	3.413	86	3.386	0.7	.028	6	.236	5
					5	Int.	★	MVS0410X05S050	21.2	.835	40.7	1.602	40.7	1.602	100.7	3.965	100	3.937	0.7	.028	5	.197	6
					5	Int.	●	MVS0410X05S060	21.2	.835	40.7	1.602	42.7	1.681	100.7	3.965	100	3.937	0.7	.028	6	.236	5
					8	Int.	★	MVS0410X08S050	33.5	1.319	52.7	2.075	52.7	2.075	100.7	3.965	100	3.937	0.7	.028	5	.197	6
					8	Int.	●	MVS0410X08S060	33.5	1.319	52.7	2.075	54.7	2.154	100.7	3.965	100	3.937	0.7	.028	6	.236	5
					10	Int.	★	MVS0410X10S050	41.7	1.642	59.7	2.350	62.7	2.472	112.7	4.437	112	4.409	0.7	.028	5	.197	8
4.100	.1614				10	Int.	●	MVS0410X10S060	41.7	1.642	59.7	2.350	64.8	2.551	112.7	4.437	112	4.409	0.7	.028	6	.236	7
					15	Int.	★	MVS0410X15S050	62.2	2.449	81.7	3.217	84.7	3.339	134.7	5.303	134	5.276	0.7	.028	5	.197	8
					15	Int.	●	MVS0410X15S060	62.2	2.449	81.7	3.217	86.8	3.417	134.7	5.303	134	5.276	0.7	.028	6	.236	7
					20	Int.	★	MVS0410X20S050	82.7	3.256	104.7	4.122	107.7	4.244	157.7	6.209	157	6.181	0.7	.028	5	.197	8
					20	Int.	●	MVS0410X20S060	82.7	3.256	104.7	4.122	109.8	4.323	157.7	6.209	157	6.181	0.7	.028	6	.236	7
					25	Int.	★	MVS0410X25S050	103.2	4.063	126.7	4.988	129.7	5.110	179.7	7.075	179	7.047	0.7	.028	5	.197	8
					25	Int.	●	MVS0410X25S060	103.2	4.063	126.7	4.988	131.8	5.189	179.7	7.075	179	7.047	0.7	.028	6	.236	7
					30	Int.	★	MVS0410X30S050	123.7	4.870	149.7	5.894	152.7	6.016	202.7	7.980	202	7.953	0.7	.028	5	.197	8
					30	Int.	●	MVS0410X30S060	123.7	4.870	149.7	5.894	154.8	6.094	202.7	7.980	202	7.953	0.7	.028	6	.236	7
					35	Int.	□	MVS0410X35S050	144.2	5.677	171.7	6.760	174.7	6.882	224.7	8.846	224	8.819	0.7	.028	5	.197	8
					35	Int.	□	MVS0410X35S060	144.2	5.677	171.7	6.760	176.8	6.961	224.7	8.846	224	8.819	0.7	.028	6	.236	7
					40	Int.	□	MVS0410X40S050	164.7	6.484	195.7	7.705	198.7	7.827	248.7	9.791	248	9.764	0.7	.028	5	.197	8
					40	Int.	□	MVS0410X40S060	164.7	6.484	195.7	7.705	200.8	7.906	248.7	9.791	248	9.764	0.7	.028	6	.236	7
					2	Ext.	★	MVE0420X02S050	9.2	.362	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0420X02S060	9.2	.362	22.8	.898	24.7	.972	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					2	Int.	★	MVS0420X02S050PL	9.1	.358	22.7	.894	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	4
					2	Int.	●	MVS0420X02S060PL	9.1	.358	22.7	.894	24.6	.969	62.7	2.469	62	2.441	0.7	.028	6	.236	3
					3	Ext.	★	MVE0420X03S050	13.4	.528	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0420X03S060	13.4	.528	29.8	1.173	31.7	1.248	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0420X03S050	13.4	.528	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	6
					3	Int.	●	MVS0420X03S060	13.4	.528	25.8	1.016	27.7	1.091	86.8	3.417	86	3.386	0.8	.031	6	.236	5
					5	Int.	★	MVS0420X05S050	21.8	.858	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					5	Int.	●	MVS0420X05S060	21.8	.858	40.8	1.606	42.7	1.681	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					8	Int.	★	MVS0420X08S050	34.4	1.354	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					8	Int.	●	MVS0420X08S060	34.4	1.354	52.8	2.079	54.7	2.154	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					10	Int.	★	MVS0420X10S050	42.8	1.685	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5	.197	8
4.200	.1654			M5x.8	10	Int.	●	MVS0420X10S060	42.8	1.685	59.8	2.354	64.7	2.547	112.8	4.441	112	4.409	0.8	.031	6	.236	7
					15	Int.	★	MVS0420X15S050	63.8	2.512	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5	.197	8
					15	Int.	●	MVS0420X15S060	63.8	2.512	81.8	3.220	86.7	3.413	134.8	5.307	134	5.276	0.8	.031	6	.236	7
					20	Int.	★	MVS0420X20S050	84.8	3.339	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5	.197	8
					20	Int.	●	MVS0420X20S060	84.8	3.339	104.8	4.126	109.7	4.319	157.8	6.213	157	6.181	0.8	.031	6	.236	7
					25	Int.	★	MVS0420X25S050	105.8	4.165	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5	.197	8
					25	Int.	●	MVS0420X25S060	105.8	4.165	126.8	4.992	131.7	5.185	179.8	7.079	179	7.047	0.8	.031	6	.236	7
					30	Int.	★	MVS0420X30S050	126.8	4.992	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5	.197	8
					30	Int.	●	MVS0420X30S060	126.8	4.992	149.8	5.898	154.7	6.091	202.8	7.984	202	7.953	0.8	.031	6	.236	7
					35	Int.	□	MVS0420X35S050	147.8	5.819	171.8	6.764	174.8	6.882	224.8	8.850	224	8.819	0.8	.031	5	.197	8
					35	Int.	□	MVS0420X35S060	147.8	5.819	171.8	6.764	176.7	6.957	224.8	8.850	224	8.819	0.8	.031	6	.236	7
					40	Int.	□	MVS0420X40S050	168.8	6.646	195.8	7.709	198.8	7.827	248.8	9.795	248	9.764	0.8	.031	5	.197	8
					40	Int.	□	MVS0420X40S060	168.8	6.646	195.8	7.709	200.7	7.902	248.8	9.795	248	9.764	0.8	.031	6	.236	7

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.300	.1693				2	Ext.	★	MVE0430X02S050	9.4	.370	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0430X02S060	9.4	.370	22.8	.898	24.6	.969	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					2	Int.	★	MVS0430X02S050PL	9.3	.366	22.7	.894	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	4
					2	Int.	●	MVS0430X02S060PL	9.3	.366	22.7	.894	24.5	.965	62.7	2.469	62	2.441	0.7	.028	6	.236	3
					3	Ext.	★	MVE0430X03S050	13.7	.539	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0430X03S060	13.7	.539	29.8	1.173	31.6	1.244	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0430X03S050	13.7	.539	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	6
					3	Int.	●	MVS0430X03S060	13.7	.539	25.8	1.016	27.6	1.087	86.8	3.417	86	3.386	0.8	.031	6	.236	5
					5	Int.	★	MVS0430X05S050	22.3	.878	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					5	Int.	●	MVS0430X05S060	22.3	.878	40.8	1.606	42.6	1.677	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					8	Int.	★	MVS0430X08S050	35.2	1.386	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					8	Int.	●	MVS0430X08S060	35.2	1.386	52.8	2.079	54.6	2.150	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					10	Int.	★	MVS0430X10S050	43.8	1.724	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5	.197	8
					10	Int.	●	MVS0430X10S060	43.8	1.724	59.8	2.354	64.6	2.543	112.8	4.441	112	4.409	0.8	.031	6	.236	7
					15	Int.	★	MVS0430X15S050	65.3	2.571	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5	.197	8
					15	Int.	●	MVS0430X15S060	65.3	2.571	81.8	3.220	86.6	3.409	134.8	5.307	134	5.276	0.8	.031	6	.236	7
					20	Int.	★	MVS0430X20S050	86.8	3.417	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5	.197	8
					20	Int.	●	MVS0430X20S060	86.8	3.417	104.8	4.126	109.6	4.315	157.8	6.213	157	6.181	0.8	.031	6	.236	7
					25	Int.	★	MVS0430X25S050	108.3	4.264	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5	.197	8
					25	Int.	●	MVS0430X25S060	108.3	4.264	126.8	4.992	131.6	5.181	179.8	7.079	179	7.047	0.8	.031	6	.236	7
					30	Int.	★	MVS0430X30S050	129.8	5.110	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5	.197	8
					30	Int.	●	MVS0430X30S060	129.8	5.110	149.8	5.898	154.6	6.087	202.8	7.984	202	7.953	0.8	.031	6	.236	7
					35	Int.	□	MVS0430X35S050	151.3	5.957	171.8	6.764	174.8	6.882	224.8	8.850	224	8.819	0.8	.031	5	.197	8
					35	Int.	□	MVS0430X35S060	151.3	5.957	171.8	6.764	176.6	6.953	224.8	8.850	224	8.819	0.8	.031	6	.236	7
					40	Int.	□	MVS0430X40S050	172.8	6.803	195.8	7.709	198.8	7.827	248.8	9.795	248	9.764	0.8	.031	5	.197	8
					40	Int.	□	MVS0430X40S060	172.8	6.803	195.8	7.709	200.6	7.898	248.8	9.795	248	9.764	0.8	.031	6	.236	7
4.366	.1719	11/64			2	Ext.	●	MVE0437X02S060	9.5	.374	22.8	.898	24.6	.969	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					2	Int.	●	MVS0437X02S060PL	9.5	.374	22.7	.894	24.4	.965	62.7	2.469	62	2.441	0.7	.028	6	.236	3
					3	Int.	●	MVS0437X03S060	13.9	.547	25.8	1.016	27.6	1.087	86.8	3.417	86	3.386	0.8	.031	6	.236	5
					5	Int.	●	MVS0437X05S060	22.6	.890	40.8	1.606	42.6	1.677	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					8	Int.	●	MVS0437X08S060	35.7	1.406	52.8	2.079	54.6	2.150	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					10	Int.	●	MVS0437X10S060	44.4	1.748	59.8	2.354	64.5	2.543	112.8	4.441	112	4.409	0.8	.031	6	.236	7
					15	Int.	●	MVS0437X15S060	66.3	2.610	81.8	3.220	86.5	3.409	134.8	5.307	134	5.276	0.8	.031	6	.236	7
					20	Int.	●	MVS0437X20S060	88.1	3.469	104.8	4.126	109.5	4.315	157.8	6.213	157	6.181	0.8	.031	6	.236	7
					25	Int.	●	MVS0437X25S060	109.9	4.327	126.8	4.992	131.5	5.181	179.8	7.079	179	7.047	0.8	.031	6	.236	7
					30	Int.	●	MVS0437X30S060	131.8	5.189	149.8	5.898	152.8	6.087	202.8	7.984	202	7.953	0.8	.031	6	.236	7
					35	Int.	●	MVS0437X35S060	153.6	6.047	171.8	6.764	174.8	6.953	224.8	8.850	224	8.819	0.8	.031	6	.236	7
					40	Int.	●	MVS0437X40S060	175.4	6.906	195.8	7.709	198.8	7.898	248.8	9.795	248	9.764	0.8	.031	6	.236	7

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0440X02S050	9.6	.378	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0440X02S060	9.6	.378	22.8	.898	24.5	.965	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					2	Int.	★	MVS0440X02S050PL	9.5	.374	22.7	.894	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	4
					2	Int.	●	MVS0440X02S060PL	9.5	.374	22.7	.894	24.4	.961	62.7	2.469	62	2.441	0.7	.028	6	.236	3
					3	Ext.	★	MVE0440X03S050	14.0	.551	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0440X03S060	14.0	.551	29.8	1.173	31.5	1.240	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0440X03S050	14.0	.551	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	6
					3	Int.	●	MVS0440X03S060	14.0	.551	25.8	1.016	27.5	1.083	86.8	3.417	86	3.386	0.8	.031	6	.236	5
					5	Int.	★	MVS0440X05S050	22.8	.898	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					5	Int.	●	MVS0440X05S060	22.8	.898	40.8	1.606	42.5	1.673	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					8	Int.	★	MVS0440X08S050	36.0	1.417	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					8	Int.	●	MVS0440X08S060	36.0	1.417	52.8	2.079	54.5	2.146	100.8	3.969	100	3.937	0.8	.031	6	.236	5
4.400	.1732		17		10	Int.	★	MVS0440X10S050	44.8	1.764	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5	.197	8
					10	Int.	●	MVS0440X10S060	44.8	1.764	59.8	2.354	64.5	2.539	112.8	4.441	112	4.409	0.8	.031	6	.236	7
					15	Int.	★	MVS0440X15S050	66.8	2.630	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5	.197	8
					15	Int.	●	MVS0440X15S060	66.8	2.630	81.8	3.220	86.5	3.406	134.8	5.307	134	5.276	0.8	.031	6	.236	7
					20	Int.	★	MVS0440X20S050	88.8	3.496	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5	.197	8
					20	Int.	●	MVS0440X20S060	88.8	3.496	104.8	4.126	109.5	4.311	157.8	6.213	157	6.181	0.8	.031	6	.236	7
					25	Int.	★	MVS0440X25S050	110.8	4.362	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5	.197	8
					25	Int.	●	MVS0440X25S060	110.8	4.362	126.8	4.992	131.5	5.177	179.8	7.079	179	7.047	0.8	.031	6	.236	7
					30	Int.	★	MVS0440X30S050	132.8	5.228	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5	.197	8
					30	Int.	●	MVS0440X30S060	132.8	5.228	149.8	5.898	154.5	6.083	202.8	7.984	202	7.953	0.8	.031	6	.236	7
					35	Int.	□	MVS0440X35S050	154.8	6.094	171.8	6.764	174.8	6.882	224.8	8.850	224	8.819	0.8	.031	5	.197	8
					35	Int.	□	MVS0440X35S060	154.8	6.094	171.8	6.764	176.5	6.949	224.8	8.850	224	8.819	0.8	.031	6	.236	7
					40	Int.	□	MVS0440X40S050	176.8	6.961	195.8	7.709	198.8	7.827	248.8	9.795	248	9.764	0.8	.031	5	.197	8
					40	Int.	□	MVS0440X40S060	176.8	6.961	195.8	7.709	200.5	7.894	248.8	9.795	248	9.764	0.8	.031	6	.236	7
					2	Ext.	★	MVE0450X02S050	9.8	.386	22.8	.898	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0450X02S060	9.8	.386	22.8	.898	24.4	.961	62.8	2.472	62	2.441	0.8	.031	6	.236	1
					2	Int.	★	MVS0450X02S050PL	9.7	.382	22.7	.894	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	4
					2	Int.	●	MVS0450X02S060PL	9.7	.382	22.7	.894	24.3	.957	62.7	2.469	62	2.441	0.7	.028	6	.236	3
					3	Ext.	★	MVE0450X03S050	14.3	.563	29.8	1.173	31.8	1.252	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0450X03S060	14.3	.563	29.8	1.173	31.4	1.236	68.8	2.709	68	2.677	0.8	.031	6	.236	1
					3	Int.	★	MVS0450X03S050	14.3	.563	25.8	1.016	25.8	1.016	86.8	3.417	86	3.386	0.8	.031	5	.197	6
					3	Int.	●	MVS0450X03S060	14.3	.563	25.8	1.016	27.4	1.079	86.8	3.417	86	3.386	0.8	.031	6	.236	5
					5	Int.	★	MVS0450X05S050	23.3	.917	40.8	1.606	40.8	1.606	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					5	Int.	●	MVS0450X05S060	23.3	.917	40.8	1.606	42.4	1.669	100.8	3.969	100	3.937	0.8	.031	6	.236	5
					8	Int.	★	MVS0450X08S050	36.8	1.449	52.8	2.079	52.8	2.079	100.8	3.969	100	3.937	0.8	.031	5	.197	6
					8	Int.	●	MVS0450X08S060	36.8	1.449	52.8	2.079	54.4	2.142	100.8	3.969	100	3.937	0.8	.031	6	.236	5
4.500	.1772		16	#12-24	10	Int.	★	MVS0450X10S050	45.8	1.803	59.8	2.354	62.8	2.472	112.8	4.441	112	4.409	0.8	.031	5	.197	8
					10	Int.	●	MVS0450X10S060	45.8	1.803	59.8	2.354	64.4	2.535	112.8	4.441	112	4.409	0.8	.031	6	.236	7
					15	Int.	★	MVS0450X15S050	68.3	2.689	81.8	3.220	84.8	3.339	134.8	5.307	134	5.276	0.8	.031	5	.197	8
					15	Int.	●	MVS0450X15S060	68.3	2.689	81.8	3.220	86.4	3.402	134.8	5.307	134	5.276	0.8	.031	6	.236	7
					20	Int.	★	MVS0450X20S050	90.8	3.575	104.8	4.126	107.8	4.244	157.8	6.213	157	6.181	0.8	.031	5	.197	8
					20	Int.	●	MVS0450X20S060	90.8	3.575	104.8	4.126	109.4	4.307	157.8	6.213	157	6.181	0.8	.031	6	.236	7
					25	Int.	★	MVS0450X25S050	113.3	4.461	126.8	4.992	129.8	5.110	179.8	7.079	179	7.047	0.8	.031	5	.197	8
					25	Int.	●	MVS0450X25S060	113.3	4.461	126.8	4.992	131.4	5.173	179.8	7.079	179	7.047	0.8	.031	6	.236	7
					30	Int.	★	MVS0450X30S050	135.8	5.346	149.8	5.898	152.8	6.016	202.8	7.984	202	7.953	0.8	.031	5	.197	8
					30	Int.	●	MVS0450X30S060	135.8	5.346	149.8	5.898	154.4	6.079	202.8	7.984	202	7.953	0.8	.031	6	.236	7
					35	Int.	★	MVS0450X35S050	158.3	6.232	171.8	6.764	174.8	6.882	224.8	8.850	224	8.819	0.8	.031	5	.197	8
					35	Int.	●	MVS0450X35S060	158.3	6.232	171.8	6.764	176.4	6.945	224.8	8.850	224	8.819	0.8	.031	6	.236	7
					40	Int.	★	MVS0450X40S050	180.8	7.118	195.8	7.709	198.8	7.827	248.8	9.795	248	9.764	0.8	.031	5	.197	8
					40	Int.	●	MVS0450X40S060	180.8	7.118	195.8	7.709	200.4	7.890	248.8	9.795	248	9.764	0.8	.031	6	.236	7

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.600	.1811				2	Ext.	★	MVE0460X02S050	10.0	.394	24.8	.976	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	2
					2	Ext.	●	MVE0460X02S060	10.0	.394	24.8	.976	27.8	1.094	62.8	2.472	62	2.441	0.8	.031	6	.236	2
					2	Int.	★	MVS0460X02S050PL	9.9	.390	24.7	.972	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	4
					2	Int.	●	MVS0460X02S060PL	9.9	.390	24.7	.972	27.7	1.091	62.7	2.469	62	2.441	0.7	.028	6	.236	4
					3	Ext.	★	MVE0460X03S050	14.6	.575	32.8	1.291	32.8	1.291	68.8	2.709	68	2.677	0.8	.031	5	.197	2
					3	Ext.	★	MVE0460X03S060	14.6	.575	32.8	1.291	35.8	1.409	68.8	2.709	68	2.677	0.8	.031	6	.236	2
					3	Int.	★	MVS0460X03S050	14.6	.575	28.3	1.114	28.3	1.114	90.8	3.575	90	3.543	0.8	.031	5	.197	6
					3	Int.	●	MVS0460X03S060	14.6	.575	28.3	1.114	31.3	1.232	90.8	3.575	90	3.543	0.8	.031	6	.236	6
					5	Int.	★	MVS0460X05S050	23.8	.937	44.8	1.764	44.8	1.764	105.8	4.165	105	4.134	0.8	.031	5	.197	6
					5	Int.	●	MVS0460X05S060	23.8	.937	44.8	1.764	47.8	1.882	105.8	4.165	105	4.134	0.8	.031	6	.236	6
					8	Int.	★	MVS0460X08S050	37.6	1.480	57.8	2.276	57.8	2.276	105.8	4.165	105	4.134	0.8	.031	5	.197	6
					8	Int.	●	MVS0460X08S060	37.6	1.480	57.8	2.276	60.8	2.394	105.8	4.165	105	4.134	0.8	.031	6	.236	6
					10	Int.	★	MVS0460X10S050	46.8	1.843	65.8	2.591	68.8	2.709	118.8	4.677	118	4.646	0.8	.031	5	.197	8
					10	Int.	●	MVS0460X10S060	46.8	1.843	65.8	2.591	68.8	2.709	118.8	4.677	118	4.646	0.8	.031	6	.236	8
					15	Int.	★	MVS0460X15S050	69.8	2.748	90.8	3.575	93.8	3.693	143.8	5.661	143	5.630	0.8	.031	5	.197	8
					15	Int.	●	MVS0460X15S060	69.8	2.748	90.8	3.575	93.8	3.693	143.8	5.661	143	5.630	0.8	.031	6	.236	8
					20	Int.	★	MVS0460X20S050	92.8	3.654	115.8	4.559	118.8	4.677	168.8	6.646	168	6.614	0.8	.031	5	.197	8
					20	Int.	●	MVS0460X20S060	92.8	3.654	115.8	4.559	118.8	4.677	168.8	6.646	168	6.614	0.8	.031	6	.236	8
					25	Int.	★	MVS0460X25S050	115.8	4.559	140.8	5.543	143.8	5.661	193.8	7.630	193	7.598	0.8	.031	5	.197	8
					25	Int.	●	MVS0460X25S060	115.8	4.559	140.8	5.543	143.8	5.661	193.8	7.630	193	7.598	0.8	.031	6	.236	8
					30	Int.	★	MVS0460X30S050	138.8	5.465	165.8	6.528	168.8	6.646	218.8	8.614	218	8.583	0.8	.031	5	.197	8
					30	Int.	●	MVS0460X30S060	138.8	5.465	165.8	6.528	168.8	6.646	218.8	8.614	218	8.583	0.8	.031	6	.236	8
					35	Int.	□	MVS0460X35S050	161.8	6.370	190.8	7.512	193.8	7.630	243.8	9.598	243	9.567	0.8	.031	5	.197	8
					35	Int.	□	MVS0460X35S060	161.8	6.370	190.8	7.512	193.8	7.630	243.8	9.598	243	9.567	0.8	.031	6	.236	8
					40	Int.	□	MVS0460X40S050	184.8	7.276	215.8	8.496	218.8	8.614	268.8	10.583	268	10.551	0.8	.031	5	.197	8
					40	Int.	□	MVS0460X40S060	184.8	7.276	215.8	8.496	218.8	8.614	268.8	10.583	268	10.551	0.8	.031	6	.236	8
4.700	.1850		13		2	Ext.	★	MVE0470X02S050	10.3	.406	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0470X02S060	10.3	.406	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					2	Int.	★	MVS0470X02S050PL	10.1	.398	24.7	.972	24.7	.972	62.7	2.469	62	2.441	0.7	.028	5	.197	4
					2	Int.	●	MVS0470X02S060PL	10.1	.398	24.7	.972	27.7	1.091	62.7	2.469	62	2.441	0.7	.028	6	.236	4
					3	Ext.	★	MVE0470X03S050	15.0	.591	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0470X03S060	15.0	.591	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0470X03S050	15.0	.591	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	6
					3	Int.	●	MVS0470X03S060	15.0	.591	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	6
					5	Int.	★	MVS0470X05S050	24.4	.961	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					5	Int.	●	MVS0470X05S060	24.4	.961	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					8	Int.	★	MVS0470X08S050	38.5	1.516	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					8	Int.	●	MVS0470X08S060	38.5	1.516	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					10	Int.	★	MVS0470X10S050	47.9	1.886	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5	.197	8
					10	Int.	●	MVS0470X10S060	47.9	1.886	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	6	.236	8
					15	Int.	★	MVS0470X15S050	71.4	2.811	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5	.197	8
					15	Int.	●	MVS0470X15S060	71.4	2.811	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	6	.236	8
					20	Int.	★	MVS0470X20S050	94.9	3.736	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5	.197	8
					20	Int.	●	MVS0470X20S060	94.9	3.736	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	6	.236	8
					25	Int.	★	MVS0470X25S050	118.4	4.661	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5	.197	8
					25	Int.	●	MVS0470X25S060	118.4	4.661	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	6	.236	8
					30	Int.	★	MVS0470X30S050	141.9	5.587	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5	.197	8
					30	Int.	●	MVS0470X30S060	141.9	5.587	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	6	.236	8
					35	Int.	□	MVS0470X35S050	165.4	6.512	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	5	.197	8
					35	Int.	□	MVS0470X35S060	165.4	6.512	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	6	.236	8
					40	Int.	□	MVS0470X40S050	188.9	7.437	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	5	.197	8
					40	Int.	□	MVS0470X40S060	188.9	7.437	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	6	.236	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.763	.1875	3/16			2	Ext.	●	MVE0476X02S060	10.3	.406	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					2	Int.	●	MVS0476X02S060PL	10.3	.406	24.8	.976	27.8	1.094	62.8	2.472	62	2.441	0.8	.031	6	.236	4
					3	Int.	●	MVS0476X03S060	15.1	.594	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	6
					5	Int.	●	MVS0476X05S060	24.7	.972	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					8	Int.	●	MVS0476X08S060	39.0	1.535	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					10	Int.	●	MVS0476X10S060	48.5	1.909	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	6	.236	8
					15	Int.	●	MVS0476X15S060	72.3	2.846	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	6	.236	8
					20	Int.	●	MVS0476X20S060	96.1	3.783	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	6	.236	8
					25	Int.	●	MVS0476X25S060	119.9	4.720	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	6	.236	8
					30	Int.	●	MVS0476X30S060	143.7	5.657	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	6	.236	8
					35	Int.	●	MVS0476X35S060	167.6	6.598	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	6	.236	8
					40	Int.	●	MVS0476X40S060	191.4	7.535	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	6	.236	8
4.800	.1890		12		2	Ext.	★	MVE0480X02S050	10.5	.413	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0480X02S060	10.5	.413	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					2	Int.	★	MVS0480X02S050PL	10.4	.409	24.8	.976	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	4
					2	Int.	●	MVS0480X02S060PL	10.4	.409	24.8	.976	27.8	1.094	62.8	2.472	62	2.441	0.8	.031	6	.236	4
					3	Ext.	★	MVE0480X03S050	15.3	.602	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0480X03S060	15.3	.602	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0480X03S050	15.3	.602	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	6
					3	Int.	●	MVS0480X03S060	15.3	.602	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	6
					5	Int.	★	MVS0480X05S050	24.9	.980	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					5	Int.	●	MVS0480X05S060	24.9	.980	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					8	Int.	★	MVS0480X08S050	39.3	1.547	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					8	Int.	●	MVS0480X08S060	39.3	1.547	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					10	Int.	★	MVS0480X10S050	48.9	1.925	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5	.197	8
					10	Int.	●	MVS0480X10S060	48.9	1.925	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	6	.236	8
					15	Int.	★	MVS0480X15S050	72.9	2.870	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5	.197	8
					15	Int.	●	MVS0480X15S060	72.9	2.870	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	6	.236	8
					20	Int.	★	MVS0480X20S050	96.9	3.815	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5	.197	8
					20	Int.	●	MVS0480X20S060	96.9	3.815	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	6	.236	8
					25	Int.	★	MVS0480X25S050	120.9	4.760	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5	.197	8
					25	Int.	●	MVS0480X25S060	120.9	4.760	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	6	.236	8
					30	Int.	★	MVS0480X30S050	144.9	5.705	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5	.197	8
					30	Int.	●	MVS0480X30S060	144.9	5.705	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	6	.236	8
					35	Int.	□	MVS0480X35S050	168.9	6.650	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	5	.197	8
					35	Int.	□	MVS0480X35S060	168.9	6.650	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	6	.236	8
					40	Int.	□	MVS0480X40S050	192.9	7.594	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	5	.197	8
					40	Int.	□	MVS0480X40S060	192.9	7.594	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	6	.236	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.900	.1929				2	Ext.	★	MVE0490X02S050	10.7	.421	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0490X02S060	10.7	.421	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					2	Int.	★	MVS0490X02S050PL	10.6	.417	24.8	.976	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	4
					2	Int.	●	MVS0490X02S060PL	10.6	.417	24.8	.976	27.8	1.094	62.8	2.472	62	2.441	0.8	.031	6	.236	4
					3	Ext.	★	MVE0490X03S050	15.6	.614	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0490X03S060	15.6	.614	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0490X03S050	15.6	.614	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	6
					3	Int.	●	MVS0490X03S060	15.6	.614	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	6
					5	Int.	★	MVS0490X05S050	25.4	1.000	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					5	Int.	●	MVS0490X05S060	25.4	1.000	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					8	Int.	★	MVS0490X08S050	40.1	1.579	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					8	Int.	●	MVS0490X08S060	40.1	1.579	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					10	Int.	★	MVS0490X10S050	49.9	1.965	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5	.197	8
					10	Int.	●	MVS0490X10S060	49.9	1.965	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	6	.236	8
					15	Int.	★	MVS0490X15S050	74.4	2.929	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5	.197	8
					15	Int.	●	MVS0490X15S060	74.4	2.929	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	6	.236	8
					20	Int.	★	MVS0490X20S050	98.9	3.894	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5	.197	8
					20	Int.	●	MVS0490X20S060	98.9	3.894	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	6	.236	8
					25	Int.	★	MVS0490X25S050	123.4	4.858	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5	.197	8
					25	Int.	●	MVS0490X25S060	123.4	4.858	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	6	.236	8
					30	Int.	★	MVS0490X30S050	147.9	5.823	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5	.197	8
					30	Int.	●	MVS0490X30S060	147.9	5.823	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	6	.236	8
					35	Int.	□	MVS0490X35S050	172.4	6.787	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	5	.197	8
					35	Int.	□	MVS0490X35S060	172.4	6.787	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	6	.236	8
					40	Int.	□	MVS0490X40S050	196.9	7.752	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	5	.197	8
					40	Int.	□	MVS0490X40S060	196.9	7.752	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	6	.236	8
5.000	.1969			M6x1.0	2	Ext.	★	MVE0500X02S050	10.9	.429	24.9	.980	24.9	.980	62.9	2.476	62	2.441	0.9	.035	5	.197	2
					2	Ext.	●	MVE0500X02S060	10.9	.429	24.9	.980	27.9	1.098	62.9	2.476	62	2.441	0.9	.035	6	.236	2
					2	Int.	★	MVS0500X02S050PL	10.8	.425	24.8	.976	24.8	.976	62.8	2.472	62	2.441	0.8	.031	5	.197	4
					2	Int.	●	MVS0500X02S060PL	10.8	.425	24.8	.976	24.8	.976	62.8	2.472	62	2.441	0.8	.031	6	.236	4
					3	Ext.	★	MVE0500X03S050	15.9	.626	32.9	1.295	32.9	1.295	68.9	2.713	68	2.677	0.9	.035	5	.197	2
					3	Ext.	★	MVE0500X03S060	15.9	.626	32.9	1.295	35.9	1.413	68.9	2.713	68	2.677	0.9	.035	6	.236	2
					3	Int.	★	MVS0500X03S050	15.9	.626	28.4	1.118	28.4	1.118	90.9	3.579	90	3.543	0.9	.035	5	.197	6
					3	Int.	●	MVS0500X03S060	15.9	.626	28.4	1.118	31.4	1.236	90.9	3.579	90	3.543	0.9	.035	6	.236	6
					5	Int.	★	MVS0500X05S050	25.9	1.020	44.9	1.768	44.9	1.768	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					5	Int.	●	MVS0500X05S060	25.9	1.020	44.9	1.768	47.9	1.886	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					8	Int.	★	MVS0500X08S050	40.9	1.610	57.9	2.280	57.9	2.280	105.9	4.169	105	4.134	0.9	.035	5	.197	6
					8	Int.	●	MVS0500X08S060	40.9	1.610	57.9	2.280	60.9	2.398	105.9	4.169	105	4.134	0.9	.035	6	.236	6
					10	Int.	★	MVS0500X10S050	50.9	2.004	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	5	.197	8
					10	Int.	●	MVS0500X10S060	50.9	2.004	65.9	2.594	68.9	2.713	118.9	4.681	118	4.646	0.9	.035	6	.236	8
					15	Int.	★	MVS0500X15S050	75.9	2.988	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	5	.197	8
					15	Int.	●	MVS0500X15S060	75.9	2.988	90.9	3.579	93.9	3.697	143.9	5.665	143	5.630	0.9	.035	6	.236	8
					20	Int.	★	MVS0500X20S050	100.9	3.972	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	5	.197	8
					20	Int.	●	MVS0500X20S060	100.9	3.972	115.9	4.563	118.9	4.681	168.9	6.650	168	6.614	0.9	.035	6	.236	8
					25	Int.	★	MVS0500X25S050	125.9	4.957	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	5	.197	8
					25	Int.	●	MVS0500X25S060	125.9	4.957	140.9	5.547	143.9	5.665	193.9	7.634	193	7.598	0.9	.035	6	.236	8
					30	Int.	★	MVS0500X30S050	150.9	5.941	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	5	.197	8
					30	Int.	●	MVS0500X30S060	150.9	5.941	165.9	6.531	168.9	6.650	218.9	8.618	218	8.583	0.9	.035	6	.236	8
					35	Int.	★	MVS0500X35S050	175.9	6.925	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	5	.197	8
					35	Int.	●	MVS0500X35S060	175.9	6.925	190.9	7.516	193.9	7.634	243.9	9.602	243	9.567	0.9	.035	6	.236	8
					40	Int.	★	MVS0500X40S050	200.9	7.909	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	5	.197	8
					40	Int.	●	MVS0500X40S060	200.9	7.909	215.9	8.500	218.9	8.618	268.9	10.587	268	10.551	0.9	.035	6	.236	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0510X02S060	11.1	.437	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	2
					2	Int.	●	MVS0510X02S060PL	11.0	.433	26.8	1.055	28.8	1.134	66.8	2.630	66	2.598	0.8	.031	6	.236	4
					3	Ext.	★	MVE0510X03S060	16.2	.638	34.9	1.374	36.9	1.453	74.9	2.949	74	2.913	0.9	.035	6	.236	2
					3	Int.	●	MVS0510X03S060	16.2	.638	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6	.236	6
					5	Int.	●	MVS0510X05S060	26.4	1.039	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6	.236	6
					8	Int.	●	MVS0510X08S060	41.7	1.642	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	6	.236	6
5.100	.2008		7	1/4-20	10	Int.	●	MVS0510X10S060	51.9	2.043	72.9	2.870	75.9	2.988	127.9	5.035	127	5.000	0.9	.035	6	.236	8
					15	Int.	●	MVS0510X15S060	77.4	3.047	99.9	3.933	102.9	4.051	154.9	6.098	154	6.063	0.9	.035	6	.236	8
					20	Int.	★	MVS0510X20S060	102.9	4.051	127.9	5.035	130.9	5.154	182.9	7.201	182	7.165	0.9	.035	6	.236	8
					25	Int.	★	MVS0510X25S060	128.4	5.055	154.9	6.098	157.9	6.217	209.9	8.264	209	8.228	0.9	.035	6	.236	8
					30	Int.	★	MVS0510X30S060	153.9	6.059	182.9	7.201	185.9	7.319	237.9	9.366	237	9.331	0.9	.035	6	.236	8
					35	Int.	□	MVS0510X35S060	179.4	7.063	209.9	8.264	212.9	8.382	264.9	10.429	264	10.394	0.9	.035	6	.236	8
					40	Int.	□	MVS0510X40S060	204.9	8.067	240.9	9.484	243.9	9.602	295.9	11.650	295	11.614	0.9	.035	6	.236	8
					2	Ext.	●	MVE0516X02S060	11.2	.441	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	2
					2	Int.	●	MVS0516X02S060PL	11.2	.441	26.8	1.055	28.8	1.134	66.8	2.630	66	2.598	0.8	.031	6	.236	4
					3	Int.	●	MVS0516X03S060	16.4	.646	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6	.236	6
					5	Int.	●	MVS0516X05S060	26.7	1.051	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6	.236	6
					8	Int.	●	MVS0516X08S060	42.2	1.661	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	6	.236	6
5.160	.2032	13/64			10	Int.	●	MVS0516X10S060	52.5	2.067	72.9	2.870	75.9	2.988	127.9	5.035	127	5.000	0.9	.035	6	.236	8
					15	Int.	●	MVS0516X15S060	78.3	3.083	99.9	3.933	102.9	4.051	154.9	6.098	154	6.063	0.9	.035	6	.236	8
					20	Int.	●	MVS0516X20S060	104.1	4.098	127.9	5.035	130.9	5.154	182.9	7.201	182	7.165	0.9	.035	6	.236	8
					25	Int.	●	MVS0516X25S060	129.9	5.114	154.9	6.098	157.9	6.217	209.9	8.264	209	8.228	0.9	.035	6	.236	8
					30	Int.	●	MVS0516X30S060	155.7	6.130	182.9	7.201	185.9	7.319	237.9	9.366	237	9.331	0.9	.035	6	.236	8
					35	Int.	●	MVS0516X35S060	181.5	7.146	209.9	8.264	212.9	8.382	264.9	10.429	264	10.394	0.9	.035	6	.236	8
					40	Int.	●	MVS0516X40S060	207.3	8.161	240.9	9.484	243.9	9.602	295.9	11.650	295	11.614	0.9	.035	6	.236	8
					2	Ext.	●	MVE0520X02S060	11.3	.445	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	2
					2	Int.	●	MVS0520X02S060PL	11.2	.441	26.8	1.055	28.8	1.134	66.8	2.630	66	2.598	0.8	.031	6	.236	4
					3	Ext.	★	MVE0520X03S060	16.5	.650	34.9	1.374	36.9	1.453	74.9	2.949	74	2.913	0.9	.035	6	.236	2
					3	Int.	●	MVS0520X03S060	16.5	.650	28.4	1.118	30.9	1.217	82.9	3.264	82	3.228	0.9	.035	6	.236	6
					5	Int.	●	MVS0520X05S060	26.9	1.059	44.9	1.768	48.9	1.925	100.9	3.972	100	3.937	0.9	.035	6	.236	6
					8	Int.	●	MVS0520X08S060	42.5	1.673	61.9	2.437	66.9	2.634	118.9	4.681	118	4.646	0.9	.035	6	.236	6
5.200	.2047				10	Int.	●	MVS0520X10S060	52.9	2.083	72.9	2.870	75.9	2.992	127.9	5.035	127	5.000	0.9	.035	6	.236	8
					15	Int.	●	MVS0520X15S060	78.9	3.106	99.9	3.933	102.9	4.051	154.9	6.098	154	6.063	0.9	.035	6	.236	8
					20	Int.	★	MVS0520X20S060	104.9	4.130	127.9	5.035	130.9	5.157	182.9	7.201	182	7.165	0.9	.035	6	.236	8
					25	Int.	★	MVS0520X25S060	130.9	5.154	154.9	6.098	157.9	6.217	209.9	8.264	209	8.228	0.9	.035	6	.236	8
					30	Int.	★	MVS0520X30S060	156.9	6.177	182.9	7.201	185.9	7.319	237.9	9.366	237	9.331	0.9	.035	6	.236	8
					35	Int.	□	MVS0520X35S060	182.9	7.201	209.9	8.264	212.9	8.386	264.9	10.429	264	10.394	0.9	.035	6	.236	8
					40	Int.	□	MVS0520X40S060	208.9	8.224	240.9	9.484	243.9	9.606	295.9	11.650	295	11.614	0.9	.035	6	.236	8
					2	Ext.	●	MVE0530X02S060	11.6	.457	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					2	Int.	●	MVS0530X02S060PL	11.4	.449	26.8	1.055	28.8	1.134	66.8	2.630	66	2.598	0.8	.031	6	.236	4
					3	Ext.	★	MVE0530X03S060	16.9	.665	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0530X03S060	16.9	.665	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	6
					5	Int.	●	MVS0530X05S060	27.5	1.083	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	6
					8	Int.	●	MVS0530X08S060	43.4	1.709	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	6
5.300	.2087		4		10	Int.	●	MVS0530X10S060	54.0	2.126	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6	.236	8
					15	Int.	●	MVS0530X15S060	80.5	3.169	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6	.236	8
					20	Int.	★	MVS0530X20S060	107.0	4.213	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6	.236	8
					25	Int.	★	MVS0530X25S060	133.5	5.256	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6	.236	8
					30	Int.	★	MVS0530X30S060	160.0	6.299	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6	.236	8
					35	Int.	□	MVS0530X35S060	186.5	7.343	210.0	8.268	213.0	8.386	265.0	10.433	264	10.394	1.0	.039	6	.236	8
					40	Int.	□	MVS0530X40S060	213.0	8.386	241.0	9.488	244.0	9.606	296.0	11.654	295	11.614	1.0	.039	6	.236	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0540X02S060	11.8	.465	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					2	Int.	●	MVS0540X02S060PL	11.7	.461	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0540X03S060	17.2	.677	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0540X03S060	17.2	.677	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	6
					5	Int.	●	MVS0540X05S060	28.0	1.102	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	6
					8	Int.	●	MVS0540X08S060	44.2	1.740	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	6
5.400	.2126		3	1/4-28	10	Int.	★	MVS0540X10S060	55.0	2.165	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6	.236	8
					15	Int.	●	MVS0540X15S060	82.0	3.228	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6	.236	8
					20	Int.	★	MVS0540X20S060	109.0	4.291	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6	.236	8
					25	Int.	★	MVS0540X25S060	136.0	5.354	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6	.236	8
					30	Int.	★	MVS0540X30S060	163.0	6.417	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6	.236	8
					35	Int.	□	MVS0540X35S060	190.0	7.480	210.0	8.268	213.0	8.386	265.0	10.433	264	10.394	1.0	.039	6	.236	8
					40	Int.	□	MVS0540X40S060	217.0	8.543	241.0	9.488	244.0	9.606	296.0	11.654	295	11.614	1.0	.039	6	.236	8
					2	Ext.	●	MVE0550X02S060	12.0	.472	27.0	1.063	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					2	Int.	●	MVS0550X02S060PL	11.9	.469	26.9	1.059	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0550X03S060	17.5	.689	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0550X03S060	17.5	.689	28.5	1.122	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	6
					5	Int.	●	MVS0550X05S060	28.5	1.122	45.0	1.772	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	6
					8	Int.	●	MVS0550X08S060	45.0	1.772	62.0	2.441	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	6
5.500	.2165				10	Int.	●	MVS0550X10S060	56.0	2.205	73.0	2.874	76.0	2.992	128.0	5.039	127	5.000	1.0	.039	6	.236	8
					15	Int.	★	MVS0550X15S060	83.5	3.287	100.0	3.937	103.0	4.055	155.0	6.102	154	6.063	1.0	.039	6	.236	8
					20	Int.	●	MVS0550X20S060	111.0	4.370	128.0	5.039	131.0	5.157	183.0	7.205	182	7.165	1.0	.039	6	.236	8
					25	Int.	●	MVS0550X25S060	138.5	5.453	155.0	6.102	158.0	6.220	210.0	8.268	209	8.228	1.0	.039	6	.236	8
					30	Int.	★	MVS0550X30S060	166.0	6.535	183.0	7.205	186.0	7.323	238.0	9.370	237	9.331	1.0	.039	6	.236	8
					35	Int.	●	MVS0550X35S060	193.5	7.618	210.0	8.268	213.0	8.386	265.0	10.433	264	10.394	1.0	.039	6	.236	8
					40	Int.	●	MVS0550X40S060	221.0	8.701	241.0	9.488	244.0	9.606	296.0	11.654	295	11.614	1.0	.039	6	.236	8
					2	Ext.	●	MVE0556X02S060	12.1	.476	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					2	Int.	●	MVS0556X02S060PL	12.1	.476	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Int.	●	MVS0556X03S060	17.7	.697	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	6
					5	Int.	●	MVS0556X05S060	28.8	1.134	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	6
					8	Int.	●	MVS0556X08S060	45.5	1.791	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	6
					10	Int.	●	MVS0556X10S060	56.6	2.228	79.0	3.110	82.0	3.228	134.0	5.276	133	5.236	1.0	.039	6	.236	8
5.557	.2188	7/32			15	Int.	●	MVS0556X15S060	84.4	3.323	109.0	4.291	112.0	4.409	164.0	6.457	163	6.417	1.0	.039	6	.236	8
					20	Int.	●	MVS0556X20S060	112.2	4.417	139.0	5.472	142.0	5.591	194.0	7.638	193	7.598	1.0	.039	6	.236	8
					25	Int.	●	MVS0556X25S060	140.0	5.512	169.0	6.654	172.0	6.772	224.0	8.819	223	8.780	1.0	.039	6	.236	8
					30	Int.	●	MVS0556X30S060	167.7	6.602	199.0	7.835	202.0	7.953	254.0	10.000	253	9.961	1.0	.039	6	.236	8
					35	Int.	●	MVS0556X35S060	195.5	7.697	229.0	9.016	232.0	9.134	284.0	11.181	283	11.142	1.0	.039	6	.236	8
					40	Int.	●	MVS0556X40S060	223.3	8.791	261.0	10.276	264.0	10.394	316.0	12.441	315	12.402	1.0	.039	6	.236	8
					2	Ext.	●	MVE0560X02S060	12.2	.480	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					2	Int.	●	MVS0560X02S060PL	12.1	.476	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0560X03S060	17.8	.701	37.0	1.457	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0560X03S060	17.8	.701	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	6
					5	Int.	●	MVS0560X05S060	29.0	1.142	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	6
					8	Int.	●	MVS0560X08S060	45.8	1.803	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	6
5.600	.2205		2		10	Int.	★	MVS0560X10S060	57.0	2.244	79.0	3.110	82.0	3.228	134.0	5.276	133	5.236	1.0	.039	6	.236	8
					15	Int.	★	MVS0560X15S060	85.0	3.346	109.0	4.291	112.0	4.409	164.0	6.457	163	6.417	1.0	.039	6	.236	8
					20	Int.	★	MVS0560X20S060	113.0	4.449	139.0	5.472	142.0	5.591	194.0	7.638	193	7.598	1.0	.039	6	.236	8
					25	Int.	★	MVS0560X25S060	141.0	5.551	169.0	6.654	172.0	6.772	224.0	8.819	223	8.780	1.0	.039	6	.236	8
					30	Int.	★	MVS0560X30S060	169.0	6.654	199.0	7.835	202.0	7.953	254.0	10.000	253	9.961	1.0	.039	6	.236	8
					35	Int.	□	MVS0560X35S060	197.0	7.756	229.0	9.016	232.0	9.134	284.0	11.181	283	11.142	1.0	.039	6	.236	8
					40	Int.	□	MVS0560X40S060	225.0	8.858	261.0	10.276	264.0	10.394	316.0	12.441	315	12.402	1.0	.039	6	.236	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of ø5.9mm or less will be round shape.

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0570X02S060	12.4	.488	29.0	1.142	29.0	1.142	67.0	2.638	66	2.598	1.0	.039	6	.236	2
					2	Int.	●	MVS0570X02S060PL	12.3	.484	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0570X03S060	18.1	.713	37.0	1.457	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	6	.236	2
					3	Int.	●	MVS0570X03S060	18.1	.713	31.0	1.220	31.0	1.220	83.0	3.268	82	3.228	1.0	.039	6	.236	6
					5	Int.	●	MVS0570X05S060	29.5	1.161	49.0	1.929	49.0	1.929	101.0	3.976	100	3.937	1.0	.039	6	.236	6
					8	Int.	●	MVS0570X08S060	46.6	1.835	67.0	2.638	67.0	2.638	119.0	4.685	118	4.646	1.0	.039	6	.236	6
5.700	.2244				10	Int.	●	MVS0570X10S060	58.0	2.283	79.0	3.110	82.0	3.228	134.0	5.276	133	5.236	1.0	.039	6	.236	8
					15	Int.	●	MVS0570X15S060	86.5	3.406	109.0	4.291	112.0	4.409	164.0	6.457	163	6.417	1.0	.039	6	.236	8
					20	Int.	●	MVS0570X20S060	115.0	4.528	139.0	5.472	142.0	5.591	194.0	7.638	193	7.598	1.0	.039	6	.236	8
					25	Int.	★	MVS0570X25S060	143.5	5.650	169.0	6.654	172.0	6.772	224.0	8.819	223	8.780	1.0	.039	6	.236	8
					30	Int.	★	MVS0570X30S060	172.0	6.772	199.0	7.835	202.0	7.953	254.0	10.000	253	9.961	1.0	.039	6	.236	8
					35	Int.	□	MVS0570X35S060	200.5	7.894	229.0	9.016	232.0	9.134	284.0	11.181	283	11.142	1.0	.039	6	.236	8
					40	Int.	□	MVS0570X40S060	229.0	9.016	261.0	10.276	264.0	10.394	316.0	12.441	315	12.402	1.0	.039	6	.236	8
					2	Ext.	●	MVE0580X02S060	12.7	.500	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					2	Int.	●	MVS0580X02S060PL	12.5	.492	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0580X03S060	18.5	.728	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	6	.236	2
					3	Int.	●	MVS0580X03S060	18.5	.728	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	6
					5	Int.	●	MVS0580X05S060	30.1	1.185	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	6
					8	Int.	●	MVS0580X08S060	47.5	1.870	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	6
5.800	.2283		1		10	Int.	●	MVS0580X10S060	59.1	2.327	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6	.236	8
					15	Int.	★	MVS0580X15S060	88.1	3.469	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6	.236	8
					20	Int.	●	MVS0580X20S060	117.1	4.610	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6	.236	8
					25	Int.	★	MVS0580X25S060	146.1	5.752	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6	.236	8
					30	Int.	★	MVS0580X30S060	175.1	6.894	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6	.236	8
					35	Int.	□	MVS0580X35S060	204.1	8.035	229.1	9.020	232.1	9.138	284.1	11.185	283	11.142	1.1	.043	6	.236	8
					40	Int.	□	MVS0580X40S060	233.1	9.177	261.1	10.280	264.1	10.398	316.1	12.445	315	12.402	1.1	.043	6	.236	8
					2	Ext.	●	MVE0590X02S060	12.9	.508	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					2	Int.	●	MVS0590X02S060PL	12.7	.500	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0590X03S060	18.8	.740	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	6	.236	2
					3	Int.	●	MVS0590X03S060	18.8	.740	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	6
					5	Int.	●	MVS0590X05S060	30.6	1.205	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	6
					8	Int.	●	MVS0590X08S060	48.3	1.902	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	6
5.900	.2323				10	Int.	★	MVS0590X10S060	60.1	2.366	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6	.236	8
					15	Int.	★	MVS0590X15S060	89.6	3.528	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6	.236	8
					20	Int.	★	MVS0590X20S060	119.1	4.689	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6	.236	8
					25	Int.	★	MVS0590X25S060	148.6	5.850	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6	.236	8
					30	Int.	★	MVS0590X30S060	178.1	7.012	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6	.236	8
					35	Int.	□	MVS0590X35S060	207.6	8.173	229.1	9.020	232.1	9.138	284.1	11.185	283	11.142	1.1	.043	6	.236	8
					40	Int.	□	MVS0590X40S060	237.1	9.335	261.1	10.280	264.1	10.398	316.1	12.445	315	12.402	1.1	.043	6	.236	8
					2	Ext.	●	MVE0595X02S060	12.9	.508	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					2	Int.	●	MVS0595X02S060PL	12.9	.508	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Int.	●	MVS0595X03S060	18.9	.744	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	6
					5	Int.	●	MVS0595X05S060	30.8	1.213	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	6
					8	Int.	●	MVS0595X08S060	48.7	1.917	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	6
					10	Int.	●	MVS0595X10S060	60.6	2.386	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6	.236	8
5.954	.2344	15/64	A		15	Int.	●	MVS0595X15S060	90.4	3.559	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6	.236	8
					20	Int.	●	MVS0595X20S060	120.2	4.732	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6	.236	8
					25	Int.	●	MVS0595X25S060	149.9	5.902	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6	.236	8
					30	Int.	●	MVS0595X30S060	179.7	7.075	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6	.236	8
					35	Int.	●	MVS0595X35S060	209.5	8.248	229.1	9.020	232.1	9.138	284.1	11.185	283	11.142	1.1	.043	6	.236	8
					40	Int.	●	MVS0595X40S060	239.2	9.417	261.1	10.280	264.1	10.398	316.1	12.445	315	12.402	1.1	.043	6	.236	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.000	.2362			M7x1.0	2	Ext.	●	MVE0600X02S060	13.1	.516	29.1	1.146	29.1	1.146	67.1	2.642	66	2.598	1.1	.043	6	.236	2
					2	Int.	●	MVS0600X02S060PL	12.9	.508	28.9	1.138	28.9	1.138	66.9	2.634	66	2.598	0.9	.035	6	.236	4
					3	Ext.	★	MVE0600X03S060	19.1	.752	37.1	1.461	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	6	.236	2
					3	Int.	●	MVS0600X03S060	19.1	.752	31.1	1.224	31.1	1.224	83.1	3.272	82	3.228	1.1	.043	6	.236	6
					5	Int.	●	MVS0600X05S060	31.1	1.224	49.1	1.933	49.1	1.933	101.1	3.980	100	3.937	1.1	.043	6	.236	6
					8	Int.	●	MVS0600X08S060	49.1	1.933	67.1	2.642	67.1	2.642	119.1	4.689	118	4.646	1.1	.043	6	.236	6
					10	Int.	●	MVS0600X10S060	61.1	2.406	79.1	3.114	82.1	3.232	134.1	5.280	133	5.236	1.1	.043	6	.236	8
					15	Int.	●	MVS0600X15S060	91.1	3.587	109.1	4.295	112.1	4.413	164.1	6.461	163	6.417	1.1	.043	6	.236	8
					20	Int.	●	MVS0600X20S060	121.1	4.768	139.1	5.476	142.1	5.594	194.1	7.642	193	7.598	1.1	.043	6	.236	8
					25	Int.	●	MVS0600X25S060	151.1	5.949	169.1	6.657	172.1	6.776	224.1	8.823	223	8.780	1.1	.043	6	.236	8
					30	Int.	●	MVS0600X30S060	181.1	7.130	199.1	7.839	202.1	7.957	254.1	10.004	253	9.961	1.1	.043	6	.236	8
					35	Int.	●	MVS0600X35S060	211.1	8.311	229.1	9.020	232.1	9.138	284.1	11.185	283	11.142	1.1	.043	6	.236	8
					40	Int.	●	MVS0600X40S060	241.1	9.492	261.1	10.280	264.1	10.398	316.1	12.445	315	12.402	1.1	.043	6	.236	8
6.100	.2402				2	Ext.	★	MVE0610X02S070	13.3	.524	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	2
					2	Ext.	●	MVE0610X02S080	13.3	.524	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	8	.315	2
					2	Int.	★	MVS0610X02S070PL	13.2	.520	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	7	.276	4
					2	Int.	●	MVS0610X02S080PL	13.2	.520	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Ext.	★	MVE0610X03S070	19.4	.764	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	7	.276	2
					3	Ext.	★	MVE0610X03S080	19.4	.764	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	8	.315	2
					3	Int.	★	MVS0610X03S070	19.4	.764	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7	.276	6
					3	Int.	●	MVS0610X03S080	19.4	.764	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	8	.315	6
					5	Int.	★	MVS0610X05S070	31.6	1.244	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7	.276	6
					5	Int.	●	MVS0610X05S080	31.6	1.244	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	8	.315	6
					8	Int.	★	MVS0610X08S070	49.9	1.965	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7	.276	6
					8	Int.	●	MVS0610X08S080	49.9	1.965	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	8	.315	6
					10	Int.	★	MVS0610X10S070	62.1	2.445	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	7	.276	8
					10	Int.	●	MVS0610X10S080	62.1	2.445	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	8	.315	8
					15	Int.	★	MVS0610X15S070	92.6	3.646	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	7	.276	8
					15	Int.	●	MVS0610X15S080	92.6	3.646	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	8	.315	8
					20	Int.	★	MVS0610X20S070	123.1	4.846	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	7	.276	8
					20	Int.	●	MVS0610X20S080	123.1	4.846	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	8	.315	8
					25	Int.	★	MVS0610X25S070	153.6	6.047	183.1	7.209	186.1	7.327	239.1	9.413	238	9.370	1.1	.043	7	.276	8
					25	Int.	●	MVS0610X25S080	153.6	6.047	183.1	7.209	186.1	7.327	239.1	9.413	238	9.370	1.1	.043	8	.315	8
					30	Int.	★	MVS0610X30S070	184.1	7.248	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	7	.276	8
					30	Int.	●	MVS0610X30S080	184.1	7.248	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	8	.315	8
					35	Int.	□	MVS0610X35S070	214.6	8.449	248.1	9.768	253.1	9.965	306.1	12.051	305	12.008	1.1	.043	7	.276	8
					35	Int.	□	MVS0610X35S080	214.6	8.449	248.1	9.768	253.1	9.965	306.1	12.051	305	12.008	1.1	.043	8	.315	8
					40	Int.	□	MVS0610X40S070	245.1	9.650	281.1	11.067	284.1	11.185	337.1	13.272	336	13.228	1.1	.043	7	.276	8
					40	Int.	□	MVS0610X40S080	245.1	9.650	281.1	11.067	284.1	11.185	337.1	13.272	336	13.228	1.1	.043	8	.315	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0620X02S070	13.5	.531	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	2
					2	Ext.	●	MVE0620X02S080	13.5	.531	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	8	.315	2
					2	Int.	★	MVS0620X02S070PL	13.4	.528	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	7	.276	4
					2	Int.	●	MVS0620X02S080PL	13.4	.528	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Ext.	★	MVE0620X03S070	19.7	.776	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	7	.276	2
					3	Ext.	★	MVE0620X03S080	19.7	.776	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	8	.315	2
					3	Int.	★	MVS0620X03S070	19.7	.776	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7	.276	6
					3	Int.	●	MVS0620X03S080	19.7	.776	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	8	.315	6
					5	Int.	★	MVS0620X05S070	32.1	1.264	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7	.276	6
					5	Int.	●	MVS0620X05S080	32.1	1.264	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	8	.315	6
					8	Int.	★	MVS0620X08S070	50.7	1.996	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7	.276	6
					8	Int.	●	MVS0620X08S080	50.7	1.996	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	8	.315	6
					10	Int.	★	MVS0620X10S070	63.1	2.484	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	7	.276	8
6.200	.2441				10	Int.	●	MVS0620X10S080	63.1	2.484	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	8	.315	8
					15	Int.	★	MVS0620X15S070	94.1	3.705	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	7	.276	8
					15	Int.	●	MVS0620X15S080	94.1	3.705	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	8	.315	8
					20	Int.	★	MVS0620X20S070	125.1	4.925	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	7	.276	8
					20	Int.	●	MVS0620X20S080	125.1	4.925	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	8	.315	8
					25	Int.	★	MVS0620X25S070	156.1	6.146	183.1	7.209	186.1	7.327	239.1	9.413	238	9.370	1.1	.043	7	.276	8
					25	Int.	●	MVS0620X25S080	156.1	6.146	183.1	7.209	186.1	7.327	239.1	9.413	238	9.370	1.1	.043	8	.315	8
					30	Int.	★	MVS0620X30S070	187.1	7.366	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	7	.276	8
					30	Int.	●	MVS0620X30S080	187.1	7.366	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	8	.315	8
					35	Int.	□	MVS0620X35S070	218.1	8.587	248.1	9.768	253.1	9.965	306.1	12.051	305	12.008	1.1	.043	7	.276	8
					35	Int.	□	MVS0620X35S080	218.1	8.587	248.1	9.768	253.1	9.965	306.1	12.051	305	12.008	1.1	.043	8	.315	8
					40	Int.	□	MVS0620X40S070	249.1	9.807	281.1	11.067	284.1	11.185	337.1	13.272	336	13.228	1.1	.043	7	.276	8
					40	Int.	□	MVS0620X40S080	249.1	9.807	281.1	11.067	284.1	11.185	337.1	13.272	336	13.228	1.1	.043	8	.315	8
					2	Ext.	★	MVE0630X02S070	13.7	.539	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	2
					2	Ext.	●	MVE0630X02S080	13.7	.539	32.1	1.264	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	8	.315	2
					2	Int.	★	MVS0630X02S070PL	13.6	.535	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	7	.276	4
					2	Int.	●	MVS0630X02S080PL	13.6	.535	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Ext.	★	MVE0630X03S070	20.0	.787	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	7	.276	2
					3	Ext.	★	MVE0630X03S080	20.0	.787	42.1	1.657	45.1	1.776	84.1	3.311	83	3.268	1.1	.043	8	.315	2
					3	Int.	★	MVS0630X03S070	20.0	.787	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	7	.276	6
					3	Int.	●	MVS0630X03S080	20.0	.787	33.6	1.323	36.1	1.421	89.1	3.508	88	3.465	1.1	.043	8	.315	6
					5	Int.	★	MVS0630X05S070	32.6	1.283	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	7	.276	6
					5	Int.	●	MVS0630X05S080	32.6	1.283	53.1	2.091	57.1	2.248	110.1	4.335	109	4.291	1.1	.043	8	.315	6
					8	Int.	★	MVS0630X08S070	51.5	2.028	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	7	.276	6
					8	Int.	●	MVS0630X08S080	51.5	2.028	73.1	2.878	78.1	3.075	131.1	5.161	130	5.118	1.1	.043	8	.315	6
					10	Int.	★	MVS0630X10S070	64.1	2.524	86.1	3.390	89.1	3.512	142.1	5.594	141	5.551	1.1	.043	7	.276	8
6.300	.2480				10	Int.	●	MVS0630X10S080	64.1	2.524	86.1	3.390	89.1	3.508	142.1	5.594	141	5.551	1.1	.043	8	.315	8
					15	Int.	★	MVS0630X15S070	95.6	3.764	118.1	4.650	121.1	4.772	174.1	6.854	173	6.811	1.1	.043	7	.276	8
					15	Int.	●	MVS0630X15S080	95.6	3.764	118.1	4.650	121.1	4.768	174.1	6.854	173	6.811	1.1	.043	8	.315	8
					20	Int.	★	MVS0630X20S070	127.1	5.004	151.1	5.949	154.1	6.071	207.1	8.154	206	8.110	1.1	.043	7	.276	8
					20	Int.	●	MVS0630X20S080	127.1	5.004	151.1	5.949	154.1	6.067	207.1	8.154	206	8.110	1.1	.043	8	.315	8
					25	Int.	★	MVS0630X25S070	158.6	6.244	183.1	7.209	186.1	7.331	239.1	9.413	238	9.370	1.1	.043	7	.276	8
					25	Int.	●	MVS0630X25S080	158.6	6.244	183.1	7.209	186.1	7.327	239.1	9.413	238	9.370	1.1	.043	8	.315	8
					30	Int.	★	MVS0630X30S070	190.1	7.484	216.1	8.508	219.1	8.630	272.1	10.713	271	10.669	1.1	.043	7	.276	8
					30	Int.	●	MVS0630X30S080	190.1	7.484	216.1	8.508	219.1	8.626	272.1	10.713	271	10.669	1.1	.043	8	.315	8
					35	Int.	□	MVS0630X35S070	221.6	8.724	248.1	9.768	253.1	9.969	306.1	12.051	305	12.008	1.1	.043	7	.276	8
					35	Int.	□	MVS0630X35S080	221.6	8.724	248.1	9.768	253.1	9.969	306.1	12.051	305	12.008	1.1	.043	8	.315	8
					40	Int.	□	MVS0630X40S070	253.1	9.965	281.1	11.067	284.1	11.189	337.1	13.272	336	13.228	1.1	.043	7	.276	8
					40	Int.	□	MVS0630X40S080	253.1	9.965	281.1	11.067	284.1	11.189	337.1	13.272	336	13.228	1.1	.043	8	.315	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.350	.2500	1/4	E		2	Ext.	●	MVE0635X02S080	13.8	.543	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	●	MVS0635X02S080PL	13.8	.543	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Int.	●	MVS0635X03S080	20.2	.795	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	●	MVS0635X05S080	32.9	1.295	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	●	MVS0635X08S080	51.9	2.043	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	●	MVS0635X10S080	64.6	2.543	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	8	.315	8
					15	Int.	●	MVS0635X15S080	96.4	3.795	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	8	.315	8
					20	Int.	●	MVS0635X20S080	128.1	5.043	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	8	.315	8
					25	Int.	●	MVS0635X25S080	159.9	6.295	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	8	.315	8
					30	Int.	●	MVS0635X30S080	191.6	7.543	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	8	.315	8
					35	Int.	●	MVS0635X35S080	223.4	8.795	248.2	9.772	253.2	9.969	306.2	12.055	305	12.008	1.2	.047	8	.315	8
					40	Int.	●	MVS0635X40S080	255.1	10.043	281.2	11.071	284.2	11.189	337.2	13.276	336	13.228	1.2	.047	8	.315	8
6.400	.2520				2	Ext.	★	MVE0640X02S070	14.0	.551	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0640X02S080	14.0	.551	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	★	MVS0640X02S070PL	13.8	.543	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	7	.276	4
					2	Int.	●	MVS0640X02S080PL	13.8	.543	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Ext.	★	MVE0640X03S070	20.4	.803	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0640X03S080	20.4	.803	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0640X03S070	20.4	.803	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	6
					3	Int.	●	MVS0640X03S080	20.4	.803	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	★	MVS0640X05S070	33.2	1.307	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	6
					5	Int.	●	MVS0640X05S080	33.2	1.307	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	★	MVS0640X08S070	52.4	2.063	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	6
					8	Int.	●	MVS0640X08S080	52.4	2.063	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	★	MVS0640X10S070	65.2	2.567	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	7	.276	8
					10	Int.	●	MVS0640X10S080	65.2	2.567	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	8	.315	8
					15	Int.	★	MVS0640X15S070	97.2	3.827	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	7	.276	8
					15	Int.	●	MVS0640X15S080	97.2	3.827	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	8	.315	8
					20	Int.	★	MVS0640X20S070	129.2	5.087	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	7	.276	8
					20	Int.	●	MVS0640X20S080	129.2	5.087	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	8	.315	8
					25	Int.	★	MVS0640X25S070	161.2	6.346	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	7	.276	8
					25	Int.	●	MVS0640X25S080	161.2	6.346	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	8	.315	8
					30	Int.	★	MVS0640X30S070	193.2	7.606	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	7	.276	8
					30	Int.	●	MVS0640X30S080	193.2	7.606	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	8	.315	8
					35	Int.	□	MVS0640X35S070	225.2	8.866	248.2	9.772	253.2	9.969	306.2	12.055	305	12.008	1.2	.047	7	.276	8
					35	Int.	□	MVS0640X35S080	225.2	8.866	248.2	9.772	253.2	9.969	306.2	12.055	305	12.008	1.2	.047	8	.315	8
					40	Int.	□	MVS0640X40S070	257.2	10.126	281.2	11.071	284.2	11.189	337.2	13.276	336	13.228	1.2	.047	7	.276	8
					40	Int.	□	MVS0640X40S080	257.2	10.126	281.2	11.071	284.2	11.189	337.2	13.276	336	13.228	1.2	.047	8	.315	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	**MVE0650X02S070**	14.2	.559	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	**MVE0650X02S080**	14.2	.559	32.2	1.268	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	★	**MVS0650X02S070PL**	14.0	.551	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	7	.276	4
					2	Int.	●	**MVS0650X02S080PL**	14.0	.551	32.0	1.260	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Ext.	★	**MVE0650X03S070**	20.7	.815	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	**MVE0650X03S080**	20.7	.815	42.2	1.661	45.2	1.780	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	**MVS0650X03S070**	20.7	.815	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	6
					3	Int.	●	**MVS0650X03S080**	20.7	.815	33.7	1.327	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	★	**MVS0650X05S070**	33.7	1.327	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	6
					5	Int.	●	**MVS0650X05S080**	33.7	1.327	53.2	2.094	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	★	**MVS0650X08S070**	53.2	2.094	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	6
					8	Int.	●	**MVS0650X08S080**	53.2	2.094	73.2	2.882	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	★	**MVS0650X10S070**	66.2	2.606	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	7	.276	8
6.500	**.2559**				10	Int.	●	**MVS0650X10S080**	66.2	2.606	86.2	3.394	89.2	3.512	142.2	5.598	141	5.551	1.2	.047	8	.315	8
					15	Int.	★	**MVS0650X15S070**	98.7	3.886	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	7	.276	8
					15	Int.	●	**MVS0650X15S080**	98.7	3.886	118.2	4.654	121.2	4.772	174.2	6.858	173	6.811	1.2	.047	8	.315	8
					20	Int.	★	**MVS0650X20S070**	131.2	5.165	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	7	.276	8
					20	Int.	●	**MVS0650X20S080**	131.2	5.165	151.2	5.953	154.2	6.071	207.2	8.157	206	8.110	1.2	.047	8	.315	8
					25	Int.	★	**MVS0650X25S070**	163.7	6.445	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	7	.276	8
					25	Int.	●	**MVS0650X25S080**	163.7	6.445	183.2	7.213	186.2	7.331	239.2	9.417	238	9.370	1.2	.047	8	.315	8
					30	Int.	★	**MVS0650X30S070**	196.2	7.724	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	7	.276	8
					30	Int.	●	**MVS0650X30S080**	196.2	7.724	216.2	8.512	219.2	8.630	272.2	10.717	271	10.669	1.2	.047	8	.315	8
					35	Int.	★	**MVS0650X35S070**	228.7	9.004	248.2	9.772	253.2	9.969	306.2	12.055	305	12.008	1.2	.047	7	.276	8
					35	Int.	●	**MVS0650X35S080**	228.7	9.004	248.2	9.772	253.2	9.969	306.2	12.055	305	12.008	1.2	.047	8	.315	8
					40	Int.	★	**MVS0650X40S070**	261.2	10.283	281.2	11.071	284.2	11.189	337.2	13.276	336	13.228	1.2	.047	7	.276	8
					40	Int.	●	**MVS0650X40S080**	261.2	10.283	281.2	11.071	284.2	11.189	337.2	13.276	336	13.228	1.2	.047	8	.315	8
					2	Ext.	●	**MVE0653X02S080**	14.2	.559	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	●	**MVS0653X02S080PL**	14.2	.559	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Int.	●	**MVS0653X03S080**	20.8	.819	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	●	**MVS0653X05S080**	33.8	1.331	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	●	**MVS0653X08S080**	53.4	2.102	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	●	**MVS0653X10S080**	66.5	2.618	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	8	.315	8
6.528	**.2570**		**F**	**5/16-18**	15	Int.	●	**MVS0653X15S080**	99.1	3.902	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	8	.315	8
					20	Int.	●	**MVS0653X20S080**	131.7	5.185	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	8	.315	8
					25	Int.	●	**MVS0653X25S080**	164.4	6.472	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	8	.315	8
					30	Int.	●	**MVS0653X30S080**	197.0	7.756	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	8	.315	8
					35	Int.	●	**MVS0653X35S080**	229.7	9.043	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	8	.315	8
					40	Int.	●	**MVS0653X40S080**	262.3	10.327	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	8	.315	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.600	.2598				2	Ext.	★	MVE0660X02S070	14.4	.567	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0660X02S080	14.4	.567	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	★	MVS0660X02S070PL	14.2	.559	35.0	1.378	35.0	1.378	75.0	2.953	74	2.913	1.0	.039	7	.276	4
					2	Int.	●	MVS0660X02S080PL	14.2	.559	35.0	1.378	37.0	1.457	75.0	2.953	74	2.913	1.0	.039	8	.315	4
					3	Ext.	★	MVE0660X03S070	21.0	.827	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0660X03S080	21.0	.827	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0660X03S070	21.0	.827	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	6
					3	Int.	●	MVS0660X03S080	21.0	.827	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	★	MVS0660X05S070	34.2	1.346	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	6
					5	Int.	●	MVS0660X05S080	34.2	1.346	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	★	MVS0660X08S070	54.0	2.126	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	6
					8	Int.	●	MVS0660X08S080	54.0	2.126	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	★	MVS0660X10S070	67.2	2.646	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	7	.276	8
					10	Int.	●	MVS0660X10S080	67.2	2.646	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	8	.315	8
					15	Int.	★	MVS0660X15S070	100.2	3.945	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	7	.276	8
					15	Int.	●	MVS0660X15S080	100.2	3.945	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	8	.315	8
					20	Int.	★	MVS0660X20S070	133.2	5.244	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	7	.276	8
					20	Int.	●	MVS0660X20S080	133.2	5.244	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	8	.315	8
					25	Int.	★	MVS0660X25S070	166.2	6.543	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	7	.276	8
					25	Int.	●	MVS0660X25S080	166.2	6.543	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	8	.315	8
					30	Int.	★	MVS0660X30S070	199.2	7.843	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	7	.276	8
					30	Int.	●	MVS0660X30S080	199.2	7.843	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	8	.315	8
					35	Int.	□	MVS0660X35S070	232.2	9.142	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	7	.276	8
					35	Int.	□	MVS0660X35S080	232.2	9.142	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	8	.315	8
					40	Int.	□	MVS0660X40S070	265.2	10.441	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	7	.276	8
					40	Int.	□	MVS0660X40S080	265.2	10.441	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	8	.315	8
6.700	.2638			M8x1.25	2	Ext.	★	MVE0670X02S070	14.6	.575	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0670X02S080	14.6	.575	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	★	MVS0670X02S070PL	14.5	.571	35.1	1.382	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	4
					2	Int.	●	MVS0670X02S080PL	14.5	.571	35.1	1.382	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	8	.315	4
					3	Ext.	★	MVE0670X03S070	21.3	.839	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0670X03S080	21.3	.839	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0670X03S070	21.3	.839	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	6
					3	Int.	●	MVS0670X03S080	21.3	.839	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	★	MVS0670X05S070	34.7	1.366	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	6
					5	Int.	●	MVS0670X05S080	34.7	1.366	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	★	MVS0670X08S070	54.8	2.157	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	6
					8	Int.	●	MVS0670X08S080	54.8	2.157	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	★	MVS0670X10S070	68.2	2.685	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	7	.276	8
					10	Int.	●	MVS0670X10S080	68.2	2.685	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	8	.315	8
					15	Int.	★	MVS0670X15S070	101.7	4.004	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	7	.276	8
					15	Int.	●	MVS0670X15S080	101.7	4.004	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	8	.315	8
					20	Int.	★	MVS0670X20S070	135.2	5.323	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	7	.276	8
					20	Int.	●	MVS0670X20S080	135.2	5.323	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	8	.315	8
					25	Int.	★	MVS0670X25S070	168.7	6.642	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	7	.276	8
					25	Int.	●	MVS0670X25S080	168.7	6.642	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	8	.315	8
					30	Int.	★	MVS0670X30S070	202.2	7.961	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	7	.276	8
					30	Int.	●	MVS0670X30S080	202.2	7.961	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	8	.315	8
					35	Int.	□	MVS0670X35S070	235.7	9.280	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	7	.276	8
					35	Int.	□	MVS0670X35S080	235.7	9.280	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	8	.315	8
					40	Int.	□	MVS0670X40S070	269.2	10.598	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	7	.276	8
					40	Int.	□	MVS0670X40S080	269.2	10.598	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	8	.315	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.747	.2657	17/64			2	Ext.	●	MVE0675X02S080	14.6	.575	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	●	MVS0675X02S080PL	14.6	.575	35.1	1.382	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	8	.315	4
					3	Int.	●	MVS0675X03S080	21.5	.846	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	●	MVS0675X05S080	34.9	1.374	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	●	MVS0675X08S080	55.2	2.173	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	●	MVS0675X10S080	68.7	2.705	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	8	.315	8
					15	Int.	●	MVS0675X15S080	102.4	4.031	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	8	.315	8
					20	Int.	●	MVS0675X20S080	136.1	5.358	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	8	.315	8
					25	Int.	●	MVS0675X25S080	169.9	6.689	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	8	.315	8
					30	Int.	●	MVS0675X30S080	203.6	8.016	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	8	.315	8
					35	Int.	●	MVS0675X35S080	237.3	9.343	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	8	.315	8
					40	Int.	●	MVS0675X40S080	271.1	10.673	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	8	.315	8
6.800	.2677				2	Ext.	★	MVE0680X02S070	14.8	.583	35.2	1.386	35.2	1.386	75.2	2.961	74	2.913	1.2	.047	7	.276	2
					2	Ext.	●	MVE0680X02S080	14.8	.583	35.2	1.386	37.2	1.465	75.2	2.961	74	2.913	1.2	.047	8	.315	2
					2	Int.	★	MVS0680X02S070PL	14.7	.579	35.1	1.382	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	4
					2	Int.	●	MVS0680X02S080PL	14.7	.579	35.1	1.382	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	8	.315	4
					3	Ext.	★	MVE0680X03S070	21.6	.850	44.2	1.740	44.2	1.740	84.2	3.315	83	3.268	1.2	.047	7	.276	2
					3	Ext.	★	MVE0680X03S080	21.6	.850	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	8	.315	2
					3	Int.	★	MVS0680X03S070	21.6	.850	36.2	1.425	36.2	1.425	89.2	3.512	88	3.465	1.2	.047	7	.276	6
					3	Int.	●	MVS0680X03S080	21.6	.850	36.2	1.425	38.2	1.504	89.2	3.512	88	3.465	1.2	.047	8	.315	6
					5	Int.	★	MVS0680X05S070	35.2	1.386	57.2	2.252	57.2	2.252	110.2	4.339	109	4.291	1.2	.047	7	.276	6
					5	Int.	●	MVS0680X05S080	35.2	1.386	57.2	2.252	59.2	2.331	110.2	4.339	109	4.291	1.2	.047	8	.315	6
					8	Int.	★	MVS0680X08S070	55.6	2.189	78.2	3.079	78.2	3.079	131.2	5.165	130	5.118	1.2	.047	7	.276	6
					8	Int.	●	MVS0680X08S080	55.6	2.189	78.2	3.079	80.2	3.157	131.2	5.165	130	5.118	1.2	.047	8	.315	6
					10	Int.	★	MVS0680X10S070	69.2	2.724	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	7	.276	8
					10	Int.	●	MVS0680X10S080	69.2	2.724	92.2	3.630	95.2	3.748	148.2	5.835	147	5.787	1.2	.047	8	.315	8
					15	Int.	★	MVS0680X15S070	103.2	4.063	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	7	.276	8
					15	Int.	●	MVS0680X15S080	103.2	4.063	127.2	5.008	130.2	5.126	183.2	7.213	182	7.165	1.2	.047	8	.315	8
					20	Int.	★	MVS0680X20S070	137.2	5.402	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	7	.276	8
					20	Int.	●	MVS0680X20S080	137.2	5.402	162.2	6.386	165.2	6.504	218.2	8.591	217	8.543	1.2	.047	8	.315	8
					25	Int.	★	MVS0680X25S070	171.2	6.740	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	7	.276	8
					25	Int.	●	MVS0680X25S080	171.2	6.740	197.2	7.764	200.2	7.882	253.2	9.969	252	9.921	1.2	.047	8	.315	8
					30	Int.	★	MVS0680X30S070	205.2	8.079	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	7	.276	8
					30	Int.	●	MVS0680X30S080	205.2	8.079	232.2	9.142	235.2	9.260	288.2	11.346	287	11.299	1.2	.047	8	.315	8
					35	Int.	□	MVS0680X35S070	239.2	9.417	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	7	.276	8
					35	Int.	□	MVS0680X35S080	239.2	9.417	267.2	10.520	270.2	10.638	323.2	12.724	322	12.677	1.2	.047	8	.315	8
					40	Int.	□	MVS0680X40S070	273.2	10.756	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	7	.276	8
					40	Int.	□	MVS0680X40S080	273.2	10.756	301.2	11.858	304.2	11.976	357.2	14.063	356	14.016	1.2	.047	8	.315	8

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MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.900	.2717		I	5/16-24	2	Ext.	★	MVE0690X02S070	15.1	.594	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7	.276	2
					2	Ext.	●	MVE0690X02S080	15.1	.594	35.3	1.390	37.3	1.469	75.3	2.965	74	2.913	1.3	.051	8	.315	2
					2	Int.	★	MVS0690X02S070PL	14.9	.587	35.1	1.382	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	4
					2	Int.	●	MVS0690X02S080PL	14.9	.587	35.1	1.382	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	8	.315	4
					3	Ext.	★	MVE0690X03S070	22.0	.866	44.3	1.744	44.3	1.744	84.3	3.319	83	3.268	1.3	.051	7	.276	2
					3	Ext.	★	MVE0690X03S080	22.0	.866	44.3	1.744	46.3	1.823	84.3	3.319	83	3.268	1.3	.051	8	.315	2
					3	Int.	★	MVS0690X03S070	22.0	.866	36.3	1.429	36.3	1.429	89.3	3.516	88	3.465	1.3	.051	7	.276	6
					3	Int.	●	MVS0690X03S080	22.0	.866	36.3	1.429	38.3	1.508	89.3	3.516	88	3.465	1.3	.051	8	.315	6
					5	Int.	★	MVS0690X05S070	35.8	1.409	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	7	.276	6
					5	Int.	●	MVS0690X05S080	35.8	1.409	57.3	2.256	59.3	2.335	110.3	4.343	109	4.291	1.3	.051	8	.315	6
					8	Int.	★	MVS0690X08S070	56.5	2.224	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	7	.276	6
					8	Int.	●	MVS0690X08S080	56.5	2.226	78.3	3.083	80.3	3.161	131.3	5.169	130	5.118	1.3	.051	8	.315	6
					10	Int.	★	MVS0690X10S070	70.3	2.768	92.3	3.634	95.3	3.752	148.3	5.839	147	5.787	1.3	.051	7	.276	8
					10	Int.	●	MVS0690X10S080	70.3	2.768	92.3	3.634	95.3	3.752	148.3	5.839	147	5.787	1.3	.051	8	.315	8
					15	Int.	★	MVS0690X15S070	104.8	4.126	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	7	.276	8
					15	Int.	●	MVS0690X15S080	104.8	4.126	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	8	.315	8
					20	Int.	★	MVS0690X20S070	139.3	5.484	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	7	.276	8
					20	Int.	●	MVS0690X20S080	139.3	5.484	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	8	.315	8
					25	Int.	★	MVS0690X25S070	173.8	6.843	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	7	.276	8
					25	Int.	●	MVS0690X25S080	173.8	6.843	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	8	.315	8
					30	Int.	★	MVS0690X30S070	208.3	8.201	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	7	.276	8
					30	Int.	●	MVS0690X30S080	208.3	8.201	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	8	.315	8
					35	Int.	□	MVS0690X35S070	242.8	9.559	267.3	10.524	270.3	10.642	323.3	12.728	322	12.677	1.3	.051	7	.276	8
					35	Int.	□	MVS0690X35S080	242.8	9.559	267.3	10.524	270.3	10.642	323.3	12.728	322	12.677	1.3	.051	8	.315	8
					40	Int.	□	MVS0690X40S070	277.3	10.917	301.3	11.862	304.3	11.980	357.3	14.067	356	14.016	1.3	.051	7	.276	8
					40	Int.	□	MVS0690X40S080	277.3	10.917	301.3	11.862	304.3	11.980	357.3	14.067	356	14.016	1.3	.051	8	.315	8
7.000	.2756			M8x1.0	2	Ext.	★	MVE0700X02S070	15.3	.602	35.3	1.390	35.3	1.390	75.3	2.965	74	2.913	1.3	.051	7	.276	2
					2	Ext.	●	MVE0700X02S080	15.3	.602	35.3	1.390	37.3	1.469	75.3	2.965	74	2.913	1.3	.051	8	.315	2
					2	Int.	★	MVS0700X02S070PL	15.1	.594	35.1	1.382	35.1	1.382	75.1	2.957	74	2.913	1.1	.043	7	.276	4
					2	Int.	●	MVS0700X02S080PL	15.1	.594	35.1	1.382	37.1	1.461	75.1	2.957	74	2.913	1.1	.043	8	.315	4
					3	Ext.	★	MVE0700X03S070	22.3	.878	44.3	1.744	44.3	1.744	84.3	3.319	83	3.268	1.3	.051	7	.276	2
					3	Ext.	★	MVE0700X03S080	22.3	.878	44.3	1.744	46.3	1.823	84.3	3.319	83	3.268	1.3	.051	8	.315	2
					3	Int.	★	MVS0700X03S070	22.3	.878	36.3	1.429	36.3	1.429	89.3	3.516	88	3.465	1.3	.051	7	.276	6
					3	Int.	●	MVS0700X03S080	22.3	.878	36.3	1.429	38.3	1.508	89.3	3.516	88	3.465	1.3	.051	8	.315	6
					5	Int.	★	MVS0700X05S070	36.3	1.429	57.3	2.256	57.3	2.256	110.3	4.343	109	4.291	1.3	.051	7	.276	6
					5	Int.	●	MVS0700X05S080	36.3	1.429	57.3	2.256	59.3	2.335	110.3	4.343	109	4.291	1.3	.051	8	.315	6
					8	Int.	★	MVS0700X08S070	57.3	2.256	78.3	3.083	78.3	3.083	131.3	5.169	130	5.118	1.3	.051	7	.276	6
					8	Int.	●	MVS0700X08S080	57.3	2.256	78.3	3.083	80.3	3.161	131.3	5.169	130	5.118	1.3	.051	8	.315	6
					10	Int.	★	MVS0700X10S070	71.3	2.807	92.3	3.634	95.3	3.752	148.3	5.839	147	5.787	1.3	.051	7	.276	8
					10	Int.	●	MVS0700X10S080	71.3	2.807	92.3	3.634	95.3	3.752	148.3	5.839	147	5.787	1.3	.051	8	.315	8
					15	Int.	★	MVS0700X15S070	106.3	4.185	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	7	.276	8
					15	Int.	●	MVS0700X15S080	106.3	4.185	127.3	5.012	130.3	5.130	183.3	7.217	182	7.165	1.3	.051	8	.315	8
					20	Int.	★	MVS0700X20S070	141.3	5.563	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	7	.276	8
					20	Int.	●	MVS0700X20S080	141.3	5.563	162.3	6.390	165.3	6.508	218.3	8.594	217	8.543	1.3	.051	8	.315	8
					25	Int.	★	MVS0700X25S070	176.3	6.941	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	7	.276	8
					25	Int.	●	MVS0700X25S080	176.3	6.941	197.3	7.768	200.3	7.886	253.3	9.972	252	9.921	1.3	.051	8	.315	8
					30	Int.	★	MVS0700X30S070	211.3	8.319	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	7	.276	8
					30	Int.	●	MVS0700X30S080	211.3	8.319	232.3	9.146	235.3	9.264	288.3	11.350	287	11.299	1.3	.051	8	.315	8
					35	Int.	★	MVS0700X35S070	246.3	9.697	267.3	10.524	270.3	10.642	323.3	12.728	322	12.677	1.3	.051	7	.276	8
					35	Int.	●	MVS0700X35S080	246.3	9.697	267.3	10.524	270.3	10.642	323.3	12.728	322	12.677	1.3	.051	8	.315	8
					40	Int.	★	MVS0700X40S070	281.3	11.075	301.3	11.862	304.3	11.980	357.3	14.067	356	14.016	1.3	.051	7	.276	8
					40	Int.	●	MVS0700X40S080	281.3	11.075	301.3	11.862	304.3	11.980	357.3	14.067	356	14.016	1.3	.051	8	.315	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	**MVE0710X02S080**	15.5	.610	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					2	Int.	●	**MVS0710X02S080PL**	15.3	.602	35.1	1.382	38.1	1.500	80.1	3.154	79	3.110	1.1	.043	8	.315	4
					3	Ext.	★	**MVE0710X03S080**	22.6	.890	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	**MVS0710X03S080**	22.6	.890	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	6
					5	Int.	●	**MVS0710X05S080**	36.8	1.449	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	6
					8	Int.	●	**MVS0710X08S080**	58.1	2.287	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	6
7.100	**.2795**				10	Int.	★	**MVS0710X10S080**	72.3	2.846	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8	.315	8
					15	Int.	★	**MVS0710X15S080**	107.8	4.244	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8	.315	8
					20	Int.	★	**MVS0710X20S080**	143.3	5.642	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8	.315	8
					25	Int.	★	**MVS0710X25S080**	178.8	7.039	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8	.315	8
					30	Int.	★	**MVS0710X30S080**	214.3	8.437	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8	.315	8
					35	Int.	□	**MVS0710X35S080**	249.8	9.835	286.3	11.272	289.3	11.390	343.3	13.516	342	13.465	1.3	.051	8	.315	8
					40	Int.	□	**MVS0710X40S080**	285.3	11.232	321.3	12.650	324.3	12.768	378.3	14.894	377	14.843	1.3	.051	8	.315	8
					2	Ext.	●	**MVE0714X02S080**	15.5	.610	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					2	Int.	●	**MVS0714X02S080PL**	15.5	.610	35.1	1.382	38.1	1.500	80.1	3.154	79	3.110	1.1	.043	8	.315	4
					3	Int.	●	**MVS0714X03S080**	22.7	.894	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	6
					5	Int.	●	**MVS0714X05S080**	37.0	1.457	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	6
					8	Int.	●	**MVS0714X08S080**	58.4	2.299	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	6
					10	Int.	●	**MVS0714X10S080**	72.7	2.862	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8	.315	8
7.144	**.2813**	**9/32**	**K**		15	Int.	●	**MVS0714X15S080**	108.4	4.268	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8	.315	8
					20	Int.	●	**MVS0714X20S080**	144.1	5.673	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8	.315	8
					25	Int.	●	**MVS0714X25S080**	179.8	7.079	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8	.315	8
					30	Int.	●	**MVS0714X30S080**	215.5	8.484	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8	.315	8
					35	Int.	●	**MVS0714X35S080**	251.3	9.894	286.3	11.272	289.3	11.390	343.3	13.516	342	13.465	1.3	.051	8	.315	8
					40	Int.	●	**MVS0714X40S080**	287.0	11.299	321.3	12.650	324.3	12.768	378.3	14.894	377	14.843	1.3	.051	8	.315	8
					2	Ext.	●	**MVE0720X02S080**	15.7	.618	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					2	Int.	●	**MVS0720X02S080PL**	15.5	.610	35.1	1.382	38.1	1.500	80.1	3.154	79	3.110	1.1	.043	8	.315	4
					3	Ext.	★	**MVE0720X03S080**	22.9	.902	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	**MVS0720X03S080**	22.9	.902	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	6
					5	Int.	●	**MVS0720X05S080**	37.3	1.469	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	6
					8	Int.	●	**MVS0720X08S080**	58.9	2.319	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	6
7.200	**.2835**				10	Int.	★	**MVS0720X10S080**	73.3	2.886	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8	.315	8
					15	Int.	★	**MVS0720X15S080**	109.3	4.303	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8	.315	8
					20	Int.	★	**MVS0720X20S080**	145.3	5.720	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8	.315	8
					25	Int.	★	**MVS0720X25S080**	181.3	7.138	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8	.315	8
					30	Int.	★	**MVS0720X30S080**	217.3	8.555	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8	.315	8
					35	Int.	□	**MVS0720X35S080**	253.3	9.972	286.3	11.272	289.3	11.390	343.3	13.516	342	13.465	1.3	.051	8	.315	8
					40	Int.	□	**MVS0720X40S080**	289.3	11.390	321.3	12.650	324.3	12.768	378.3	14.894	377	14.843	1.3	.051	8	.315	8
					2	Ext.	●	**MVE0730X02S080**	15.9	.626	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					2	Int.	●	**MVS0730X02S080PL**	15.8	.622	35.2	1.386	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	**MVE0730X03S080**	23.2	.913	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	**MVS0730X03S080**	23.2	.913	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	6
					5	Int.	●	**MVS0730X05S080**	37.8	1.488	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	6
					8	Int.	●	**MVS0730X08S080**	59.7	2.350	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	6
7.300	**.2874**				10	Int.	★	**MVS0730X10S080**	74.3	2.925	99.3	3.909	102.3	4.028	156.3	6.154	155	6.102	1.3	.051	8	.315	8
					15	Int.	★	**MVS0730X15S080**	110.8	4.362	136.3	5.366	139.3	5.484	193.3	7.610	192	7.559	1.3	.051	8	.315	8
					20	Int.	★	**MVS0730X20S080**	147.3	5.799	174.3	6.862	177.3	6.980	231.3	9.106	230	9.055	1.3	.051	8	.315	8
					25	Int.	★	**MVS0730X25S080**	183.8	7.236	211.3	8.319	214.3	8.437	268.3	10.563	267	10.512	1.3	.051	8	.315	8
					30	Int.	★	**MVS0730X30S080**	220.3	8.673	249.3	9.815	252.3	9.933	306.3	12.059	305	12.008	1.3	.051	8	.315	8
					35	Int.	□	**MVS0730X35S080**	256.8	10.110	286.3	11.272	289.3	11.390	343.3	13.516	342	13.465	1.3	.051	8	.315	8
					40	Int.	□	**MVS0730X40S080**	293.3	11.547	321.3	12.650	324.3	12.768	378.3	14.894	377	14.843	1.3	.051	8	.315	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0740X02S080	16.1	.634	35.3	1.390	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	2
					2	Int.	●	MVS0740X02S080PL	16.0	.630	35.2	1.386	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	MVE0740X03S080	23.5	.925	46.3	1.823	49.3	1.941	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					3	Int.	●	MVS0740X03S080	23.5	.925	38.8	1.528	41.3	1.626	95.3	3.752	94	3.701	1.3	.051	8	.315	6
					5	Int.	●	MVS0740X05S080	38.3	1.508	61.3	2.413	65.3	2.571	119.3	4.697	118	4.646	1.3	.051	8	.315	6
					8	Int.	●	MVS0740X08S080	60.5	2.382	84.3	3.319	89.3	3.516	143.3	5.642	142	5.591	1.3	.051	8	.315	6
7.400	.2913				10	Int.	★	MVS0740X10S080	75.3	2.965	99.3	3.909	102.3	4.031	156.3	6.154	155	6.102	1.3	.051	8	.315	8
					15	Int.	★	MVS0740X15S080	112.3	4.421	136.3	5.366	139.3	5.488	193.3	7.610	192	7.559	1.3	.051	8	.315	8
					20	Int.	★	MVS0740X20S080	149.3	5.878	174.3	6.862	177.3	6.984	231.3	9.106	230	9.055	1.3	.051	8	.315	8
					25	Int.	★	MVS0740X25S080	186.3	7.335	211.3	8.319	214.3	8.441	268.3	10.563	267	10.512	1.3	.051	8	.315	8
					30	Int.	★	MVS0740X30S080	223.3	8.791	249.3	9.815	252.3	9.937	306.3	12.059	305	12.008	1.3	.051	8	.315	8
					35	Int.	□	MVS0740X35S080	260.3	10.248	286.3	11.272	289.3	11.394	343.3	13.516	342	13.465	1.3	.051	8	.315	8
					40	Int.	□	MVS0740X40S080	297.3	11.705	321.3	12.650	324.3	12.772	378.3	14.894	377	14.843	1.3	.051	8	.315	8
					2	Ext.	●	MVE0750X02S080	16.4	.646	35.4	1.394	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0750X02S080PL	16.2	.638	35.2	1.386	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	MVE0750X03S080	23.9	.941	46.4	1.827	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0750X03S080	23.9	.941	38.9	1.531	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0750X05S080	38.9	1.531	61.4	2.417	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0750X08S080	61.4	2.417	84.4	3.323	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
7.500	.2953		M		10	Int.	●	MVS0750X10S080	76.4	3.008	99.4	3.913	102.4	4.031	156.4	6.157	155	6.102	1.4	.055	8	.315	8
					15	Int.	★	MVS0750X15S080	113.9	4.484	136.4	5.370	139.4	5.488	193.4	7.614	192	7.559	1.4	.055	8	.315	8
					20	Int.	★	MVS0750X20S080	151.4	5.961	174.4	6.866	177.4	6.984	231.4	9.110	230	9.055	1.4	.055	8	.315	8
					25	Int.	★	MVS0750X25S080	188.9	7.437	211.4	8.323	214.4	8.441	268.4	10.567	267	10.512	1.4	.055	8	.315	8
					30	Int.	★	MVS0750X30S080	226.4	8.913	249.4	9.819	252.4	9.937	306.4	12.063	305	12.008	1.4	.055	8	.315	8
					35	Int.	●	MVS0750X35S080	263.9	10.390	286.4	11.276	289.4	11.394	343.4	13.520	342	13.465	1.4	.055	8	.315	8
					40	Int.	●	MVS0750X40S080	301.4	11.866	321.4	12.654	324.4	12.772	378.4	14.898	377	14.843	1.4	.055	8	.315	8
					2	Ext.	●	MVE0754X02S080	16.4	.646	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0754X02S080PL	16.4	.646	38.2	1.504	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Int.	●	MVS0754X03S080	24.0	.945	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0754X05S080	39.1	1.539	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0754X08S080	61.7	2.429	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
					10	Int.	●	MVS0754X10S080	76.8	3.024	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8	.315	8
7.541	.2969	19/64			15	Int.	●	MVS0754X15S080	114.5	4.508	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8	.315	8
					20	Int.	●	MVS0754X20S080	152.2	5.992	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8	.315	8
					25	Int.	●	MVS0754X25S080	189.9	7.478	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8	.315	8
					30	Int.	●	MVS0754X30S080	227.6	8.961	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8	.315	8
					35	Int.	●	MVS0754X35S080	265.3	10.445	305.4	12.024	308.4	12.142	362.4	14.268	361	14.213	1.4	.055	8	.315	8
					40	Int.	●	MVS0754X40S080	303.0	11.929	341.4	13.441	344.4	13.559	398.4	15.685	397	15.630	1.4	.055	8	.315	8
					2	Ext.	●	MVE0760X02S080	16.6	.654	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0760X02S080PL	16.4	.646	38.2	1.504	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	MVE0760X03S080	24.2	.953	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0760X03S080	24.2	.953	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0760X05S080	39.4	1.551	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0760X08S080	62.2	2.449	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
7.600	.2992				10	Int.	★	MVS0760X10S080	77.4	3.047	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8	.315	8
					15	Int.	★	MVS0760X15S080	115.1	4.531	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8	.315	8
					20	Int.	★	MVS0760X20S080	153.4	6.039	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8	.315	8
					25	Int.	★	MVS0760X25S080	191.4	7.535	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8	.315	8
					30	Int.	★	MVS0760X30S080	229.4	9.031	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8	.315	8
					35	Int.	□	MVS0760X35S080	267.4	10.528	305.4	12.024	308.4	12.142	362.4	14.268	361	14.213	1.4	.055	8	.315	8
					40	Int.	□	MVS0760X40S080	305.4	12.024	341.4	13.441	344.4	13.559	398.4	15.685	397	15.630	1.4	.055	8	.315	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0770X02S080	16.8	.661	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0770X02S080PL	16.6	.654	38.2	1.504	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	MVE0770X03S080	24.5	.965	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0770X03S080	24.5	.965	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0770X05S080	39.9	1.571	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0770X08S080	63.0	2.480	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
7.700	.3031				10	Int.	★	MVS0770X10S080	78.4	3.087	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8	.315	8
					15	Int.	★	MVS0770X15S080	116.9	4.602	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8	.315	8
					20	Int.	★	MVS0770X20S080	155.4	6.118	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8	.315	8
					25	Int.	★	MVS0770X25S080	193.9	7.634	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8	.315	8
					30	Int.	★	MVS0770X30S080	232.4	9.150	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8	.315	8
					35	Int.	□	MVS0770X35S080	270.9	10.665	305.4	12.024	308.4	12.142	362.4	14.268	361	14.213	1.4	.055	8	.315	8
					40	Int.	□	MVS0770X40S080	309.4	12.181	341.4	13.441	344.4	13.559	398.4	15.685	397	15.630	1.4	.055	8	.315	8
					2	Ext.	●	MVE0780X02S080	17.0	.669	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0780X02S080PL	16.8	.661	38.2	1.504	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	MVE0780X03S080	24.8	.976	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0780X03S080	24.8	.976	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0780X05S080	40.4	1.591	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0780X08S080	63.8	2.512	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
7.800	.3071				10	Int.	★	MVS0780X10S080	79.4	3.126	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8	.315	8
					15	Int.	●	MVS0780X15S080	118.4	4.661	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8	.315	8
					20	Int.	★	MVS0780X20S080	157.4	6.197	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8	.315	8
					25	Int.	●	MVS0780X25S080	196.4	7.732	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8	.315	8
					30	Int.	★	MVS0780X30S080	235.4	9.268	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8	.315	8
					35	Int.	□	MVS0780X35S080	274.4	10.803	305.4	12.024	308.4	12.142	362.4	14.268	361	14.213	1.4	.055	8	.315	8
					40	Int.	□	MVS0780X40S080	313.4	12.339	341.4	13.441	344.4	13.559	398.4	15.685	397	15.630	1.4	.055	8	.315	8
					2	Ext.	●	MVE0790X02S080	17.2	.677	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0790X02S080PL	17.0	.669	38.2	1.504	38.2	1.504	80.2	3.157	79	3.110	1.2	.047	8	.315	4
					3	Ext.	★	MVE0790X03S080	25.1	.988	49.4	1.945	49.4	1.945	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					3	Int.	●	MVS0790X03S080	25.1	.988	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0790X05S080	40.9	1.610	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0790X08S080	64.6	2.543	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
7.900	.3110				10	Int.	★	MVS0790X10S080	80.4	3.165	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8	.315	8
					15	Int.	★	MVS0790X15S080	119.9	4.720	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8	.315	8
					20	Int.	★	MVS0790X20S080	159.4	6.276	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8	.315	8
					25	Int.	★	MVS0790X25S080	198.9	7.831	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8	.315	8
					30	Int.	★	MVS0790X30S080	238.4	9.386	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8	.315	8
					35	Int.	□	MVS0790X35S080	277.9	10.941	305.4	12.024	308.4	12.142	362.4	14.268	361	14.213	1.4	.055	8	.315	8
					40	Int.	□	MVS0790X40S080	317.4	12.496	341.4	13.441	344.4	13.559	398.4	15.685	397	15.630	1.4	.055	8	.315	8
					2	Ext.	●	MVE0794X02S080	17.2	.677	38.4	1.512	38.4	1.512	80.4	3.165	79	3.110	1.4	.055	8	.315	2
					2	Int.	●	MVS0794X02S080PL	17.2	.677	38.3	1.508	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	4
					3	Int.	●	MVS0794X03S080	25.2	.992	41.4	1.630	41.4	1.630	95.4	3.756	94	3.701	1.4	.055	8	.315	6
					5	Int.	●	MVS0794X05S080	41.1	1.618	65.4	2.575	65.4	2.575	119.4	4.701	118	4.646	1.4	.055	8	.315	6
					8	Int.	●	MVS0794X08S080	64.9	2.555	89.4	3.520	89.4	3.520	143.4	5.646	142	5.591	1.4	.055	8	.315	6
7.938	.3125	5/16		3/8-16	10	Int.	●	MVS0794X10S080	80.8	3.181	105.4	4.150	108.4	4.268	162.4	6.394	161	6.339	1.4	.055	8	.315	8
					15	Int.	●	MVS0794X15S080	120.5	4.744	145.4	5.724	148.4	5.843	202.4	7.969	201	7.913	1.4	.055	8	.315	8
					20	Int.	●	MVS0794X20S080	160.2	6.307	185.4	7.299	188.4	7.417	242.4	9.543	241	9.488	1.4	.055	8	.315	8
					25	Int.	●	MVS0794X25S080	199.9	7.870	225.4	8.874	228.4	8.992	282.4	11.118	281	11.063	1.4	.055	8	.315	8
					30	Int.	●	MVS0794X30S080	239.6	9.433	265.4	10.449	268.4	10.567	322.4	12.693	321	12.638	1.4	.055	8	.315	8
					35	Int.	●	MVS0794X35S080	279.3	10.996	305.4	12.024	308.4	12.142	362.4	14.268	361	14.213	1.4	.055	8	.315	8
					40	Int.	●	MVS0794X40S080	318.9	12.555	341.4	13.441	344.4	13.559	398.4	15.685	397	15.630	1.4	.055	8	.315	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.000	.3150				2	Ext.	●	MVE0800X02S080	17.5	.689	38.5	1.516	38.5	1.516	80.5	3.169	79	3.110	1.5	.059	8	.315	2
					2	Int.	●	MVS0800X02S080PL	17.3	.681	38.3	1.508	38.3	1.508	80.3	3.161	79	3.110	1.3	.051	8	.315	4
					3	Ext.	★	MVE0800X03S080	25.5	1.004	49.5	1.949	49.5	1.949	91.5	3.602	90	3.543	1.5	.059	8	.315	2
					3	Int.	●	MVS0800X03S080	25.5	1.004	41.5	1.634	41.5	1.634	95.5	3.760	94	3.701	1.5	.059	8	.315	6
					5	Int.	●	MVS0800X05S080	41.5	1.634	65.5	2.579	65.5	2.579	119.5	4.705	118	4.646	1.5	.059	8	.315	6
					8	Int.	●	MVS0800X08S080	65.5	2.579	89.5	3.524	89.5	3.524	143.5	5.650	142	5.591	1.5	.059	8	.315	6
					10	Int.	●	MVS0800X10S080	81.5	3.209	105.5	4.154	108.5	4.272	162.5	6.398	161	6.339	1.5	.059	8	.315	8
					15	Int.	●	MVS0800X15S080	121.5	4.783	145.5	5.728	148.5	5.846	202.5	7.972	201	7.913	1.5	.059	8	.315	8
					20	Int.	●	MVS0800X20S080	161.5	6.358	185.5	7.303	188.5	7.421	242.5	9.547	241	9.488	1.5	.059	8	.315	8
					25	Int.	★	MVS0800X25S080	201.5	7.933	225.5	8.878	228.5	8.996	282.5	11.122	281	11.063	1.5	.059	8	.315	8
					30	Int.	●	MVS0800X30S080	241.5	9.508	265.5	10.453	268.5	10.571	322.5	12.697	321	12.638	1.5	.059	8	.315	8
					35	Int.	●	MVS0800X35S080	281.5	11.083	305.5	12.028	308.5	12.146	362.5	14.272	361	14.213	1.5	.059	8	.315	8
					40	Int.	●	MVS0800X40S080	321.5	12.657	341.5	13.445	344.5	13.563	398.5	15.689	397	15.630	1.5	.059	8	.315	8
8.100	.3189				2	Ext.	★	MVE0810X02S090	17.7	.697	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0810X02S100	17.7	.697	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	★	MVS0810X02S090PL	17.5	.689	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	9	.354	4
					2	Int.	●	MVS0810X02S100PL	17.5	.689	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Ext.	★	MVE0810X03S090	25.8	1.016	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0810X03S100	25.8	1.016	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0810X03S090	25.8	1.016	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	6
					3	Int.	●	MVS0810X03S100	25.8	1.016	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	★	MVS0810X05S090	42.0	1.654	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	6
					5	Int.	●	MVS0810X05S100	42.0	1.654	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	★	MVS0810X08S090	66.3	2.610	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	6
					8	Int.	●	MVS0810X08S100	66.3	2.610	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	★	MVS0810X10S090	82.5	3.248	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9	.354	8
					10	Int.	●	MVS0810X10S100	82.5	3.248	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	★	MVS0810X15S090	123.0	4.843	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9	.354	8
					15	Int.	●	MVS0810X15S100	123.0	4.843	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	★	MVS0810X20S090	163.5	6.437	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9	.354	8
					20	Int.	●	MVS0810X20S100	163.5	6.437	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	★	MVS0810X25S090	204.0	8.031	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9	.354	8
					25	Int.	●	MVS0810X25S100	204.0	8.031	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	★	MVS0810X30S090	244.5	9.626	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9	.354	8
					30	Int.	●	MVS0810X30S100	244.5	9.626	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	□	MVS0810X35S090	285.0	11.220	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	9	.354	8
					35	Int.	□	MVS0810X35S100	285.0	11.220	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	□	MVS0810X40S090	325.5	12.815	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	9	.354	8
					40	Int.	□	MVS0810X40S100	325.5	12.815	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0820X02S090	17.9	.705	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0820X02S100	17.9	.705	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	★	MVS0820X02S090PL	17.7	.697	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	9	.354	4
					2	Int.	●	MVS0820X02S100PL	17.7	.697	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Ext.	★	MVE0820X03S090	26.1	1.028	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0820X03S100	26.1	1.028	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0820X03S090	26.1	1.028	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	6
					3	Int.	●	MVS0820X03S100	26.1	1.028	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	★	MVS0820X05S090	42.5	1.673	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	6
					5	Int.	●	MVS0820X05S100	42.5	1.673	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	★	MVS0820X08S090	67.1	2.642	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	6
					8	Int.	●	MVS0820X08S100	67.1	2.642	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	★	MVS0820X10S090	83.5	3.287	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9	.354	8
8.200	.3228		P		10	Int.	●	MVS0820X10S100	83.5	3.287	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	★	MVS0820X15S090	124.5	4.902	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9	.354	8
					15	Int.	●	MVS0820X15S100	124.5	4.902	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	★	MVS0820X20S090	165.5	6.516	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9	.354	8
					20	Int.	●	MVS0820X20S100	165.5	6.516	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	★	MVS0820X25S090	206.5	8.130	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9	.354	8
					25	Int.	●	MVS0820X25S100	206.5	8.130	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	★	MVS0820X30S090	247.5	9.744	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9	.354	8
					30	Int.	●	MVS0820X30S100	247.5	9.744	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	□	MVS0820X35S090	288.5	11.358	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	9	.354	8
					35	Int.	□	MVS0820X35S100	288.5	11.358	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	□	MVS0820X40S090	329.5	12.972	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	9	.354	8
					40	Int.	□	MVS0820X40S100	329.5	12.972	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8
					2	Ext.	★	MVE0830X02S090	18.1	.713	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0830X02S100	18.1	.713	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	★	MVS0830X02S090PL	17.9	.705	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	9	.354	4
					2	Int.	●	MVS0830X02S100PL	17.9	.705	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Ext.	★	MVE0830X03S090	26.4	1.039	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0830X03S100	26.4	1.039	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0830X03S090	26.4	1.039	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	6
					3	Int.	●	MVS0830X03S100	26.4	1.039	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	★	MVS0830X05S090	43.0	1.693	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	6
					5	Int.	●	MVS0830X05S100	43.0	1.693	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	★	MVS0830X08S090	67.9	2.673	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	6
					8	Int.	●	MVS0830X08S100	67.9	2.673	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	★	MVS0830X10S090	84.5	3.327	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9	.354	8
8.300	.3268				10	Int.	●	MVS0830X10S100	84.5	3.327	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	★	MVS0830X15S090	126.0	4.961	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9	.354	8
					15	Int.	●	MVS0830X15S100	126.0	4.961	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	★	MVS0830X20S090	167.5	6.594	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9	.354	8
					20	Int.	●	MVS0830X20S100	167.5	6.594	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	★	MVS0830X25S090	209.0	8.228	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9	.354	8
					25	Int.	●	MVS0830X25S100	209.0	8.228	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	★	MVS0830X30S090	250.5	9.862	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9	.354	8
					30	Int.	●	MVS0830X30S100	250.5	9.862	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	□	MVS0830X35S090	292.0	11.496	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	9	.354	8
					35	Int.	□	MVS0830X35S100	292.0	11.496	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	□	MVS0830X40S090	333.5	13.130	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	9	.354	8
					40	Int.	□	MVS0830X40S100	333.5	13.130	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.335	.3282	21/64			2	Ext.	●	MVE0833X02S100	18.1	.713	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	●	MVS0833X02S100PL	18.1	.713	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Int.	●	MVS0833X03S100	26.5	1.043	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	●	MVS0833X05S100	43.2	1.701	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	●	MVS0833X08S100	68.2	2.685	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	●	MVS0833X10S100	84.8	3.339	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	●	MVS0833X15S100	126.5	4.980	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	●	MVS0833X20S100	168.2	6.622	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	●	MVS0833X25S100	209.9	8.264	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	●	MVS0833X30S100	251.5	9.902	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	●	MVS0833X35S100	293.2	11.543	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	●	MVS0833X40S100	334.9	13.185	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8
8.400	.3307				2	Ext.	★	MVE0840X02S090	18.3	.720	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0840X02S100	18.3	.720	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	★	MVS0840X02S090PL	18.1	.713	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	9	.354	4
					2	Int.	●	MVS0840X02S100PL	18.1	.713	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Ext.	★	MVE0840X03S090	26.7	1.051	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0840X03S100	26.7	1.051	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0840X03S090	26.7	1.051	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	6
					3	Int.	●	MVS0840X03S100	26.7	1.051	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	★	MVS0840X05S090	43.5	1.713	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	6
					5	Int.	●	MVS0840X05S100	43.5	1.713	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	★	MVS0840X08S090	68.7	2.705	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	6
					8	Int.	●	MVS0840X08S100	68.7	2.705	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	★	MVS0840X10S090	85.5	3.366	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9	.354	8
					10	Int.	●	MVS0840X10S100	85.5	3.366	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	★	MVS0840X15S090	127.5	5.020	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9	.354	8
					15	Int.	●	MVS0840X15S100	127.5	5.020	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	★	MVS0840X20S090	169.5	6.673	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9	.354	8
					20	Int.	●	MVS0840X20S100	169.5	6.673	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	★	MVS0840X25S090	211.5	8.327	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9	.354	8
					25	Int.	●	MVS0840X25S100	211.5	8.327	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	★	MVS0840X30S090	253.5	9.980	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9	.354	8
					30	Int.	●	MVS0840X30S100	253.5	9.980	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	□	MVS0840X35S090	295.5	11.634	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	9	.354	8
					35	Int.	□	MVS0840X35S100	295.5	11.634	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	□	MVS0840X40S090	337.5	13.287	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	9	.354	8
					40	Int.	□	MVS0840X40S100	337.5	13.287	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8
8.433	.3320		Q	3/8-24	2	Ext.	●	MVE0843X02S100	18.3	.720	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	●	MVS0843X02S100PL	18.3	.720	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Int.	●	MVS0843X03S100	26.8	1.055	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	●	MVS0843X05S100	43.7	1.720	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	●	MVS0843X08S100	69.0	2.717	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	●	MVS0843X10S100	85.8	3.378	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	●	MVS0843X15S100	128.0	5.039	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	●	MVS0843X20S100	170.2	6.701	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	●	MVS0843X25S100	212.3	8.358	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	●	MVS0843X30S100	254.5	10.020	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	●	MVS0843X35S100	296.7	11.681	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	●	MVS0843X40S100	338.8	13.339	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0850X02S090	18.5	.728	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	9	.354	2
					2	Ext.	●	MVE0850X02S100	18.5	.728	38.5	1.516	41.5	1.634	85.5	3.366	84	3.307	1.5	.059	10	.394	2
					2	Int.	★	MVS0850X02S090PL	18.3	.720	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	9	.354	4
					2	Int.	●	MVS0850X02S100PL	18.3	.720	38.3	1.508	41.3	1.626	85.3	3.358	84	3.307	1.3	.051	10	.394	4
					3	Ext.	★	MVE0850X03S090	27.0	1.063	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	9	.354	2
					3	Ext.	★	MVE0850X03S100	27.0	1.063	54.5	2.146	57.5	2.264	99.5	3.917	98	3.858	1.5	.059	10	.394	2
					3	Int.	★	MVS0850X03S090	27.0	1.063	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	9	.354	6
					3	Int.	●	MVS0850X03S100	27.0	1.063	44.0	1.732	46.5	1.831	101.5	3.996	100	3.937	1.5	.059	10	.394	6
					5	Int.	★	MVS0850X05S090	44.0	1.732	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	9	.354	6
					5	Int.	●	MVS0850X05S100	44.0	1.732	69.5	2.736	73.5	2.894	128.5	5.059	127	5.000	1.5	.059	10	.394	6
					8	Int.	★	MVS0850X08S090	69.5	2.736	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	9	.354	6
					8	Int.	●	MVS0850X08S100	69.5	2.736	95.5	3.760	100.5	3.957	155.5	6.122	154	6.063	1.5	.059	10	.394	6
					10	Int.	★	MVS0850X10S090	86.5	3.406	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	9	.354	8
8.500	.3346			M10x1.5	10	Int.	●	MVS0850X10S100	86.5	3.406	112.5	4.429	115.5	4.547	170.5	6.713	169	6.654	1.5	.059	10	.394	8
					15	Int.	★	MVS0850X15S090	129.0	5.079	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	9	.354	8
					15	Int.	●	MVS0850X15S100	129.0	5.079	154.5	6.083	157.5	6.201	212.5	8.366	211	8.307	1.5	.059	10	.394	8
					20	Int.	★	MVS0850X20S090	171.5	6.752	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	9	.354	8
					20	Int.	●	MVS0850X20S100	171.5	6.752	197.5	7.776	200.5	7.894	255.5	10.059	254	10.000	1.5	.059	10	.394	8
					25	Int.	★	MVS0850X25S090	214.0	8.425	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	9	.354	8
					25	Int.	●	MVS0850X25S100	214.0	8.425	239.5	9.429	242.5	9.547	297.5	11.713	296	11.654	1.5	.059	10	.394	8
					30	Int.	★	MVS0850X30S090	256.5	10.098	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	9	.354	8
					30	Int.	●	MVS0850X30S100	256.5	10.098	282.5	11.122	285.5	11.240	340.5	13.406	339	13.346	1.5	.059	10	.394	8
					35	Int.	★	MVS0850X35S090	299.0	11.772	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	9	.354	8
					35	Int.	●	MVS0850X35S100	299.0	11.772	324.5	12.776	327.5	12.894	382.5	15.059	381	15.000	1.5	.059	10	.394	8
					40	Int.	★	MVS0850X40S090	341.5	13.445	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	9	.354	8
					40	Int.	●	MVS0850X40S100	341.5	13.445	366.5	14.429	369.5	14.547	424.5	16.713	423	16.654	1.5	.059	10	.394	8
					2	Ext.	★	MVE0860X02S090	18.8	.740	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0860X02S100	18.8	.740	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					2	Int.	★	MVS0860X02S090PL	18.6	.732	41.4	1.630	41.4	1.630	85.4	3.362	84	3.307	1.4	.055	9	.354	4
					2	Int.	●	MVS0860X02S100PL	18.6	.732	41.4	1.630	43.4	1.709	85.4	3.362	84	3.307	1.4	.055	10	.394	4
					3	Ext.	★	MVE0860X03S090	27.4	1.079	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0860X03S100	27.4	1.079	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0860X03S090	27.4	1.079	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	6
					3	Int.	●	MVS0860X03S100	27.4	1.079	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	6
					5	Int.	★	MVS0860X05S090	44.6	1.756	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	6
					5	Int.	●	MVS0860X05S100	44.6	1.756	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	6
					8	Int.	★	MVS0860X08S090	70.4	2.772	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	6
					8	Int.	●	MVS0860X08S100	70.4	2.772	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	6
					10	Int.	★	MVS0860X10S090	87.6	3.449	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9	.354	8
8.600	.3386		R		10	Int.	●	MVS0860X10S100	87.6	3.449	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	10	.394	8
					15	Int.	★	MVS0860X15S090	130.6	5.142	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9	.354	8
					15	Int.	●	MVS0860X15S100	130.6	5.142	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	10	.394	8
					20	Int.	★	MVS0860X20S090	173.6	6.835	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9	.354	8
					20	Int.	●	MVS0860X20S100	173.6	6.835	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	10	.394	8
					25	Int.	★	MVS0860X25S090	216.6	8.528	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9	.354	8
					25	Int.	●	MVS0860X25S100	216.6	8.528	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	10	.394	8
					30	Int.	★	MVS0860X30S090	259.6	10.220	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9	.354	8
					30	Int.	●	MVS0860X30S100	259.6	10.220	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	10	.394	8
					35	Int.	□	MVS0860X35S090	302.6	11.913	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	9	.354	8
					35	Int.	□	MVS0860X35S100	302.6	11.913	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	10	.394	8
					40	Int.	□	MVS0860X40S090	345.6	13.606	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	9	.354	8
					40	Int.	□	MVS0860X40S100	345.6	13.606	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	10	.394	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0870X02S090	19.0	.748	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0870X02S100	19.0	.748	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					2	Int.	★	MVS0870X02S090PL	18.8	.740	41.4	1.630	41.4	1.630	85.4	3.362	84	3.307	1.4	.055	9	.354	4
					2	Int.	●	MVS0870X02S100PL	18.8	.740	41.4	1.630	43.4	1.709	85.4	3.362	84	3.307	1.4	.055	10	.394	4
					3	Ext.	★	MVE0870X03S090	27.7	1.091	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0870X03S100	27.7	1.091	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0870X03S090	27.7	1.091	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	6
					3	Int.	●	MVS0870X03S100	27.7	1.091	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	6
					5	Int.	★	MVS0870X05S090	45.1	1.776	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	6
					5	Int.	●	MVS0870X05S100	45.1	1.776	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	6
					8	Int.	★	MVS0870X08S090	71.2	2.803	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	6
					8	Int.	●	MVS0870X08S100	71.2	2.803	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	6
					10	Int.	★	MVS0870X10S090	88.6	3.488	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9	.354	8
8.700	.3425			M10x1.25	10	Int.	●	MVS0870X10S100	88.6	3.488	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	10	.394	8
					15	Int.	★	MVS0870X15S090	132.1	5.201	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9	.354	8
					15	Int.	●	MVS0870X15S100	132.1	5.201	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	10	.394	8
					20	Int.	★	MVS0870X20S090	175.6	6.913	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9	.354	8
					20	Int.	●	MVS0870X20S100	175.6	6.913	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	10	.394	8
					25	Int.	★	MVS0870X25S090	219.1	8.626	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9	.354	8
					25	Int.	●	MVS0870X25S100	219.1	8.626	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	10	.394	8
					30	Int.	★	MVS0870X30S090	262.6	10.339	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9	.354	8
					30	Int.	●	MVS0870X30S100	262.6	10.339	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	10	.394	8
					35	Int.	□	MVS0870X35S090	306.1	12.051	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	9	.354	8
					35	Int.	□	MVS0870X35S100	306.1	12.051	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	10	.394	8
					40	Int.	□	MVS0870X40S090	349.6	13.764	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	9	.354	8
					40	Int.	□	MVS0870X40S100	349.6	13.764	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	10	.394	8
					2	Ext.	●	MVE0873X02S100	19.0	.748	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					2	Int.	●	MVS0873X02S100PL	19.0	.748	41.4	1.630	43.4	1.709	85.4	3.362	84	3.307	1.4	.055	10	.394	4
					3	Int.	●	MVS0873X03S100	27.8	1.094	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	6
					5	Int.	●	MVS0873X05S100	45.2	1.780	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	6
					8	Int.	●	MVS0873X08S100	71.4	2.811	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	6
					10	Int.	●	MVS0873X10S100	88.9	3.500	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	10	.394	8
8.732	.3438	11/32			15	Int.	●	MVS0873X15S100	132.6	5.220	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	10	.394	8
					20	Int.	●	MVS0873X20S100	176.2	6.937	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	10	.394	8
					25	Int.	●	MVS0873X25S100	219.9	8.657	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	10	.394	8
					30	Int.	●	MVS0873X30S100	263.6	10.378	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	10	.394	8
					35	Int.	●	MVS0873X35S100	307.2	12.094	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	10	.394	8
					40	Int.	●	MVS0873X40S100	350.9	13.815	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	10	.394	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE0880X02S090	19.2	.756	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0880X02S100	19.2	.756	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					2	Int.	★	MVS0880X02S090PL	19.0	.748	41.4	1.630	41.4	1.630	85.4	3.362	84	3.307	1.4	.055	9	.354	4
					2	Int.	●	MVS0880X02S100PL	19.0	.748	41.4	1.630	43.4	1.709	85.4	3.362	84	3.307	1.4	.055	10	.394	4
					3	Ext.	★	MVE0880X03S090	28.0	1.102	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0880X03S100	28.0	1.102	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0880X03S090	28.0	1.102	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	6
					3	Int.	●	MVS0880X03S100	28.0	1.102	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	6
					5	Int.	★	MVS0880X05S090	45.6	1.795	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	6
					5	Int.	●	MVS0880X05S100	45.6	1.795	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	6
					8	Int.	★	MVS0880X08S090	72.0	2.835	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	6
					8	Int.	●	MVS0880X08S100	72.0	2.835	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	6
					10	Int.	★	MVS0880X10S090	89.6	3.528	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9	.354	8
8.800	.3465				10	Int.	●	MVS0880X10S100	89.6	3.528	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	10	.394	8
					15	Int.	★	MVS0880X15S090	133.6	5.260	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9	.354	8
					15	Int.	●	MVS0880X15S100	133.6	5.260	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	10	.394	8
					20	Int.	★	MVS0880X20S090	177.6	6.992	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9	.354	8
					20	Int.	●	MVS0880X20S100	177.6	6.992	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	10	.394	8
					25	Int.	★	MVS0880X25S090	221.6	8.724	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9	.354	8
					25	Int.	●	MVS0880X25S100	221.6	8.724	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	10	.394	8
					30	Int.	★	MVS0880X30S090	265.6	10.457	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9	.354	8
					30	Int.	●	MVS0880X30S100	265.6	10.457	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	10	.394	8
					35	Int.	□	MVS0880X35S090	309.6	12.189	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	9	.354	8
					35	Int.	□	MVS0880X35S100	309.6	12.189	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	10	.394	8
					40	Int.	□	MVS0880X40S090	353.6	13.921	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	9	.354	8
					40	Int.	□	MVS0880X40S100	353.6	13.921	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	10	.394	8
					2	Ext.	★	MVE0890X02S090	19.4	.764	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0890X02S100	19.4	.764	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					2	Int.	★	MVS0890X02S090PL	19.2	.756	41.4	1.630	41.4	1.630	85.4	3.362	84	3.307	1.4	.055	9	.354	4
					2	Int.	●	MVS0890X02S100PL	19.2	.756	41.4	1.630	43.4	1.709	85.4	3.362	84	3.307	1.4	.055	10	.394	4
					3	Ext.	★	MVE0890X03S090	28.3	1.114	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0890X03S100	28.3	1.114	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0890X03S090	28.3	1.114	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	6
					3	Int.	●	MVS0890X03S100	28.3	1.114	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	6
					5	Int.	★	MVS0890X05S090	46.1	1.815	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	6
					5	Int.	●	MVS0890X05S100	46.1	1.815	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	6
					8	Int.	★	MVS0890X08S090	72.8	2.866	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	6
					8	Int.	●	MVS0890X08S100	72.8	2.866	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	6
					10	Int.	★	MVS0890X10S090	90.6	3.567	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9	.354	8
8.900	.3504				10	Int.	●	MVS0890X10S100	90.6	3.567	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	10	.394	8
					15	Int.	★	MVS0890X15S090	135.1	5.319	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9	.354	8
					15	Int.	●	MVS0890X15S100	135.1	5.319	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	10	.394	8
					20	Int.	★	MVS0890X20S090	179.6	7.071	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9	.354	8
					20	Int.	●	MVS0890X20S100	179.6	7.071	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	10	.394	8
					25	Int.	★	MVS0890X25S090	224.1	8.823	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9	.354	8
					25	Int.	●	MVS0890X25S100	224.1	8.823	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	10	.394	8
					30	Int.	★	MVS0890X30S090	268.6	10.575	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9	.354	8
					30	Int.	●	MVS0890X30S100	268.6	10.575	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	10	.394	8
					35	Int.	□	MVS0890X35S090	313.1	12.327	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	9	.354	8
					35	Int.	□	MVS0890X35S100	313.1	12.327	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	10	.394	8
					40	Int.	□	MVS0890X40S090	357.6	14.079	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	9	.354	8
					40	Int.	□	MVS0890X40S100	357.6	14.079	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	10	.394	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.000	.3543				2	Ext.	★	MVE0900X02S090	19.6	.772	41.6	1.638	41.6	1.638	85.6	3.370	84	3.307	1.6	.063	9	.354	2
					2	Ext.	●	MVE0900X02S100	19.6	.772	41.6	1.638	43.6	1.717	85.6	3.370	84	3.307	1.6	.063	10	.394	2
					2	Int.	★	MVS0900X02S090PL	19.4	.764	41.4	1.630	41.4	1.630	85.4	3.362	84	3.307	1.4	.055	9	.354	4
					2	Int.	●	MVS0900X02S100PL	19.4	.764	41.4	1.630	43.4	1.709	85.4	3.362	84	3.307	1.4	.055	10	.394	4
					3	Ext.	★	MVE0900X03S090	28.6	1.126	56.6	2.228	56.6	2.228	99.6	3.921	98	3.858	1.6	.063	9	.354	2
					3	Ext.	★	MVE0900X03S100	28.6	1.126	56.6	2.228	58.6	2.307	99.6	3.921	98	3.858	1.6	.063	10	.394	2
					3	Int.	★	MVS0900X03S090	28.6	1.126	46.6	1.835	46.6	1.835	101.6	4.000	100	3.937	1.6	.063	9	.354	6
					3	Int.	●	MVS0900X03S100	28.6	1.126	46.6	1.835	48.6	1.913	101.6	4.000	100	3.937	1.6	.063	10	.394	6
					5	Int.	★	MVS0900X05S090	46.6	1.835	73.6	2.898	73.6	2.898	128.6	5.063	127	5.000	1.6	.063	9	.354	6
					5	Int.	●	MVS0900X05S100	46.6	1.835	73.6	2.898	75.6	2.976	128.6	5.063	127	5.000	1.6	.063	10	.394	6
					8	Int.	★	MVS0900X08S090	73.6	2.898	100.6	3.961	100.6	3.961	155.6	6.126	154	6.063	1.6	.063	9	.354	6
					8	Int.	●	MVS0900X08S100	73.6	2.898	100.6	3.961	102.6	4.039	155.6	6.126	154	6.063	1.6	.063	10	.394	6
					10	Int.	★	MVS0900X10S090	91.6	3.606	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	9	.354	8
					10	Int.	●	MVS0900X10S100	91.6	3.606	118.6	4.669	121.6	4.787	176.6	6.953	175	6.890	1.6	.063	10	.394	8
					15	Int.	★	MVS0900X15S090	136.6	5.378	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	9	.354	8
					15	Int.	●	MVS0900X15S100	136.6	5.378	163.6	6.441	166.6	6.559	221.6	8.724	220	8.661	1.6	.063	10	.394	8
					20	Int.	★	MVS0900X20S090	181.6	7.150	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	9	.354	8
					20	Int.	●	MVS0900X20S100	181.6	7.150	208.6	8.213	211.6	8.331	266.6	10.496	265	10.433	1.6	.063	10	.394	8
					25	Int.	★	MVS0900X25S090	226.6	8.921	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	9	.354	8
					25	Int.	●	MVS0900X25S100	226.6	8.921	253.6	9.984	256.6	10.102	311.6	12.268	310	12.205	1.6	.063	10	.394	8
					30	Int.	★	MVS0900X30S090	271.6	10.693	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	9	.354	8
					30	Int.	●	MVS0900X30S100	271.6	10.693	298.6	11.756	301.6	11.874	356.6	14.039	355	13.976	1.6	.063	10	.394	8
					35	Int.	★	MVS0900X35S090	316.6	12.465	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	9	.354	8
					35	Int.	●	MVS0900X35S100	316.6	12.465	343.6	13.528	346.6	13.646	401.6	15.811	400	15.748	1.6	.063	10	.394	8
					40	Int.	★	MVS0900X40S090	361.6	14.236	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	9	.354	8
					40	Int.	●	MVS0900X40S100	361.6	14.236	391.6	15.417	394.6	15.535	449.6	17.701	448	17.638	1.6	.063	10	.394	8
9.100	.3583		T		2	Ext.	●	MVE0910X02S100	19.9	.783	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0910X02S100PL	19.6	.772	41.4	1.630	44.4	1.748	90.4	3.559	89	3.504	1.4	.055	10	.394	4
					3	Ext.	★	MVE0910X03S100	29.0	1.142	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0910X03S100	29.0	1.142	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0910X05S100	47.2	1.858	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0910X08S100	74.5	2.933	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
					10	Int.	★	MVS0910X10S100	92.7	3.650	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	★	MVS0910X15S100	138.2	5.441	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	★	MVS0910X20S100	183.7	7.232	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	★	MVS0910X25S100	229.2	9.024	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	★	MVS0910X30S100	274.7	10.815	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	□	MVS0910X35S100	320.2	12.606	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8
9.129	.3594	23/64			2	Ext.	●	MVE0913X02S100	19.8	.780	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0913X02S100PL	19.8	.780	41.4	1.630	44.4	1.748	90.4	3.559	89	3.504	1.4	.055	10	.394	4
					3	Int.	●	MVS0913X03S100	29.0	1.142	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0913X05S100	47.3	1.862	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0913X08S100	74.7	2.941	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
					10	Int.	●	MVS0913X10S100	92.9	3.657	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	●	MVS0913X15S100	138.6	5.457	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	●	MVS0913X20S100	184.2	7.252	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	●	MVS0913X25S100	229.8	9.047	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	●	MVS0913X30S100	275.5	10.846	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	●	MVS0913X35S100	321.1	12.642	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0920X02S100	20.1	.791	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0920X02S100PL	19.9	.783	41.5	1.634	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0920X03S100	29.3	1.154	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0920X03S100	29.3	1.154	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0920X05S100	47.7	1.878	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0920X08S100	75.3	2.965	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
9.200	.3622				10	Int.	★	MVS0920X10S100	93.7	3.689	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	★	MVS0920X15S100	139.7	5.500	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	★	MVS0920X20S100	185.7	7.311	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	★	MVS0920X25S100	231.7	9.122	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	★	MVS0920X30S100	277.7	10.933	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	□	MVS0920X35S100	323.7	12.744	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8
					2	Ext.	●	MVE0930X02S100	20.3	.799	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0930X02S100PL	20.1	.791	41.5	1.634	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0930X03S100	29.6	1.165	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0930X03S100	29.6	1.165	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0930X05S100	48.2	1.898	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0930X08S100	76.1	2.996	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
9.300	.3661				10	Int.	★	MVS0930X10S100	94.7	3.728	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	★	MVS0930X15S100	141.2	5.559	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	★	MVS0930X20S100	187.7	7.390	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	★	MVS0930X25S100	234.2	9.220	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	★	MVS0930X30S100	280.7	11.051	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	□	MVS0930X35S100	327.2	12.882	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8
					2	Ext.	●	MVE0935X02S100	20.3	.799	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0935X02S100PL	20.3	.799	41.5	1.634	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Int.	●	MVS0935X03S100	29.7	1.169	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0935X05S100	48.4	1.906	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0935X08S100	76.5	3.012	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
9.348	.3680		U	7/16-14	10	Int.	●	MVS0935X10S100	95.2	3.748	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	●	MVS0935X15S100	141.9	5.587	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	●	MVS0935X20S100	188.6	7.425	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	●	MVS0935X25S100	235.4	9.268	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	●	MVS0935X30S100	282.1	11.106	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	●	MVS0935X35S100	328.8	12.945	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8
					2	Ext.	●	MVE0940X02S100	20.5	.807	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0940X02S100PL	20.3	.799	41.5	1.634	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0940X03S100	29.9	1.177	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0940X03S100	29.9	1.177	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0940X05S100	48.7	1.917	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0940X08S100	76.9	3.028	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
9.400	.3701				10	Int.	★	MVS0940X10S100	95.7	3.768	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	★	MVS0940X15S100	142.7	5.618	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	★	MVS0940X20S100	189.7	7.469	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	★	MVS0940X25S100	236.7	9.319	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	★	MVS0940X30S100	283.7	11.169	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	□	MVS0940X35S100	330.7	13.020	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.500	.3740				2	Ext.	●	MVE0950X02S100	20.7	.815	41.7	1.642	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0950X02S100PL	20.5	.807	41.5	1.634	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0950X03S100	30.2	1.189	59.7	2.350	62.7	2.469	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0950X03S100	30.2	1.189	49.2	1.937	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0950X05S100	49.2	1.937	77.7	3.059	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0950X08S100	77.7	3.059	106.7	4.201	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
					10	Int.	★	MVS0950X10S100	96.7	3.807	125.7	4.949	128.7	5.067	183.7	7.232	182	7.165	1.7	.067	10	.394	8
					15	Int.	★	MVS0950X15S100	144.2	5.677	172.7	6.799	175.7	6.917	230.7	9.083	229	9.016	1.7	.067	10	.394	8
					20	Int.	●	MVS0950X20S100	191.7	7.547	220.7	8.689	223.7	8.807	278.7	10.972	277	10.906	1.7	.067	10	.394	8
					25	Int.	★	MVS0950X25S100	239.2	9.417	267.7	10.539	270.7	10.657	325.7	12.823	324	12.756	1.7	.067	10	.394	8
					30	Int.	★	MVS0950X30S100	286.7	11.287	315.7	12.429	318.7	12.547	373.7	14.713	372	14.646	1.7	.067	10	.394	8
					35	Int.	●	MVS0950X35S100	334.2	13.157	362.7	14.280	365.7	14.398	420.7	16.563	419	16.496	1.7	.067	10	.394	8
9.525	.3750	3/8			2	Ext.	●	MVE0953X02S100	20.7	.815	44.7	1.760	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0953X02S100PL	20.7	.815	44.5	1.752	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Int.	●	MVS0953X03S100	30.3	1.193	51.7	2.035	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0953X05S100	49.3	1.941	81.7	3.217	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0953X08S100	77.9	3.067	111.7	4.398	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
					10	Int.	●	MVS0953X10S100	97.0	3.819	131.7	5.185	134.7	5.303	189.7	7.469	188	7.402	1.7	.067	10	.394	8
					15	Int.	●	MVS0953X15S100	144.6	5.693	181.7	7.154	184.7	7.272	239.7	9.437	238	9.370	1.7	.067	10	.394	8
					20	Int.	●	MVS0953X20S100	192.2	7.567	231.7	9.122	234.7	9.240	289.7	11.406	288	11.339	1.7	.067	10	.394	8
					25	Int.	●	MVS0953X25S100	239.8	9.441	281.7	11.091	284.7	11.209	339.7	13.374	338	13.307	1.7	.067	10	.394	8
					30	Int.	●	MVS0953X30S100	287.5	11.319	331.7	13.059	334.7	13.177	389.7	15.343	388	15.276	1.7	.067	10	.394	8
					35	Int.	●	MVS0953X35S100	335.1	13.193	381.7	15.028	384.7	15.146	439.7	17.311	438	17.244	1.7	.067	10	.394	8
9.600	.3780				2	Ext.	●	MVE0960X02S100	20.9	.823	44.7	1.760	44.7	1.760	90.7	3.571	89	3.504	1.7	.067	10	.394	2
					2	Int.	●	MVS0960X02S100PL	20.7	.815	44.5	1.752	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0960X03S100	30.5	1.201	61.7	2.429	61.7	2.429	106.7	4.201	105	4.134	1.7	.067	10	.394	2
					3	Int.	●	MVS0960X03S100	30.5	1.201	51.7	2.035	51.7	2.035	107.7	4.240	106	4.173	1.7	.067	10	.394	6
					5	Int.	●	MVS0960X05S100	49.7	1.957	81.7	3.217	81.7	3.217	137.7	5.421	136	5.354	1.7	.067	10	.394	6
					8	Int.	●	MVS0960X08S100	78.5	3.091	111.7	4.398	111.7	4.398	167.7	6.602	166	6.535	1.7	.067	10	.394	6
					10	Int.	●	MVS0960X10S100	97.7	3.846	131.7	5.185	134.7	5.307	189.7	7.469	188	7.402	1.7	.067	10	.394	8
					15	Int.	★	MVS0960X15S100	145.7	5.736	181.7	7.154	184.7	7.276	239.7	9.437	238	9.370	1.7	.067	10	.394	8
					20	Int.	★	MVS0960X20S100	193.7	7.626	231.7	9.122	234.7	9.244	289.7	11.406	288	11.339	1.7	.067	10	.394	8
					25	Int.	★	MVS0960X25S100	241.7	9.516	281.7	11.091	284.7	11.213	339.7	13.374	338	13.307	1.7	.067	10	.394	8
					30	Int.	★	MVS0960X30S100	289.7	11.406	331.7	13.059	334.7	13.181	389.7	15.343	388	15.276	1.7	.067	10	.394	8
					35	Int.	□	MVS0960X35S100	337.7	13.295	381.7	15.028	384.7	15.150	439.7	17.311	438	17.244	1.7	.067	10	.394	8
9.700	.3819		Tube Sheet		2	Ext.	●	MVE0970X02S100	21.2	.835	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					2	Int.	●	MVS0970X02S100PL	20.9	.823	44.5	1.752	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0970X03S100	30.9	1.217	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0970X03S100	30.9	1.217	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	6
					5	Int.	●	MVS0970X05S100	50.3	1.980	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	6
					8	Int.	●	MVS0970X08S100	79.4	3.126	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	6
					10	Int.	★	MVS0970X10S100	98.8	3.890	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10	.394	8
					15	Int.	●	MVS0970X15S100	147.3	5.799	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10	.394	8
					20	Int.	★	MVS0970X20S100	195.8	7.709	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10	.394	8
					25	Int.	★	MVS0970X25S100	244.3	9.618	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10	.394	8
					30	Int.	★	MVS0970X30S100	292.8	11.528	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10	.394	8
					35	Int.	□	MVS0970X35S100	341.3	13.437	381.8	15.031	384.8	15.150	439.8	17.315	438	17.244	1.8	.071	10	.394	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE0980X02S100	21.4	.843	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					2	Int.	●	MVS0980X02S100PL	21.1	.831	44.5	1.752	44.5	1.752	90.5	3.563	89	3.504	1.5	.059	10	.394	4
					3	Ext.	★	MVE0980X03S100	31.2	1.228	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0980X03S100	31.2	1.228	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	6
					5	Int.	●	MVS0980X05S100	50.8	2.000	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	6
					8	Int.	●	MVS0980X08S100	80.2	3.157	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	6
9.800	.3858		W		10	Int.	●	MVS0980X10S100	99.8	3.929	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10	.394	8
					15	Int.	★	MVS0980X15S100	148.8	5.858	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10	.394	8
					20	Int.	★	MVS0980X20S100	197.8	7.787	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10	.394	8
					25	Int.	★	MVS0980X25S100	246.8	9.717	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10	.394	8
					30	Int.	★	MVS0980X30S100	295.8	11.646	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10	.394	8
					35	Int.	□	MVS0980X35S100	344.8	13.575	381.8	15.031	384.8	15.150	439.8	17.315	438	17.244	1.8	.071	10	.394	8
					2	Ext.	●	MVE0990X02S100	21.6	.850	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					2	Int.	●	MVS0990X02S100PL	21.4	.843	44.6	1.756	44.6	1.756	90.6	3.567	89	3.504	1.6	.063	10	.394	4
					3	Ext.	★	MVE0990X03S100	31.5	1.240	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS0990X03S100	31.5	1.240	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	6
					5	Int.	●	MVS0990X05S100	51.3	2.020	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	6
					8	Int.	●	MVS0990X08S100	81.0	3.189	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	6
9.900	.3898				10	Int.	★	MVS0990X10S100	100.8	3.969	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10	.394	8
					15	Int.	★	MVS0990X15S100	150.3	5.917	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10	.394	8
					20	Int.	★	MVS0990X20S100	199.8	7.866	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10	.394	8
					25	Int.	★	MVS0990X25S100	249.3	9.815	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10	.394	8
					30	Int.	★	MVS0990X30S100	298.8	11.764	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10	.394	8
					35	Int.	□	MVS0990X35S100	348.3	13.713	381.8	15.031	384.8	15.150	439.8	17.315	438	17.244	1.8	.071	10	.394	8
					2	Ext.	●	MVE0992X02S100	21.5	.846	44.8	1.764	44.9	1.768	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					2	Int.	●	MVS0992X02S100PL	21.5	.846	44.6	1.756	44.6	1.756	90.6	3.567	89	3.504	1.6	.063	10	.394	4
					3	Int.	●	MVS0992X03S100	31.5	1.240	51.8	2.039	51.9	2.043	107.8	4.244	106	4.173	1.8	.071	10	.394	6
					5	Int.	●	MVS0992X05S100	51.4	2.024	81.8	3.220	81.9	3.224	137.8	5.425	136	5.354	1.8	.071	10	.394	6
					8	Int.	●	MVS0992X08S100	81.2	3.197	111.8	4.402	111.9	4.406	167.8	6.606	166	6.535	1.8	.071	10	.394	6
9.922	.3907	25/64		7/16-20	10	Int.	●	MVS0992X10S100	101.0	3.976	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10	.394	8
					15	Int.	●	MVS0992X15S100	150.6	5.929	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10	.394	8
					20	Int.	●	MVS0992X20S100	200.2	7.882	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10	.394	8
					25	Int.	●	MVS0992X25S100	249.8	9.835	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10	.394	8
					30	Int.	●	MVS0992X30S100	299.4	11.787	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10	.394	8
					35	Int.	●	MVS0992X35S100	349.0	13.740	381.8	15.031	384.8	15.150	439.8	17.315	438	17.244	1.8	.071	10	.394	8
					2	Ext.	●	MVE1000X02S100	21.8	.858	44.8	1.764	44.8	1.764	90.8	3.575	89	3.504	1.8	.071	10	.394	2
					2	Int.	●	MVS1000X02S100PL	21.6	.850	44.6	1.756	44.6	1.756	90.6	3.567	89	3.504	1.6	.063	10	.394	4
					3	Ext.	★	MVE1000X03S100	31.8	1.252	61.8	2.433	61.8	2.433	106.8	4.205	105	4.134	1.8	.071	10	.394	2
					3	Int.	●	MVS1000X03S100	31.8	1.252	51.8	2.039	51.8	2.039	107.8	4.244	106	4.173	1.8	.071	10	.394	6
					5	Int.	●	MVS1000X05S100	51.8	2.039	81.8	3.220	81.8	3.220	137.8	5.425	136	5.354	1.8	.071	10	.394	6
					8	Int.	●	MVS1000X08S100	81.8	3.220	111.8	4.402	111.8	4.402	167.8	6.606	166	6.535	1.8	.071	10	.394	6
10.000	.3937				10	Int.	●	MVS1000X10S100	101.8	4.008	131.8	5.189	134.8	5.307	189.8	7.472	188	7.402	1.8	.071	10	.394	8
					15	Int.	●	MVS1000X15S100	151.8	5.976	181.8	7.157	184.8	7.276	239.8	9.441	238	9.370	1.8	.071	10	.394	8
					20	Int.	★	MVS1000X20S100	201.8	7.945	231.8	9.126	234.8	9.244	289.8	11.409	288	11.339	1.8	.071	10	.394	8
					25	Int.	★	MVS1000X25S100	251.8	9.913	281.8	11.094	284.8	11.213	339.8	13.378	338	13.307	1.8	.071	10	.394	8
					30	Int.	★	MVS1000X30S100	301.8	11.882	331.8	13.063	334.8	13.181	389.8	15.346	388	15.276	1.8	.071	10	.394	8
					35	Int.	●	MVS1000X35S100	351.8	13.850	381.8	15.031	384.8	15.150	439.8	17.315	438	17.244	1.8	.071	10	.394	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.100	.3976				2	Ext.	★	MVE1010X02S110	22.0	.866	44.8	1.764	47.8	1.882	96.8	3.811	95	3.740	1.8	.071	11	.433	2
					2	Ext.	●	MVE1010X02S120	22.0	.866	44.8	1.764	47.8	1.882	96.8	3.811	95	3.740	1.8	.071	12	.472	2
					2	Int.	●	MVS1010X02S110PL	21.8	.858	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	11	.433	4
					2	Int.	●	MVS1010X02S120PL	21.8	.858	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	12	.472	4
					3	Ext.	★	MVE1010X03S110	32.1	1.264	67.8	2.669	70.8	2.787	115.8	4.559	114	4.488	1.8	.071	11	.433	2
					3	Ext.	★	MVE1010X03S120	32.1	1.264	67.8	2.669	70.8	2.787	115.8	4.559	114	4.488	1.8	.071	12	.472	2
					3	Int.	★	MVS1010X03S110	32.1	1.264	54.3	2.138	56.8	2.236	117.8	4.638	116	4.567	1.8	.071	11	.433	6
					3	Int.	●	MVS1010X03S120	32.1	1.264	54.3	2.138	56.8	2.236	117.8	4.638	116	4.567	1.8	.071	12	.472	6
					5	Int.	★	MVS1010X05S110	52.3	2.059	85.8	3.378	89.8	3.535	150.8	5.937	149	5.866	1.8	.071	11	.433	6
					5	Int.	●	MVS1010X05S120	52.3	2.059	85.8	3.378	89.8	3.535	150.8	5.937	149	5.866	1.8	.071	12	.472	6
					8	Int.	★	MVS1010X08S110	82.6	3.252	117.8	4.638	122.8	4.835	183.8	7.236	182	7.165	1.8	.071	11	.433	6
					8	Int.	●	MVS1010X08S120	82.6	3.252	117.8	4.638	122.8	4.835	183.8	7.236	182	7.165	1.8	.071	12	.472	6
					10	Int.	★	MVS1010X10S110	102.8	4.047	138.8	5.465	141.8	5.583	202.8	7.984	201	7.913	1.8	.071	11	.433	8
					10	Int.	●	MVS1010X10S120	102.8	4.047	138.8	5.465	141.8	5.583	202.8	7.984	201	7.913	1.8	.071	12	.472	8
					15	Int.	★	MVS1010X15S110	153.3	6.035	190.8	7.512	193.8	7.630	254.8	10.031	253	9.961	1.8	.071	11	.433	8
					15	Int.	●	MVS1010X15S120	153.3	6.035	190.8	7.512	193.8	7.630	254.8	10.031	253	9.961	1.8	.071	12	.472	8
					20	Int.	★	MVS1010X20S110	203.8	8.024	243.8	9.598	246.8	9.717	307.8	12.118	306	12.047	1.8	.071	11	.433	8
					20	Int.	●	MVS1010X20S120	203.8	8.024	243.8	9.598	246.8	9.717	307.8	12.118	306	12.047	1.8	.071	12	.472	8
					25	Int.	★	MVS1010X25S110	254.3	10.012	295.8	11.646	298.8	11.764	359.8	14.165	358	14.094	1.8	.071	11	.433	8
					25	Int.	●	MVS1010X25S120	254.3	10.012	295.8	11.646	298.8	11.764	359.8	14.165	358	14.094	1.8	.071	12	.472	8
10.200	.4016			M12x1.75	2	Ext.	★	MVE1020X02S110	22.3	.878	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1020X02S120	22.3	.878	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	●	MVS1020X02S110PL	22.0	.866	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	11	.433	4
					2	Int.	●	MVS1020X02S120PL	22.0	.866	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	12	.472	4
					3	Ext.	★	MVE1020X03S110	32.5	1.280	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1020X03S120	32.5	1.280	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1020X03S110	32.5	1.280	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	6
					3	Int.	●	MVS1020X03S120	32.5	1.280	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	★	MVS1020X05S110	52.9	2.083	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	6
					5	Int.	●	MVS1020X05S120	52.9	2.083	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	★	MVS1020X08S110	83.5	3.287	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	6
					8	Int.	●	MVS1020X08S120	83.5	3.287	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	★	MVS1020X10S110	103.9	4.091	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11	.433	8
					10	Int.	●	MVS1020X10S120	103.9	4.091	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	12	.472	8
					15	Int.	★	MVS1020X15S110	154.9	6.098	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11	.433	8
					15	Int.	●	MVS1020X15S120	154.9	6.098	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	12	.472	8
					20	Int.	★	MVS1020X20S110	205.9	8.106	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11	.433	8
					20	Int.	●	MVS1020X20S120	205.9	8.106	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	12	.472	8
					25	Int.	★	MVS1020X25S110	256.9	10.114	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11	.433	8
					25	Int.	●	MVS1020X25S120	256.9	10.114	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	12	.472	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.300	.4055				2	Ext.	★	MVE1030X02S110	22.5	.886	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1030X02S120	22.5	.886	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	●	MVS1030X02S110PL	22.2	.874	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	11	.433	4
					2	Int.	●	MVS1030X02S120PL	22.2	.874	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	12	.472	4
					3	Ext.	★	MVE1030X03S110	32.8	1.291	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1030X03S120	32.8	1.291	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1030X03S110	32.8	1.291	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	6
					3	Int.	●	MVS1030X03S120	32.8	1.291	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	★	MVS1030X05S110	53.4	2.102	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	6
					5	Int.	●	MVS1030X05S120	53.4	2.102	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	★	MVS1030X08S110	84.3	3.319	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	6
					8	Int.	●	MVS1030X08S120	84.3	3.319	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	★	MVS1030X10S110	104.9	4.130	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11	.433	8
					10	Int.	●	MVS1030X10S120	104.9	4.130	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	12	.472	8
					15	Int.	★	MVS1030X15S110	156.4	6.157	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11	.433	8
					15	Int.	●	MVS1030X15S120	156.4	6.157	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	12	.472	8
					20	Int.	★	MVS1030X20S110	207.9	8.185	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11	.433	8
					20	Int.	●	MVS1030X20S120	207.9	8.185	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	12	.472	8
					25	Int.	★	MVS1030X25S110	259.4	10.213	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11	.433	8
					25	Int.	●	MVS1030X25S120	259.4	10.213	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	12	.472	8
10.319	.4063	13/32			2	Ext.	●	MVE1032X02S120	22.4	.882	44.9	1.768	46.7	1.839	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	●	MVS1032X02S120PL	22.4	.882	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	12	.472	4
					3	Int.	●	MVS1032X03S120	32.8	1.291	54.4	2.142	56.2	2.213	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	●	MVS1032X05S120	53.4	2.102	85.9	3.382	87.7	3.453	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	●	MVS1032X08S120	84.4	3.323	117.9	4.642	119.7	4.713	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	●	MVS1032X10S120	105.0	4.134	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	12	.472	8
					15	Int.	●	MVS1032X15S120	156.6	6.165	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	12	.472	8
					20	Int.	●	MVS1032X20S120	208.2	8.197	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	12	.472	8
					25	Int.	●	MVS1032X25S120	259.8	10.228	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	12	.472	8
10.400	.4094				2	Ext.	★	MVE1040X02S110	22.7	.894	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1040X02S120	22.7	.894	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	★	MVS1040X02S110PL	22.4	.882	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	11	.433	4
					2	Int.	●	MVS1040X02S120PL	22.4	.882	44.6	1.756	47.6	1.874	96.6	3.803	95	3.740	1.6	.063	12	.472	4
					3	Ext.	★	MVE1040X03S110	33.1	1.303	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1040X03S120	33.1	1.303	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1040X03S110	33.1	1.303	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	6
					3	Int.	●	MVS1040X03S120	33.1	1.303	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	★	MVS1040X05S110	53.9	2.122	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	6
					5	Int.	●	MVS1040X05S120	53.9	2.122	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	★	MVS1040X08S110	85.1	3.350	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	6
					8	Int.	●	MVS1040X08S120	85.1	3.350	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	★	MVS1040X10S110	105.9	4.169	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11	.433	8
					10	Int.	●	MVS1040X10S120	105.9	4.169	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	12	.472	8
					15	Int.	★	MVS1040X15S110	157.9	6.217	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11	.433	8
					15	Int.	●	MVS1040X15S120	157.9	6.217	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	12	.472	8
					20	Int.	★	MVS1040X20S110	209.9	8.264	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11	.433	8
					20	Int.	●	MVS1040X20S120	209.9	8.264	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	12	.472	8
					25	Int.	★	MVS1040X25S110	261.9	10.311	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11	.433	8
					25	Int.	●	MVS1040X25S120	261.9	10.311	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	12	.472	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.500	.4134		Z		2	Ext.	★	MVE1050X02S110	22.9	.902	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1050X02S120	22.9	.902	44.9	1.768	47.9	1.886	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	★	MVS1050X02S110PL	22.7	.894	44.7	1.760	47.7	1.878	96.7	3.807	95	3.740	1.7	.067	11	.433	4
					2	Int.	●	MVS1050X02S120PL	22.7	.894	44.7	1.760	47.7	1.878	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1050X03S110	33.4	1.315	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1050X03S120	33.4	1.315	67.9	2.673	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1050X03S110	33.4	1.315	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	6
					3	Int.	●	MVS1050X03S120	33.4	1.315	54.4	2.142	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	★	MVS1050X05S110	54.4	2.142	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	6
					5	Int.	●	MVS1050X05S120	54.4	2.142	85.9	3.382	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	★	MVS1050X08S110	85.9	3.382	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	6
					8	Int.	●	MVS1050X08S120	85.9	3.382	117.9	4.642	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	★	MVS1050X10S110	106.9	4.209	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	11	.433	8
					10	Int.	●	MVS1050X10S120	106.9	4.209	138.9	5.469	141.9	5.587	202.9	7.988	201	7.913	1.9	.075	12	.472	8
					15	Int.	★	MVS1050X15S110	159.4	6.276	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	11	.433	8
					15	Int.	●	MVS1050X15S120	159.4	6.276	190.9	7.516	193.9	7.634	254.9	10.035	253	9.961	1.9	.075	12	.472	8
					20	Int.	★	MVS1050X20S110	211.9	8.343	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	11	.433	8
					20	Int.	●	MVS1050X20S120	211.9	8.343	243.9	9.602	246.9	9.720	307.9	12.122	306	12.047	1.9	.075	12	.472	8
					25	Int.	★	MVS1050X25S110	264.4	10.409	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	11	.433	8
					25	Int.	●	MVS1050X25S120	264.4	10.409	295.9	11.650	298.9	11.768	359.9	14.169	358	14.094	1.9	.075	12	.472	8
10.600	.4173				2	Ext.	★	MVE1060X02S110	23.1	.909	48.9	1.925	48.9	1.925	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1060X02S120	23.1	.909	48.9	1.925	49.9	1.965	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	★	MVS1060X02S110PL	22.9	.902	48.7	1.917	48.7	1.917	96.7	3.807	95	3.740	1.7	.067	11	.433	4
					2	Int.	●	MVS1060X02S120PL	22.9	.902	48.7	1.917	49.7	1.957	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1060X03S110	33.7	1.327	69.9	2.752	69.9	2.752	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1060X03S120	33.7	1.327	69.9	2.752	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1060X03S110	33.7	1.327	56.9	2.240	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	6
					3	Int.	●	MVS1060X03S120	33.7	1.327	56.9	2.240	57.9	2.280	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	★	MVS1060X05S110	54.9	2.161	89.9	3.539	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	6
					5	Int.	●	MVS1060X05S120	54.9	2.161	89.9	3.539	90.9	3.579	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	★	MVS1060X08S110	86.7	3.413	122.9	4.839	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	6
					8	Int.	●	MVS1060X08S120	86.7	3.413	122.9	4.839	123.9	4.878	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	★	MVS1060X10S110	107.9	4.248	144.9	5.705	147.9	5.823	208.9	8.224	207	8.150	1.9	.075	11	.433	8
					10	Int.	●	MVS1060X10S120	107.9	4.248	144.9	5.705	147.9	5.823	208.9	8.224	207	8.150	1.9	.075	12	.472	8
					15	Int.	★	MVS1060X15S110	160.9	6.335	199.9	7.870	202.9	7.988	263.9	10.390	262	10.315	1.9	.075	11	.433	8
					15	Int.	●	MVS1060X15S120	160.9	6.335	199.9	7.870	202.9	7.988	263.9	10.390	262	10.315	1.9	.075	12	.472	8
					20	Int.	★	MVS1060X20S110	213.9	8.421	254.9	10.035	257.9	10.154	318.9	12.555	317	12.480	1.9	.075	11	.433	8
					20	Int.	●	MVS1060X20S120	213.9	8.421	254.9	10.035	257.9	10.154	318.9	12.555	317	12.480	1.9	.075	12	.472	8
					25	Int.	★	MVS1060X25S110	266.9	10.508	309.9	12.201	312.9	12.319	373.9	14.720	372	14.646	1.9	.075	11	.433	8
					25	Int.	●	MVS1060X25S120	266.9	10.508	309.9	12.201	312.9	12.319	373.9	14.720	372	14.646	1.9	.075	12	.472	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.700	.4213				2	Ext.	★	MVE1070X02S110	23.3	.917	48.9	1.925	48.9	1.925	96.9	3.815	95	3.740	1.9	.075	11	.433	2
					2	Ext.	●	MVE1070X02S120	23.3	.917	48.9	1.925	49.9	1.965	96.9	3.815	95	3.740	1.9	.075	12	.472	2
					2	Int.	★	MVS1070X02S110PL	23.1	.909	48.7	1.917	48.7	1.917	96.7	3.807	95	3.740	1.7	.067	11	.433	4
					2	Int.	●	MVS1070X02S120PL	23.1	.909	48.7	1.917	49.7	1.957	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1070X03S110	34.0	1.339	69.9	2.752	69.9	2.752	115.9	4.563	114	4.488	1.9	.075	11	.433	2
					3	Ext.	★	MVE1070X03S120	34.0	1.339	69.9	2.752	70.9	2.791	115.9	4.563	114	4.488	1.9	.075	12	.472	2
					3	Int.	★	MVS1070X03S110	34.0	1.339	56.9	2.240	56.9	2.240	117.9	4.642	116	4.567	1.9	.075	11	.433	6
					3	Int.	●	MVS1070X03S120	34.0	1.339	56.9	2.240	57.9	2.280	117.9	4.642	116	4.567	1.9	.075	12	.472	6
					5	Int.	★	MVS1070X05S110	55.4	2.181	89.9	3.539	89.9	3.539	150.9	5.941	149	5.866	1.9	.075	11	.433	6
					5	Int.	●	MVS1070X05S120	55.4	2.181	89.9	3.539	90.9	3.579	150.9	5.941	149	5.866	1.9	.075	12	.472	6
					8	Int.	★	MVS1070X08S110	87.5	3.445	122.9	4.839	122.9	4.839	183.9	7.240	182	7.165	1.9	.075	11	.433	6
					8	Int.	●	MVS1070X08S120	87.5	3.445	122.9	4.839	123.9	4.878	183.9	7.240	182	7.165	1.9	.075	12	.472	6
					10	Int.	★	MVS1070X10S110	108.9	4.287	144.9	5.705	147.9	5.827	208.9	8.224	207	8.150	1.9	.075	11	.433	8
					10	Int.	●	MVS1070X10S120	108.9	4.287	144.9	5.705	147.9	5.823	208.9	8.224	207	8.150	1.9	.075	12	.472	8
					15	Int.	★	MVS1070X15S110	162.4	6.394	199.9	7.870	202.9	7.992	263.9	10.390	262	10.315	1.9	.075	11	.433	8
					15	Int.	●	MVS1070X15S120	162.4	6.394	199.9	7.870	202.9	7.988	263.9	10.390	262	10.315	1.9	.075	12	.472	8
					20	Int.	★	MVS1070X20S110	215.9	8.500	254.9	10.035	257.9	10.157	318.9	12.555	317	12.480	1.9	.075	11	.433	8
					20	Int.	●	MVS1070X20S120	215.9	8.500	254.9	10.035	257.9	10.154	318.9	12.555	317	12.480	1.9	.075	12	.472	8
					25	Int.	★	MVS1070X25S110	269.4	10.606	309.9	12.201	312.9	12.323	373.9	14.720	372	14.646	1.9	.075	11	.433	8
					25	Int.	●	MVS1070X25S120	269.4	10.606	309.9	12.201	312.9	12.319	373.9	14.720	372	14.646	1.9	.075	12	.472	8
10.716	.4219	27/64		1/2-13	2	Ext.	●	MVE1072X02S120	23.3	.917	49.0	1.929	50.4	1.984	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	●	MVS1072X02S120PL	23.3	.917	48.7	1.917	49.7	1.957	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Int.	●	MVS1072X03S120	34.1	1.343	57.0	2.244	58.4	2.299	118.0	4.646	116	4.567	2.0	.079	12	.472	6
					5	Int.	●	MVS1072X05S120	55.5	2.185	90.0	3.543	91.4	3.598	151.0	5.945	149	5.866	2.0	.079	12	.472	6
					8	Int.	●	MVS1072X08S120	87.7	3.453	123.0	4.843	124.4	4.898	184.0	7.244	182	7.165	2.0	.079	12	.472	6
					10	Int.	●	MVS1072X10S120	109.1	4.295	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	12	.472	8
					15	Int.	●	MVS1072X15S120	162.7	6.406	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	12	.472	8
					20	Int.	●	MVS1072X20S120	216.2	8.512	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	12	.472	8
					25	Int.	●	MVS1072X25S120	269.8	10.622	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	12	.472	8
10.800	.4252			M12x1.25	2	Ext.	★	MVE1080X02S110	23.6	.929	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1080X02S120	23.6	.929	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	★	MVS1080X02S110PL	23.3	.917	48.7	1.917	48.7	1.917	96.7	3.807	95	3.740	1.7	.067	11	.433	4
					2	Int.	●	MVS1080X02S120PL	23.3	.917	48.7	1.917	49.7	1.957	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1080X03S110	34.4	1.354	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1080X03S120	34.4	1.354	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1080X03S110	34.4	1.354	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	6
					3	Int.	●	MVS1080X03S120	34.4	1.354	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	6
					5	Int.	★	MVS1080X05S110	56.0	2.205	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	6
					5	Int.	●	MVS1080X05S120	56.0	2.205	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	6
					8	Int.	★	MVS1080X08S110	88.4	3.480	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	6
					8	Int.	●	MVS1080X08S120	88.4	3.480	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	6
					10	Int.	★	MVS1080X10S110	110.0	4.331	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	11	.433	8
					10	Int.	●	MVS1080X10S120	110.0	4.331	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	12	.472	8
					15	Int.	★	MVS1080X15S110	164.0	6.457	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11	.433	8
					15	Int.	●	MVS1080X15S120	164.0	6.457	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	12	.472	8
					20	Int.	★	MVS1080X20S110	218.0	8.583	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11	.433	8
					20	Int.	●	MVS1080X20S120	218.0	8.583	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	12	.472	8
					25	Int.	★	MVS1080X25S110	272.0	10.709	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11	.433	8
					25	Int.	●	MVS1080X25S120	272.0	10.709	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	12	.472	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.900	.4291				2	Ext.	★	MVE1090X02S110	23.8	.937	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1090X02S120	23.8	.937	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	★	MVS1090X02S110PL	23.5	.925	48.7	1.917	48.7	1.917	96.7	3.807	95	3.740	1.7	.067	11	.433	4
					2	Int.	●	MVS1090X02S120PL	23.5	.925	48.7	1.917	49.7	1.957	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1090X03S110	34.7	1.366	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1090X03S120	34.7	1.366	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1090X03S110	34.7	1.366	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	6
					3	Int.	●	MVS1090X03S120	34.7	1.366	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	6
					5	Int.	★	MVS1090X05S110	56.5	2.224	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	6
					5	Int.	●	MVS1090X05S120	56.5	2.224	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	6
					8	Int.	★	MVS1090X08S110	89.2	3.512	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	6
					8	Int.	●	MVS1090X08S120	89.2	3.512	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	6
					10	Int.	★	MVS1090X10S110	111.0	4.370	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	11	.433	8
					10	Int.	●	MVS1090X10S120	111.0	4.370	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	12	.472	8
					15	Int.	★	MVS1090X15S110	165.5	6.516	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11	.433	8
					15	Int.	●	MVS1090X15S120	165.5	6.516	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	12	.472	8
					20	Int.	★	MVS1090X20S110	220.0	8.661	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11	.433	8
					20	Int.	●	MVS1090X20S120	220.0	8.661	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	12	.472	8
					25	Int.	★	MVS1090X25S110	274.5	10.807	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11	.433	8
					25	Int.	●	MVS1090X25S120	274.5	10.807	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11	.433	8
11.000	.4331				2	Ext.	★	MVE1100X02S110	24.0	.945	49.0	1.929	49.0	1.929	97.0	3.819	95	3.740	2.0	.079	11	.433	2
					2	Ext.	●	MVE1100X02S120	24.0	.945	49.0	1.929	50.0	1.969	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	★	MVS1100X02S110PL	23.7	.933	48.7	1.917	48.7	1.917	96.7	3.807	95	3.740	1.7	.067	11	.433	4
					2	Int.	●	MVS1100X02S120PL	23.7	.933	48.7	1.917	49.7	1.957	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1100X03S110	35.0	1.378	70.0	2.756	70.0	2.756	116.0	4.567	114	4.488	2.0	.079	11	.433	2
					3	Ext.	★	MVE1100X03S120	35.0	1.378	70.0	2.756	71.0	2.795	116.0	4.567	114	4.488	2.0	.079	12	.472	2
					3	Int.	★	MVS1100X03S110	35.0	1.378	57.0	2.244	57.0	2.244	118.0	4.646	116	4.567	2.0	.079	11	.433	6
					3	Int.	●	MVS1100X03S120	35.0	1.378	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	6
					5	Int.	★	MVS1100X05S110	57.0	2.244	90.0	3.543	90.0	3.543	151.0	5.945	149	5.866	2.0	.079	11	.433	6
					5	Int.	●	MVS1100X05S120	57.0	2.244	90.0	3.543	91.0	3.583	151.0	5.945	149	5.866	2.0	.079	12	.472	6
					8	Int.	★	MVS1100X08S110	90.0	3.543	123.0	4.843	123.0	4.843	184.0	7.244	182	7.165	2.0	.079	11	.433	6
					8	Int.	●	MVS1100X08S120	90.0	3.543	123.0	4.843	124.0	4.882	184.0	7.244	182	7.165	2.0	.079	12	.472	6
					10	Int.	★	MVS1100X10S110	112.0	4.409	145.0	5.709	147.0	5.827	209.0	8.228	207	8.150	2.0	.079	11	.433	8
					10	Int.	●	MVS1100X10S120	112.0	4.409	145.0	5.709	148.0	5.827	209.0	8.228	207	8.150	2.0	.079	12	.472	8
					15	Int.	★	MVS1100X15S110	167.0	6.575	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	11	.433	8
					15	Int.	●	MVS1100X15S120	167.0	6.575	200.0	7.874	203.0	7.992	264.0	10.394	262	10.315	2.0	.079	12	.472	8
					20	Int.	★	MVS1100X20S110	222.0	8.740	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	11	.433	8
					20	Int.	●	MVS1100X20S120	222.0	8.740	255.0	10.039	258.0	10.157	319.0	12.559	317	12.480	2.0	.079	12	.472	8
					25	Int.	★	MVS1100X25S110	277.0	10.906	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	11	.433	8
					25	Int.	●	MVS1100X25S120	277.0	10.906	310.0	12.205	313.0	12.323	374.0	14.724	372	14.646	2.0	.079	12	.472	8
11.100	.4370				2	Ext.	●	MVE1110X02S120	24.2	.953	49.0	1.929	52.0	2.047	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	●	MVS1110X02S120PL	23.9	.941	48.7	1.917	51.7	2.035	96.7	3.807	95	3.740	1.7	.067	12	.472	4
					3	Ext.	★	MVE1110X03S120	35.3	1.390	73.0	2.874	76.0	2.992	123.0	4.843	121	4.764	2.0	.079	12	.472	2
					3	Int.	●	MVS1110X03S120	35.3	1.390	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12	.472	6
					5	Int.	●	MVS1110X05S120	57.5	2.264	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12	.472	6
					8	Int.	●	MVS1110X08S120	90.8	3.575	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12	.472	6
					10	Int.	★	MVS1110X10S120	113.0	4.449	152.0	5.984	155.0	6.102	217.0	8.543	215	8.465	2.0	.079	12	.472	8
					15	Int.	★	MVS1110X15S120	168.5	6.634	209.0	8.228	212.0	8.346	274.0	10.787	272	10.709	2.0	.079	12	.472	8
					20	Int.	★	MVS1110X20S120	224.0	8.819	267.0	10.512	270.0	10.630	332.0	13.071	330	12.992	2.0	.079	12	.472	8
					25	Int.	★	MVS1110X25S120	279.5	11.004	324.0	12.756	327.0	12.874	389.0	15.315	387	15.236	2.0	.079	12	.472	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE1111X02S120	24.1	.949	49.0	1.929	52.0	2.047	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	●	MVS1111X02S120PL	24.1	.949	48.8	1.921	51.8	2.039	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Int.	●	MVS1111X03S120	35.3	1.390	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12	.472	6
					5	Int.	●	MVS1111X05S120	57.6	2.268	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12	.472	6
11.113	.4375	7/16			8	Int.	●	MVS1111X08S120	90.9	3.579	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12	.472	6
					10	Int.	●	MVS1111X10S120	113.1	4.453	152.0	5.984	155.0	6.102	217.0	8.543	215	8.465	2.0	.079	12	.472	8
					15	Int.	●	MVS1111X15S120	168.7	6.642	209.0	8.228	212.0	8.346	274.0	10.787	272	10.709	2.0	.079	12	.472	8
					20	Int.	●	MVS1111X20S120	224.3	8.831	267.0	10.512	270.0	10.630	332.0	13.071	330	12.992	2.0	.079	12	.472	8
					25	Int.	●	MVS1111X25S120	279.8	11.016	324.0	12.756	327.0	12.874	389.0	15.315	387	15.236	2.0	.079	12	.472	8
					2	Ext.	●	MVE1120X02S120	24.4	.961	49.0	1.929	52.0	2.047	97.0	3.819	95	3.740	2.0	.079	12	.472	2
					2	Int.	●	MVS1120X02S120PL	24.2	.953	48.8	1.921	51.8	2.039	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Ext.	★	MVE1120X03S120	35.6	1.402	73.0	2.874	76.0	2.992	123.0	4.843	121	4.764	2.0	.079	12	.472	2
					3	Int.	●	MVS1120X03S120	35.6	1.402	59.5	2.343	62.0	2.441	124.0	4.882	122	4.803	2.0	.079	12	.472	6
					5	Int.	●	MVS1120X05S120	58.0	2.283	94.0	3.701	98.0	3.858	160.0	6.299	158	6.220	2.0	.079	12	.472	6
11.200	.4409				8	Int.	●	MVS1120X08S120	91.6	3.606	129.0	5.079	134.0	5.276	196.0	7.717	194	7.638	2.0	.079	12	.472	6
					10	Int.	★	MVS1120X10S120	114.0	4.488	152.0	5.984	155.0	6.102	217.0	8.543	215	8.465	2.0	.079	12	.472	8
					15	Int.	★	MVS1120X15S120	170.0	6.693	209.0	8.228	212.0	8.346	274.0	10.787	272	10.709	2.0	.079	12	.472	8
					20	Int.	★	MVS1120X20S120	226.0	8.898	267.0	10.512	270.0	10.630	332.0	13.071	330	12.992	2.0	.079	12	.472	8
					25	Int.	★	MVS1120X25S120	282.0	11.102	324.0	12.756	327.0	12.874	389.0	15.315	387	15.236	2.0	.079	12	.472	8
					2	Ext.	●	MVE1130X02S120	24.7	.972	49.1	1.933	52.1	2.051	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1130X02S120PL	24.4	.961	48.8	1.921	51.8	2.039	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Ext.	★	MVE1130X03S120	36.0	1.417	73.1	2.878	76.1	2.996	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1130X03S120	36.0	1.417	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1130X05S120	58.6	2.307	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.300	.4449				8	Int.	●	MVS1130X08S120	92.5	3.642	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	★	MVS1130X10S120	115.1	4.531	152.1	5.988	155.1	6.106	217.1	8.547	215	8.465	2.1	.083	12	.472	8
					15	Int.	★	MVS1130X15S120	171.6	6.756	209.1	8.232	212.1	8.350	274.1	10.791	272	10.709	2.1	.083	12	.472	8
					20	Int.	★	MVS1130X20S120	228.1	8.980	267.1	10.516	270.1	10.634	332.1	13.075	330	12.992	2.1	.083	12	.472	8
					25	Int.	★	MVS1130X25S120	284.6	11.205	324.1	12.760	327.1	12.878	389.1	15.319	387	15.236	2.1	.083	12	.472	8
					2	Ext.	●	MVE1140X02S120	24.9	.980	49.1	1.933	52.1	2.051	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1140X02S120PL	24.6	.969	48.8	1.921	51.8	2.039	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Ext.	★	MVE1140X03S120	36.3	1.429	73.1	2.878	76.1	2.996	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1140X03S120	36.3	1.429	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1140X05S120	59.1	2.327	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.400	.4488				8	Int.	●	MVS1140X08S120	93.3	3.673	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	★	MVS1140X10S120	116.1	4.571	152.1	5.988	155.1	6.106	217.1	8.547	215	8.465	2.1	.083	12	.472	8
					15	Int.	★	MVS1140X15S120	173.1	6.815	209.1	8.232	212.1	8.350	274.1	10.791	272	10.709	2.1	.083	12	.472	8
					20	Int.	★	MVS1140X20S120	230.1	9.059	267.1	10.516	270.1	10.634	332.1	13.075	330	12.992	2.1	.083	12	.472	8
					25	Int.	★	MVS1140X25S120	287.1	11.303	324.1	12.760	327.1	12.878	389.1	15.319	387	15.236	2.1	.083	12	.472	8
					2	Ext.	●	MVE1150X02S120	25.1	.988	49.1	1.933	52.1	2.051	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1150X02S120PL	24.8	.976	48.8	1.921	51.8	2.039	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Ext.	★	MVE1150X03S120	36.6	1.441	73.1	2.878	76.1	2.996	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1150X03S120	36.6	1.441	59.6	2.346	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1150X05S120	59.6	2.346	94.1	3.705	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.500	.4528				8	Int.	●	MVS1150X08S120	94.1	3.705	129.1	5.083	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	★	MVS1150X10S120	117.1	4.610	152.1	5.988	155.1	6.106	217.1	8.547	215	8.465	2.1	.083	12	.472	8
					15	Int.	★	MVS1150X15S120	174.6	6.874	209.1	8.232	212.1	8.350	274.1	10.791	272	10.709	2.1	.083	12	.472	8
					20	Int.	★	MVS1150X20S120	232.1	9.138	267.1	10.516	270.1	10.634	332.1	13.075	330	12.992	2.1	.083	12	.472	8
					25	Int.	★	MVS1150X25S120	289.6	11.402	324.1	12.760	327.1	12.878	389.1	15.319	387	15.236	2.1	.083	12	.472	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE1151X02S120	25.0	.984	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1151X02S120PL	25.0	.984	48.8	1.921	48.8	1.921	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Int.	●	MVS1151X03S120	36.6	1.441	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1151X05S120	59.6	2.346	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.510	.4532	29/64		1/2-20	8	Int.	●	MVS1151X08S120	94.1	3.705	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	●	MVS1151X10S120	117.2	4.614	158.1	6.224	161.1	6.343	223.1	8.783	221	8.701	2.1	.083	12	.472	8
					15	Int.	●	MVS1151X15S120	174.7	6.878	218.1	8.587	221.1	8.705	283.1	11.146	281	11.063	2.1	.083	12	.472	8
					20	Int.	●	MVS1151X20S120	232.3	9.146	278.1	10.949	281.1	11.067	343.1	13.508	341	13.425	2.1	.083	12	.472	8
					25	Int.	●	MVS1151X25S120	289.8	11.409	338.1	13.311	341.1	13.429	403.1	15.870	401	15.787	2.1	.083	12	.472	8
					2	Ext.	●	MVE1160X02S120	25.3	.996	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1160X02S120PL	25.0	.984	48.8	1.921	48.8	1.921	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Ext.	★	MVE1160X03S120	36.9	1.453	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1160X03S120	36.9	1.453	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1160X05S120	60.1	2.366	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.600	.4567				8	Int.	●	MVS1160X08S120	94.9	3.736	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	★	MVS1160X10S120	118.1	4.650	158.1	6.224	161.1	6.343	223.1	8.783	221	8.701	2.1	.083	12	.472	8
					15	Int.	★	MVS1160X15S120	176.1	6.933	218.1	8.587	221.1	8.705	283.1	11.146	281	11.063	2.1	.083	12	.472	8
					20	Int.	★	MVS1160X20S120	234.1	9.217	278.1	10.949	281.1	11.067	343.1	13.508	341	13.425	2.1	.083	12	.472	8
					25	Int.	★	MVS1160X25S120	292.1	11.500	338.1	13.311	341.1	13.429	403.1	15.870	401	15.787	2.1	.083	12	.472	8
					2	Ext.	●	MVE1170X02S120	25.5	1.004	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1170X02S120PL	25.2	.992	48.8	1.921	48.8	1.921	96.8	3.811	95	3.740	1.8	.071	12	.472	4
					3	Ext.	★	MVE1170X03S120	37.2	1.465	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1170X03S120	37.2	1.465	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1170X05S120	60.6	2.386	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.700	.4606				8	Int.	●	MVS1170X08S120	95.7	3.768	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	★	MVS1170X10S120	119.1	4.689	158.1	6.224	161.1	6.343	223.1	8.783	221	8.701	2.1	.083	12	.472	8
					15	Int.	★	MVS1170X15S120	177.6	6.992	218.1	8.587	221.1	8.705	283.1	11.146	281	11.063	2.1	.083	12	.472	8
					20	Int.	★	MVS1170X20S120	236.1	9.295	278.1	10.949	281.1	11.067	343.1	13.508	341	13.425	2.1	.083	12	.472	8
					25	Int.	★	MVS1170X25S120	294.6	11.598	338.1	13.311	341.1	13.429	403.1	15.870	401	15.787	2.1	.083	12	.472	8
					2	Ext.	●	MVE1180X02S120	25.7	1.012	49.1	1.933	49.1	1.933	97.1	3.823	95	3.740	2.1	.083	12	.472	2
					2	Int.	●	MVS1180X02S120PL	25.5	1.004	48.9	1.925	48.9	1.925	96.9	3.815	95	3.740	1.9	.075	12	.472	4
					3	Ext.	★	MVE1180X03S120	37.5	1.476	75.1	2.957	75.1	2.957	123.1	4.846	121	4.764	2.1	.083	12	.472	2
					3	Int.	●	MVS1180X03S120	37.5	1.476	62.1	2.445	62.1	2.445	124.1	4.886	122	4.803	2.1	.083	12	.472	6
					5	Int.	●	MVS1180X05S120	61.1	2.406	98.1	3.862	98.1	3.862	160.1	6.303	158	6.220	2.1	.083	12	.472	6
11.800	.4646				8	Int.	●	MVS1180X08S120	96.5	3.799	134.1	5.280	134.1	5.280	196.1	7.720	194	7.638	2.1	.083	12	.472	6
					10	Int.	★	MVS1180X10S120	120.1	4.728	158.1	6.224	161.1	6.346	223.1	8.783	221	8.701	2.1	.083	12	.472	8
					15	Int.	★	MVS1180X15S120	179.1	7.051	218.1	8.587	221.1	8.709	283.1	11.146	281	11.063	2.1	.083	12	.472	8
					20	Int.	★	MVS1180X20S120	238.1	9.374	278.1	10.949	281.1	11.071	343.1	13.508	341	13.425	2.1	.083	12	.472	8
					25	Int.	★	MVS1180X25S120	297.1	11.697	338.1	13.311	341.1	13.433	403.1	15.870	401	15.787	2.1	.083	12	.472	8
					2	Ext.	●	MVE1190X02S120	26.0	1.024	49.2	1.937	49.2	1.937	97.2	3.827	95	3.740	2.2	.087	12	.472	2
					2	Int.	●	MVS1190X02S120PL	25.7	1.012	48.9	1.925	48.9	1.925	96.9	3.815	95	3.740	1.9	.075	12	.472	4
					3	Ext.	★	MVE1190X03S120	37.9	1.492	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	12	.472	2
					3	Int.	●	MVS1190X03S120	37.9	1.492	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12	.472	6
					5	Int.	●	MVS1190X05S120	61.7	2.429	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12	.472	6
11.900	.4685				8	Int.	●	MVS1190X08S120	97.4	3.835	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12	.472	6
					10	Int.	★	MVS1190X10S120	121.2	4.772	158.2	6.228	161.2	6.346	223.2	8.787	221	8.701	2.2	.087	12	.472	8
					15	Int.	★	MVS1190X15S120	180.7	7.114	218.2	8.591	221.2	8.709	283.2	11.150	281	11.063	2.2	.087	12	.472	8
					20	Int.	★	MVS1190X20S120	240.2	9.457	278.2	10.953	281.2	11.071	343.2	13.512	341	13.425	2.2	.087	12	.472	8
					25	Int.	★	MVS1190X25S120	299.7	11.799	338.2	13.315	341.2	13.433	403.2	15.874	401	15.787	2.2	.087	12	.472	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.000	.4724			M14x2.0	2	Ext.	●	MVE1200X02S120	26.2	1.031	49.2	1.937	49.2	1.937	97.2	3.827	95	3.740	2.2	.087	12	.472	2
					2	Int.	●	MVS1200X02S120PL	25.9	1.020	48.9	1.925	48.9	1.925	96.9	3.815	95	3.740	1.9	.075	12	.472	4
					3	Ext.	★	MVE1200X03S120	38.2	1.504	75.2	2.961	75.2	2.961	123.2	4.850	121	4.764	2.2	.087	12	.472	2
					3	Int.	●	MVS1200X03S120	38.2	1.504	62.2	2.449	62.2	2.449	124.2	4.890	122	4.803	2.2	.087	12	.472	6
					5	Int.	●	MVS1200X05S120	62.2	2.449	98.2	3.866	98.2	3.866	160.2	6.307	158	6.220	2.2	.087	12	.472	6
					8	Int.	●	MVS1200X08S120	98.2	3.866	134.2	5.283	134.2	5.283	196.2	7.724	194	7.638	2.2	.087	12	.472	6
					10	Int.	●	MVS1200X10S120	122.2	4.811	158.2	6.228	161.2	6.346	223.2	8.787	221	8.701	2.2	.087	12	.472	8
					15	Int.	★	MVS1200X15S120	182.2	7.173	218.2	8.591	221.2	8.709	283.2	11.150	281	11.063	2.2	.087	12	.472	8
					20	Int.	★	MVS1200X20S120	242.2	9.535	278.2	10.953	281.2	11.071	343.2	13.512	341	13.425	2.2	.087	12	.472	8
					25	Int.	★	MVS1200X25S120	302.2	11.898	338.2	13.315	341.2	13.433	403.2	15.874	401	15.787	2.2	.087	12	.472	8
12.100	.4764				2	Ext.	★	MVE1210X02S130	26.4	1.039	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	13	.512	2
					2	Ext.	●	MVE1210X02S140	26.4	1.039	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	14	.551	2
					2	Int.	★	MVS1210X02S130PL	26.1	1.028	52.9	2.083	55.9	2.201	103.9	4.091	102	4.016	1.9	.075	13	.512	4
					2	Int.	●	MVS1210X02S140PL	26.1	1.028	52.9	2.083	55.9	2.201	103.9	4.091	102	4.016	1.9	.075	14	.551	4
					3	Ext.	★	MVE1210X03S130	38.5	1.516	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	13	.512	2
					3	Ext.	□	MVE1210X03S140	38.5	1.516	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	14	.551	2
					3	Int.	★	MVS1210X03S130	38.5	1.516	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13	.512	6
					3	Int.	●	MVS1210X03S140	38.5	1.516	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	14	.551	6
					5	Int.	★	MVS1210X05S130	62.7	2.469	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13	.512	6
					5	Int.	●	MVS1210X05S140	62.7	2.469	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	14	.551	6
					8	Int.	□	MVS1210X08S130	99.0	3.898	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	13	.512	6
					8	Int.	●	MVS1210X08S140	99.0	3.898	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	14	.551	6
					10	Int.	□	MVS1210X10S130	123.2	4.850	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	13	.512	8
					10	Int.	●	MVS1210X10S140	123.2	4.850	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	14	.551	8
					15	Int.	□	MVS1210X15S130	183.7	7.232	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	13	.512	8
					15	Int.	●	MVS1210X15S140	183.7	7.232	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	14	.551	8
					20	Int.	□	MVS1210X20S130	244.2	9.614	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	13	.512	8
					20	Int.	●	MVS1210X20S140	244.2	9.614	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	14	.551	8
12.200	.4803				2	Ext.	★	MVE1220X02S130	26.6	1.047	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	13	.512	2
					2	Ext.	●	MVE1220X02S140	26.6	1.047	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	14	.551	2
					2	Int.	★	MVS1220X02S130PL	26.3	1.035	52.9	2.083	55.9	2.201	103.9	4.091	102	4.016	1.9	.075	13	.512	4
					2	Int.	●	MVS1220X02S140PL	26.3	1.035	52.9	2.083	55.9	2.201	103.9	4.091	102	4.016	1.9	.075	14	.551	4
					3	Ext.	★	MVE1220X03S130	38.8	1.528	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	13	.512	2
					3	Ext.	□	MVE1220X03S140	38.8	1.528	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	14	.551	2
					3	Int.	★	MVS1220X03S130	38.8	1.528	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13	.512	6
					3	Int.	●	MVS1220X03S140	38.8	1.528	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	14	.551	6
					5	Int.	★	MVS1220X05S130	63.2	2.488	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13	.512	6
					5	Int.	●	MVS1220X05S140	63.2	2.488	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	14	.551	6
					8	Int.	□	MVS1220X08S130	99.8	3.929	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	13	.512	6
					8	Int.	●	MVS1220X08S140	99.8	3.929	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	14	.551	6
					10	Int.	□	MVS1220X10S130	124.2	4.890	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	13	.512	8
					10	Int.	●	MVS1220X10S140	124.2	4.890	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	14	.551	8
					15	Int.	□	MVS1220X15S130	185.2	7.291	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	13	.512	8
					15	Int.	●	MVS1220X15S140	185.2	7.291	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	14	.551	8
					20	Int.	□	MVS1220X20S130	246.2	9.693	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	13	.512	8
					20	Int.	●	MVS1220X20S140	246.2	9.693	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	14	.551	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.300	.4843			9/16-12	2	Ext.	★	MVE1230X02S130	26.8	1.055	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	13	.512	2
					2	Ext.	●	MVE1230X02S140	26.8	1.055	53.2	2.094	56.2	2.213	104.2	4.102	102	4.016	2.2	.087	14	.551	2
					2	Int.	★	MVS1230X02S130PL	26.5	1.043	52.9	2.083	55.9	2.201	103.9	4.091	102	4.016	1.9	.075	13	.512	4
					2	Int.	●	MVS1230X02S140PL	26.5	1.043	52.9	2.083	55.9	2.201	103.9	4.091	102	4.016	1.9	.075	14	.551	4
					3	Ext.	★	MVE1230X03S130	39.1	1.539	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	13	.512	2
					3	Ext.	□	MVE1230X03S140	39.1	1.539	78.2	3.079	81.2	3.197	139.2	5.480	137	5.394	2.2	.087	14	.551	2
					3	Int.	★	MVS1230X03S130	39.1	1.539	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	13	.512	6
					3	Int.	●	MVS1230X03S140	39.1	1.539	64.7	2.547	67.2	2.646	130.2	5.126	128	5.039	2.2	.087	14	.551	6
					5	Int.	★	MVS1230X05S130	63.7	2.508	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	13	.512	6
					5	Int.	●	MVS1230X05S140	63.7	2.508	102.2	4.024	106.2	4.181	169.2	6.661	167	6.575	2.2	.087	14	.551	6
					8	Int.	□	MVS1230X08S130	100.6	3.961	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	13	.512	6
					8	Int.	●	MVS1230X08S140	100.6	3.961	140.2	5.520	145.2	5.717	208.2	8.197	206	8.110	2.2	.087	14	.551	6
					10	Int.	□	MVS1230X10S130	125.2	4.929	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	13	.512	8
					10	Int.	●	MVS1230X10S140	125.2	4.929	165.2	6.504	168.2	6.622	231.2	9.102	229	9.016	2.2	.087	14	.551	8
					15	Int.	□	MVS1230X15S130	186.7	7.350	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	13	.512	8
					15	Int.	●	MVS1230X15S140	186.7	7.350	227.2	8.945	230.2	9.063	293.2	11.543	291	11.457	2.2	.087	14	.551	8
					20	Int.	□	MVS1230X20S130	248.2	9.772	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	13	.512	8
					20	Int.	●	MVS1230X20S140	248.2	9.772	290.2	11.425	293.2	11.543	356.2	14.024	354	13.937	2.2	.087	14	.551	8
12.400	.4882				2	Ext.	★	MVE1240X02S130	27.1	1.067	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1240X02S140	27.1	1.067	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					2	Int.	★	MVS1240X02S130PL	26.8	1.055	53.0	2.087	56.0	2.205	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1240X02S140PL	26.8	1.055	53.0	2.087	56.0	2.205	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1240X03S130	39.5	1.555	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1240X03S140	39.5	1.555	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1240X03S130	39.5	1.555	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	6
					3	Int.	●	MVS1240X03S140	39.5	1.555	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	6
					5	Int.	★	MVS1240X05S130	64.3	2.531	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	6
					5	Int.	●	MVS1240X05S140	64.3	2.531	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	6
					8	Int.	□	MVS1240X08S130	101.5	3.996	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	6
					8	Int.	●	MVS1240X08S140	101.5	3.996	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	6
					10	Int.	□	MVS1240X10S130	126.3	4.972	165.3	6.508	168.3	6.626	231.3	9.106	229	9.016	2.3	.091	13	.512	8
					10	Int.	●	MVS1240X10S140	126.3	4.972	165.3	6.508	168.3	6.626	231.3	9.106	229	9.016	2.3	.091	14	.551	8
					15	Int.	□	MVS1240X15S130	188.3	7.413	227.3	8.949	230.3	9.067	293.3	11.547	291	11.457	2.3	.091	13	.512	8
					15	Int.	●	MVS1240X15S140	188.3	7.413	227.3	8.949	230.3	9.067	293.3	11.547	291	11.457	2.3	.091	14	.551	8
					20	Int.	□	MVS1240X20S130	250.3	9.854	290.3	11.429	293.3	11.547	356.3	14.028	354	13.937	2.3	.091	13	.512	8
					20	Int.	●	MVS1240X20S140	250.3	9.854	290.3	11.429	293.3	11.547	356.3	14.028	354	13.937	2.3	.091	14	.551	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.500	.4921			M14x4.5	2	Ext.	★	MVE1250X02S130	27.3	1.075	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1250X02S140	27.3	1.075	53.3	2.098	56.3	2.217	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					2	Int.	★	MVS1250X02S130PL	27.0	1.063	53.0	2.087	56.0	2.205	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1250X02S140PL	27.0	1.063	53.0	2.087	56.0	2.205	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1250X03S130	39.8	1.567	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1250X03S140	39.8	1.567	78.3	3.083	81.3	3.201	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1250X03S130	39.8	1.567	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	6
					3	Int.	●	MVS1250X03S140	39.8	1.567	64.8	2.551	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	6
					5	Int.	★	MVS1250X05S130	64.8	2.551	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	6
					5	Int.	●	MVS1250X05S140	64.8	2.551	102.3	4.028	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	6
					8	Int.	★	MVS1250X08S130	102.3	4.028	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	6
					8	Int.	●	MVS1250X08S140	102.3	4.028	140.3	5.524	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	6
					10	Int.	★	MVS1250X10S130	127.3	5.012	165.3	6.508	168.3	6.626	231.3	9.106	229	9.016	2.3	.091	13	.512	8
					10	Int.	●	MVS1250X10S140	127.3	5.012	165.3	6.508	168.3	6.626	231.3	9.106	229	9.016	2.3	.091	14	.551	8
					15	Int.	★	MVS1250X15S130	189.8	7.472	227.3	8.949	230.3	9.067	293.3	11.547	291	11.457	2.3	.091	13	.512	8
					15	Int.	●	MVS1250X15S140	189.8	7.472	227.3	8.949	230.3	9.067	293.3	11.547	291	11.457	2.3	.091	14	.551	8
					20	Int.	★	MVS1250X20S130	252.3	9.933	290.3	11.429	293.3	11.547	356.3	14.028	354	13.937	2.3	.091	13	.512	8
					20	Int.	●	MVS1250X20S140	252.3	9.933	290.3	11.429	293.3	11.547	356.3	14.028	354	13.937	2.3	.091	14	.551	8
12.600	.4961				2	Ext.	★	MVE1260X02S130	27.5	1.083	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1260X02S140	27.5	1.083	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					2	Int.	★	MVS1260X02S130PL	27.2	1.071	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1260X02S140PL	27.2	1.071	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1260X03S130	40.1	1.579	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1260X03S140	40.1	1.579	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1260X03S130	40.1	1.579	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	6
					3	Int.	●	MVS1260X03S140	40.1	1.579	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	6
					5	Int.	★	MVS1260X05S130	65.3	2.571	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	6
					5	Int.	●	MVS1260X05S140	65.3	2.571	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	6
					8	Int.	□	MVS1260X08S130	103.1	4.059	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	6
					8	Int.	●	MVS1260X08S140	103.1	4.059	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	6
					10	Int.	□	MVS1260X10S130	128.3	5.051	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	13	.512	8
					10	Int.	●	MVS1260X10S140	128.3	5.051	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	14	.551	8
					15	Int.	□	MVS1260X15S130	191.3	7.531	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	13	.512	8
					15	Int.	●	MVS1260X15S140	191.3	7.531	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	14	.551	8
					20	Int.	□	MVS1260X20S130	254.3	10.012	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	13	.512	8
					20	Int.	●	MVS1260X20S140	254.3	10.012	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	14	.551	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.700	.5000	1/2			2	Ext.	★	MVE1270X02S130	27.7	1.091	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1270X02S140	27.7	1.091	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					2	Int.	★	MVS1270X02S130PL	27.4	1.079	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1270X02S140PL	27.4	1.079	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1270X03S130	40.4	1.591	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1270X03S140	40.4	1.591	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1270X03S130	40.4	1.591	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	6
					3	Int.	●	MVS1270X03S140	40.4	1.591	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	6
					5	Int.	★	MVS1270X05S130	65.8	2.591	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	6
					5	Int.	●	MVS1270X05S140	65.8	2.591	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	6
					8	Int.	□	MVS1270X08S130	103.9	4.091	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	6
					8	Int.	●	MVS1270X08S140	103.9	4.091	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	6
					10	Int.	□	MVS1270X10S130	129.3	5.091	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	13	.512	8
					10	Int.	●	MVS1270X10S140	129.3	5.091	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	14	.551	8
					15	Int.	□	MVS1270X15S130	192.8	7.591	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	13	.512	8
					15	Int.	●	MVS1270X15S140	192.8	7.591	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	14	.551	8
					20	Int.	□	MVS1270X20S130	256.3	10.091	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	13	.512	8
					20	Int.	●	MVS1270X20S140	256.3	10.091	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	14	.551	8
12.800	.5039				2	Ext.	★	MVE1280X02S130	27.9	1.098	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1280X02S140	27.9	1.098	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					2	Int.	★	MVS1280X02S130PL	27.6	1.087	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1280X02S140PL	27.6	1.087	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1280X03S130	40.7	1.602	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1280X03S140	40.7	1.602	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1280X03S130	40.7	1.602	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	6
					3	Int.	●	MVS1280X03S140	40.7	1.602	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	6
					5	Int.	★	MVS1280X05S130	66.3	2.610	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	6
					5	Int.	●	MVS1280X05S140	66.3	2.610	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	6
					8	Int.	□	MVS1280X08S130	104.7	4.122	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	6
					8	Int.	●	MVS1280X08S140	104.7	4.122	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	6
					10	Int.	□	MVS1280X10S130	130.3	5.130	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	13	.512	8
					10	Int.	●	MVS1280X10S140	130.3	5.130	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	14	.551	8
					15	Int.	□	MVS1280X15S130	194.3	7.650	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	13	.512	8
					15	Int.	●	MVS1280X15S140	194.3	7.650	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	14	.551	8
					20	Int.	□	MVS1280X20S130	258.3	10.169	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	13	.512	8
					20	Int.	●	MVS1280X20S140	258.3	10.169	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	14	.551	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.900	.5079				2	Ext.	★	MVE1290X02S130	28.1	1.106	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	13	.512	2
					2	Ext.	●	MVE1290X02S140	28.1	1.106	53.3	2.098	53.3	2.098	104.3	4.106	102	4.016	2.3	.091	14	.551	2
					2	Int.	★	MVS1290X02S130PL	27.8	1.094	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1290X02S140PL	27.8	1.094	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1290X03S130	41.0	1.614	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	13	.512	2
					3	Ext.	□	MVE1290X03S140	41.0	1.614	80.3	3.161	80.3	3.161	139.3	5.484	137	5.394	2.3	.091	14	.551	2
					3	Int.	★	MVS1290X03S130	41.0	1.614	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	13	.512	6
					3	Int.	●	MVS1290X03S140	41.0	1.614	67.3	2.650	67.3	2.650	130.3	5.130	128	5.039	2.3	.091	14	.551	6
					5	Int.	★	MVS1290X05S130	66.8	2.630	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	13	.512	6
					5	Int.	●	MVS1290X05S140	66.8	2.630	106.3	4.185	106.3	4.185	169.3	6.665	167	6.575	2.3	.091	14	.551	6
					8	Int.	□	MVS1290X08S130	105.5	4.154	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	13	.512	6
					8	Int.	●	MVS1290X08S140	105.5	4.154	145.3	5.720	145.3	5.720	208.3	8.201	206	8.110	2.3	.091	14	.551	6
					10	Int.	□	MVS1290X10S130	131.3	5.169	171.3	6.744	174.3	6.866	237.3	9.343	235	9.252	2.3	.091	13	.512	8
					10	Int.	●	MVS1290X10S140	131.3	5.169	171.3	6.744	174.3	6.862	237.3	9.343	235	9.252	2.3	.091	14	.551	8
					15	Int.	□	MVS1290X15S130	195.8	7.709	236.3	9.303	239.3	9.425	302.3	11.902	300	11.811	2.3	.091	13	.512	8
					15	Int.	●	MVS1290X15S140	195.8	7.709	236.3	9.303	239.3	9.421	302.3	11.902	300	11.811	2.3	.091	14	.551	8
					20	Int.	□	MVS1290X20S130	260.3	10.248	301.3	11.862	304.3	11.984	367.3	14.461	365	14.370	2.3	.091	13	.512	8
					20	Int.	●	MVS1290X20S140	260.3	10.248	301.3	11.862	304.3	11.980	367.3	14.461	365	14.370	2.3	.091	14	.551	8
13.000	.5118				2	Ext.	★	MVE1300X02S130	28.4	1.118	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	13	.512	2
					2	Ext.	●	MVE1300X02S140	28.4	1.118	53.4	2.102	53.4	2.102	104.4	4.110	102	4.016	2.4	.094	14	.551	2
					2	Int.	★	MVS1300X02S130PL	28.0	1.102	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	13	.512	4
					2	Int.	●	MVS1300X02S140PL	28.0	1.102	53.0	2.087	53.0	2.087	104.0	4.094	102	4.016	2.0	.079	14	.551	4
					3	Ext.	★	MVE1300X03S130	41.4	1.630	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	13	.512	2
					3	Ext.	□	MVE1300X03S140	41.4	1.630	80.4	3.165	80.4	3.165	139.4	5.488	137	5.394	2.4	.094	14	.551	2
					3	Int.	★	MVS1300X03S130	41.4	1.630	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	13	.512	6
					3	Int.	●	MVS1300X03S140	41.4	1.630	67.4	2.654	67.4	2.654	130.4	5.134	128	5.039	2.4	.094	14	.551	6
					5	Int.	★	MVS1300X05S130	67.4	2.654	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	13	.512	6
					5	Int.	●	MVS1300X05S140	67.4	2.654	106.4	4.189	106.4	4.189	169.4	6.669	167	6.575	2.4	.094	14	.551	6
					8	Int.	★	MVS1300X08S130	106.4	4.189	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	13	.512	6
					8	Int.	●	MVS1300X08S140	106.4	4.189	145.4	5.724	145.4	5.724	208.4	8.205	206	8.110	2.4	.094	14	.551	6
					10	Int.	★	MVS1300X10S130	132.4	5.213	171.4	6.748	174.4	6.866	237.4	9.346	235	9.252	2.4	.094	13	.512	8
					10	Int.	●	MVS1300X10S140	132.4	5.213	171.4	6.748	174.4	6.866	237.4	9.346	235	9.252	2.4	.094	14	.551	8
					15	Int.	★	MVS1300X15S130	197.4	7.772	236.4	9.307	239.4	9.425	302.4	11.906	300	11.811	2.4	.094	13	.512	8
					15	Int.	●	MVS1300X15S140	197.4	7.772	236.4	9.307	239.4	9.425	302.4	11.906	300	11.811	2.4	.094	14	.551	8
					20	Int.	★	MVS1300X20S130	262.4	10.331	301.4	11.866	304.4	11.984	367.4	14.465	365	14.370	2.4	.094	13	.512	8
					20	Int.	●	MVS1300X20S140	262.4	10.331	301.4	11.866	304.4	11.984	367.4	14.465	365	14.370	2.4	.094	14	.551	8
13.100	.5157			9/16-18	2	Ext.	●	MVE1310X02S140	28.6	1.126	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					2	Int.	●	MVS1310X02S140PL	28.3	1.114	56.1	2.209	59.1	2.327	109.1	4.295	107	4.213	2.1	.083	14	.551	4
					3	Ext.	★	MVE1310X03S140	41.7	1.642	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1310X03S140	41.7	1.642	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	6
					5	Int.	●	MVS1310X05S140	67.9	2.673	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	6
					8	Int.	●	MVS1310X08S140	107.2	4.220	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	6
					10	Int.	□	MVS1310X10S140	133.4	5.252	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14	.551	8
					15	Int.	□	MVS1310X15S140	198.9	7.831	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14	.551	8
					20	Int.	□	MVS1310X20S140	264.4	10.409	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14	.551	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE1320X02S140	28.8	1.134	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					2	Int.	●	MVS1320X02S140PL	28.5	1.122	56.1	2.209	59.1	2.327	109.1	4.295	107	4.213	2.1	.083	14	.551	4
					3	Ext.	★	MVE1320X03S140	42.0	1.654	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1320X03S140	42.0	1.654	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	6
13.200	.5197				5	Int.	●	MVS1320X05S140	68.4	2.693	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	6
					8	Int.	●	MVS1320X08S140	108.0	4.252	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	6
					10	Int.	□	MVS1320X10S140	133.4	5.252	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14	.551	8
					15	Int.	□	MVS1320X15S140	200.4	7.890	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14	.551	8
					20	Int.	□	MVS1320X20S140	266.4	10.488	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14	.551	8
					2	Ext.	●	MVE1330X02S140	29.0	1.142	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					2	Int.	●	MVS1330X02S140PL	28.7	1.130	56.1	2.209	59.1	2.327	109.1	4.295	107	4.213	2.1	.083	14	.551	4
					3	Ext.	★	MVE1330X03S140	42.3	1.665	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1330X03S140	42.3	1.665	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	6
13.300	.5236				5	Int.	●	MVS1330X05S140	68.9	2.713	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	6
					8	Int.	●	MVS1330X08S140	108.8	4.283	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	6
					10	Int.	□	MVS1330X10S140	135.4	5.331	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14	.551	8
					15	Int.	□	MVS1330X15S140	201.9	7.949	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14	.551	8
					20	Int.	□	MVS1330X20S140	268.4	10.567	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14	.551	8
					2	Ext.	●	MVE1340X02S140	29.2	1.150	56.4	2.220	59.4	2.339	109.4	4.307	107	4.213	2.4	.094	14	.551	2
					2	Int.	●	MVS1340X02S140PL	28.9	1.138	56.1	2.209	59.1	2.327	109.1	4.295	107	4.213	2.1	.083	14	.551	4
					3	Ext.	★	MVE1340X03S140	42.6	1.677	86.4	3.402	89.4	3.520	149.4	5.882	147	5.787	2.4	.094	14	.551	2
					3	Int.	●	MVS1340X03S140	42.6	1.677	69.9	2.752	72.4	2.850	136.4	5.370	134	5.276	2.4	.094	14	.551	6
13.400	.5276				5	Int.	●	MVS1340X05S140	69.4	2.732	110.4	4.346	114.4	4.504	178.4	7.024	176	6.929	2.4	.094	14	.551	6
					8	Int.	●	MVS1340X08S140	109.6	4.315	151.4	5.961	156.4	6.157	220.4	8.677	218	8.583	2.4	.094	14	.551	6
					10	Int.	□	MVS1340X10S140	136.4	5.370	178.4	7.024	181.4	7.142	245.4	9.661	243	9.567	2.4	.094	14	.551	8
					15	Int.	□	MVS1340X15S140	203.4	8.008	245.4	9.661	248.4	9.780	312.4	12.299	310	12.205	2.4	.094	14	.551	8
					20	Int.	□	MVS1340X20S140	270.4	10.646	313.4	12.339	316.4	12.457	380.4	14.976	378	14.882	2.4	.094	14	.551	8
					2	Ext.	●	MVE1350X02S140	29.5	1.161	56.5	2.224	59.5	2.343	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1350X02S140PL	29.1	1.146	56.1	2.209	59.1	2.327	109.1	4.295	107	4.213	2.1	.083	14	.551	4
					3	Ext.	★	MVE1350X03S140	43.0	1.693	86.5	3.406	89.5	3.524	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1350X03S140	43.0	1.693	70.0	2.756	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
13.500	.5315			5/8-11	5	Int.	●	MVS1350X05S140	70.0	2.756	110.5	4.350	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
					8	Int.	●	MVS1350X08S140	110.5	4.350	151.5	5.965	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	●	MVS1350X10S140	137.5	5.413	178.5	7.028	181.5	7.146	245.5	9.665	243	9.567	2.5	.098	14	.551	8
					15	Int.	★	MVS1350X15S140	205.0	8.071	245.5	9.665	248.5	9.783	312.5	12.303	310	12.205	2.5	.098	14	.551	8
					20	Int.	★	MVS1350X20S140	272.5	10.728	313.5	12.343	316.5	12.461	380.5	14.980	378	14.882	2.5	.098	14	.551	8
					2	Ext.	●	MVE1360X02S140	29.7	1.169	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1360X02S140PL	29.3	1.154	56.1	2.209	56.1	2.209	109.1	4.295	107	4.213	2.1	.083	14	.551	4
					3	Ext.	★	MVE1360X03S140	43.3	1.705	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1360X03S140	43.3	1.705	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
13.600	.5354				5	Int.	●	MVS1360X05S140	70.5	2.776	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
					8	Int.	●	MVS1360X08S140	111.3	4.382	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	□	MVS1360X10S140	138.5	5.453	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14	.551	8
					15	Int.	□	MVS1360X15S140	206.5	8.130	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14	.551	8
					20	Int.	□	MVS1360X20S140	274.5	10.807	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14	.551	8

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	●	MVE1370X02S140	29.9	1.177	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1370X02S140PL	29.6	1.165	56.2	2.213	56.2	2.213	109.2	4.299	107	4.213	2.2	.087	14	.551	4
					3	Ext.	★	MVE1370X03S140	43.6	1.717	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1370X03S140	43.6	1.717	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
13.700	.5394				5	Int.	●	MVS1370X05S140	71.0	2.795	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
					8	Int.	●	MVS1370X08S140	112.1	4.413	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	□	MVS1370X10S140	139.5	5.492	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14	.551	8
					15	Int.	□	MVS1370X15S140	208.0	8.189	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14	.551	8
					20	Int.	□	MVS1370X20S140	276.5	10.886	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14	.551	8
					2	Ext.	●	MVE1380X02S140	30.1	1.185	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1380X02S140PL	29.8	1.173	56.2	2.213	56.2	2.213	109.2	4.299	107	4.213	2.2	.087	14	.551	4
					3	Ext.	★	MVE1380X03S140	43.9	1.728	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1380X03S140	43.9	1.728	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
13.800	.5433				5	Int.	●	MVS1380X05S140	71.5	2.815	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
					8	Int.	●	MVS1380X08S140	112.9	4.445	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	□	MVS1380X10S140	140.5	5.531	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14	.551	8
					15	Int.	□	MVS1380X15S140	209.5	8.248	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14	.551	8
					20	Int.	□	MVS1380X20S140	278.5	10.965	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14	.551	8
					2	Ext.	●	MVE1389X02S140	30.1	1.185	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1389X02S140PL	30.1	1.185	56.2	2.213	56.2	2.213	109.2	4.299	107	4.213	2.2	.087	14	.551	4
					3	Int.	●	MVS1389X03S140	44.2	1.740	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
					5	Int.	●	MVS1389X05S140	72.0	2.835	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
13.891	.5469	35/64			8	Int.	●	MVS1389X08S140	113.6	4.472	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	●	MVS1389X10S140	141.4	5.567	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14	.551	8
					15	Int.	●	MVS1389X15S140	210.9	8.303	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14	.551	8
					20	Int.	●	MVS1389X20S140	280.3	11.035	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14	.551	8
					2	Ext.	●	MVE1390X02S140	30.3	1.193	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1390X02S140PL	30.0	1.181	56.2	2.213	56.2	2.213	109.2	4.299	107	4.213	2.2	.087	14	.551	4
					3	Ext.	★	MVE1390X03S140	44.2	1.740	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1390X03S140	44.2	1.740	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
13.900	.5472				5	Int.	●	MVS1390X05S140	72.0	2.835	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
					8	Int.	●	MVS1390X08S140	113.7	4.476	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	□	MVS1390X10S140	141.5	5.571	184.5	7.264	187.5	7.382	251.5	9.902	249	9.803	2.5	.098	14	.551	8
					15	Int.	□	MVS1390X15S140	211.0	8.307	254.5	10.020	257.5	10.138	321.5	12.657	319	12.559	2.5	.098	14	.551	8
					20	Int.	□	MVS1390X20S140	280.5	11.043	324.5	12.776	327.5	12.894	391.5	15.413	389	15.315	2.5	.098	14	.551	8
					2	Ext.	●	MVE1400X02S140	30.5	1.201	56.5	2.224	56.5	2.224	109.5	4.311	107	4.213	2.5	.098	14	.551	2
					2	Int.	●	MVS1400X02S140PL	30.2	1.189	56.2	2.213	56.2	2.213	109.2	4.299	107	4.213	2.2	.087	14	.551	4
					3	Ext.	★	MVE1400X03S140	44.5	1.752	88.5	3.484	88.5	3.484	149.5	5.886	147	5.787	2.5	.098	14	.551	2
					3	Int.	●	MVS1400X03S140	44.5	1.752	72.5	2.854	72.5	2.854	136.5	5.374	134	5.276	2.5	.098	14	.551	6
14.000	.5512			M16x2.0	5	Int.	●	MVS1400X05S140	72.5	2.854	114.5	4.508	114.5	4.508	178.5	7.028	176	6.929	2.5	.098	14	.551	6
					8	Int.	●	MVS1400X08S140	114.5	4.508	156.5	6.161	156.5	6.161	220.5	8.681	218	8.583	2.5	.098	14	.551	6
					10	Int.	★	MVS1400X10S140	142.5	5.610	184.5	7.264	187.5	7.386	251.5	9.902	249	9.803	2.5	.098	14	.551	8
					15	Int.	●	MVS1400X15S140	212.5	8.366	254.5	10.020	257.5	10.142	321.5	12.657	319	12.559	2.5	.098	14	.551	8
					20	Int.	★	MVS1400X20S140	282.5	11.122	324.5	12.776	327.5	12.898	391.5	15.413	389	15.315	2.5	.098	14	.551	8

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
14.100	.5551				2	Ext.	★	MVE1410X02S150	30.8	1.213	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1410X02S160	30.8	1.213	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1410X03S150	44.9	1.768	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1410X03S160	44.9	1.768	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1410X03S150	44.9	1.768	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	6
					3	Int.	●	MVS1410X03S160	44.9	1.768	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	6
					5	Int.	★	MVS1410X05S150	73.1	2.878	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	6
					5	Int.	●	MVS1410X05S160	73.1	2.878	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	6
					8	Int.	□	MVS1410X08S150	115.4	4.543	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	6
					8	Int.	●	MVS1410X08S160	115.4	4.543	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	6
14.200	.5591				2	Ext.	★	MVE1420X02S150	31.0	1.220	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1420X02S160	31.0	1.220	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1420X03S150	45.2	1.780	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1420X03S160	45.2	1.780	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1420X03S150	45.2	1.780	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	6
					3	Int.	●	MVS1420X03S160	45.2	1.780	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	6
					5	Int.	★	MVS1420X05S150	73.6	2.898	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	6
					5	Int.	●	MVS1420X05S160	73.6	2.898	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	6
					8	Int.	★	MVS1420X08S150	116.2	4.575	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	6
					8	Int.	●	MVS1420X08S160	116.2	4.575	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	6
14.288	.5625	9/16			2	Ext.	●	MVE1429X02S160	31.1	1.224	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Int.	●	MVS1429X03S160	45.4	1.787	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	6
					5	Int.	●	MVS1429X05S160	74.0	2.913	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	6
					8	Int.	●	MVS1429X08S160	116.9	4.602	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	6
14.300	.5630				2	Ext.	★	MVE1430X02S150	31.2	1.228	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1430X02S160	31.2	1.228	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1430X03S150	45.5	1.791	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1430X03S160	45.5	1.791	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1430X03S150	45.5	1.791	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	6
					3	Int.	●	MVS1430X03S160	45.5	1.791	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	6
					5	Int.	★	MVS1430X05S150	74.1	2.917	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	6
					5	Int.	●	MVS1430X05S160	74.1	2.917	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	6
					8	Int.	□	MVS1430X08S150	117.0	4.606	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	6
					8	Int.	●	MVS1430X08S160	117.0	4.606	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	6
14.400	.5569				2	Ext.	★	MVE1440X02S150	31.4	1.236	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1440X02S160	31.4	1.236	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1440X03S150	45.8	1.803	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1440X03S160	45.8	1.803	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1440X03S150	45.8	1.803	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	6
					3	Int.	●	MVS1440X03S160	45.8	1.803	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	6
					5	Int.	★	MVS1440X05S150	74.6	2.937	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	6
					5	Int.	●	MVS1440X05S160	74.6	2.937	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	6
					8	Int.	□	MVS1440X08S150	117.8	4.638	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	6
					8	Int.	●	MVS1440X08S160	117.8	4.638	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	6

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
14.500	.5709			M16x1.5	2	Ext.	★	MVE1450X02S150	31.6	1.244	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	15	.591	2
					2	Ext.	●	MVE1450X02S160	31.6	1.244	58.6	2.307	61.6	2.425	113.6	4.472	111	4.370	2.6	.102	16	.630	2
					3	Ext.	★	MVE1450X03S150	46.1	1.815	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	15	.591	2
					3	Ext.	□	MVE1450X03S160	46.1	1.815	91.6	3.606	94.6	3.724	155.6	6.126	153	6.024	2.6	.102	16	.630	2
					3	Int.	★	MVS1450X03S150	46.1	1.815	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	15	.591	6
					3	Int.	●	MVS1450X03S160	46.1	1.815	75.1	2.957	77.6	3.055	142.6	5.614	140	5.512	2.6	.102	16	.630	6
					5	Int.	★	MVS1450X05S150	75.1	2.957	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	15	.591	6
					5	Int.	●	MVS1450X05S160	75.1	2.957	118.6	4.669	122.6	4.827	187.6	7.386	185	7.283	2.6	.102	16	.630	6
					8	Int.	★	MVS1450X08S150	118.6	4.669	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	15	.591	6
					8	Int.	●	MVS1450X08S160	118.6	4.669	162.6	6.402	167.6	6.598	227.6	8.961	225	8.858	2.6	.102	16	.630	6
14.600	.5748				2	Ext.	★	MVE1460X02S150	31.8	1.252	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1460X02S160	31.9	1.256	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1460X03S150	46.5	1.831	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1460X03S160	46.5	1.831	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1460X03S150	46.5	1.831	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	6
					3	Int.	●	MVS1460X03S160	46.5	1.831	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	6
					5	Int.	★	MVS1460X05S150	75.7	2.980	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	6
					5	Int.	●	MVS1460X05S160	75.7	2.980	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	6
					8	Int.	□	MVS1460X08S150	119.5	4.705	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	6
					8	Int.	●	MVS1460X08S160	119.5	4.705	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	6
14.685	.5782	37/64		5/8-18	2	Ext.	●	MVE1468X02S160	31.9	1.256	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Int.	●	MVS1468X03S160	46.7	1.839	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	6
					5	Int.	●	MVS1468X05S160	76.1	2.996	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	6
					8	Int.	●	MVS1468X08S160	120.1	4.728	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	6
14.700	.5787				2	Ext.	★	MVE1470X02S150	32.1	1.264	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1470X02S160	32.1	1.264	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1470X03S150	46.8	1.843	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1470X03S160	46.8	1.843	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1470X03S150	46.8	1.843	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	6
					3	Int.	●	MVS1470X03S160	46.8	1.843	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	6
					5	Int.	★	MVS1470X05S150	76.2	3.000	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	6
					5	Int.	●	MVS1470X05S160	76.2	3.000	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	6
					8	Int.	□	MVS1470X08S150	120.3	4.736	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	6
					8	Int.	●	MVS1470X08S160	120.3	4.736	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	6
14.800	.5827				2	Ext.	★	MVE1480X02S150	32.3	1.272	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1480X02S160	32.3	1.272	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1480X03S150	47.1	1.854	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1480X03S160	47.1	1.854	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1480X03S150	47.1	1.854	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	6
					3	Int.	●	MVS1480X03S160	47.1	1.854	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	6
					5	Int.	★	MVS1480X05S150	76.7	3.020	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	6
					5	Int.	●	MVS1480X05S160	76.7	3.020	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	6
					8	Int.	□	MVS1480X08S150	121.1	4.768	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	6
					8	Int.	●	MVS1480X08S160	121.1	4.768	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	6

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	Ext.	★	MVE1490X02S150	32.5	1.280	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1490X02S160	32.5	1.280	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1490X03S150	47.4	1.866	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1490X03S160	47.4	1.866	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1490X03S150	47.4	1.866	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	6
14.900	.5866				3	Int.	●	MVS1490X03S160	47.4	1.866	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	6
					5	Int.	★	MVS1490X05S150	77.2	3.039	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	6
					5	Int.	●	MVS1490X05S160	77.2	3.039	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	6
					8	Int.	□	MVS1490X08S150	121.9	4.799	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	6
					8	Int.	●	MVS1490X08S160	121.9	4.799	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	6
					2	Ext.	★	MVE1500X02S150	32.7	1.287	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	15	.591	2
					2	Ext.	●	MVE1500X02S160	32.7	1.287	58.7	2.311	58.7	2.311	113.7	4.476	111	4.370	2.7	.106	16	.630	2
					3	Ext.	★	MVE1500X03S150	47.7	1.878	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	15	.591	2
					3	Ext.	□	MVE1500X03S160	47.7	1.878	93.7	3.689	93.7	3.689	155.7	6.130	153	6.024	2.7	.106	16	.630	2
					3	Int.	★	MVS1500X03S150	47.7	1.878	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	15	.591	6
15.000	.5906				3	Int.	●	MVS1500X03S160	47.7	1.878	77.7	3.059	77.7	3.059	142.7	5.618	140	5.512	2.7	.106	16	.630	6
					5	Int.	★	MVS1500X05S150	77.7	3.059	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	15	.591	6
					5	Int.	●	MVS1500X05S160	77.7	3.059	122.7	4.831	122.7	4.831	187.7	7.390	185	7.283	2.7	.106	16	.630	6
					8	Int.	★	MVS1500X08S150	122.7	4.831	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	15	.591	6
					8	Int.	●	MVS1500X08S160	122.7	4.831	167.7	6.602	167.7	6.602	227.7	8.965	225	8.858	2.7	.106	16	.630	6
					2	Ext.	●	MVE1508X02S160	32.9	1.295	60.7	2.390	63.7	2.508	117.7	4.634	115	4.528	2.7	.106	16	.630	2
15.082	.5938	19/32			3	Int.	●	MVS1508X03S160	48.0	1.890	80.2	3.157	82.7	3.256	147.7	5.815	145	5.709	2.7	.106	16	.630	6
					5	Int.	●	MVS1508X05S160	78.1	3.075	126.7	4.988	130.7	5.146	195.7	7.705	193	7.598	2.7	.106	16	.630	6
					8	Int.	●	MVS1508X08S160	123.4	4.858	173.7	6.839	183.7	7.232	243.7	9.594	241	9.488	2.7	.106	16	.630	6
					2	Ext.	●	MVE1510X02S160	32.9	1.295	60.7	2.390	63.7	2.508	117.7	4.634	115	4.528	2.7	.106	16	.630	2
					3	Ext.	★	MVE1510X03S160	48.0	1.890	96.7	3.807	99.7	3.925	162.7	6.406	160	6.299	2.7	.106	16	.630	2
15.100	.5945				3	Int.	●	MVS1510X03S160	48.0	1.890	80.2	3.157	82.7	3.256	147.7	5.815	145	5.709	2.7	.106	16	.630	6
					5	Int.	●	MVS1510X05S160	78.2	3.079	126.7	4.988	130.7	5.146	195.7	7.705	193	7.598	2.7	.106	16	.630	6
					8	Int.	●	MVS1510X08S160	123.5	4.862	173.7	6.839	183.7	7.232	243.7	9.594	241	9.488	2.7	.106	16	.630	6
					2	Ext.	●	MVE1520X02S160	33.2	1.307	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1520X03S160	48.4	1.906	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
15.200	.5984				3	Int.	●	MVS1520X03S160	48.4	1.906	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	6
					5	Int.	●	MVS1520X05S160	78.8	3.102	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	6
					8	Int.	●	MVS1520X08S160	124.4	4.898	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	6
					2	Ext.	●	MVE1530X02S160	33.4	1.315	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1530X03S160	48.7	1.917	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
15.300	.6024				3	Int.	●	MVS1530X03S160	48.7	1.917	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	6
					5	Int.	●	MVS1530X05S160	79.3	3.122	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	6
					8	Int.	●	MVS1530X08S160	125.2	4.929	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	6
					2	Ext.	●	MVE1540X02S160	33.6	1.323	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1540X03S160	49.0	1.929	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
15.400	.6063				3	Int.	●	MVS1540X03S160	49.0	1.929	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	6
					5	Int.	●	MVS1540X05S160	79.8	3.142	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	6
					8	Int.	●	MVS1540X08S160	126.0	4.961	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	6
					2	Ext.	●	MVE1548X02S160	33.7	1.327	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
15.479	.6094	39/64			3	Int.	●	MVS1548X03S160	49.2	1.937	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	6
					5	Int.	●	MVS1548X05S160	80.2	3.157	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	6
					8	Int.	●	MVS1548X08S160	126.6	4.984	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	6
					2	Ext.	●	MVE1550X02S160	33.8	1.331	60.8	2.394	63.8	2.512	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1550X03S160	49.3	1.941	96.8	3.811	99.8	3.929	162.8	6.409	160	6.299	2.8	.110	16	.630	2
15.500	.6102			M18x2.5	3	Int.	●	MVS1550X03S160	49.3	1.941	80.3	3.161	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	6
					5	Int.	●	MVS1550X05S160	80.3	3.161	126.8	4.992	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	6
					8	Int.	●	MVS1550X08S160	126.8	4.992	173.8	6.843	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	6

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
15.600	.6142				2	Ext.	●	MVE1560X02S160	34.0	1.339	60.8	2.394	60.8	2.394	117.8	4.638	115	4.528	2.8	.110	16	.630	2
					3	Ext.	★	MVE1560X03S160	49.6	1.953	98.8	3.890	98.8	3.890	162.8	6.409	160	6.299	2.8	.110	16	.630	2
					3	Int.	●	MVS1560X03S160	49.6	1.953	82.8	3.260	82.8	3.260	147.8	5.819	145	5.709	2.8	.110	16	.630	6
					5	Int.	●	MVS1560X05S160	80.8	3.181	130.8	5.150	130.8	5.150	195.8	7.709	193	7.598	2.8	.110	16	.630	6
					8	Int.	●	MVS1560X08S160	127.6	5.024	178.8	7.039	183.8	7.236	243.8	9.598	241	9.488	2.8	.110	16	.630	6
15.700	.6181				2	Ext.	●	MVE1570X02S160	34.3	1.350	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1570X03S160	50.0	1.969	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1570X03S160	50.0	1.969	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	6
					5	Int.	●	MVS1570X05S160	81.4	3.205	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	6
					8	Int.	●	MVS1570X08S160	128.5	5.059	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	6
15.800	.6220				2	Ext.	●	MVE1580X02S160	34.5	1.358	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1580X03S160	50.3	1.980	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1580X03S160	50.3	1.980	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	6
					5	Int.	●	MVS1580X05S160	81.9	3.224	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	6
					8	Int.	●	MVS1580X08S160	129.3	5.091	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	6
15.875	.6250	5/8			2	Ext.	●	MVE1588X02S160	34.6	1.362	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Int.	●	MVS1588X03S160	50.5	1.988	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	6
					5	Int.	●	MVS1588X05S160	82.2	3.236	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	6
					8	Int.	●	MVS1588X08S160	129.9	5.114	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	6
15.900	.6260				2	Ext.	●	MVE1590X02S160	34.7	1.366	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1590X03S160	50.6	1.992	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1590X03S160	50.6	1.992	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	6
					5	Int.	●	MVS1590X05S160	82.4	3.244	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	6
					8	Int.	●	MVS1590X08S160	130.1	5.122	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	6
16.000	.6299				2	Ext.	●	MVE1600X02S160	34.9	1.374	60.9	2.398	60.9	2.398	117.9	4.642	115	4.528	2.9	.114	16	.630	2
					3	Ext.	★	MVE1600X03S160	50.9	2.004	98.9	3.894	98.9	3.894	162.9	6.413	160	6.299	2.9	.114	16	.630	2
					3	Int.	●	MVS1600X03S160	50.9	2.004	82.9	3.264	82.9	3.264	147.9	5.823	145	5.709	2.9	.114	16	.630	6
					5	Int.	●	MVS1600X05S160	82.9	3.264	130.9	5.154	130.9	5.154	195.9	7.713	193	7.598	2.9	.114	16	.630	6
					8	Int.	●	MVS1600X08S160	130.9	5.154	178.9	7.043	183.9	7.240	243.9	9.602	241	9.488	2.9	.114	16	.630	6
16.100	.6339				2	Ext.	□	MVE1610X02S170	35.1	1.382	62.9	2.476	62.9	2.476	121.9	4.799	119	4.685	2.9	.114	17	.669	2
					2	Ext.	□	MVE1610X02S180	35.1	1.382	62.9	2.476	62.9	2.476	121.9	4.799	119	4.685	2.9	.114	18	.709	2
					3	Ext.	□	MVE1610X03S170	51.2	2.016	104.9	4.130	104.9	4.130	169.9	6.689	167	6.575	2.9	.114	17	.669	2
					3	Ext.	□	MVE1610X03S180	51.2	2.016	104.9	4.130	104.9	4.130	169.9	6.689	167	6.575	2.9	.114	18	.709	2
					3	Int.	□	MVS1610X03S170	51.2	2.016	85.4	3.362	87.9	3.461	152.9	6.020	150	5.906	2.9	.114	17	.669	6
					3	Int.	□	MVS1610X03S180	51.2	2.016	85.4	3.362	87.9	3.461	152.9	6.020	150	5.906	2.9	.114	18	.709	6
					5	Int.	□	MVS1610X05S170	83.4	3.283	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	17	.669	6
					5	Int.	□	MVS1610X05S180	83.4	3.283	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	18	.709	6
16.200	.6378				2	Ext.	★	MVE1620X02S170	35.3	1.390	62.9	2.476	62.9	2.476	121.9	4.799	119	4.685	2.9	.114	17	.669	2
					2	Ext.	□	MVE1620X02S180	35.3	1.390	62.9	2.476	62.9	2.476	121.9	4.799	119	4.685	2.9	.114	18	.709	2
					3	Ext.	□	MVE1620X03S170	51.5	2.028	104.9	4.130	104.9	4.130	169.9	6.689	167	6.575	2.9	.114	17	.669	2
					3	Ext.	□	MVE1620X03S180	51.5	2.028	104.9	4.130	104.9	4.130	169.9	6.689	167	6.575	2.9	.114	18	.709	2
					3	Int.	□	MVS1620X03S170	51.5	2.028	85.4	3.362	87.9	3.461	152.9	6.020	150	5.906	2.9	.114	17	.669	6
					3	Int.	□	MVS1620X03S180	51.5	2.028	85.4	3.362	87.9	3.461	152.9	6.020	150	5.906	2.9	.114	18	.709	6
					5	Int.	□	MVS1620X05S170	83.9	3.303	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	17	.669	6
					5	Int.	□	MVS1620X05S180	83.9	3.303	134.9	5.311	138.9	5.469	203.9	8.028	201	7.913	2.9	.114	18	.709	6
16.272	.6407	41/64			2	Ext.	●	MVE1627X02S180	35.5	1.398	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Int.	●	MVS1627X03S180	51.7	2.035	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	●	MVS1627X05S180	84.3	3.319	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16.300	.6417				2	Ext.	★	MVE1630X02S170	35.6	1.402	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1630X02S180	35.6	1.402	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1630X03S170	51.9	2.043	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1630X03S180	51.9	2.043	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1630X03S170	51.9	2.043	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	6
					3	Int.	□	MVS1630X03S180	51.9	2.043	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	□	MVS1630X05S170	84.5	3.327	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	6
					5	Int.	□	MVS1630X05S180	84.5	3.327	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6
16.400	.6457				2	Ext.	□	MVE1640X02S170	35.8	1.409	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1640X02S180	35.8	1.409	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1640X03S170	52.2	2.055	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1640X03S180	52.2	2.055	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1640X03S170	52.2	2.055	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	6
					3	Int.	□	MVS1640X03S180	52.2	2.055	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	□	MVS1640X05S170	85.0	3.346	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	6
					5	Int.	□	MVS1640X05S180	85.0	3.346	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6
16.500	.6496			M18x1.5	2	Ext.	★	MVE1650X02S170	36.0	1.417	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	●	MVE1650X02S180	36.0	1.417	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	★	MVE1650X03S170	52.5	2.067	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1650X03S180	52.5	2.067	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	★	MVS1650X03S170	52.5	2.067	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	6
					3	Int.	●	MVS1650X03S180	52.5	2.067	85.5	3.366	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	★	MVS1650X05S170	85.5	3.366	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	6
					5	Int.	●	MVS1650X05S180	85.5	3.366	135.0	5.315	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6
16.600	.6535				2	Ext.	□	MVE1660X02S170	36.2	1.425	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1660X02S180	36.2	1.425	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1660X03S170	52.8	2.079	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1660X03S180	52.8	2.079	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1660X03S170	52.8	2.079	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	6
					3	Int.	□	MVS1660X03S180	52.8	2.079	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	□	MVS1660X05S170	86.0	3.386	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	6
					5	Int.	□	MVS1660X05S180	86.0	3.386	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6
16.669	.6563	21/32		3/4-10	2	Ext.	●	MVE1667X02S180	36.3	1.429	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Int.	●	MVS1667X03S180	53.0	2.087	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	●	MVS1667X05S180	86.4	3.402	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6
16.700	.6575				2	Ext.	□	MVE1670X02S170	36.4	1.433	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	17	.669	2
					2	Ext.	□	MVE1670X02S180	36.4	1.433	63.0	2.480	63.0	2.480	122.0	4.803	119	4.685	3.0	.118	18	.709	2
					3	Ext.	□	MVE1670X03S170	53.1	2.091	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	17	.669	2
					3	Ext.	□	MVE1670X03S180	53.1	2.091	105.0	4.134	105.0	4.134	170.0	6.693	167	6.575	3.0	.118	18	.709	2
					3	Int.	□	MVS1670X03S170	53.1	2.091	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	17	.669	6
					3	Int.	□	MVS1670X03S180	53.1	2.091	88.0	3.465	88.0	3.465	153.0	6.024	150	5.906	3.0	.118	18	.709	6
					5	Int.	□	MVS1670X05S170	86.5	3.406	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	17	.669	6
					5	Int.	□	MVS1670X05S180	86.5	3.406	139.0	5.472	139.0	5.472	204.0	8.031	201	7.913	3.0	.118	18	.709	6
16.800	.6614				2	Ext.	□	MVE1680X02S170	36.7	1.445	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17	.669	2
					2	Ext.	□	MVE1680X02S180	36.7	1.445	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	18	.709	2
					3	Ext.	□	MVE1680X03S170	53.5	2.106	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17	.669	2
					3	Ext.	□	MVE1680X03S180	53.5	2.106	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1680X03S170	53.5	2.106	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17	.669	6
					3	Int.	□	MVS1680X03S180	53.5	2.106	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	18	.709	6
					5	Int.	□	MVS1680X05S170	87.1	3.429	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17	.669	6
					5	Int.	□	MVS1680X05S180	87.1	3.429	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	18	.709	6

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
16.900	.6654				2	Ext.	□	MVE1690X02S170	36.9	1.453	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17	.669	2
					2	Ext.	□	MVE1690X02S180	36.9	1.453	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	18	.709	2
					3	Ext.	□	MVE1690X03S170	53.8	2.118	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17	.669	2
					3	Ext.	□	MVE1690X03S180	53.8	2.118	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1690X03S170	53.8	2.118	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17	.669	6
					3	Int.	□	MVS1690X03S180	53.8	2.118	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	18	.709	6
					5	Int.	□	MVS1690X05S170	87.6	3.449	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17	.669	6
					5	Int.	□	MVS1690X05S180	87.6	3.449	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	18	.709	6
17.000	.6693		Tube Sheet		2	Ext.	★	MVE1700X02S170	37.1	1.461	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	17	.669	2
					2	Ext.	●	MVE1700X02S180	37.1	1.461	63.1	2.484	63.1	2.484	122.1	4.807	119	4.685	3.1	.122	18	.709	2
					3	Ext.	★	MVE1700X03S170	54.1	2.130	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	17	.669	2
					3	Ext.	□	MVE1700X03S180	54.1	2.130	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	★	MVS1700X03S170	54.1	2.130	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	17	.669	6
					3	Int.	●	MVS1700X03S180	54.1	2.130	88.1	3.469	88.1	3.469	153.1	6.028	150	5.906	3.1	.122	18	.709	6
					5	Int.	★	MVS1700X05S170	88.1	3.469	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	17	.669	6
					5	Int.	●	MVS1700X05S180	88.1	3.469	139.1	5.476	139.1	5.476	204.1	8.035	201	7.913	3.1	.122	18	.709	6
17.066	.6719	43/64			2	Ext.	●	MVE1707X02S180	37.2	1.465	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Int.	●	MVS1707X03S180	54.3	2.138	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	6
					5	Int.	●	MVS1707X05S180	88.4	3.480	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	6
17.100	.6732				2	Ext.	□	MVE1710X02S180	37.3	1.469	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Ext.	□	MVE1710X03S180	54.4	2.142	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1710X03S180	54.4	2.142	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	6
					5	Int.	□	MVS1710X05S180	88.6	3.488	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	6
17.200	.6772				2	Ext.	□	MVE1720X02S180	37.5	1.476	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Ext.	□	MVE1720X03S180	54.7	2.154	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1720X03S180	54.7	2.154	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	6
					5	Int.	□	MVS1720X05S180	89.1	3.508	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	6
17.300	.6811				2	Ext.	□	MVE1730X02S180	37.7	1.484	65.1	2.563	65.1	2.563	126.1	4.965	123	4.843	3.1	.122	18	.709	2
					3	Ext.	□	MVE1730X03S180	55.0	2.165	105.1	4.138	105.1	4.138	170.1	6.697	167	6.575	3.1	.122	18	.709	2
					3	Int.	□	MVS1730X03S180	55.0	2.165	90.6	3.567	93.1	3.665	158.1	6.224	155	6.102	3.1	.122	18	.709	6
					5	Int.	□	MVS1730X05S180	89.6	3.528	143.1	5.634	147.1	5.791	212.1	8.350	209	8.228	3.1	.122	18	.709	6
17.400	.6850				2	Ext.	□	MVE1740X02S180	38.0	1.496	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1740X03S180	55.4	2.181	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1740X03S180	55.4	2.181	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	6
					5	Int.	□	MVS1740X05S180	90.2	3.551	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	6
17.463	.6875	11/16		3/4-16	2	Ext.	●	MVE1746X02S180	38.1	1.500	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Int.	●	MVS1746X03S180	55.5	2.185	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	6
					5	Int.	●	MVS1746X05S180	90.5	3.563	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	6
17.500	.6890			M20x2.5	2	Ext.	●	MVE1750X02S180	38.2	1.504	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	★	MVE1750X03S180	55.7	2.193	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	●	MVS1750X03S180	55.7	2.193	90.7	3.571	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	6
					5	Int.	●	MVS1750X05S180	90.7	3.571	143.2	5.638	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	6
17.600	.6929				2	Ext.	□	MVE1760X02S180	38.4	1.512	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1760X03S180	56.0	2.205	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1760X03S180	56.0	2.205	93.2	3.669	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	6
					5	Int.	□	MVS1760X05S180	91.2	3.591	147.2	5.795	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	6
17.700	.6969				2	Ext.	□	MVE1770X02S180	38.6	1.520	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1770X03S180	56.3	2.217	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1770X03S180	56.3	2.217	93.2	3.669	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	6
					5	Int.	□	MVS1770X05S180	91.7	3.610	147.2	5.795	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	6

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
17.800	.7008				2	Ext.	★	MVE1780X02S180	38.8	1.528	65.2	2.567	65.2	2.567	126.2	4.969	123	4.843	3.2	.126	18	.709	2
					3	Ext.	□	MVE1780X03S180	56.6	2.228	105.2	4.142	105.2	4.142	170.2	6.701	167	6.575	3.2	.126	18	.709	2
					3	Int.	□	MVS1780X03S180	56.6	2.228	93.2	3.669	93.2	3.669	158.2	6.228	155	6.102	3.2	.126	18	.709	6
					5	Int.	□	MVS1780X05S180	92.2	3.630	147.2	5.795	147.2	5.795	212.2	8.354	209	8.228	3.2	.126	18	.709	6
17.860	.7032	45/64			2	Ext.	●	MVE1786X02S180	38.9	1.531	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18	.709	2
					3	Int.	●	MVS1786X03S180	56.8	2.236	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18	.709	6
					5	Int.	●	MVS1786X05S180	92.5	3.642	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18	.709	6
17.900	.7047				2	Ext.	□	MVE1790X02S180	39.1	1.539	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18	.709	2
					3	Ext.	□	MVE1790X03S180	57.0	2.244	105.3	4.146	105.3	4.146	170.3	6.705	167	6.575	3.3	.130	18	.709	2
					3	Int.	□	MVS1790X03S180	57.0	2.244	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18	.709	6
					5	Int.	□	MVS1790X05S180	92.8	3.654	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18	.709	6
18.000	.7087				2	Ext.	●	MVE1800X02S180	39.3	1.547	65.3	2.571	65.3	2.571	126.3	4.972	123	4.843	3.3	.130	18	.709	2
					3	Ext.	★	MVE1800X03S180	57.3	2.256	105.3	4.146	105.3	4.146	170.3	6.705	167	6.575	3.3	.130	18	.709	2
					3	Int.	●	MVS1800X03S180	57.3	2.256	93.3	3.673	93.3	3.673	158.3	6.232	155	6.102	3.3	.130	18	.709	6
					5	Int.	●	MVS1800X05S180	93.3	3.673	147.3	5.799	147.3	5.799	212.3	8.358	209	8.228	3.3	.130	18	.709	6
18.100	.7126				2	Ext.	□	MVE1810X02S190	39.5	1.555	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1810X02S200	39.5	1.555	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1810X03S190	57.6	2.268	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1810X03S200	57.6	2.268	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1810X03S190	57.6	2.268	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	6
					3	Int.	□	MVS1810X03S200	57.6	2.268	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	6
					5	Int.	□	MVS1810X05S190	93.8	3.693	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	6
					5	Int.	□	MVS1810X05S200	93.8	3.693	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	6
18.200	.7165				2	Ext.	□	MVE1820X02S190	39.7	1.563	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1820X02S200	39.7	1.563	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1820X03S190	57.9	2.280	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1820X03S200	57.9	2.280	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1820X03S190	57.9	2.280	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	6
					3	Int.	□	MVS1820X03S200	57.9	2.280	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	6
					5	Int.	□	MVS1820X05S190	94.3	3.713	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	6
					5	Int.	□	MVS1820X05S200	94.3	3.713	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	6
18.257	.7188	23/32			2	Ext.	●	MVE1826X02S200	39.8	1.567	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Int.	●	MVS1826X03S200	58.1	2.287	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	6
					5	Int.	●	MVS1826X05S200	94.6	3.724	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	6
18.300	.7205				2	Ext.	□	MVE1830X02S190	39.9	1.571	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1830X02S200	39.9	1.571	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1830X03S190	58.2	2.291	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1830X03S200	58.2	2.291	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1830X03S190	58.2	2.291	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	6
					3	Int.	□	MVS1830X03S200	58.2	2.291	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	6
					5	Int.	□	MVS1830X05S190	94.8	3.732	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	6
					5	Int.	□	MVS1830X05S200	94.8	3.732	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	6
18.400	.7244				2	Ext.	□	MVE1840X02S190	40.1	1.579	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	19	.748	2
					2	Ext.	□	MVE1840X02S200	40.1	1.579	67.3	2.650	67.3	2.650	130.3	5.130	127	5.000	3.3	.130	20	.787	2
					3	Ext.	□	MVE1840X03S190	58.5	2.303	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	19	.748	2
					3	Ext.	□	MVE1840X03S200	58.5	2.303	117.3	4.618	117.3	4.618	182.3	7.177	179	7.047	3.3	.130	20	.787	2
					3	Int.	□	MVS1840X03S190	58.5	2.303	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	19	.748	6
					3	Int.	□	MVS1840X03S200	58.5	2.303	95.8	3.772	98.3	3.870	163.3	6.429	160	6.299	3.3	.130	20	.787	6
					5	Int.	□	MVS1840X05S190	95.3	3.752	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	19	.748	6
					5	Int.	□	MVS1840X05S200	95.3	3.752	151.3	5.957	155.3	6.114	220.3	8.673	217	8.543	3.3	.130	20	.787	6

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
18.500	.7283			M20x1.5	2	Ext.	★	MVE1850X02S190	40.4	1.591	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	●	MVE1850X02S200	40.4	1.591	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	★	MVE1850X03S190	58.9	2.319	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1850X03S200	58.9	2.319	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	★	MVS1850X03S190	58.9	2.319	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	6
					3	Int.	●	MVS1850X03S200	58.9	2.319	95.9	3.776	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	6
					5	Int.	★	MVS1850X05S190	95.9	3.776	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	6
					5	Int.	●	MVS1850X05S200	95.9	3.776	151.4	5.961	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	6
18.600	.7323				2	Ext.	□	MVE1860X02S190	40.6	1.598	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1860X02S200	40.6	1.598	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1860X03S190	59.2	2.331	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1860X03S200	59.2	2.331	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1860X03S190	59.2	2.331	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	6
					3	Int.	□	MVS1860X03S200	59.2	2.331	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	6
					5	Int.	□	MVS1860X05S190	96.4	3.795	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	6
					5	Int.	□	MVS1860X05S200	96.4	3.795	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	6
18.654	.7344	47/64			2	Ext.	●	MVE1865X02S200	40.7	1.602	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Int.	●	MVS1865X03S200	59.3	2.335	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	6
					5	Int.	●	MVS1865X05S200	96.6	3.803	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	6
18.700	.7362				2	Ext.	□	MVE1870X02S190	40.8	1.606	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1870X02S200	40.8	1.606	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1870X03S190	59.5	2.343	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1870X03S200	59.5	2.343	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1870X03S190	59.5	2.343	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	6
					3	Int.	□	MVS1870X03S200	59.5	2.343	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	6
					5	Int.	□	MVS1870X05S190	96.9	3.815	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	6
					5	Int.	□	MVS1870X05S200	96.9	3.815	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	6
18.800	.7402				2	Ext.	□	MVE1880X02S190	41.0	1.614	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1880X02S200	41.0	1.614	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1880X03S190	59.8	2.354	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1880X03S200	59.8	2.354	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1880X03S190	59.8	2.354	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	6
					3	Int.	□	MVS1880X03S200	59.8	2.354	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	6
					5	Int.	□	MVS1880X05S190	97.4	3.835	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	6
					5	Int.	□	MVS1880X05S200	97.4	3.835	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	6
18.900	.7441				2	Ext.	□	MVE1890X02S190	41.2	1.622	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	19	.748	2
					2	Ext.	□	MVE1890X02S200	41.2	1.622	67.4	2.654	67.4	2.654	130.4	5.134	127	5.000	3.4	.134	20	.787	2
					3	Ext.	□	MVE1890X03S190	60.1	2.366	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	19	.748	2
					3	Ext.	□	MVE1890X03S200	60.1	2.366	117.4	4.622	117.4	4.622	182.4	7.181	179	7.047	3.4	.134	20	.787	2
					3	Int.	□	MVS1890X03S190	60.1	2.366	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	19	.748	6
					3	Int.	□	MVS1890X03S200	60.1	2.366	98.4	3.874	98.4	3.874	163.4	6.433	160	6.299	3.4	.134	20	.787	6
					5	Int.	□	MVS1890X05S190	97.9	3.854	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	19	.748	6
					5	Int.	□	MVS1890X05S200	97.9	3.854	155.4	6.118	155.4	6.118	220.4	8.677	217	8.543	3.4	.134	20	.787	6
19.000	.7480				2	Ext.	★	MVE1900X02S190	41.5	1.634	67.5	2.657	67.5	2.657	130.5	5.138	127	5.000	3.5	.138	19	.748	2
					2	Ext.	●	MVE1900X02S200	41.5	1.634	67.5	2.657	67.5	2.657	130.5	5.138	127	5.000	3.5	.138	20	.787	2
					3	Ext.	★	MVE1900X03S190	60.5	2.382	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	19	.748	2
					3	Ext.	□	MVE1900X03S200	60.5	2.382	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	★	MVS1900X03S190	60.5	2.382	98.5	3.878	98.5	3.878	163.5	6.437	160	6.299	3.5	.138	19	.748	6
					3	Int.	●	MVS1900X03S200	60.5	2.382	98.5	3.878	98.5	3.878	163.5	6.437	160	6.299	3.5	.138	20	.787	6
					5	Int.	★	MVS1900X05S190	98.5	3.878	155.5	6.122	155.5	6.122	220.5	8.681	217	8.543	3.5	.138	19	.748	6
					5	Int.	●	MVS1900X05S200	98.5	3.878	155.5	6.122	155.5	6.122	220.5	8.681	217	8.543	3.5	.138	20	.787	6

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L083
CUTTING CONDITIONS ➤ L085

MVE/MVS

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
19.050	.7500	3/4			2	Ext.	●	MVE1905X02S200	41.5	1.634	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Int.	●	MVS1905X03S200	60.6	2.386	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	●	MVS1905X05S200	98.7	3.886	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.100	.7520				2	Ext.	□	MVE1910X02S200	41.7	1.642	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1910X03S200	60.8	2.394	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1910X03S200	60.8	2.394	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	□	MVS1910X05S200	99.0	3.898	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.200	.7559				2	Ext.	□	MVE1920X02S200	41.9	1.650	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1920X03S200	61.1	2.406	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1920X03S200	61.1	2.406	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	□	MVS1920X05S200	99.5	3.917	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.254	.7580		Tube Sheet		2	Ext.	●	MVE1925X02S200	42.0	1.654	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Int.	●	MVS1925X03S200	61.2	2.409	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	●	MVS1925X05S200	99.7	3.925	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.300	.7598				2	Ext.	□	MVE1930X02S200	42.1	1.657	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1930X03S200	61.4	2.417	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1930X03S200	61.4	2.417	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	□	MVS1930X05S200	100.0	3.937	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.400	.7638				2	Ext.	□	MVE1940X02S200	42.3	1.665	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	□	MVE1940X03S200	61.7	2.429	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	□	MVS1940X03S200	61.7	2.429	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	□	MVS1940X05S200	100.5	3.957	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.447	.7657	49/64		7/8-9	2	Ext.	●	MVE1945X02S200	42.4	1.669	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Int.	●	MVS1945X03S200	61.8	2.433	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	●	MVS1945X05S200	100.7	3.965	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.500	.7677			M22x2.5	2	Ext.	●	MVE1950X02S200	42.5	1.673	69.5	2.736	69.5	2.736	134.5	5.295	131	5.157	3.5	.138	20	.787	2
					3	Ext.	★	MVE1950X03S200	62.0	2.441	117.5	4.626	117.5	4.626	182.5	7.185	179	7.047	3.5	.138	20	.787	2
					3	Int.	●	MVS1950X03S200	62.0	2.441	101.0	3.976	103.5	4.075	168.5	6.634	165	6.496	3.5	.138	20	.787	6
					5	Int.	●	MVS1950X05S200	101.0	3.976	159.5	6.280	163.5	6.437	228.5	8.996	225	8.858	3.5	.138	20	.787	6
19.600	.7717				2	Ext.	□	MVE1960X02S200	42.8	1.685	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1960X03S200	62.4	2.457	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1960X03S200	62.4	2.457	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	6
					5	Int.	□	MVS1960X05S200	101.6	4.000	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	6
19.700	.7756				2	Ext.	□	MVE1970X02S200	43.0	1.693	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1970X03S200	62.7	2.469	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1970X03S200	62.7	2.469	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	6
					5	Int.	□	MVS1970X05S200	102.1	4.020	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	6
19.800	.7795				2	Ext.	□	MVE1980X02S200	43.2	1.701	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1980X03S200	63.0	2.480	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1980X03S200	63.0	2.480	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	6
					5	Int.	□	MVS1980X05S200	102.6	4.039	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	6
19.844	.7813	25/32			2	Ext.	●	MVE1984X02S200	43.3	1.705	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Int.	●	MVS1984X03S200	63.1	2.484	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	6
					5	Int.	●	MVS1984X05S200	102.8	4.047	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	6
19.900	.7835				2	Ext.	□	MVE1990X02S200	43.4	1.709	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	□	MVE1990X03S200	63.3	2.492	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	□	MVS1990X03S200	63.3	2.492	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	6
					5	Int.	□	MVS1990X05S200	103.1	4.059	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	6
20.000	.7874				2	Ext.	●	MVE2000X02S200	43.6	1.717	69.6	2.740	69.6	2.740	134.6	5.299	131	5.157	3.6	.142	20	.787	2
					3	Ext.	★	MVE2000X03S200	63.6	2.504	117.6	4.630	117.6	4.630	182.6	7.189	179	7.047	3.6	.142	20	.787	2
					3	Int.	●	MVS2000X03S200	63.6	2.504	103.6	4.079	103.6	4.079	168.6	6.638	165	6.496	3.6	.142	20	.787	6
					5	Int.	●	MVS2000X05S200	103.6	4.079	163.6	6.441	163.6	6.441	228.6	9.000	225	8.858	3.6	.142	20	.787	6

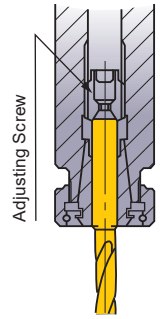
Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L085

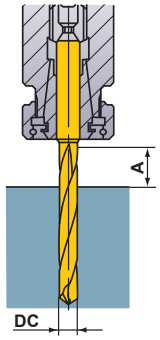
■ OPERATIONAL GUIDANCE FOR THE MVS DRILL (L/D<10)

Drill Holding



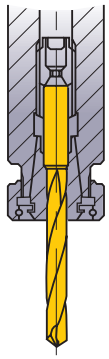
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A > DC x 1.5(DC×over .079" for DC<.118")

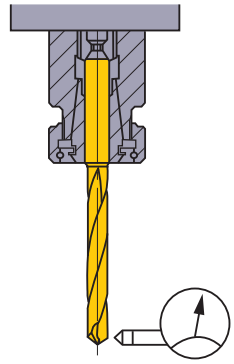
Drill Installation



NG

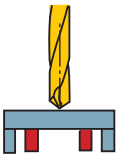
Do not clamp on the flutes.

Installation Tolerance



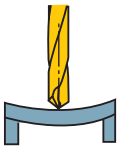
Run-out ≤ .0012 inch

Thin Workpiece



Support the Workpiece

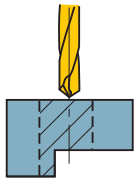
OK



If Bending Occurs

NG

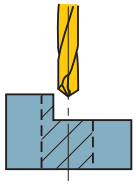
Interrupted Cutting



One Process

OK

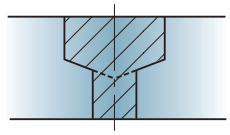
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

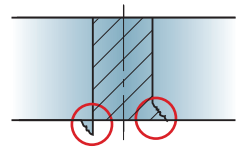
①Spot face with an end mill prior to drilling.

Stepped Holes



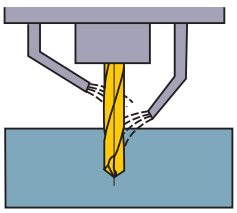
①Divide the two processes.
②Drill the larger hole first.
*A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



①Lower the feed rate by 50% at the end of through cutting.
②Add a 45°chamfer.
③Change the point angle.

Coolant Method (MVE)

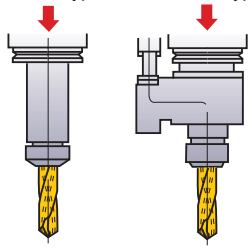


Two coolant positions, at the end and at the center are ideal.

Through Coolant Type (MVS)

Spindles Through Coolant Type

Revolving Coolant Machine Type



Less than ø.118 inch : 225PSI-1000PSI
More than ø.118 inch : 75PSI-1000PSI
More than 450PSI is recommended.

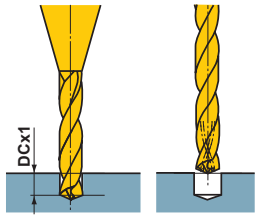
Coolant Handling

<MVS Type>

①Small chip particles can jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

②Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Drill Installation



①Drill a prepared hole about DCx1 using the shortest flute length of MVS. (DC=drill diameter)
②Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

■ CAUTIONS FOR USE (For DC<.118")

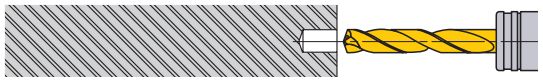
Please use a fine mesh filter (5 microns or less) for coolant to prevent chips from jamming in the coolant hole.
For deep drilling with the long type drill, machining a pilot hole is recommended.
(Otherwise, centrifugal forces may cause drill breakage.)

MVE/MVS

■ OPERATIONAL GUIDANCE FOR THE MVS LONG TYPE DRILL (L/D≥10)

Flat Face Drilling ●Drilling a blind hole

■ 1. Drilling a Pilot Hole



①Use a drill with the same or larger point angle than the long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx DCx1.
(Adjust the pilot hole depth according to the length of the long type drill.)

■ 2. Initial Cutting with the Long Type Drill

①Penetrate the guide hole at low revolution.
(Revolution 500-1000 min-1, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

■ 3. Drill the Deep Hole

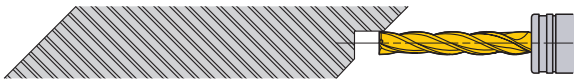
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

■ 4. Drill Retraction

①After drilling, lower the cutting revolution about .020—.039 inch short of the hole end. (Revolution 500-1000 min-1)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 IPM.
③Finally, clear the hole at a cutting speed of 65—100 SFM and feed rate of .008—.012 IPR.

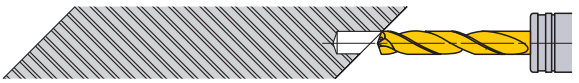
Interrupted Drilling ●Drilling and breaking through on irregular faces or angles

■ 1. Spot Facing



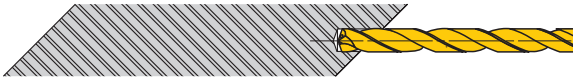
①Machine a flat on the irregular face by using an MFE (flat bottom drill) or an end mill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

■ 2. Drilling a Pilot Hole



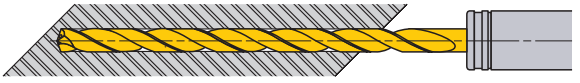
①Use a drill with the same or larger point angle than the long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx DCx1.
(Adjust the pilot hole depth according to the length of the long type drill.)

■ 3. Initial Cutting with the Long Type Drill



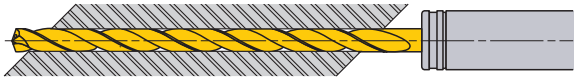
①Penetrate the guide hole at a low revolution.
(Revolution 500-1000 min-1, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

■ 4. Drill the Deep Hole



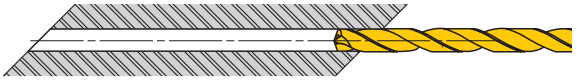
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
②Feed as usual until breaking through.

■ 5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②Recommend about half rate of the usual feed rate after breaking through.

■ 6. Drill Retraction



①Finally clear the hole at a revolution speed 500-1000 min-1 and feed rate of .008—.012 IPR.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 IPM.

RECOMMENDED CUTTING CONDITIONS

■ MVE

(inch)

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1260	**3.2**	214	.0039 (.0024—.0051)	197	.0039 (.0024—.0051)
.1575	**4.0**	230	.0047 (.0031—.0063)	214	.0047 (.0031—.0063)
.1969	**5.0**	230	.0059 (.0039—.0079)	214	.0059 (.0039—.0079)
.2480	**6.3**	263	.0079 (.0051—.0102)	246	.0079 (.0051—.0102)
.3150	**8.0**	279	.0091 (.0071—.0110)	263	.0091 (.0071—.0110)
.3937	**10.0**	296	.0106 (.0087—.0126)	279	.0106 (.0087—.0126)
.4724	**12.0**	312	.0122 (.0110—.0134)	296	.0122 (.0110—.0134)
.6299	**16.0**	328	.0130 (.0110—.0150)	296	.0130 (.0110—.0150)
.7874	**20.0**	328	.0138 (.0118—.0157)	296	.0138 (.0118—.0157)

Workpiece Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1260	**3.2**	181	.0035 (.0024—.0047)	66	.0028 (.0020—.0031)
.1575	**4.0**	197	.0043 (.0028—.0055)	66	.0031 (.0024—.0039)
.1969	**5.0**	197	.0055 (.0035—.0071)	66	.0039 (.0028—.0051)
.2480	**6.3**	230	.0071 (.0043—.0094)	82	.0051 (.0035—.0067)
.3150	**8.0**	246	.0083 (.0063—.0098)	82	.0055 (.0039—.0071)
.3937	**10.0**	263	.0091 (.0075—.0106)	82	.0063 (.0047—.0075)
.4724	**12.0**	279	.0102 (.0091—.0114)	82	.0071 (.0059—.0079)
.6299	**16.0**	279	.0114 (.0094—.0130)	82	.0075 (.0059—.0091)
.7874	**20.0**	279	.0118 (.0102—.0134)	82	.0079 (.0059—.0094)

Workpiece Material		Gray Cast Iron (≤350MPa) AISI No.45B etc.		Ductile Cast Iron (≤450MPa) AISI 60-40-18 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1260	**3.2**	230	.0039 (.0024—.0051)	214	.0039 (.0024—.0051)
.1575	**4.0**	230	.0047 (.0031—.0063)	214	.0047 (.0031—.0063)
.1969	**5.0**	230	.0059 (.0039—.0079)	214	.0059 (.0039—.0079)
.2480	**6.3**	246	.0079 (.0051—.0102)	230	.0079 (.0051—.0102)
.3150	**8.0**	246	.0098 (.0071—.0122)	230	.0091 (.0071—.0110)
.3937	**10.0**	246	.0114 (.0087—.0138)	230	.0106 (.0087—.0126)
.4724	**12.0**	263	.0130 (.0110—.0146)	246	.0122 (.0110—.0134)
.6299	**16.0**	263	.0138 (.0110—.0165)	246	.0130 (.0110—.0150)
.7874	**20.0**	279	.0146 (.0118—.0173)	263	.0138 (.0118—.0157)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MVE/MVS

RECOMMENDED CUTTING CONDITIONS

■ MVE

(inch)

Workpiece Material		Aluminum Alloy (Si<5%) ASTM A6061, 7075 etc.		Heat Resistant Alloy Inconel718 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1260	**3.2**	263	.0039 (.0024—.0051)	66	.0028 (.0020—.0035)
.1575	**4.0**	263	.0047 (.0031—.0063)	66	.0035 (.0024—.0043)
.1969	**5.0**	263	.0059 (.0039—.0079)	66	.0043 (.0031—.0055)
.2480	**6.3**	296	.0079 (.0051—.0102)	82	.0047 (.0035—.0059)
.3150	**8.0**	296	.0091 (.0071—.0110)	82	.0051 (.0043—.0063)
.3937	**10.0**	296	.0106 (.0087—.0126)	82	.0055 (.0047—.0067)
.4724	**12.0**	328	.0122 (.0110—.0134)	82	.0063 (.0051—.0071)
.6299	**16.0**	328	.0130 (.0110—.0150)	82	.0071 (.0055—.0083)
.7874	**20.0**	361	.0138 (.0118—.0157)	99	.0075 (.0059—.0087)

Workpiece Material		Hardened Steel (40—55HRC) AISI H13, L6 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm		
.1260	**3.2**	66	.0028 (.0020—.0035)
.1575	**4.0**	66	.0035 (.0024—.0043)
.1969	**5.0**	66	.0043 (.0031—.0055)
.2480	**6.3**	82	.0047 (.0035—.0059)
.3150	**8.0**	82	.0051 (.0043—.0063)
.3937	**10.0**	82	.0055 (.0047—.0067)
.4724	**12.0**	82	.0063 (.0051—.0071)
.6299	**16.0**	82	.0071 (.0055—.0083)
.7874	**20.0**	99	.0075 (.0059—.0087)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

■ MVS

(inch)

Workpiece Material			Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm					
.0394	1.0	2DC,7DC	164	.0016 (.0008—.0020)	164	.0016 (.0008—.0020)
		12DC-30DC	164	.0008 (.0004—.0012)	131	.0008 (.0004—.0012)
.0591	1.5	2DC,7DC	164	.0020 (.0012—.0031)	164	.0020 (.0012—.0031)
		12DC-30DC	164	.0020 (.0008—.0031)	131	.0020 (.0012—.0031)
.0787	2.0	2DC,7DC	164	.0028 (.0016—.0039)	164	.0028 (.0016—.0039)
		12DC-30DC	164	.0028 (.0016—.0039)	164	.0028 (.0016—.0039)
.0984	2.5	2DC,7DC	197	.0035 (.0020—.0051)	197	.0035 (.0020—.0051)
		12DC-30DC	197	.0035 (.0024—.0051)	164	.0035 (.0024—.0051)
.1260	3.2	2DC-8DC	296	.0039 (.0024—.0051)	263	.0039 (.0024—.0051)
		10DC-25DC	295	.0067 (.0039—.0094)	295	.0067 (.0039—.0094)
		30DC,40DC	246	.0054 (.0031—.0076)	246	.0054 (.0031—.0076)
.1575	4.0	2DC-8DC	328	.0047 (.0031—.0063)	296	.0047 (.0031—.0063)
		10DC-26DC	295	.0079 (.0047—.0118)	295	.0079 (.0047—.0118)
		30DC,40DC	246	.0063 (.0038—.0094)	246	.0063 (.0038—.0094)
.1969	5.0	2DC-8DC	328	.0059 (.0039—.0079)	296	.0059 (.0039—.0079)
		10DC-27DC	295	.0098 (.0059—.0138)	295	.0098 (.0059—.0138)
		30DC,40DC	246	.0079 (.0047—.0110)	246	.0079 (.0047—.0110)
.2480	6.3	2DC-8DC	361	.0079 (.0051—.0102)	328	.0079 (.0051—.0102)
		10DC-28DC	361	.0106 (.0067—.0146)	328	.0106 (.0067—.0146)
		30DC,40DC	295	.0085 (.0054—.0117)	262	.0085 (.0054—.0117)
.3150	8.0	2DC-8DC	394	.0091 (.0071—.0110)	361	.0091 (.0071—.0110)
		10DC-29DC	361	.0118 (.0079—.0157)	328	.0118 (.0079—.0157)
		30DC,40DC	295	.0094 (.0063—.0126)	262	.0094 (.0063—.0126)
.3937	10.0	2DC-8DC	427	.0106 (.0087—.0126)	394	.0106 (.0087—.0126)
		10DC-30DC	361	.0126 (.0087—.0165)	328	.0126 (.0087—.0165)
		30DC,40DC	295	.0101 (.0069—.0132)	262	.0101 (.0069—.0132)
.4724	12.0	2DC-8DC	460	.0118 (.0102—.0134)	427	.0118 (.0102—.0134)
		10DC-31DC	427	.0134 (.0094—.0173)	394	.0134 (.0094—.0173)
		30DC,40DC	344	.0107 (.0076—.0139)	312	.0107 (.0076—.0139)
.6299	16.0	2DC-8DC	525	.0130 (.0106—.0150)	460	.0130 (.0106—.0150)
		10DC-32DC	427	.0142 (.0102—.0181)	394	.0142 (.0102—.0181)
		30DC,40DC	344	.0113 (.0082—.0145)	312	.0113 (.0082—.0145)
.7874	20.0	2DC-8DC	525	.0138 (.0118—.0157)	460	.0138 (.0118—.0157)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MVE/MVS

RECOMMENDED CUTTING CONDITIONS

■ MVS

(inch)

Workpiece Material			Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm					
.0394	1.0	2DC,7DC	131	.0016 (.0008—.0020)	98	.0012 (.0008—.0020)
		12DC-30DC	98	.0008 (.0004—.0012)	98	.0008 (.0004—.0012)
.0591	1.5	2DC,7DC	131	.0020 (.0012—.0031)	98	.0020 (.0012—.0028)
		12DC-30DC	98	.0020 (.0008—.0031)	98	.0020 (.0008—.0031)
.0787	2.0	2DC,7DC	131	.0028 (.0016—.0039)	98	.0024 (.0016—.0031)
		12DC-30DC	131	.0028 (.0016—.0039)	98	.0028 (.0016—.0039)
.0984	2.5	2DC,7DC	164	.0035 (.0020—.0051)	131	.0031 (.0020—.0039)
		12DC-30DC	164	.0031 (.0020—.0051)	98	.0031 (.0020—.0047)
.1260	3.2	2DC-8DC	230	.0039 (.0024—.0051)	132	.0031 (.0024—.0039)
		10DC-25DC	262	.0059 (.0035—.0087)	131	.0028 (.0020—.0035)
		30DC,40DC	213	.0059 (.0028—.0069)	98	.0022 (.0016—.0028)
.1575	4.0	2DC-8DC	263	.0043 (.0028—.0055)	132	.0035 (.0024—.0043)
		10DC-26DC	262	.0071 (.0043—.0106)	131	.0031 (.0024—.0039)
		30DC,40DC	213	.0071 (.0035—.0085)	98	.0025 (.0019—.0031)
.1969	5.0	2DC-8DC	263	.0055 (.0035—.0071)	132	.0043 (.0031—.0055)
		10DC-27DC	262	.0087 (.0055—.0126)	131	.0039 (.0028—.0047)
		30DC,40DC	213	.0087 (.0044—.0101)	98	.0031 (.0022—.0038)
.2480	6.3	2DC-8DC	296	.0071 (.0043—.0094)	164	.0055 (.0035—.0071)
		10DC-28DC	295	.0094 (.0059—.0130)	164	.0047 (.0031—.0063)
		30DC,40DC	246	.0094 (.0047—.0104)	131	.0038 (.0025—.0050)
.3150	8.0	2DC-8DC	328	.0083 (.0063—.0098)	164	.0059 (.0039—.0075)
		10DC-29DC	295	.0106 (.0071—.0142)	164	.0055 (.0039—.0067)
		30DC,40DC	246	.0106 (.0057—.0113)	131	.0044 (.0031—.0054)
.3937	10.0	2DC-8DC	361	.0091 (.0075—.0106)	164	.0063 (.0047—.0079)
		10DC-30DC	295	.0114 (.0079—.0150)	164	.0059 (.0047—.0071)
		30DC,40DC	246	.0114 (.0063—.0120)	131	.0047 (.0038—.0057)
.4724	12.0	2DC-8DC	394	.0102 (.0087—.0114)	197	.0071 (.0059—.0083)
		10DC-31DC	328	.0118 (.0087—.0157)	197	.0067 (.0055—.0075)
		30DC,40DC	262	.0118 (.0069—.0126)	164	.0054 (.0044—.0060)
.6299	16.0	2DC-8DC	427	.0110 (.0091—.0130)	197	.0075 (.0055—.0094)
		10DC-32DC	328	.0126 (.0091—.0161)	197	.0067 (.0055—.0075)
		30DC,40DC	262	.0126 (.0072—.0129)	164	.0054 (.0044—.0060)
.7874	20.0	2DC-8DC	427	.0118 (.0102—.0134)	197	.0083 (.0059—.0102)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

(inch)

Workpiece Material			Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-60-8 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm					
.0394	**1.0**	**2DC,7DC**	164	.0016 (.0008—.0020)	131	.0016 (.0008—.0020)
		12DC-30DC	131	.0008 (.0004—.0012)	98	.0008 (.0004—.0012)
.0591	**1.5**	**2DC,7DC**	164	.0020 (.0012—.0031)	131	.0020 (.0012—.0031)
		12DC-30DC	131	.0020 (.0012—.0031)	98	.0020 (.0008—.0031)
.0787	**2.0**	**2DC,7DC**	164	.0028 (.0016—.0039)	131	.0028 (.0016—.0039)
		12DC-30DC	164	.0028 (.0016—.0039)	131	.0028 (.0016—.0039)
.0984	**2.5**	**2DC,7DC**	197	.0035 (.0020—.0051)	164	.0035 (.0020—.0051)
		12DC-30DC	164	.0035 (.0024—.0051)	164	.0031 (.0020—.0047)
.1260	**3.2**	**2DC-8DC**	296	.0039 (.0024—.0051)	214	.0039 (.0024—.0051)
		10DC-25DC	295	.0075 (.0043—.0102)	295	.0067 (.0039—.0094)
		30DC,40DC	246	.0060 (.0035—.0082)	246	.0054 (.0031—.0076)
.1575	**4.0**	**2DC-8DC**	328	.0047 (.0031—.0063)	214	.0047 (.0031—.0063)
		10DC-26DC	295	.0087 (.0051—.0130)	295	.0079 (.0047—.0118)
		30DC,40DC	246	.0069 (.0041—.0104)	246	.0063 (.0038—.0094)
.1969	**5.0**	**2DC-8DC**	328	.0059 (.0039—.0079)	214	.0059 (.0039—.0079)
		10DC-27DC	295	.0110 (.0276—.0154)	295	.0098 (.0059—.0138)
		30DC,40DC	246	.0088 (.0220—.0123)	246	.0079 (.0047—.0110)
.2480	**6.3**	**2DC-8DC**	361	.0079 (.0051—.0102)	230	.0079 (.0051—.0102)
		10DC-28DC	361	.0118 (.0075—.0161)	328	.0106 (.0067—.0146)
		30DC,40DC	295	.0094 (.0060—.0129)	262	.0085 (.0054—.0117)
.3150	**8.0**	**2DC-8DC**	394	.0098 (.0071—.0122)	230	.0091 (.0071—.0110)
		10DC-29DC	361	.0130 (.0087—.0173)	328	.0118 (.0079—.0157)
		30DC,40DC	295	.0104 (.0069—.0139)	262	.0094 (.0063—.0126)
.3937	**10.0**	**2DC-8DC**	427	.0114 (.0087—.0138)	230	.0106 (.0087—.0126)
		10DC-30DC	361	.0138 (.0094—.0181)	328	.0126 (.0087—.0165)
		30DC,40DC	295	.0110 (.0076—.0145)	262	.0101 (.0069—.0132)
.4724	**12.0**	**2DC-8DC**	460	.0126 (.0102—.0146)	296	.0118 (.0102—.0134)
		10DC-31DC	427	.0146 (.0102—.0189)	394	.0134 (.0094—.0173)
		30DC,40DC	344	.0117 (.0082—.0151)	328	.0107 (.0076—.0139)
.6299	**16.0**	**2DC-8DC**	525	.0138 (.0110—.0165)	296	.0130 (.0110—.0150)
		10DC-32DC	427	.0157 (.0114—.0189)	394	.0142 (.0102—.0181)
		30DC,40DC	344	.0126 (.0091—.0151)	328	.0113 (.0082—.0145)
.7874	**20.0**	**2DC-8DC**	525	.0146 (.0118—.0173)	328	.0138 (.0118—.0157)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MVE/MVS

RECOMMENDED CUTTING CONDITIONS

■ MVS

(inch)

Workpiece Material			Aluminum Alloy (Si<5%) ASTM 6061, 7075 etc.		Heat Resistant Alloy Inconel718 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm					
.0394	1.0	2DC,7DC	197	.0020 (.0012—.0031)	33	.0008 (.0004—.0012)
		12DC-30DC	164	.0020 (.0012—.0031)	33	.0008 (.0004—.0012)
.0591	1.5	2DC,7DC	262	.0028 (.0020—.0047)	33	.0012 (.0008—.0016)
		12DC-30DC	230	.0031 (.0020—.0047)	33	.0012 (.0008—.0016)
.0787	2.0	2DC,7DC	295	.0039 (.0024—.0059)	49	.0016 (.0012—.0020)
		12DC-30DC	262	.0043 (.0024—.0059)	49	.0016 (.0012—.0020)
.0984	2.5	2DC,7DC	328	.0051 (.0031—.0079)	49	.0020 (.0016—.0024)
		12DC-30DC	295	.0055 (.0031—.0079)	49	.0020 (.0016—.0024)
.1260	3.2	2DC-8DC	394	.0091 (.0039—.0138)	66	.0028 (.0020—.0035)
		10DC-25DC	328	.0091 (.0039—.0138)	66	.0028 (.0020—.0035)
		30DC,40DC	262	.0072 (.0031—.0110)	49	.0022 (.0016—.0028)
.1575	4.0	2DC-8DC	394	.0094 (.0047—.0138)	66	.0035 (.0024—.0043)
		10DC-26DC	328	.0094 (.0047—.0138)	66	.0035 (.0024—.0043)
		30DC,40DC	262	.0076 (.0038—.0110)	49	.0028 (.0019—.0035)
.1969	5.0	2DC-8DC	394	.0098 (.0059—.0138)	66	.0043 (.0031—.0055)
		10DC-27DC	328	.0098 (.0059—.0138)	66	.0043 (.0031—.0055)
		30DC,40DC	262	.0079 (.0047—.0110)	49	.0035 (.0025—.0044)
.2480	6.3	2DC-8DC	492	.0138 (.0079—.0197)	82	.0051 (.0035—.0063)
		10DC-28DC	427	.0138 (.0079—.0197)	66	.0051 (.0035—.0063)
		30DC,40DC	344	.0110 (.0063—.0157)	49	.0041 (.0028—.0050)
.3150	8.0	2DC-8DC	492	.0138 (.0079—.0197)	82	.0055 (.0043—.0067)
		10DC-29DC	427	.0138 (.0079—.0197)	66	.0055 (.0043—.0063)
		30DC,40DC	344	.0110 (.0063—.0157)	49	.0044 (.0035—.0050)
.3937	10.0	2DC-8DC	492	.0197 (.0079—.0315)	82	.0059 (.0047—.0067)
		10DC-30DC	427	.0197 (.0079—.0315)	66	.0059 (.0047—.0067)
		30DC,40DC	344	.0157 (.0063—.0252)	49	.0047 (.0038—.0054)
.4724	12.0	2DC-8DC	525	.0197 (.0079—.0315)	82	.0063 (.0051—.0071)
		10DC-31DC	459	.0197 (.0079—.0315)	66	.0063 (.0051—.0071)
		30DC,40DC	377	.0157 (.0063—.0252)	49	.0050 (.0041—.0057)
.6299	16.0	2DC-8DC	525	.0236 (.0079—.0394)	82	.0071 (.0055—.0083)
		10DC-32DC	459	.0197 (.0079—.0315)	66	.0067 (.0055—.0075)
		30DC,40DC	377	.0157 (.0063—.0252)	49	.0054 (.0044—.0060)
.7874	20.0	2DC-8DC	558	.0236 (.0079—.0394)	99	.0075 (.0059—.0087)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

Memo

MICRO-MWS

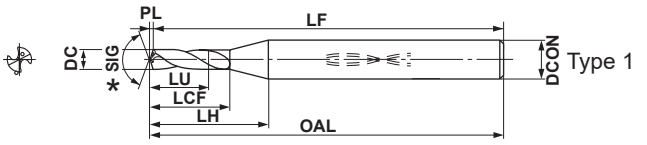
● For high accuracy and efficient drilling of carbon steels through to difficult-to-cut materials.

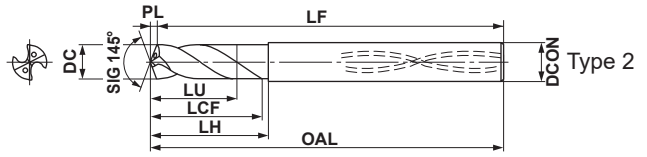
P M K N S H

Internal Coolant

	(inch)		(mm)	
	.0197≤DC<.03	.0304≤DC<.1161	0.5≤DC<1	1≤DC<2.95
	+ .00035 0	+ .00055 0	+0.009 0	+0.014 0
h6	.1181≤DCON		DCON=3	
	0 − .00031		0 −0.006	

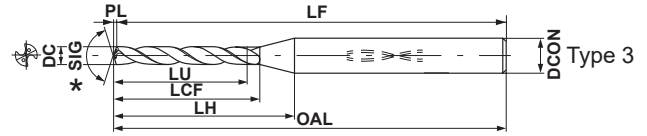
SB Type



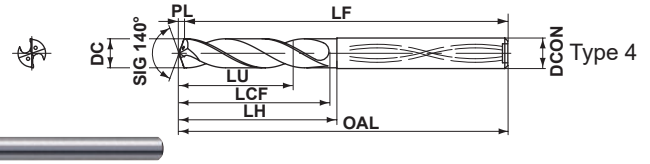


	(inch)		(mm)	
	.0197≤DC<.03	.0304≤DC<.1161	0.5≤DC<1	1≤DC<2.95
	0 − .00035	0 − .00035	0 −0.009	0 −0.014
h6	.0197≤DCON<.03	.0304≤DCON<.1161	DCON=3	
	0 − .00024	0 − .00024	0 −0.006	

LB/XB Type (ϕ.0200"−ϕ.1200" & ϕ0.50−ϕ2.95mm)



DB Type (ϕ.0400"−ϕ.1200" & ϕ1.00−ϕ2.95mm)



* Point Angle:Type 1 140° for drill diameter ϕ0.50-2.0mm and 145° for ϕ2.05-2.95mm.
Type 3 135° for drill diameter ϕ0.50-2.0mm and 140° for ϕ2.05-2.95mm.

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.500	.0197				1	★	MWS0050SB	0.6	.024	2.59	.102	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	1
					5	★	MWS0050LB	2.6	.102	8.10	.319	13.10	.516	47.10	1.854	47	1.850	0.10	.004	3.0	.118	3
					12	★	MWS0050XB	6.1	.240	16.10	.634	21.10	.831	47.10	1.854	47	1.850	0.10	.004	3.0	.118	3
0.508	.0200		76		1	●	MWS00200SB	0.6	.024	2.59	.102	7.59	.299	45.09	1.775	45	1.772	0.09	.004	3.175	.125	1
					5	●	MWS00200LB	2.6	.102	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
					12	●	MWS00200XB	6.2	.244	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
0.510	.0201				1	★	MWS0051SB	0.6	.024	2.69	.106	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	1
					5	★	MWS0051LB	2.7	.106	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	★	MWS0051XB	6.2	.244	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.520	.0205				1	●	MWS0052SB	0.6	.024	2.69	.106	7.29	.287	47.09	1.854	47	1.850	0.09	.004	3.0	.118	1
					5	★	MWS0052LB	2.7	.106	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	●	MWS0052XB	6.4	.252	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.530	**.0209**				1	★	**MWS0053SB**	0.6	.024	2.70	.106	7.30	.287	47.1	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0053LB**	2.8	.110	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	★	**MWS0053XB**	6.5	.256	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.534	**.0210**		**75**		1	●	**MWS00210SB**	0.6	.024	2.70	.106	7.60	.299	45.1	1.776	45	1.772	0.10	.004	3.175	.125	1
					5	●	**MWS00210LB**	2.8	.110	8.11	.319	13.01	.512	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
					12	●	**MWS00210XB**	6.5	.256	16.11	.634	21.01	.827	47.11	1.855	47	1.850	0.11	.004	3.175	.125	3
0.540	**.0213**				1	★	**MWS0054SB**	0.6	.024	2.70	.106	7.30	.287	47.1	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0054LB**	2.8	.110	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	★	**MWS0054XB**	6.6	.260	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.550	**.0217**				1	●	**MWS0055SB**	0.7	.028	2.70	.106	7.30	.287	47.10	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0055LB**	2.9	.114	8.11	.319	13.11	.516	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					12	●	**MWS0055XB**	6.7	.264	16.11	.634	21.11	.831	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
0.560	**.0220**				1	●	**MWS0056SB**	0.7	.028	3.00	.118	7.60	.299	47.10	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0056LB**	2.9	.114	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	●	**MWS0056XB**	6.8	.268	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.570	**.0224**				1	●	**MWS0057SB**	0.7	.028	3.00	.118	7.50	.295	47.10	1.854	47	1.850	0.10	.004	3.0	.118	1
					5	★	**MWS0057LB**	3.0	.118	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	●	**MWS0057XB**	7.0	.276	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.572	**.0225**		**74**		1	●	**MWS00225SB**	0.7	.028	3.00	.118	7.90	.311	45.10	1.776	45	1.772	0.10	.004	3.175	.125	1
					5	●	**MWS00225LB**	3.0	.118	8.12	.320	13.02	.513	47.12	1.855	47	1.850	0.12	.005	3.175	.125	3
					12	●	**MWS00225XB**	7.0	.276	16.12	.635	21.02	.828	47.12	1.855	47	1.850	0.12	.005	3.175	.125	3
0.580	**.0228**				1	★	**MWS0058SB**	0.7	.028	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0058LB**	3.0	.118	8.12	.320	13.12	.517	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	★	**MWS0058XB**	7.1	.280	16.12	.635	21.12	.831	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.590	**.0232**				1	★	**MWS0059SB**	0.7	.028	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0059LB**	3.1	.122	8.12	.320	12.12	.477	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	★	**MWS0059XB**	7.2	.283	16.12	.635	20.12	.792	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.600	**.0236**				1	●	**MWS0060SB**	0.7	.028	3.01	.119	7.51	.296	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0060LB**	3.1	.122	8.12	.320	12.12	.477	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
					12	●	**MWS0060XB**	7.3	.287	16.12	.635	20.12	.792	47.12	1.855	47	1.850	0.12	.005	3.0	.118	3
0.610	**.0240**		**73**		1	●	**MWS00240SB**	0.7	.028	3.21	.126	8.01	.315	45.11	1.776	45	1.772	0.11	.004	3.175	.125	1
					1	★	**MWS0061SB**	0.7	.028	3.21	.126	7.71	.304	47.11	1.855	47	1.850	0.11	.004	3.0	.118	3
					5	●	**MWS00240LB**	3.2	.126	8.13	.320	12.93	.509	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
					5	★	**MWS0061LB**	3.2	.126	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	●	**MWS00240XB**	7.4	.291	16.13	.635	20.93	.824	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
					12	★	**MWS0061XB**	7.5	.295	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.620	**.0244**				1	★	**MWS0062SB**	0.7	.028	3.21	.126	7.61	.300	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0062LB**	3.2	.126	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	★	**MWS0062XB**	7.6	.299	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.630	**.0248**				1	★	**MWS0063SB**	0.7	.028	3.21	.126	7.61	.300	47.11	1.855	47	1.850	0.11	.004	3.0	.118	1
					5	★	**MWS0063LB**	3.3	.130	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	★	**MWS0063XB**	7.7	.303	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
0.635	**.0250**		**72**		1	●	**MWS00250SB**	0.8	.031	3.22	.127	7.92	.312	45.12	1.776	45	1.772	0.12	.005	3.175	.125	1
					5	●	**MWS00250LB**	3.3	.130	8.13	.320	12.83	.505	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
					12	●	**MWS00250XB**	7.8	.307	16.13	.635	20.83	.820	47.13	1.856	47	1.850	0.13	.005	3.175	.125	3
0.640	**.0252**				1	★	**MWS0064SB**	0.8	.031	3.22	.127	7.62	.300	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
					5	★	**MWS0064LB**	3.3	.130	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	★	**MWS0064XB**	7.8	.307	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					1	●	MWS0065SB	0.8	.031	3.22	.127	7.62	.300	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
0.650	.0256				5	★	MWS0065LB	3.4	.134	8.13	.320	12.13	.478	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					12	●	MWS0065XB	7.9	.311	16.13	.635	20.13	.793	47.13	1.856	47	1.850	0.13	.005	3.0	.118	3
					1	●	MWS00260SB	0.8	.031	3.52	.139	8.22	.324	45.12	1.776	45	1.772	0.12	.005	3.175	.125	1
					1	●	MWS0066SB	0.8	.031	3.52	.139	7.92	.312	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
0.660	.0260		71		5	●	MWS00260LB	3.4	.134	8.14	.320	12.84	.506	47.14	1.856	47	1.850	0.14	.006	3.175	.125	3
					5	●	MWS0066LB	3.4	.134	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	●	MWS00260XB	8.1	.319	16.14	.635	20.84	.820	47.14	1.856	47	1.850	0.14	.006	3.175	.125	3
					12	★	MWS0066XB	8.1	.319	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					1	★	MWS0067SB	0.8	.031	3.52	.139	7.82	.308	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
0.670	.0264				5	★	MWS0067LB	3.5	.138	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0067XB	8.2	.323	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					1	★	MWS0068SB	0.8	.031	3.52	.139	7.82	.308	47.12	1.855	47	1.850	0.12	.005	3.0	.118	1
0.680	.0268				5	★	MWS0068LB	3.5	.138	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0068XB	8.3	.327	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					1	★	MWS0069SB	0.8	.031	3.53	.139	7.83	.308	47.13	1.856	47	1.850	0.13	.005	3.0	.118	1
0.690	.0272				5	★	MWS0069LB	3.6	.142	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0069XB	8.4	.331	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					1	●	MWS0070SB	0.8	.031	3.53	.139	7.83	.308	47.13	1.856	47	1.850	0.13	.005	3.0	.118	1
0.700	.0276				5	★	MWS0070LB	3.6	.142	8.14	.320	12.14	.478	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					12	★	MWS0070XB	8.5	.335	16.14	.635	20.14	.793	47.14	1.856	47	1.850	0.14	.006	3.0	.118	3
					1	★	MWS0071SB	0.8	.031	3.73	.147	8.03	.316	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
0.710	.0280		70		5	★	MWS0071LB	3.7	.146	20.15	.793	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0071XB	8.7	.343	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					1	●	MWS00280SB	0.8	.031	3.73	.147	8.33	.328	50.13	1.974	50	1.969	0.13	.005	3.175	.125	1
0.712	.0280		70		5	●	MWS00280LB	3.7	.146	10.15	.400	14.75	.581	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
					12	●	MWS00280XB	8.7	.343	20.15	.793	24.75	.974	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
					1	★	MWS0072SB	0.9	.035	3.73	.147	8.03	.316	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
0.720	.0283				5	★	MWS0072LB	3.8	.150	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0072XB	8.8	.346	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					1	★	MWS0073SB	0.9	.035	3.73	.147	7.93	.312	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
0.730	.0287				5	★	MWS0073LB	3.8	.150	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0073XB	8.9	.350	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					1	★	MWS0074SB	0.9	.035	3.73	.147	7.93	.312	50.13	1.974	50	1.969	0.13	.005	3.0	.118	1
0.740	.0291				5	★	MWS0074LB	3.9	.154	10.15	.400	14.15	.557	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					12	★	MWS0074XB	9.0	.354	20.15	.793	24.15	.951	50.15	1.974	50	1.969	0.15	.006	3.0	.118	3
					1	●	MWS00292SB	0.9	.035	3.74	.147	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.175	.125	1
0.742	.0292		69		5	●	MWS00292LB	3.9	.154	10.15	.400	14.65	.577	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
					12	●	MWS00292XB	9.1	.358	20.15	.793	24.65	.970	50.15	1.974	50	1.969	0.15	.006	3.175	.125	3
					1	●	MWS0075SB	0.9	.035	3.74	.147	7.94	.313	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
0.750	.0295				5	●	MWS0075LB	3.9	.154	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	●	MWS0075XB	9.2	.362	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					1	●	MWS0076SB	0.9	.035	4.04	.159	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
0.760	.0299				5	●	MWS0076LB	4.0	.157	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	●	MWS0076XB	9.3	.366	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					1	★	MWS0077SB	0.9	.035	4.04	.159	8.24	.324	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
0.770	.0303				5	★	MWS0077LB	4.0	.157	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	★	MWS0077XB	9.4	.370	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.780	.0307				1	●	MWS0078SB	0.9	.035	4.04	.159	8.14	.320	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	★	MWS0078LB	4.1	.161	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	●	MWS0078XB	9.5	.374	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
0.788	.0310		68		1	●	MWS00310SB	0.9	.035	4.04	.159	8.54	.336	50.14	1.974	50	1.969	0.14	.006	3.175	.125	1
					5	●	MWS00310LB	4.1	.161	10.16	.400	14.66	.577	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
					12	●	MWS00310XB	9.6	.378	20.16	.794	24.66	.971	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
0.790	.0311				1	★	MWS0079SB	0.9	.035	4.04	.159	8.14	.320	50.14	1.974	50	1.969	0.14	.006	3.0	.118	1
					5	★	MWS0079LB	4.1	.161	10.16	.400	14.16	.557	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
					12	★	MWS0079XB	9.6	.378	20.16	.794	24.16	.951	50.16	1.975	50	1.969	0.16	.006	3.0	.118	3
0.794	.0313	1/32			1	●	MWS00312SB	0.9	.035	4.04	.159	8.44	.332	50.14	1.974	50	1.969	0.14	.006	3.175	.125	1
					5	●	MWS00312LB	4.1	.161	10.16	.400	14.56	.573	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
					12	●	MWS00312XB	9.7	.382	20.16	.794	24.56	.967	50.16	1.975	50	1.969	0.16	.006	3.175	.125	3
0.800	.0315				1	●	MWS0080SB	1.0	.039	4.05	.159	8.15	.321	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0080LB	4.2	.165	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	●	MWS0080XB	9.8	.386	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.810	.0319				1	★	MWS0081SB	1.0	.039	4.25	.167	8.35	.329	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	★	MWS0081LB	4.2	.165	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	★	MWS0081XB	9.9	.390	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.813	.0320		67		1	●	MWS00320SB	1.0	.039	4.25	.167	8.65	.341	50.15	1.974	50	1.969	0.15	.006	3.175	.125	1
					5	●	MWS00320LB	4.2	.165	10.17	.400	14.57	.574	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
					12	●	MWS00320XB	9.9	.390	20.17	.794	24.57	.967	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
0.820	.0323				1	●	MWS0082SB	1.0	.039	4.25	.167	8.35	.329	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0082LB	4.3	.169	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0.	.118	3
					12	★	MWS0082XB	10.0	.394	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.830	.0327				1	●	MWS0083SB	1.0	.039	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0083LB	4.3	.169	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	★	MWS0083XB	10.1	.398	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.839	.0330		66		1	●	MWS00330SB	1.0	.039	4.25	.167	8.65	.341	50.15	1.974	50	1.969	0.15	.006	3.175	.125	1
					5	●	MWS00330LB	4.4	.173	10.17	.400	14.57	.574	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
					12	●	MWS00330XB	10.2	.402	20.17	.794	24.57	.967	50.17	1.975	50	1.969	0.17	.007	3.175	.125	3
0.840	.0331				1	★	MWS0084SB	1.0	.039	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	★	MWS0084LB	4.4	.173	10.17	.400	14.17	.558	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
					12	★	MWS0084XB	10.3	.406	20.17	.794	24.17	.952	50.17	1.975	50	1.969	0.17	.007	3.0	.118	3
0.850	.0335				1	●	MWS0085SB	1.0	.039	4.25	.167	8.25	.325	50.15	1.974	50	1.969	0.15	.006	3.0	.118	1
					5	●	MWS0085LB	4.4	.173	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0085XB	10.4	.409	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.860	.0339				1	●	MWS0086SB	1.0	.039	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0086LB	4.5	.177	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0086XB	10.5	.413	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.870	.0343				1	★	MWS0087SB	1.0	.039	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0087LB	4.5	.177	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0087XB	10.6	.417	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.880	.0346				1	★	MWS0088SB	1.0	.039	4.56	.180	8.56	.337	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0088LB	4.6	.181	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0088XB	10.7	.421	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.889	.0350		65		1	●	MWS00350SB	1.1	.043	4.56	.180	8.86	.349	50.16	1.975	50	1.969	0.16	.006	3.175	.125	1
					5	●	MWS00350LB	4.6	.181	10.18	.401	14.48	.570	50.18	1.976	50	1.969	0.18	.007	3.175	.125	3
					12	●	MWS00350XB	10.9	.429	20.18	.794	24.48	.964	50.18	1.976	50	1.969	0.18	.007	3.175	.125	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.890	.0350		65		1	★	MWS0089SB	1.1	.043	4.56	.180	8.46	.333	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	★	MWS0089LB	4.6	.181	10.18	.401	14.18	.558	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
					12	★	MWS0089XB	10.9	.429	20.18	.794	24.18	.952	50.18	1.976	50	1.969	0.18	.007	3.0	.118	3
0.900	.0354				1	●	MWS0090SB	1.1	.043	4.56	.180	8.46	.333	50.16	1.975	50	1.969	0.16	.006	3.0	.118	1
					5	●	MWS0090LB	4.7	.185	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0090XB	11.0	.433	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.910	.0358				1	★	MWS0091SB	1.1	.043	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0091LB	4.7	.185	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0091XB	11.1	.437	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.915	.0360		64		1	●	MWS00360SB	1.1	.043	4.77	.188	8.97	.353	50.17	1.975	50	1.969	0.17	.007	3.175	.125	1
					5	●	MWS00360LB	4.8	.189	10.19	.401	14.39	.567	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
					12	●	MWS00360XB	11.1	.437	20.19	.795	24.39	.960	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
0.920	.0362				1	★	MWS0092SB	1.1	.043	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0092LB	4.8	.189	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0092XB	11.2	.441	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.930	.0366				1	●	MWS0093SB	1.1	.043	4.77	.188	8.67	.341	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	●	MWS0093LB	4.8	.189	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	★	MWS0093XB	11.4	.449	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.940	.0370		63		1	●	MWS00370SB	1.1	.043	4.77	.188	8.97	.353	50.17	1.975	50	1.969	0.17	.007	3.175	.125	1
					1	★	MWS0094SB	1.1	.043	4.77	.188	8.57	.337	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	●	MWS00370LB	4.9	.193	10.19	.401	14.39	.567	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
					5	★	MWS0094LB	4.9	.193	10.19	.401	14.19	.559	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
					12	●	MWS00370XB	11.5	.453	20.19	.795	24.39	.960	50.19	1.976	50	1.969	0.19	.007	3.175	.125	3
					12	★	MWS0094XB	11.5	.453	20.19	.795	24.19	.952	50.19	1.976	50	1.969	0.19	.007	3.0	.118	3
0.950	.0374				1	★	MWS0095SB	1.1	.043	4.77	.188	8.57	.337	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0095LB	5.0	.197	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0095XB	11.6	.457	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.960	.0378				1	★	MWS0096SB	1.1	.043	5.07	.200	8.87	.349	50.17	1.975	50	1.969	0.17	.007	3.0	.118	1
					5	★	MWS0096LB	5.0	.197	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0096XB	11.7	.461	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.966	.0380		62		1	●	MWS00380SB	1.1	.043	5.08	.200	9.18	.361	50.18	1.976	50	1.969	0.18	.007	3.175	.125	1
					5	●	MWS00380LB	5.0	.197	10.20	.402	14.30	.563	50.20	1.976	50	1.969	0.20	.008	3.175	.125	3
					12	●	MWS00380XB	11.8	.465	20.20	.795	24.30	.957	50.20	1.976	50	1.969	0.20	.008	3.175	.125	3
0.970	.0382				1	●	MWS0097SB	1.2	.047	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	1
					5	●	MWS0097LB	5.1	.201	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0097XB	11.8	.465	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.980	.0386				1	★	MWS0098SB	1.2	.047	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	1
					5	★	MWS0098LB	5.1	.201	10.20	.402	14.20	.559	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
					12	★	MWS0098XB	12.0	.472	20.20	.795	24.20	.953	50.20	1.976	50	1.969	0.20	.008	3.0	.118	3
0.990	.0390		61		1	●	MWS0099SB	1.2	.047	5.08	.200	8.88	.350	50.18	1.976	50	1.969	0.18	.007	3.0	.118	1
					5	★	MWS0099LB	5.2	.205	10.21	.402	14.21	.559	50.21	1.977	50	1.969	0.21	.008	3.0	.118	3
					12	★	MWS0099XB	12.1	.476	20.21	.796	24.21	.953	50.21	1.977	50	1.969	0.21	.008	3.0	.118	3
0.991	.0390		61		1	●	MWS00390SB	1.2	.047	5.08	.200	9.18	.361	50.18	1.976	50	1.969	0.18	.007	3.175	.125	1
					5	●	MWS00390LB	5.2	.205	10.21	.402	14.31	.563	50.21	1.977	50	1.969	0.21	.008	3.175	.125	3
					12	●	MWS00390XB	12.1	.476	20.21	.796	24.31	.957	50.21	1.977	50	1.969	0.21	.008	3.175	.125	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.000	.0394				1	●	MWS0100SB	1.2	.047	5.20	.205	8.9	.350	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	●	MWS0100LB	5.2	.205	11.20	.441	15.2	.598	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					12	●	MWS0100XB	12.2	.480	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					20	●	MWS0100X20DB	20.2	.795	24.20	.953	28.2	1.110	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	●	MWS0100X25DB	25.2	.992	28.20	1.110	32.2	1.268	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	●	MWS0100X30DB	30.2	1.189	33.20	1.307	37.2	1.465	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.001	.0394				1	●	MWS00394SB	1.2	.047	5.20	.205	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00394XB	12.2	.480	23.20	.913	27.3	1.075	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.016	.0400		60		1	●	MWS00400SB	1.2	.047	5.20	.205	9.2	.362	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00400XB	12.4	.488	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.042	.0410		59		1	●	MWS00410SB	1.2	.047	5.40	.213	9.4	.370	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00410XB	12.7	.500	23.20	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.050	.0413				1	●	MWS0105SB	1.3	.051	5.4	.213	9.0	.354	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					20	□	MWS0105X20DB	21.2	.835	24.2	.953	28.2	1.110	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	●	MWS0105X25DB	26.5	1.043	29.2	1.150	33.2	1.307	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	□	MWS0105X30DB	31.7	1.248	35.2	1.386	38.2	1.504	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.067	.0420		58		1	●	MWS00420SB	1.3	.051	5.4	.213	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00420XB	13.0	.512	23.2	.913	27.1	1.067	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.093	.0430		57		1	●	MWS00430SB	1.3	.051	5.6	.220	9.5	.374	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00430XB	13.3	.524	23.2	.913	27.1	1.067	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.100	.0433				1	●	MWS0110SB	1.3	.051	5.6	.220	9.1	.358	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	★	MWS0110LB	5.7	.224	17.2	.677	21.2	.835	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					12	●	MWS0110XB	13.4	.528	23.2	.913	27.2	1.071	55.2	2.173	55	2.165	0.2	.008	3.0	.118	3
					20	★	MWS0110X20DB	22.2	.874	25.2	.992	29.2	1.150	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	●	MWS0110X25DB	27.7	1.091	31.2	1.228	34.2	1.346	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	★	MWS0110X30DB	33.2	1.307	36.2	1.425	40.2	1.583	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.150	.0453				1	□	MWS0115SB	1.4	.055	5.8	.228	9.3	.366	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					20	□	MWS0115X20DB	23.2	.913	26.2	1.031	30.2	1.189	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	□	MWS0115X25DB	29.0	1.142	32.2	1.268	36.2	1.425	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	□	MWS0115X30DB	34.7	1.366	38.2	1.504	41.2	1.622	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.182	.0465		56		1	●	MWS00465SB	1.4	.055	6.2	.244	9.9	.390	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00465XB	14.4	.567	23.2	.913	26.9	1.059	55.2	2.173	55	2.165	0.2	.008	3.175	.125	3
1.200	.0472				1	●	MWS0120SB	1.4	.055	6.2	.244	9.6	.378	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	★	MWS0120LB	6.3	.248	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	●	MWS0120XB	14.7	.579	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	●	MWS0120X20DB	24.3	.957	28.2	1.110	31.2	1.228	60.2	2.370	60	2.362	0.2	.008	3.0	.118	3
					25	●	MWS0120X25DB	30.3	1.193	34.2	1.346	37.2	1.465	66.2	2.606	66	2.598	0.2	.008	3.0	.118	3
					30	●	MWS0120X30DB	36.3	1.429	40.2	1.583	43.2	1.701	72.2	2.843	72	2.835	0.2	.008	3.0	.118	3
1.250	.0492				1	●	MWS0125SB	1.5	.059	6.4	.252	9.7	.382	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					20	●	MWS0125X20DB	25.3	.996	29.2	1.150	32.2	1.268	68.2	2.685	68	2.677	0.2	.008	3.0	.118	3
					25	□	MWS0125X25DB	31.6	1.244	35.2	1.386	38.2	1.504	74.2	2.921	74	2.913	0.2	.008	3.0	.118	3
					30	□	MWS0125X30DB	37.8	1.488	41.2	1.622	45.2	1.780	82.2	3.236	82	3.228	0.2	.008	3.0	.118	3
1.300	.0512				1	●	MWS0130SB	1.5	.059	6.6	.260	9.8	.386	55.2	2.173	55	2.165	0.2	.008	3.0	.118	1
					5	★	MWS0130LB	6.8	.268	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	●	MWS0130XB	15.9	.626	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	●	MWS0130X20DB	26.3	1.035	30.2	1.189	33.2	1.307	68.2	2.685	68	2.677	0.2	.008	3.0	.118	3
					25	●	MWS0130X25DB	32.8	1.291	36.2	1.425	40.2	1.583	74.2	2.921	74	2.913	0.2	.008	3.0	.118	3
					30	●	MWS0130X30DB	39.3	1.547	43.2	1.701	46.2	1.819	82.2	3.236	82	3.228	0.2	.008	3.0	.118	3

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.321	.0520		55		1	●	MWS00520SB	1.6	.063	6.6	.260	10.1	.398	55.2	2.173	55	2.165	0.2	.008	3.175	.125	1
					12	●	MWS00520XB	16.1	.634	23.3	.917	26.8	1.055	55.3	2.177	55	2.165	0.3	.012	3.175	.125	3
1.350	.0531				1	□	MWS0135SB	1.7	.067	6.9	.272	10.0	.394	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					20	□	MWS0135X20DB	27.3	1.075	31.3	1.232	34.3	1.350	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	□	MWS0135X25DB	34.1	1.343	38.3	1.508	41.3	1.626	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	□	MWS0135X30DB	40.8	1.606	45.3	1.783	48.3	1.902	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.397	.0550		54		1	●	MWS00550SB	1.7	.067	7.3	.287	10.6	.417	55.3	2.177	55	2.165	0.3	.012	3.175	.125	1
					12	●	MWS00550XB	17.1	.673	23.3	.917	26.6	1.047	55.3	2.177	55	2.165	0.3	.012	3.175	.125	3
1.400	.0551				1	●	MWS0140SB	1.7	.067	7.3	.287	10.3	.406	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					5	★	MWS0140LB	7.3	.287	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	●	MWS0140XB	17.1	.673	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	●	MWS0140X20DB	28.3	1.114	32.3	1.272	35.3	1.390	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	●	MWS0140X25DB	35.3	1.390	39.3	1.547	42.3	1.665	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	●	MWS0140X30DB	42.3	1.665	46.3	1.823	49.3	1.941	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.450	.0571				1	●	MWS0145SB	1.8	.071	7.5	.295	10.4	.409	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					20	●	MWS0145X20DB	29.3	1.154	33.3	1.311	36.3	1.429	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	□	MWS0145X25DB	36.6	1.441	41.3	1.626	43.3	1.705	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	□	MWS0145X30DB	43.8	1.724	48.3	1.902	51.3	2.020	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.500	.0591			#1-64	1	●	MWS0150SB	1.8	.071	7.7	.303	10.5	.413	55.3	2.177	55	2.165	0.3	.012	3.0	.118	1
					5	●	MWS0150LB	7.8	.307	17.3	.681	20.3	.799	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					12	●	MWS0150XB	18.3	.720	23.3	.917	26.3	1.035	55.3	2.177	55	2.165	0.3	.012	3.0	.118	3
					20	●	MWS0150X20DB	30.3	1.193	35.3	1.390	37.3	1.469	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					25	●	MWS0150X25DB	37.8	1.488	42.3	1.665	45.3	1.783	74.3	2.925	74	2.913	0.3	.012	3.0	.118	3
					30	●	MWS0150X30DB	45.3	1.783	50.3	1.980	52.3	2.059	82.3	3.240	82	3.228	0.3	.012	3.0	.118	3
1.502	.0591			#1-64	1	●	MWS00591SB	1.8	.071	7.7	.303	10.8	.425	55.3	2.177	55	2.165	0.3	.012	3.175	.125	1
					12	●	MWS00591XB	18.3	.720	23.3	.917	26.4	1.039	55.3	2.177	55	2.165	0.3	.012	3.175	.125	3
1.550	.0610				1	●	MWS0155SB	1.9	.075	7.9	.311	10.6	.417	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	●	MWS0155X20DB	31.3	1.232	36.3	1.429	38.3	1.508	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	□	MWS0155X25DB	39.1	1.539	43.3	1.705	46.3	1.823	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	□	MWS0155X30DB	46.8	1.843	51.3	2.020	54.3	2.138	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3
1.588	.0625	1/16			1	●	MWS00625SB	1.9	.075	8.3	.327	11.3	.445	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	●	MWS00625XB	19.4	.764	30.3	1.193	33.3	1.311	68.3	2.689	68	2.677	0.3	.012	3.175	.125	3
1.600	.0630				1	●	MWS0160SB	1.9	.075	8.3	.327	10.9	.429	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	★	MWS0160LB	8.3	.327	22.3	.878	25.3	.996	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					12	●	MWS0160XB	19.5	.768	30.3	1.193	33.3	1.311	68.3	2.689	68	2.677	0.3	.012	3.0	.118	3
					20	●	MWS0160X20DB	32.3	1.272	37.3	1.469	39.3	1.547	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	●	MWS0160X25DB	40.3	1.587	45.3	1.783	47.3	1.862	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	●	MWS0160X30DB	48.3	1.902	53.3	2.098	55.3	2.177	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3
1.613	.0635		52		1	●	MWS00635SB	1.9	.075	8.3	.327	11.2	.441	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	●	MWS00635XB	19.7	.776	30.3	1.193	33.2	1.307	68.3	2.689	68	2.677	0.3	.012	3.175	.125	3
1.650	.0650				1	□	MWS0165SB	2.0	.079	8.5	.335	11.0	.433	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	□	MWS0165X20DB	33.3	1.311	38.3	1.508	40.3	1.587	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	□	MWS0165X25DB	41.6	1.638	46.3	1.823	49.3	1.941	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	□	MWS0165X30DB	49.8	1.961	54.3	2.138	57.3	2.256	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
1.700	.0669				1	●	MWS0170SB	2.0	.079	8.7	.343	11.1	.437	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	★	MWS0170LB	8.9	.350	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	●	MWS0170XB	20.8	.819	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	●	MWS0170X20DB	34.4	1.354	39.3	1.547	42.3	1.665	78.3	3.083	78	3.071	0.3	.012	3.0	.118	3
					25	●	MWS0170X25DB	42.9	1.689	48.3	1.902	50.3	1.980	86.3	3.398	86	3.386	0.3	.012	3.0	.118	3
					30	★	MWS0170X30DB	51.4	2.024	56.3	2.217	59.3	2.335	95.3	3.752	95	3.740	0.3	.012	3.0	.118	3
1.702	.0670		51		1	●	MWS00670SB	2.0	.079	8.7	.343	11.4	.449	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	●	MWS00670XB	20.8	.819	30.4	1.197	33.1	1.303	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.750	.0689				1	●	MWS0175SB	2.1	.083	8.9	.350	11.2	.441	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	□	MWS0175X20DB	35.4	1.394	40.3	1.587	43.3	1.705	84.3	3.319	84	3.307	0.3	.012	3.0	.118	3
					25	□	MWS0175X25DB	44.2	1.740	49.3	1.941	51.3	2.020	94.3	3.713	94	3.701	0.3	.012	3.0	.118	3
					30	□	MWS0175X30DB	52.9	2.083	58.3	2.295	60.3	2.374	102.3	4.028	102	4.016	0.3	.012	3.0	.118	3
1.778	.0700		50	#2-56	1	●	MWS00700SB	2.1	.083	9.3	.366	11.9	.469	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	●	MWS00700XB	21.7	.854	30.4	1.197	33.0	1.299	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.800	.0709				1	●	MWS0180SB	2.1	.083	9.3	.366	11.5	.453	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	★	MWS0180LB	9.4	.370	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	●	MWS0180XB	22.0	.866	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	●	MWS0180X20DB	36.4	1.433	41.3	1.626	44.3	1.744	84.3	3.319	84	3.307	0.3	.012	3.0	.118	3
					25	●	MWS0180X25DB	45.4	1.787	50.3	1.980	53.3	2.098	94.3	3.713	94	3.701	0.3	.012	3.0	.118	3
					30	●	MWS0180X30DB	54.4	2.142	59.3	2.335	62.3	2.453	102.3	4.028	102	4.016	0.3	.012	3.0	.118	3
1.850	.0728				1	□	MWS0185SB	2.2	.087	9.5	.374	11.6	.457	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					20	□	MWS0185X20DB	37.4	1.472	43.3	1.705	45.3	1.783	84.3	3.319	84	3.307	0.3	.012	3.0	.118	3
					25	□	MWS0185X25DB	46.7	1.839	52.3	2.059	54.3	2.138	94.3	3.713	94	3.701	0.3	.012	3.0	.118	3
					30	□	MWS0185X30DB	55.9	2.201	61.3	2.413	63.3	2.492	102.3	4.028	102	4.016	0.3	.012	3.0	.118	3
1.855	.0730		49		1	●	MWS00730SB	2.2	.087	9.5	.374	12.0	.472	68.3	2.689	68	2.677	0.3	.012	3.175	.125	1
					12	●	MWS00730XB	22.6	.890	30.4	1.197	32.9	1.295	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.900	.0748				1	●	MWS0190SB	2.3	.091	9.8	.386	11.9	.469	68.4	2.693	68	2.677	0.4	.016	3.0	.118	1
					5	★	MWS0190LB	9.9	.390	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	★	MWS0190XB	23.2	.913	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	●	MWS0190X20DB	38.4	1.512	44.4	1.748	46.4	1.827	84.4	3.323	84	3.307	0.4	.016	3.0	.118	3
					25	●	MWS0190X25DB	47.9	1.886	53.4	2.102	55.4	2.181	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					30	●	MWS0190X30DB	57.4	2.260	63.4	2.496	65.4	2.575	102.4	4.031	102	4.016	0.4	.016	3.0	.118	3
1.931	.0760		48		1	●	MWS00760SB	2.3	.091	10.0	.394	12.3	.484	68.4	2.693	68	2.677	0.4	.016	3.175	.125	1
					12	●	MWS00760XB	23.6	.929	30.4	1.197	32.7	1.287	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
1.950	.0768				1	□	MWS0195SB	2.4	.094	10.0	.394	12.0	.472	68.4	2.693	68	2.677	0.4	.016	3.0	.118	1
					20	□	MWS0195X20DB	39.4	1.551	45.4	1.787	47.4	1.866	84.4	3.323	84	3.307	0.4	.016	3.0	.118	3
					25	□	MWS0195X25DB	49.2	1.937	55.4	2.181	57.4	2.260	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					30	□	MWS0195X30DB	58.9	2.319	64.4	2.535	66.4	2.614	102.4	4.031	102	4.016	0.4	.016	3.0	.118	3
1.994	.0785				1	●	MWS00785SB	2.4	.094	10.4	.409	12.6	.496	68.4	2.693	68	2.677	0.4	.016	3.175	.125	1
					12	●	MWS00785XB	24.3	.957	30.4	1.197	32.6	1.283	68.4	2.693	68	2.677	0.4	.016	3.175	.125	3
2.000	.0787			#3-48	1	●	MWS0200SB	2.4	.094	10.4	.409	12.3	.484	68.4	2.693	68	2.677	0.4	.016	3.0	.118	1
					5	●	MWS0200LB	10.4	.409	22.4	.882	24.4	.961	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					12	●	MWS0200XB	24.4	.961	30.4	1.197	32.4	1.276	68.4	2.693	68	2.677	0.4	.016	3.0	.118	3
					20	●	MWS0200X20DB	40.4	1.591	46.4	1.827	48.4	1.906	84.4	3.323	84	3.307	0.4	.016	3.0	.118	3
					25	●	MWS0200X25DB	50.4	1.984	56.4	2.220	58.4	2.299	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					30	●	MWS0200X30DB	60.4	2.378	66.4	2.614	68.4	2.693	102.4	4.031	102	4.016	0.4	.016	3.0	.118	3

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L103
OPERATIONAL GUIDANCE ➤ L106

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.050	.0807				1	●	MWS0205SB	2.4	.094	10.5	.413	12.3	.484	74.3	2.925	74	2.913	0.3	.012	3.0	.118	1
					20	□	MWS0205X20DB	41.4	1.630	47.4	1.866	49.4	1.945	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	□	MWS0205X25DB	51.7	2.035	57.4	2.260	59.4	2.339	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	□	MWS0205X30DB	61.9	2.437	68.4	2.693	69.4	2.732	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.058	.0810		46		1	●	MWS00810SB	2.4	.094	10.5	.413	12.6	.496	74.3	2.925	74	2.913	0.3	.012	3.175	.125	1
					12	●	MWS00810XB	25.1	.988	38.4	1.512	40.5	1.594	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.100	.0827				1	●	MWS0210SB	2.4	.094	10.7	.421	12.4	.488	68.3	2.689	68	2.677	0.3	.012	3.0	.118	1
					5	★	MWS0210LB	10.9	.429	28.4	1.118	30.4	1.197	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	●	MWS0210XB	25.6	1.008	38.4	1.512	40.4	1.591	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	★	MWS0210X20DB	42.4	1.669	48.4	1.906	50.4	1.984	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	★	MWS0210X25DB	52.9	2.083	59.4	2.339	60.4	2.378	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	●	MWS0210X30DB	63.4	2.496	69.4	2.732	71.4	2.811	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.150	.0846				1	□	MWS0215SB	2.5	.098	10.9	.429	12.5	.492	74.3	2.925	74	2.913	0.3	.012	3.0	.118	1
					20	□	MWS0215X20DB	43.4	1.709	49.4	1.945	51.4	2.024	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	□	MWS0215X25DB	54.2	2.134	60.4	2.378	62.4	2.457	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	□	MWS0215X30DB	64.9	2.555	71.4	2.811	73.4	2.890	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.185	.0860		44		1	●	MWS00860SB	2.5	.098	11.3	.445	13.1	.516	74.3	2.925	74	2.913	0.3	.012	3.175	.125	1
					12	●	MWS00860XB	26.6	1.047	38.4	1.512	40.2	1.583	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.200	.0866				1	●	MWS0220SB	2.6	.102	11.4	.449	12.9	.508	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	★	MWS0220LB	11.4	.449	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	●	MWS0220XB	26.8	1.055	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	★	MWS0220X20DB	44.4	1.748	51.4	2.024	52.4	2.063	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	★	MWS0220X25DB	55.4	2.181	62.4	2.457	63.4	2.496	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	●	MWS0220X30DB	66.4	2.614	73.4	2.890	74.4	2.929	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.250	.0886				1	●	MWS0225SB	2.7	.106	11.6	.457	13.0	.512	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					20	□	MWS0225X20DB	45.4	1.787	52.4	2.063	53.4	2.102	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	□	MWS0225X25DB	56.7	2.232	63.4	2.496	64.4	2.535	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	□	MWS0225X30DB	67.9	2.673	74.4	2.929	76.4	3.008	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.261	.0890		43	#4-40	1	●	MWS00890SB	2.6	.102	11.6	.457	13.3	.524	74.4	2.929	74	2.913	0.4	.016	3.175	.125	1
					12	●	MWS00890XB	27.5	1.083	38.4	1.512	40.1	1.579	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.300	.0906				1	●	MWS0230SB	2.7	.106	11.8	.465	13.1	.516	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	★	MWS0230LB	11.9	.469	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	●	MWS0230XB	28.0	1.102	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	●	MWS0230X20DB	46.4	1.827	53.4	2.102	54.4	2.142	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	●	MWS0230X25DB	57.9	2.280	64.4	2.535	66.4	2.614	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	●	MWS0230X30DB	69.4	2.732	76.4	3.008	77.4	3.047	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.350	.0925				1	●	MWS0235SB	2.8	.110	12.0	.472	13.2	.520	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					20	●	MWS0235X20DB	47.4	1.866	54.4	2.142	55.4	2.181	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	□	MWS0235X25DB	59.2	2.331	66.4	2.614	67.4	2.654	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	□	MWS0235X30DB	70.9	2.791	78.4	3.087	79.4	3.126	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.382	.0938	3/32			1	●	MWS00938SB	2.8	.110	12.4	.488	13.9	.547	74.4	2.929	74	2.913	0.4	.016	3.175	.125	1
					12	●	MWS00938XB	29.0	1.142	38.4	1.512	39.9	1.571	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.400	.0945				1	●	MWS0240SB	2.8	.110	12.4	.488	13.5	.531	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	★	MWS0240LB	12.4	.488	28.4	1.118	29.4	1.157	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					12	●	MWS0240XB	29.2	1.150	38.4	1.512	39.4	1.551	74.4	2.929	74	2.913	0.4	.016	3.0	.118	3
					20	●	MWS0240X20DB	48.4	1.906	55.4	2.181	56.4	2.220	94.4	3.717	94	3.701	0.4	.016	3.0	.118	3
					25	●	MWS0240X25DB	60.4	2.378	67.4	2.654	68.4	2.693	107.4	4.228	107	4.213	0.4	.016	3.0	.118	3
					30	●	MWS0240X30DB	72.4	2.850	79.4	3.126	80.4	3.165	118.4	4.661	118	4.646	0.4	.016	3.0	.118	3
2.439	.0960		41		1	●	MWS00960SB	2.8	.110	12.6	.496	14.0	.551	74.4	2.929	74	2.913	0.4	.016	3.175	.125	1
					12	●	MWS00960XB	29.7	1.169	38.4	1.512	39.8	1.567	74.4	2.929	74	2.913	0.4	.016	3.175	.125	3
2.450	.0965				1	□	MWS0245SB	2.9	.114	12.6	.496	13.6	.535	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					20	□	MWS0245X20DB	49.5	1.949	56.5	2.224	57.5	2.264	94.5	3.720	94	3.701	0.5	.020	3.0	.118	3
					25	□	MWS0245X25DB	61.8	2.433	69.5	2.736	70.5	2.776	107.5	4.232	107	4.213	0.5	.020	3.0	.118	3
					30	□	MWS0245X30DB	74.0	2.913	81.5	3.209	82.5	3.248	118.5	4.665	118	4.646	0.5	.020	3.0	.118	3
2.500	.0984				1	●	MWS0250SB	2.9	.114	12.8	.504	13.7	.539	74.4	2.929	74	2.913	0.4	.016	3.0	.118	1
					5	●	MWS0250LB	13.0	.512	28.5	1.122	29.5	1.161	74.5	2.933	74	2.913	0.5	.020	3.0	.118	3
					12	●	MWS0250XB	30.5	1.201	38.5	1.516	39.5	1.555	74.5	2.933	74	2.913	0.5	.020	3.0	.118	3
					20	●	MWS0250X20DB	50.5	1.988	58.5	2.303	59.5	2.343	94.5	3.720	94	3.701	0.5	.020	3.0	.118	3
					25	●	MWS0250X25DB	63.0	2.480	70.5	2.776	71.5	2.815	107.5	4.232	107	4.213	0.5	.020	3.0	.118	3
					30	●	MWS0250X30DB	75.5	2.972	83.5	3.287	84.5	3.327	118.5	4.665	118	4.646	0.5	.020	3.0	.118	3
2.550	.1004				1	□	MWS0255SB	3.1	.122	13.0	.512	13.0	.512	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					20	□	MWS0255X20DB	51.5	2.028	59.5	2.343	59.5	2.343	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	□	MWS0255X25DB	64.3	2.531	71.5	2.815	71.5	2.815	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	□	MWS0255X30DB	77.0	3.031	84.5	3.327	84.5	3.327	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.566	.1010				1	●	MWS01010SB	3.0	.118	13.0	.512	13.0	.512	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	●	MWS01010XB	31.3	1.232	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.600	.1024				1	●	MWS0260SB	3.1	.122	13.4	.528	13.4	.528	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					5	★	MWS0260LB	13.5	.531	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	●	MWS0260XB	31.7	1.248	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	●	MWS0260X20DB	52.5	2.067	60.5	2.382	60.5	2.382	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	●	MWS0260X25DB	65.5	2.579	73.5	2.894	73.5	2.894	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	●	MWS0260X30DB	78.5	3.091	86.5	3.406	86.5	3.406	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.642	.1040		37	#5-44	1	●	MWS01040SB	3.1	.122	13.6	.535	13.6	.535	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	●	MWS01040XB	32.2	1.268	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.650	.1043				1	□	MWS0265SB	3.2	.126	13.6	.535	13.6	.535	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					20	□	MWS0265X20DB	53.5	2.106	61.5	2.421	61.5	2.421	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	□	MWS0265X25DB	66.8	2.630	74.5	2.933	74.5	2.933	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	□	MWS0265X30DB	80.0	3.150	87.5	3.445	87.5	3.445	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.693	.1060				1	●	MWS01060SB	3.1	.122	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	●	MWS01060XB	32.8	1.291	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.700	.1063		36	#6-32	1	●	MWS0270SB	3.2	.126	13.8	.543	13.8	.543	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					5	★	MWS0270LB	14.0	.551	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	●	MWS0270XB	32.9	1.295	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	★	MWS0270X20DB	54.5	2.146	62.5	2.461	62.5	2.461	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	●	MWS0270X25DB	68.0	2.677	76.5	3.012	76.5	3.012	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	●	MWS0270X30DB	81.5	3.209	89.5	3.524	89.5	3.524	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.750	.1083				1	□	MWS0275SB	3.3	.130	14.0	.551	14.0	.551	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					20	□	MWS0275X20DB	55.5	2.185	63.5	2.500	63.5	2.500	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	□	MWS0275X25DB	69.3	2.728	77.5	3.051	77.5	3.051	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	□	MWS0275X30DB	83.0	3.268	91.5	3.602	91.5	3.602	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4

MICRO-MWS

DC					L/D	Stock	Order Number	Dimensions														Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		LU		LCF		LH		OAL		LF		PL		DCON		
								mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.779	**.1094**	**7/64**			1	●	**MWS01094SB**	3.2	.126	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3.175	.125	2
					12	●	**MWS01094XB**	33.9	1.335	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.175	.125	4
2.800	**.1102**		**35**		1	●	**MWS0280SB**	3.3	.130	14.4	.567	14.4	.567	81.4	3.205	81	3.189	0.4	.016	3.0	.118	2
					5	★	**MWS0280LB**	14.5	.571	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	●	**MWS0280XB**	34.1	1.343	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	●	**MWS0280X20DB**	56.5	2.224	64.5	2.539	64.5	2.539	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	●	**MWS0280X25DB**	70.5	2.776	78.5	3.091	78.5	3.091	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	●	**MWS0280X30DB**	84.5	3.327	92.5	3.642	92.5	3.642	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.850	**.1122**				1	□	**MWS0285SB**	3.4	.134	14.7	.579	14.7	.579	81.5	3.209	81	3.189	0.5	.020	3.0	.118	2
					20	□	**MWS0285X20DB**	57.5	2.264	66.5	2.618	66.5	2.618	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	□	**MWS0285X25DB**	71.8	2.827	80.5	3.169	80.5	3.169	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	□	**MWS0285X30DB**	86.0	3.386	94.5	3.720	94.5	3.720	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.900	**.1142**				1	●	**MWS0290SB**	3.4	.134	14.9	.587	14.9	.587	81.5	3.209	81	3.189	0.5	.020	3.0	.118	2
					5	●	**MWS0290LB**	15.0	.591	33.5	1.319	33.5	1.319	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					12	●	**MWS0290XB**	35.3	1.390	45.5	1.791	45.5	1.791	81.5	3.209	81	3.189	0.5	.020	3.0	.118	4
					20	★	**MWS0290X20DB**	58.5	2.303	67.5	2.657	67.5	2.657	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	★	**MWS0290X25DB**	73.0	2.874	81.5	3.209	81.5	3.209	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	★	**MWS0290X30DB**	87.5	3.445	96.5	3.799	96.5	3.799	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4
2.950	**.1161**		**32**		1	□	**MWS0295SB**	3.5	.138	15.1	.594	15.1	.594	81.5	3.209	81	3.189	0.5	.020	3.0	.118	2
					20	□	**MWS0295X20DB**	59.5	2.343	68.5	2.697	68.5	2.697	103.5	4.075	103	4.055	0.5	.020	3.0	.118	4
					25	□	**MWS0295X25DB**	74.3	2.925	83.5	3.287	83.5	3.287	117.5	4.626	117	4.606	0.5	.020	3.0	.118	4
					30	□	**MWS0295X30DB**	89.0	3.504	97.5	3.839	97.5	3.839	132.5	5.217	132	5.197	0.5	.020	3.0	.118	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock ★ : Stocked in Japan □ : Made to Order

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L106

RECOMMENDED CUTTING CONDITIONS

■ MWS SB/LB/XB/DB Type (L/D<10)

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	130 (100—150)	.0004 (.0002—.0006)	130 (100—150)	.0004 (.0002—.0006)
.0248	**0.63**	130 (100—150)	.0006 (.0003—.0008)	130 (100—150)	.0006 (.0003—.0008)
.0315	**0.80**	150 (115—165)	.0011 (.0006—.0016)	150 (115—165)	.0011 (.0006—.0016)
.0394	**1.00**	165 (130—180)	.0014 (.0008—.0020)	165 (130—180)	.0014 (.0008—.0020)
.0472	**1.20**	165 (130—180)	.0018 (.0012—.0024)	165 (130—180)	.0018 (.0012—.0024)
.0630	**1.60**	165 (130—180)	.0022 (.0014—.0031)	165 (130—180)	.0022 (.0014—.0031)
.0787	**2.00**	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	**2.50**	195 (150—230)	.0033 (.0020—.0049)	195 (150—215)	.0033 (.0020—.0049)

Workpiece Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	100 (65—115)	.0004 (.0002—.0006)	65 (50—80)	.0003 (.0002—.0004)
.0248	**0.63**	100 (65—115)	.0006 (.0003—.0008)	65 (50—80)	.0004 (.0003—.0005)
.0315	**0.80**	115 (80—130)	.0011 (.0006—.0016)	80 (65—100)	.0008 (.0006—.0010)
.0394	**1.00**	130 (100—150)	.0014 (.0008—.0020)	100 (65—115)	.0012 (.0008—.0017)
.0472	**1.20**	130 (100—150)	.0018 (.0012—.0024)	100 (65—115)	.0016 (.0012—.0021)
.0630	**1.60**	130 (100—150)	.0022 (.0014—.0031)	100 (65—115)	.0020 (.0014—.0028)
.0787	**2.00**	130 (100—150)	.0028 (.0016—.0039)	100 (65—115)	.0024 (.0016—.0031)
.0984	**2.50**	165 (130—180)	.0033 (.0020—.0049)	130 (100—150)	.0030 (.0020—.0039)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MWS

RECOMMENDED CUTTING CONDITIONS

■ MWS SB/LB/XB/DB Type (L/D<10)

Workpiece Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	130 (100—150)	.0004 (.0002—.0006)	100 (65—115)	.0004 (.0002—.0006)
.0248	**0.63**	130 (100—150)	.0006 (.0003—.0008)	100 (65—115)	.0006 (.0003—.0008)
.0315	**0.80**	150 (115—165)	.0011 (.0006—.0016)	115 (80—130)	.0011 (.0006—.0016)
.0394	**1.00**	165 (130—180)	.0014 (.0008—.0020)	130 (100—150)	.0014 (.0008—.0020)
.0472	**1.20**	165 (130—180)	.0018 (.0012—.0024)	130 (100—150)	.0018 (.0012—.0024)
.0630	**1.60**	165 (130—180)	.0022 (.0014—.0031)	130 (100—150)	.0022 (.0014—.0031)
.0787	**2.00**	165 (130—180)	.0028 (.0016—.0039)	130 (100—150)	.0028 (.0016—.0039)
.0984	**2.50**	195 (150—215)	.0033 (.0020—.0049)	165 (130—180)	.0033 (.0020—.0049)

Workpiece Material		Aluminum Alloy (Si<5%) ASTM A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0197	**0.50**	130 (100—150)	.0006 (.0003—.0008)	35 (15—50)	.0002 (.0002—.0003)
.0248	**0.63**	130 (100—150)	.0008 (.0005—.0012)	35 (15—50)	.0003 (.0003—.0004)
.0315	**0.80**	150 (115—165)	.0014 (.0009—.0020)	35 (15—50)	.0006 (.0005—.0008)
.0394	**1.00**	195 (150—215)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	**1.20**	230 (180—245)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	**1.60**	260 (195—280)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	**2.00**	295 (230—310)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	**2.50**	330 (260—360)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

■ MWS DB Type (L/D≥10)

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	165 (130—180)	.0008 (.0004—.0012)	130 (100—130)	.0008 (.0004—.0012)
.0472	**1.2**	165 (130—180)	.0010 (.0006—.0015)	130 (100—130)	.0010 (.0006—.0015)
.0630	**1.6**	165 (130—180)	.0022 (.0013—.0031)	130 (100—130)	.0022 (.0013—.0031)
.0787	**2.0**	195 (150—215)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	**2.5**	195 (150—215)	.0035 (.0025—.0049)	165 (130—180)	.0035 (.0022—.0049)

Workpiece Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	100 (65—100)	.0006 (.0004—.0011)	100 (65—115)	.0006 (.0004—.0011)
.0472	**1.2**	100 (65—100)	.0008 (.0005—.0014)	100 (65—115)	.0008 (.0005—.0014)
.0630	**1.6**	100 (65—100)	.0020 (.0011—.0030)	100 (65—115)	.0020 (.0011—.0030)
.0787	**2.0**	165 (130—180)	.0026 (.0013—.0037)	100 (65—115)	.0026 (.0013—.0037)
.0984	**2.5**	165 (130—180)	.0031 (.0018—.0047)	130 (100—150)	.0031 (.0018—.0047)

Workpiece Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	130 (100—130)	.0008 (.0004—.0012)	100 (65—100)	.0006 (.0004—.0011)
.0472	**1.2**	130 (100—130)	.0010 (.0006—.0015)	100 (65—100)	.0008 (.0005—.0014)
.0630	**1.6**	130 (100—130)	.0022 (.0013—.0031)	100 (65—100)	.0020 (.0011—.0030)
.0787	**2.0**	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0026 (.0013—.0037)
.0984	**2.5**	165 (130—180)	.0035 (.0022—.0049)	165 (130—180)	.0031 (.0018—.0047)

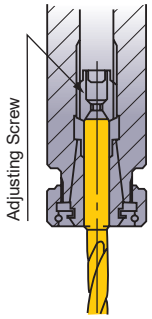
Workpiece Material		Aluminum Alloy (Si<5%) AISI A6061, A7075 etc.		Heat Resistant Alloy Inconel718 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0394	**1.0**	165 (130—180)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	**1.2**	195 (150—215)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	**1.6**	230 (180—245)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	**2.0**	260 (195—280)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	**2.5**	295 (230—310)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)

Note 1) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MICRO-MWS

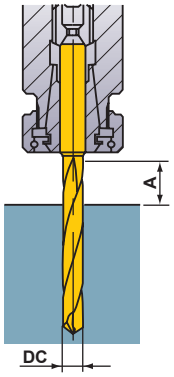
OPERATIONAL GUIDANCE FOR THE MICRO-MWS DRILLS (Φ.0200"-Φ.1200" & Φ0.50mm-Φ2.95mm)

Drill Holding



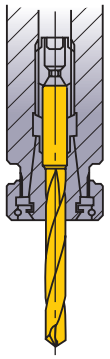
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

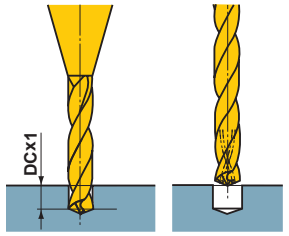
Drill Installation



NG

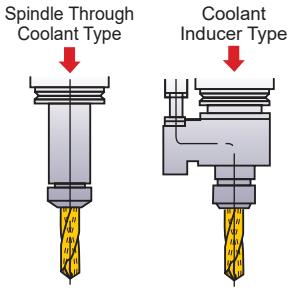
Do not clamp on the flutes.

Drill Installation



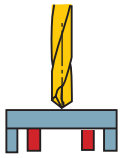
①A pilot hole must proceed application of XB or DB drill.
②Use SB drill for pilot hole.
③Depending on cutting conditions peck feeding may be necessary.

Through Coolant Type



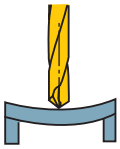
Recommended coolant pressure:
≥ 435 PSI (3MPa)
At least 220 PSI (1.5MPa) is required.

Thin Workpiece



Support the Workpiece

OK



If Bending Occurs

NG

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

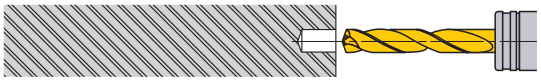
CAUTIONS FOR USE

- Please use a fine mesh filter (mesh≤5 micron) for coolant to prevent jamming in the oil hole.
- For deep drilling with the long type drill, machining a pilot hole is recommended.
  (Otherwise, centrifugal forces may cause drill breakage.)

■OPERATIONAL GUIDANCE FOR THE MICRO-MWS DRILL (Φ.0200"-Φ.1200" & Φ0.50mm-Φ2.95mm) (L/D≥10)

Flat Face Drilling ●Drilling a blind hole

■ 1. Drilling a Pilot Hole



①Use the SB type drill.
②Use a drill with the same diameter as the deep hole drill.
③Drill depth : Approx 1DC.
④Ensure a high precision hole is drilled for the guide pilot.

■ 2. Initial Cutting with the Long Type Drill

①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

■ 3. Drill the Deep Hole

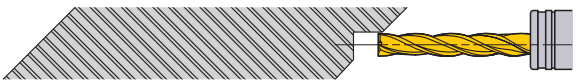
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

■ 4. Drill Retraction

①After drilling, lower the cutting revolution about .020-.039 inch short of the hole end. (Revolution speed of around 500-1000 min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

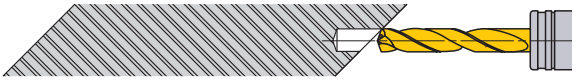
Irregular Face Drilling ●Drilling and breaking through on irregular faces or angles

■ 1. Spot Facing



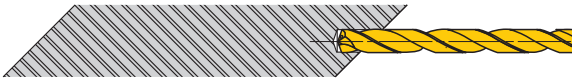
①Machine a flat on the irregular face by using an MFE (flat bottom drill) or an end mill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

■ 2. Drilling a Pilot Hole



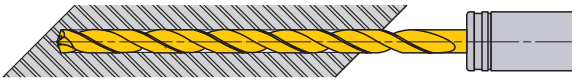
①Use a drill with the same or larger point angle than XB or DB type. The MWS-SB type is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC.

■ 3. Initial Cutting with the Long Type Drill



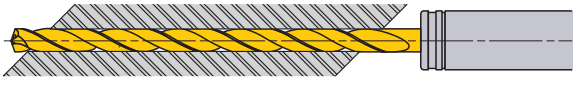
①Penetrate the pilot hole at a low revolution. (Revolution speed 500-1000 min^{-1}, feed rate .008-.012 IPR)
②Stop the long type drill .020-.039 inch short of the pilot hole bottom.

■ 4. Drill the Deep Hole



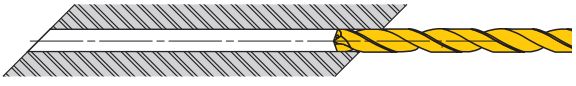
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

■ 5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②Feed rate should be half the normal feed.

■ 6. Drill Retraction



①Finally clear the hole at a revolution speed of 500-1000 min^{-1}.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 IPM.

MMS

- Stainless Steel drill with unique narrow margins which reduces cutting resistance and "TRI-Cooling technology" coolant holes which provides excellent chip evacuation.
- New DP7020 grade provides excellent tool life and unique wavy cutting edge improves sharpness and cutting edge strength.

P | **M** | K | N | S | H

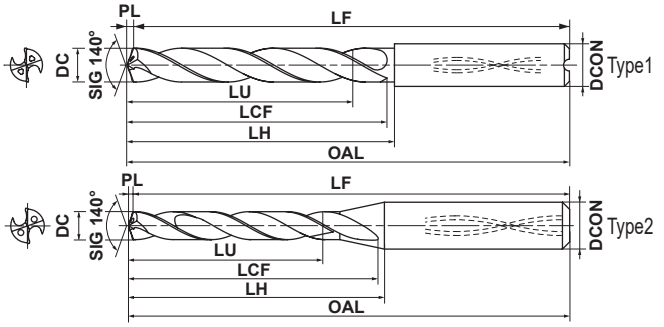
Internal Coolant

(inch)

DC=.1181	.1181<DC≤.2362	.2362<DC≤.3937	.3937<DC≤.7087	.7087<DC≤.7874
0 −0.00055	0 −0.00071	0 −0.00087	0 −0.00106	0 −0.00130
	.1181<DCON≤.2362	.2362<DCON≤.3937	.3937<DCON≤.7087	.7087<DCON≤.7874
	0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

(mm)

DC=3	3<DC≤6	6<DC≤10	10<DC≤18	18<DC≤20
0 −0.014	0 −0.018	0 −0.022	0 −0.027	0 −0.033
	3<DCON≤6	6<DCON≤10	10<DCON≤18	18<DCON≤20
	0 −0.008	0 −0.009	0 −0.011	0 −0.013



*When looking at the coating the color can vary depending on the direction of viewing. This does not have any effect on the performance of the drill.

Note 1) MMS drills are suitable for use with shrink fit holders.

DC Metric (mm)	DC Decimal (inch)	DC Fraction (inch)	Wire / Letter	Thread size	L/D	Stock DP7020	Order Number	LU mm	LU inch	LCF mm	LCF inch	LH mm	LH inch	OAL mm	OAL inch	LF mm	LF inch	PL mm	PL inch	DCON mm	DCON inch	Type
3.000	.1181				3	●	MMS0300X3DB	9.5	.374	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0300X5DB	15.5	.610	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.048	.1200		31		3	●	MMS0305X3D060	9.7	.382	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0305X5D060	15.8	.622	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.100	.1220				3	●	MMS0310X3DB	9.9	.390	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0310X5DB	16.1	.634	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.175	.1250	1/8			3	●	MMS0318X3D060	10.1	.398	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0318X5D060	16.4	.646	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.200	.1260				3	●	MMS0320X3DB	10.2	.402	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0320X5DB	16.6	.654	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.300	.1299			M4x.7	3	●	MMS0330X3DB	10.5	.413	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0330X5DB	17.1	.673	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.400	.1339				3	●	MMS0340X3DB	10.8	.425	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0340X5DB	17.6	.693	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.500	.1378				3	●	MMS0350X3DB	11.1	.437	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	2
					5	●	MMS0350X5DB	18.1	.713	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	2
3.572	.1407	9/64			3	●	MMS0357X3D060	11.4	.449	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0357X5D060	18.5	.728	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
3.600	.1417				3	●	MMS0360X3DB	11.5	.453	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0360X5DB	18.7	.736	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
3.700	.1457			M4.5x.75	3	●	MMS0370X3DB	11.8	.465	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0370X5DB	19.2	.756	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
3.800	.1496		25	#10-24	3	●	MMS0380X3DB	12.1	.476	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0380X5DB	19.7	.776	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
3.900	.1535				3	●	MMS0390X3DB	12.4	.488	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0390X5DB	20.2	.795	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
3.969	.1563	5/32			3	●	MMS0397X3D060	12.6	.496	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0397X5D060	20.6	.811	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
4.000	.1575				3	●	MMS0400X3DB	12.7	.500	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	2
					5	●	MMS0400X5DB	20.7	.815	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	2
4.039	.1590		21	#10-32	3	●	MMS0404X3D060	12.8	.504	24.7	.972	26.7	1.051	73.7	2.902	73	2.874	0.7	.028	6	.236	2
					5	●	MMS0404X5D060	20.9	.823	33.7	1.327	35.7	1.406	82.7	3.256	82	3.228	0.7	.028	6	.236	2
4.100	.1614				3	●	MMS0410X3DB	13.0	.512	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	2
					5	●	MMS0410X5DB	21.2	.835	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	2

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
Note 2) The coolant hole of 5.9mm diameter or less will be round shape.

● : USA Stock

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.200	.1654			M5x.8	3	●	MMS0420X3DB	13.4	.528	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	2
					5	●	MMS0420X5DB	21.8	.858	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	2
4.300	.1693				3	●	MMS0430X3DB	13.7	.539	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	2
					5	●	MMS0430X5DB	22.3	.878	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	2
4.366	.1719	11/64			3	●	MMS0437X3D060	13.9	.547	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	2
					5	●	MMS0437X5D060	22.6	.890	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	2
4.400	.1732		17		3	●	MMS0440X3DB	14.0	.551	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	2
					5	●	MMS0440X5DB	22.8	.898	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	2
4.500	.1772		16	#12-24	3	●	MMS0450X3DB	14.3	.563	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	2
					5	●	MMS0450X5DB	23.3	.917	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	2
4.600	.1811				3	●	MMS0460X3DB	14.6	.575	25.8	1.016	28.8	1.134	75.8	2.984	75	2.953	0.8	.031	6	.236	1
					5	●	MMS0460X5DB	23.8	.937	35.8	1.409	38.8	1.528	85.8	3.378	85	3.346	0.8	.031	6	.236	1
4.700	.1850		13		3	●	MMS0470X3DB	15.0	.591	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	●	MMS0470X5DB	24.4	.961	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.763	.1875	3/16			3	●	MMS0476X3D060	15.1	.594	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	●	MMS0476X5D060	24.7	.972	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.800	.1890				3	●	MMS0480X3DB	15.3	.602	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	●	MMS0480X5DB	24.9	.980	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.900	.1929				3	●	MMS0490X3DB	15.6	.614	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	●	MMS0490X5DB	25.4	1.000	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
5.000	.1969			M6x1.0	3	●	MMS0500X3DB	15.9	.626	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	●	MMS0500X5DB	25.9	1.020	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
5.100	.2008		7	1/4-20	3	●	MMS0510X3DB	16.2	.638	28.9	1.138	30.9	1.217	81.9	3.224	81	3.189	0.9	.035	6	.236	1
					5	●	MMS0510X5DB	26.4	1.039	39.9	1.571	42.9	1.689	89.9	3.539	89	3.504	0.9	.035	6	.236	1
5.160	.2032	13/64			3	●	MMS0516X3D060	16.4	.646	28.9	1.138	30.9	1.217	81.9	3.224	81	3.189	0.9	.035	6	.236	1
					5	●	MMS0516X5D060	26.7	1.051	39.9	1.571	42.9	1.689	89.9	3.539	89	3.504	0.9	.035	6	.236	1
5.200	.2047				3	●	MMS0520X3DB	16.5	.650	29.0	1.142	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0520X5DB	26.9	1.059	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.300	.2087		4		3	●	MMS0530X3DB	16.9	.665	29.0	1.142	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0530X5DB	27.5	1.083	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.400	.2126		3	1/4-28	3	●	MMS0540X3DB	17.2	.677	29.0	1.142	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0540X5DB	28.0	1.102	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.500	.2165				3	●	MMS0550X3DB	17.5	.689	29.0	1.142	31.0	1.220	820	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0550X5DB	28.5	1.122	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.557	.2188	7/32			3	●	MMS0556X3D060	17.7	.697	31.0	1.220	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0556X5D060	28.8	1.134	43.0	1.693	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.600	.2205		2		3	●	MMS0560X3DB	17.8	.701	31.0	1.220	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0560X5DB	29.0	1.142	43.0	1.693	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.700	.2244				3	●	MMS0570X3DB	18.1	.713	31.0	1.220	31.0	1.220	82.0	3.228	81	3.189	1.0	.039	6	.236	1
					5	●	MMS0570X5DB	29.5	1.161	43.0	1.693	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	1
5.800	.2283		1		3	●	MMS0580X3DB	18.5	.728	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	1
					5	●	MMS0580X5DB	30.1	1.185	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	1
5.900	.2323				3	●	MMS0590X3DB	18.8	.740	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	1
					5	●	MMS0590X5DB	30.6	1.205	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	1
5.954	.2344	15/64	A		3	●	MMS0595X3D060	18.9	.744	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	1
					5	●	MMS0595X5D060	30.8	1.213	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	1
6.000	.2362			M7x1.0	3	●	MMS0600X3DB	19.1	.752	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	1
					5	●	MMS0600X5DB	31.1	1.224	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	1

MMS

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.100	.2402				3	●	MMS0610X3DB	19.4	.764	34.1	1.343	36.1	1.421	87.1	3.429	86	3.386	1.1	.043	8	.315	1
					5	●	MMS0610X5DB	31.6	1.244	47.1	1.854	49.1	1.933	96.1	3.783	95	3.740	1.1	.043	8	.315	1
6.200	.2441				3	●	MMS0620X3DB	19.7	.776	34.1	1.343	36.1	1.421	87.1	3.429	86	3.386	1.1	.043	8	.315	1
					5	●	MMS0620X5DB	32.1	1.264	47.1	1.854	49.1	1.933	96.1	3.783	95	3.740	1.1	.043	8	.315	1
6.300	.2480				3	●	MMS0630X3DB	20.0	.787	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315	1
					5	●	MMS0630X5DB	32.6	1.283	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	1
6.350	.2500	1/4	E		3	●	MMS0635X3D080	20.2	.795	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315	1
					5	●	MMS0635X5D080	32.9	1.295	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	1
6.400	.2520				3	●	MMS0640X3DB	20.4	.803	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315	1
					5	●	MMS0640X5DB	33.2	1.307	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	1
6.500	.2559				3	●	MMS0650X3DB	20.7	.815	34.2	1.346	36.2	1.425	87.2	3.433	86	3.386	1.2	.047	8	.315	1
					5	●	MMS0650X5DB	33.7	1.327	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	1
6.528	.2570		F	5/16-18	3	●	MMS0653X3D080	20.8	.819	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315	1
					5	●	MMS0653X5D080	33.8	1.331	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315	1
6.600	.2598				3	●	MMS0660X3DB	21.0	.827	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315	1
					5	●	MMS0660X5DB	34.2	1.346	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315	1
6.700	.2638			M8x1.25	3	●	MMS0670X3DB	21.3	.839	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315	1
					5	●	MMS0670X5DB	34.7	1.366	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315	1
6.747	.2657	17/64			3	●	MMS0675X3D080	21.5	.846	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315	1
					5	●	MMS0675X5D080	34.9	1.374	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315	1
6.800	.2677				3	●	MMS0680X3DB	21.6	.850	36.2	1.425	38.2	1.504	91.2	3.591	90	3.543	1.2	.047	8	.315	1
					5	●	MMS0680X5DB	35.2	1.386	50.2	1.976	52.2	2.055	99.2	3.906	98	3.858	1.2	.047	8	.315	1
6.900	.2717		I	5/16-24	3	●	MMS0690X3DB	22.0	.866	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	1
					5	●	MMS0690X5DB	35.8	1.409	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	1
7.000	.2756			M8x1.0	3	●	MMS0700X3DB	22.3	.878	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	1
					5	●	MMS0700X5DB	36.3	1.429	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	1
7.100	.2795				3	●	MMS0710X3DB	22.6	.890	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315	1
					5	●	MMS0710X5DB	36.8	1.449	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315	1
7.144	.2813	9/32	K		3	●	MMS0714X3D080	22.7	.894	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315	1
					5	●	MMS0714X5D080	37.0	1.457	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315	1
7.200	.2835				3	●	MMS0720X3DB	22.9	.902	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315	1
					5	●	MMS0720X5DB	37.3	1.469	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315	1
7.300	.2874				3	●	MMS0730X3DB	23.2	.913	39.3	1.547	40.3	1.587	91.3	3.594	90	3.543	1.3	.051	8	.315	1
					5	●	MMS0730X5DB	37.8	1.488	54.3	2.138	57.3	2.256	104.3	4.106	103	4.055	1.3	.051	8	.315	1
7.400	.2913				3	●	MMS0740X3DB	23.5	.925	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0740X5DB	38.3	1.508	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
7.500	.2953		M		3	●	MMS0750X3DB	23.9	.941	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0750X5DB	38.9	1.531	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
7.541	.2969	19/64			3	●	MMS0754X3D080	24.0	.945	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0754X5D080	39.1	1.539	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
7.600	.2992				3	●	MMS0760X3DB	24.2	.953	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0760X5DB	39.4	1.551	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
7.700	.3031				3	●	MMS0770X3DB	24.5	.965	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0770X5DB	39.9	1.571	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
7.800	.3071				3	●	MMS0780X3DB	24.8	.976	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0780X5DB	40.4	1.591	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
7.900	.3110				3	●	MMS0790X3DB	25.1	.988	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0790X5DB	40.9	1.610	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.938	.3125	5/16		3/8-16	3	●	MMS0794X3D080	25.2	.992	41.4	1.630	41.4	1.630	91.4	3.598	90	3.543	1.4	.055	8	.315	1
					5	●	MMS0794X5D080	41.1	1.618	57.4	2.260	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	1
8.000	.3150				3	●	MMS0800X3DB	25.5	1.004	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	1
					5	●	MMS0800X5DB	41.5	1.634	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	1
8.100	.3189				3	●	MMS0810X3DB	25.8	1.016	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394	1
					5	●	MMS0810X5DB	42.0	1.654	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	1
8.200	.3228		P		3	●	MMS0820X3DB	26.1	1.028	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394	1
					5	●	MMS0820X5DB	42.5	1.673	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	1
8.300	.3268				3	●	MMS0830X3DB	26.4	1.039	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394	1
					5	●	MMS0830X5DB	43.0	1.693	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	1
8.335	.3282	21/64			3	●	MMS0833X3D100	26.5	1.043	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394	1
					5	●	MMS0833X5D100	43.2	1.701	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	1
8.400	.3307				3	●	MMS0840X3DB	26.7	1.051	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394	1
					5	●	MMS0840X5DB	43.5	1.713	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	1
8.433	.3320		Q	3/8-24	3	●	MMS0843X3D100	26.8	1.055	44.5	1.752	46.5	1.831	97.5	3.839	96	3.780	1.5	.059	10	.394	1
					5	●	MMS0843X5D100	43.7	1.720	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	1
8.500	.3346			M10x1.5	3	●	MMS0850X3DB	27.0	1.063	44.6	1.756	46.6	1.835	97.6	3.843	96	3.780	1.6	.063	10	.394	1
					5	●	MMS0850X5DB	44.0	1.732	61.6	2.425	63.6	2.504	114.6	4.512	113	4.449	1.6	.063	10	.394	1
8.600	.3386		R		3	●	MMS0860X3DB	27.4	1.079	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	1
					5	●	MMS0860X5DB	44.6	1.756	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	1
8.700	.3425			M10x1.25	3	●	MMS0870X3DB	27.7	1.091	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	1
					5	●	MMS0870X5DB	45.1	1.776	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	1
8.732	.3438	11/32			3	●	MMS0873X3D100	27.8	1.094	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	1
					5	●	MMS0873X5D100	45.2	1.780	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	1
8.800	.3465				3	●	MMS0880X3DB	28.0	1.102	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	1
					5	●	MMS0880X5DB	45.6	1.795	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	1
8.900	.3504				3	●	MMS0890X3DB	28.3	1.114	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	1
					5	●	MMS0890X5DB	46.1	1.815	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	1
9.000	.3543				3	●	MMS0900X3DB	28.6	1.126	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	1
					5	●	MMS0900X5DB	46.6	1.835	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	1
9.100	.3583		T		3	●	MMS0910X3DB	29.0	1.142	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0910X5DB	47.2	1.858	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.129	.3594	23/64			3	●	MMS0913X3D100	29.0	1.142	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0913X5D100	47.3	1.862	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.200	.3622				3	●	MMS0920X3DB	29.3	1.154	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0920X5DB	47.7	1.878	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.300	.3661				3	●	MMS0930X3DB	29.6	1.165	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0930X5DB	48.2	1.898	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.348	.3680		U	7/16-14	3	●	MMS0935X3D100	29.7	1.169	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0935X5D100	48.4	1.906	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.400	.3701				3	●	MMS0940X3DB	29.9	1.177	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0940X5DB	48.7	1.917	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.500	.3740				3	●	MMS0950X3DB	30.2	1.189	49.7	1.957	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0950X5DB	49.2	1.937	68.7	2.705	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.525	.3750	3/8			3	●	MMS0953X3D100	30.3	1.193	51.7	2.035	51.7	2.035	102.7	4.043	101	3.976	1.7	.067	10	.394	1
					5	●	MMS0953X5D100	49.3	1.941	71.7	2.823	71.7	2.823	122.7	4.831	121	4.764	1.7	.067	10	.394	1
9.600	.3780				3	●	MMS0960X3DB	30.5	1.201	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	1
					5	●	MMS0960X5DB	49.7	1.957	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	1

MMS

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.700	.3819		Tube Sheet		3	●	MMS0970X3DB	30.9	1.217	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	1
					5	●	MMS0970X5DB	50.3	1.980	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	1
9.800	.3858		W		3	●	MMS0980X3DB	31.2	1.228	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	1
					5	●	MMS0980X5DB	50.8	2.000	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	1
9.900	.3898				3	●	MMS0990X3DB	31.5	1.240	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	1
					5	●	MMS0990X5DB	51.3	2.020	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	1
9.922	.3907	25/64		7/16-20	3	●	MMS0992X3D100	31.5	1.240	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	1
					5	●	MMS0992X5D100	51.4	2.024	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	1
10.000	.3937				3	●	MMS1000X3DB	31.8	1.252	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	1
					5	●	MMS1000X5DB	51.8	2.039	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	1
10.100	.3976				3	●	MMS1010X3DB	32.1	1.264	54.8	2.157	56.8	2.236	112.8	4.441	111	4.370	1.8	.071	12	.472	1
					5	●	MMS1010X5DB	52.3	2.059	75.8	2.984	79.8	3.142	135.8	5.346	134	5.276	1.8	.071	12	.472	1
10.200	.4016			M12x1.75	3	●	MMS1020X3DB	32.5	1.280	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472	1
					5	●	MMS1020X5DB	52.9	2.083	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	1
10.300	.4055				3	●	MMS1030X3DB	32.8	1.291	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472	1
					5	●	MMS1030X5DB	53.4	2.102	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	1
10.319	.4063	13/32			3	●	MMS1032X3D120	32.8	1.291	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472	1
					5	●	MMS1032X5D120	53.5	2.106	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	1
10.400	.4094				3	●	MMS1040X3DB	33.1	1.303	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472	1
					5	●	MMS1040X5DB	53.9	2.122	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	1
10.500	.4134		Z		3	●	MMS1050X3DB	33.4	1.315	54.9	2.161	56.9	2.240	112.9	4.445	111	4.370	1.9	.075	12	.472	1
					5	●	MMS1050X5DB	54.4	2.142	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	1
10.600	.4173				3	●	MMS1060X3DB	33.7	1.327	56.9	2.240	57.9	2.280	117.9	4.642	116	4.567	1.9	.075	12	.472	1
					5	●	MMS1060X5DB	54.9	2.161	78.9	3.106	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	1
10.700	.4213				3	●	MMS1070X3DB	34.0	1.339	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1070X5DB	55.4	2.181	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472	1
10.716	.4219	27/64		1/2-13	3	●	MMS1072X3D120	34.1	1.343	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1072X5D120	55.5	2.185	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472	1
10.800	.4252			M12X1.25	3	●	MMS1080X3DB	34.4	1.354	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1080X5DB	56.0	2.205	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472	1
10.900	.4291				3	●	MMS1090X3DB	34.7	1.366	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1090X5DB	56.5	2.224	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472	1
11.000	.4331				3	●	MMS1100X3DB	35.0	1.378	57.0	2.244	58.0	2.283	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1100X5DB	57.0	2.244	79.0	3.110	80.0	3.150	136.0	5.354	134	5.276	2.0	.079	12	.472	1
11.100	.4370				3	●	MMS1110X3DB	35.3	1.390	60.0	2.362	62.0	2.441	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1110X5DB	57.5	2.264	83.0	3.268	86.0	3.386	142.0	5.591	140	5.512	2.0	.079	12	.472	1
11.113	.4375	7/16			3	●	MMS1111X3D120	35.3	1.390	60.0	2.362	62.0	2.441	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1111X5D120	57.6	2.268	83.0	3.268	86.0	3.386	142.0	5.591	140	5.512	2.0	.079	12	.472	1
11.200	.4409				3	●	MMS1120X3DB	35.6	1.402	60.0	2.362	62.0	2.441	118.0	4.646	116	4.567	2.0	.079	12	.472	1
					5	●	MMS1120X5DB	58.0	2.283	83.0	3.268	86.0	3.386	142.0	5.591	140	5.512	2.0	.079	12	.472	1
11.300	.4449				3	●	MMS1130X3DB	36.0	1.417	60.1	2.366	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472	1
					5	●	MMS1130X5DB	58.6	2.307	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	1
11.400	.4488				3	●	MMS1140X3DB	36.3	1.429	60.1	2.366	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472	1
					5	●	MMS1140X5DB	59.1	2.327	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	1
11.500	.4528				3	●	MMS1150X3DB	36.6	1.441	60.1	2.366	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472	1
					5	●	MMS1150X5DB	59.6	2.346	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	1
11.510	.4532	29/64		1/2-20	3	●	MMS1151X3D120	36.6	1.441	62.1	2.445	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472	1
					5	●	MMS1151X5D120	59.6	2.346	86.1	3.390	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	1

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.600	.4567				3	●	MMS1160X3DB	36.9	1.453	62.1	2.445	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472	1
					5	●	MMS1160X5DB	60.1	2.366	86.1	3.390	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	1
11.700	.4606				3	●	MMS1170X3DB	37.2	1.465	62.1	2.445	62.1	2.445	118.1	4.650	116	4.567	2.1	.083	12	.472	1
					5	●	MMS1170X5DB	60.6	2.386	86.1	3.390	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	1
11.800	.4646				3	●	MMS1180X3DB	37.5	1.476	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	1
					5	●	MMS1180X5DB	61.1	2.406	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	1
11.900	.4685				3	●	MMS1190X3DB	37.9	1.492	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	1
					5	●	MMS1190X5DB	61.7	2.429	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	1
12.000	.4724			M14x2.0	3	●	MMS1200X3DB	38.2	1.504	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	1
					5	●	MMS1200X5DB	62.2	2.449	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	1
12.100	.4764				3	●	MMS1210X3DB	38.5	1.516	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551	1
					5	●	MMS1210X5DB	62.7	2.469	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551	1
12.200	.4803				3	●	MMS1220X3DB	38.8	1.528	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551	1
					5	●	MMS1220X5DB	63.2	2.488	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551	1
12.300	.4843			9/16-12	3	●	MMS1230X3DB	39.1	1.539	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551	1
					5	●	MMS1230X5DB	63.7	2.508	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551	1
12.400	.4882				3	●	MMS1240X3DB	39.5	1.555	65.3	2.571	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	1
					5	●	MMS1240X5DB	64.3	2.531	90.3	3.555	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	1
12.500	.4921			M14x1.5	3	●	MMS1250X3DB	39.8	1.567	65.3	2.571	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	1
					5	●	MMS1250X5DB	64.8	2.551	90.3	3.555	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	1
12.600	.4961				3	●	MMS1260X3DB	40.1	1.579	67.3	2.650	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	1
					5	●	MMS1260X5DB	65.3	2.571	93.3	3.673	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	1
12.700	.5000	1/2			3	●	MMS1270X3DB	40.4	1.591	67.3	2.650	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	1
					5	●	MMS1270X5DB	65.8	2.591	93.3	3.673	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	1
12.800	.5039				3	●	MMS1280X3DB	40.7	1.602	67.3	2.650	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	1
					5	●	MMS1280X5DB	66.3	2.610	93.3	3.673	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	1
12.900	.5079				3	●	MMS1290X3DB	41.0	1.614	67.4	2.654	68.4	2.693	124.4	4.898	122	4.803	2.4	.094	14	.551	1
					5	●	MMS1290X5DB	66.8	2.630	93.4	3.677	94.4	3.717	150.4	5.921	148	5.827	2.4	.094	14	.551	1
13.000	.5118				3	●	MMS1300X3DB	41.4	1.630	67.4	2.654	68.4	2.693	124.4	4.898	122	4.803	2.4	.094	14	.551	1
					5	●	MMS1300X5DB	67.4	2.654	93.4	3.677	94.4	3.717	150.4	5.921	148	5.827	2.4	.094	14	.551	1
13.100	.5157			9/16-18	3	●	MMS1310X3DB	41.7	1.642	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551	1
					5	●	MMS1310X5DB	67.9	2.673	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551	1
13.200	.5197				3	●	MMS1320X3DB	42.0	1.654	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551	1
					5	●	MMS1320X5DB	68.4	2.693	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551	1
13.300	.5236				3	●	MMS1330X3DB	42.3	1.665	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551	1
					5	●	MMS1330X5DB	68.9	2.713	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551	1
13.400	.5276				3	●	MMS1340X3DB	42.6	1.677	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551	1
					5	●	MMS1340X5DB	69.4	2.732	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551	1
13.500	.5315			5/8-11	3	●	MMS1350X3DB	43.0	1.693	70.5	2.776	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	1
					5	●	MMS1350X5DB	70.0	2.756	97.5	3.839	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	1
13.600	.5354				3	●	MMS1360X3DB	43.3	1.705	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	1
					5	●	MMS1360X5DB	70.5	2.776	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	1
13.700	.5394				3	●	MMS1370X3DB	43.6	1.717	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	1
					5	●	MMS1370X5DB	71.0	2.795	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	1
13.800	.5433				3	●	MMS1380X3DB	43.9	1.728	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	1
					5	●	MMS1380X5DB	71.5	2.815	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	1
13.891	.5469	35/64			3	●	MMS1389X3D140	44.2	1.740	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	1
					5	●	MMS1389X5D140	72.0	2.835	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	1

MMS

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
13.900	.5472				3	●	MMS1390X3DB	44.2	1.740	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	1
					5	●	MMS1390X5DB	72.0	2.835	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	1
14.000	.5512			M16x2.0	3	●	MMS1400X3DB	44.5	1.752	72.6	2.858	72.6	2.858	128.6	5.063	126	4.961	2.6	.102	14	.551	1
					5	●	MMS1400X5DB	72.5	2.854	100.6	3.961	100.6	3.961	156.6	6.165	154	6.063	2.6	.102	14	.551	1
14.100	.5551				3	●	MMS1410X3DB	44.9	1.768	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	1
					5	●	MMS1410X5DB	73.1	2.878	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	1
14.200	.5591				3	●	MMS1420X3DB	45.2	1.780	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	1
					5	●	MMS1420X5DB	73.6	2.898	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	1
14.288	.5625	9/16			3	●	MMS1429X3D160	45.4	1.787	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	1
					5	●	MMS1429X5D160	74.0	2.913	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	1
14.300	.5630				3	●	MMS1430X3DB	45.5	1.791	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	1
					5	●	MMS1430X5DB	74.1	2.917	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	1
14.400	.5569				3	●	MMS1440X3DB	45.8	1.803	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	1
					5	●	MMS1440X5DB	74.6	2.937	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	1
14.500	.5709			M16x1.5	3	●	MMS1450X3DB	46.1	1.815	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	1
					5	●	MMS1450X5DB	75.1	2.957	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	1
14.600	.5748				3	●	MMS1460X3DB	46.5	1.831	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	1
					5	●	MMS1460X5DB	75.7	2.980	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	1
14.684	.5782	37/64		5/8-18	3	●	MMS1468X3D160	46.7	1.839	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	1
					5	●	MMS1468X5D160	76.1	2.996	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	1
14.700	.5787				3	●	MMS1470X3DB	46.8	1.843	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	1
					5	●	MMS1470X5DB	76.2	3.000	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	1
14.800	.5827				3	●	MMS1480X3DB	47.1	1.854	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	1
					5	●	MMS1480X5DB	76.7	3.020	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	1
14.900	.5866				3	●	MMS1490X3DB	47.4	1.866	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	1
					5	●	MMS1490X5DB	77.2	3.039	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	1
15.000	.5906				3	●	MMS1500X3DB	47.7	1.878	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	1
					5	●	MMS1500X5DB	77.7	3.059	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	1
15.082	.5938	19/32			3	●	MMS1508X3D160	48.0	1.890	80.7	3.177	82.7	3.256	141.7	5.579	139	5.472	2.7	.106	16	.630	1
					5	●	MMS1508X5D160	78.1	3.075	111.7	4.398	114.7	4.516	173.7	6.839	171	6.732	2.7	.106	16	.630	1
15.100	.5945				3	●	MMS1510X3DB	48.0	1.890	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1510X5DB	78.2	3.079	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.200	.5984				3	●	MMS1520X3DB	48.4	1.906	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1520X5DB	78.8	3.102	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.300	.6024				3	●	MMS1530X3DB	48.7	1.917	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1530X5DB	79.3	3.122	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.400	.6063				3	●	MMS1540X3DB	49.0	1.929	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1540X5DB	79.8	3.142	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.479	.6094	39/64			3	●	MMS1548X3D160	49.2	1.937	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1548X5D160	80.2	3.157	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.500	.6102			M18x2.5	3	●	MMS1550X3DB	49.3	1.941	80.8	3.181	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1550X5DB	80.3	3.161	111.8	4.402	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.600	.6142				3	●	MMS1560X3DB	49.6	1.953	82.8	3.260	82.8	3.260	141.8	5.583	139	5.472	2.8	.110	16	.630	1
					5	●	MMS1560X5DB	80.8	3.181	114.8	4.520	114.8	4.520	173.8	6.843	171	6.732	2.8	.110	16	.630	1
15.700	.6181				3	●	MMS1570X3DB	50.0	1.969	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630	1
					5	●	MMS1570X5DB	81.4	3.205	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630	1
15.800	.6220				3	●	MMS1580X3DB	50.3	1.980	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630	1
					5	●	MMS1580X5DB	81.9	3.224	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630	1

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
15.875	.6250	5/8			3	●	MMS1588X3D160	50.5	1.988	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630	1
					5	●	MMS1588X5D160	82.2	3.236	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630	1
15.900	.6260				3	●	MMS1590X3DB	50.6	1.992	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630	1
					5	●	MMS1590X5DB	82.4	3.244	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630	1
16.000	.6299				3	●	MMS1600X3DB	50.9	2.004	82.9	3.264	82.9	3.264	141.9	5.587	139	5.472	2.9	.114	16	.630	1
					5	●	MMS1600X5DB	82.9	3.264	114.9	4.524	114.9	4.524	173.9	6.846	171	6.732	2.9	.114	16	.630	1
16.100	.6339				3	□	MMS1610X3DB	81.2	3.197	85.9	3.382	88.9	3.500	147.9	5.823	145	5.709	2.9	.114	18	.709	1
					5	□	MMS1610X5DB	83.4	3.283	118.9	4.681	122.9	4.839	181.9	7.161	179	7.047	2.9	.114	18	.709	1
16.200	.6378				3	□	MMS1620X3DB	51.5	2.028	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	□	MMS1620X5DB	83.9	3.303	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.272	.6407	41/64			3	●	MMS1627X3D180	51.7	2.035	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	●	MMS1627X5D180	84.3	3.319	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.300	.6417				3	□	MMS1630X3DB	51.9	2.043	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	□	MMS1630X5DB	84.5	3.327	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.400	.6457				3	□	MMS1640X3DB	52.2	2.055	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	□	MMS1640X5DB	85.0	3.346	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.500	.6496			M18x1.5	3	●	MMS1650X3DB	52.5	2.067	86.0	3.386	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	●	MMS1650X5DB	85.5	3.366	119.0	4.685	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.600	.6535				3	□	MMS1660X3DB	52.8	2.079	88.0	3.465	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	□	MMS1660X5DB	86.0	3.386	122.0	4.803	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.669	.6563	21/32		3/4-10	3	●	MMS1667X3D180	53.0	2.087	88.0	3.465	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	●	MMS1667X5D180	86.4	3.402	122.0	4.803	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.700	.6575				3	□	MMS1670X3DB	53.1	2.091	88.0	3.465	89.0	3.504	148.0	5.827	145	5.709	3.0	.118	18	.709	1
					5	□	MMS1670X5DB	86.5	3.406	122.0	4.803	123.0	4.843	182.0	7.165	179	7.047	3.0	.118	18	.709	1
16.800	.6614				3	□	MMS1680X3DB	53.5	2.106	88.1	3.469	89.1	3.508	148.1	5.831	145	5.709	3.1	.122	18	.709	1
					5	□	MMS1680X5DB	87.1	3.429	122.1	4.807	123.1	4.846	182.1	7.169	179	7.047	3.1	.122	18	.709	1
16.900	.6654				3	□	MMS1690X3DB	53.8	2.118	88.1	3.469	89.1	3.508	148.1	5.831	145	5.709	3.1	.122	18	.709	1
					5	□	MMS1690X5DB	87.6	3.449	122.1	4.807	123.1	4.846	182.1	7.169	179	7.047	3.1	.122	18	.709	1
17.000	.6693		Tube Sheet		3	●	MMS1700X3DB	54.1	2.130	88.1	3.469	89.1	3.508	148.1	5.831	145	5.709	3.1	.122	18	.709	1
					5	●	MMS1700X5DB	88.1	3.469	122.1	4.807	123.1	4.846	182.1	7.169	179	7.047	3.1	.122	18	.709	1
17.066	.6719	43/64			3	●	MMS1707X3D180	54.3	2.138	91.1	3.587	93.1	3.665	152.1	5.988	149	5.866	3.1	.122	18	.709	1
					5	●	MMS1707X5D180	88.4	3.480	126.1	4.965	129.1	5.083	188.1	7.406	185	7.283	3.1	.122	18	.709	1
17.100	.6732				3	□	MMS1710X3DB	54.4	2.142	91.1	3.587	93.1	3.665	152.1	5.988	149	5.866	3.1	.122	18	.709	1
					5	□	MMS1710X5DB	88.6	3.488	126.1	4.965	129.1	5.083	188.1	7.406	185	7.283	3.1	.122	18	.709	1
17.200	.6772				3	□	MMS1720X3DB	54.7	2.154	91.1	3.587	93.1	3.665	152.1	5.988	149	5.866	3.1	.122	18	.709	1
					5	□	MMS1720X5DB	89.1	3.508	126.1	4.965	129.1	5.083	188.1	7.406	185	7.283	3.1	.122	18	.709	1
17.300	.6811				3	□	MMS1730X3DB	55.0	2.165	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	□	MMS1730X5DB	89.6	3.528	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1
17.400	.6850				3	□	MMS1740X3DB	55.4	2.181	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	□	MMS1740X5DB	90.2	3.551	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1
17.463	.6875	11/16		3/4-16	3	●	MMS1746X3D180	55.5	2.185	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	●	MMS1746X5D180	90.5	3.563	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1
17.500	.6890			M20x2.5	3	●	MMS1750X3DB	55.7	2.193	91.2	3.591	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	●	MMS1750X5DB	90.7	3.571	126.2	4.969	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1
17.600	.6929				3	□	MMS1760X3DB	56.0	2.205	93.2	3.669	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	□	MMS1760X5DB	91.2	3.591	129.2	5.087	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1
17.700	.6969				3	□	MMS1770X3DB	56.3	2.217	93.2	3.669	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	□	MMS1770X5DB	91.7	3.610	129.2	5.087	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1

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DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
17.800	.7008				3	□	MMS1780X3DB	56.6	2.228	93.2	3.669	93.2	3.669	152.2	5.992	149	5.866	3.2	.126	18	.709	1
					5	□	MMS1780X5DB	92.2	3.630	129.2	5.087	129.2	5.087	188.2	7.409	185	7.283	3.2	.126	18	.709	1
17.860	.7032	45/64			3	●	MMS1786X3D180	56.8	2.236	93.3	3.673	93.3	3.673	152.3	5.996	149	5.866	3.3	.130	18	.709	1
					5	●	MMS1786X5D180	92.5	3.642	129.3	5.091	129.3	5.091	188.3	7.413	185	7.283	3.3	.130	18	.709	1
17.900	.7047				3	□	MMS1790X3DB	57.0	2.244	93.3	3.673	93.3	3.673	152.3	5.996	149	5.866	3.3	.130	18	.709	1
					5	□	MMS1790X5DB	92.8	3.654	129.3	5.091	129.3	5.091	188.3	7.413	185	7.283	3.3	.130	18	.709	1
18.000	.7087				3	●	MMS1800X3DB	57.3	2.256	93.3	3.673	93.3	3.673	152.3	5.996	149	5.866	3.3	.130	18	.709	1
					5	●	MMS1800X5DB	93.3	3.673	129.3	5.091	129.3	5.091	188.3	7.413	185	7.283	3.3	.130	18	.709	1
18.100	.7126				3	□	MMS1810X3DB	57.6	2.268	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787	1
					5	□	MMS1810X5DB	93.8	3.693	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787	1
18.200	.7165				3	□	MMS1820X3DB	57.9	2.280	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787	1
					5	□	MMS1820X5DB	94.3	3.713	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787	1
18.257	.7188	23/32			3	●	MMS1826X3D200	58.1	2.287	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787	1
					5	●	MMS1826X5D200	94.6	3.724	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787	1
18.300	.7205				3	□	MMS1830X3DB	58.2	2.291	96.3	3.791	99.3	3.909	160.3	6.311	157	6.181	3.3	.130	20	.787	1
					5	□	MMS1830X5DB	94.8	3.732	133.3	5.248	137.3	5.406	198.3	7.807	195	7.677	3.3	.130	20	.787	1
18.400	.7244				3	□	MMS1840X3DB	58.5	2.303	96.4	3.795	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	□	MMS1840X5DB	95.3	3.752	133.4	5.252	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
18.500	.7283			M20x1.5	3	●	MMS1850X3DB	58.9	2.319	96.4	3.795	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	●	MMS1850X5DB	95.9	3.776	133.4	5.252	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
18.600	.7323				3	□	MMS1860X3DB	59.2	2.331	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	□	MMS1860X5DB	96.4	3.795	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
18.654	.7344	47/64			3	●	MMS1865X3D200	59.3	2.335	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	●	MMS1865X5D200	96.6	3.803	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
18.700	.7362				3	□	MMS1870X3DB	59.5	2.343	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	□	MMS1870X5DB	96.9	3.815	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
18.800	.7402				3	□	MMS1880X3DB	59.8	2.354	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	□	MMS1880X5DB	97.4	3.835	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
18.900	.7441				3	□	MMS1890X3DB	60.1	2.366	98.4	3.874	99.4	3.913	160.4	6.315	157	6.181	3.4	.134	20	.787	1
					5	□	MMS1890X5DB	97.9	3.854	136.4	5.370	137.4	5.409	198.4	7.811	195	7.677	3.4	.134	20	.787	1
19.000	.7480				3	●	MMS1900X3DB	60.5	2.382	98.5	3.878	99.5	3.917	160.5	6.319	157	6.181	3.5	.138	20	.787	1
					5	●	MMS1900X5DB	98.5	3.878	136.5	5.374	137.5	5.413	198.5	7.815	195	7.677	3.5	.138	20	.787	1
19.050	.7500	3/4			3	●	MMS1905X3D200	60.6	2.386	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	●	MMS1905X5D200	98.7	3.886	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.100	.7520				3	□	MMS1910X3DB	60.8	2.394	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	□	MMS1910X5DB	99.0	3.898	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.200	.7559				3	□	MMS1920X3DB	61.1	2.406	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	□	MMS1920X5DB	99.5	3.917	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.254	.7580		Tube Sheet		3	●	MMS1925X3D200	61.2	2.409	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	●	MMS1925X5D200	99.7	3.925	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.300	.7598				3	□	MMS1930X3DB	61.4	2.417	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	□	MMS1930X5DB	100.0	3.937	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.400	.7638				3	□	MMS1940X3DB	61.7	2.429	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	□	MMS1940X5DB	100.5	3.957	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.447	.7657	49/64		7/8-9	3	●	MMS1945X3D200	61.8	2.433	101.5	3.996	103.5	4.075	164.5	6.476	161	6.339	3.5	.138	20	.787	1
					5	●	MMS1945X5D200	100.7	3.965	140.5	5.531	143.5	5.650	204.5	8.051	201	7.913	3.5	.138	20	.787	1
19.500	.7677			M22x2.5	3	●	MMS1950X3DB	62.0	2.441	101.6	4.000	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	●	MMS1950X5DB	101.0	3.976	140.6	5.535	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		DP7020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
19.600	.7717				3	□	MMS1960X3DB	62.4	2.457	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	□	MMS1960X5DB	101.6	4.000	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1
19.700	.7756				3	□	MMS1970X3DB	62.7	2.469	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	□	MMS1970X5DB	102.1	4.020	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1
19.800	.7795				3	□	MMS1980X3DB	63.0	2.480	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	□	MMS1980X5DB	102.6	4.039	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1
19.844	.7813	25/32			3	●	MMS1984X3D200	63.1	2.484	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	●	MMS1984X5D200	102.8	4.047	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1
19.900	.7835				3	□	MMS1990X3DB	63.3	2.492	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	□	MMS1990X5DB	103.1	4.059	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1
20.000	.7874				3	●	MMS2000X3DB	63.6	2.504	103.6	4.079	103.6	4.079	164.6	6.480	161	6.339	3.6	.142	20	.787	1
					5	●	MMS2000X5DB	103.6	4.079	143.6	5.654	143.6	5.654	204.6	8.055	201	7.913	3.6	.142	20	.787	1

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		Austenitic Stainless Steel (>200HB) AISI 304LN, 316LN etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1181	**3.0**	260 (195—330)	.0051 (.0031—.0071)	195 (150—260)	.0039 (.0020—.0059)
.1575	**4.0**	260 (195—330)	.0059 (.0039—.0079)	195 (150—260)	.0047 (.0031—.0071)
.1969	**5.0**	260 (195—330)	.0059 (.0039—.0079)	195 (150—260)	.0047 (.0031—.0071)
.2480	**6.3**	260 (195—330)	.0067 (.0047—.0087)	195 (150—260)	.0059 (.0039—.0079)
.3150	**8.0**	260 (195—330)	.0075 (.0055—.0094)	195 (150—260)	.0067 (.0047—.0087)
.3937	**10.0**	195 (150—230)	.0079 (.0059—.0098)	165 (130—195)	.0071 (.0051—.0091)
.4724	**12.0**	195 (150—230)	.0083 (.0063—.0102)	165 (130—195)	.0075 (.0055—.0094)
.6299	**16.0**	195 (150—230)	.0087 (.0067—.0106)	165 (130—195)	.0079 (.0059—.0098)
.7874	**20.0**	195 (150—230)	.0091 (.0071—.0110)	165 (130—195)	.0083 (.0063—.0102)

Workpiece Material		Duplex Steel (≤280HB) AISI 329 etc.		Ferritic, Martensitic Stainless Steel (≤200HB) AISI 410, 430 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1181	**3.0**	165 (130—195)	.0039 (.0020—.0059)	260 (195—330)	.0051 (.0031—.0071)
.1575	**4.0**	165 (130—195)	.0047 (.0031—.0071)	260 (195—330)	.0059 (.0039—.0079)
.1969	**5.0**	165 (130—195)	.0047 (.0031—.0071)	260 (195—330)	.0059 (.0039—.0079)
.2480	**6.3**	165 (130—195)	.0059 (.0039—.0079)	260 (195—330)	.0067 (.0047—.0087)
.3150	**8.0**	165 (130—195)	.0067 (.0047—.0087)	260 (195—330)	.0075 (.0055—.0094)
.3937	**10.0**	130 (100—165)	.0071 (.0051—.0091)	195 (150—260)	.0079 (.0059—.0098)
.4724	**12.0**	130 (100—165)	.0075 (.0055—.0094)	195 (150—260)	.0083 (.0063—.0102)
.6299	**16.0**	130 (100—165)	.0079 (.0059—.0098)	195 (150—260)	.0087 (.0067—.0106)
.7874	**20.0**	130 (100—165)	.0083 (.0063—.0102)	195 (150—260)	.0083 (.0071—.0110)

Note 1) For stable machining, internal coolant supply with high pressure is recommended.
Note 2) Emulsion type of water coolant is recommended.
Note 3) Recommended cutting conditions are for machining under the conditions of favorable machining environment and coolant. Please lower the cutting conditions if there is a problem in the rigidity of machine and workpiece, and coolant property or discharge amount.
Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

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RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Ferritic, Martensitic Stainless Steel (>200HB) AISI 431, 420 etc.		PH Stainless Steel (<450HB) S17400, S17700 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1181	**3.0**	195 (150—260)	.0039 (.0020—.0059)	165 (130—195)	.0039 (.0020—.0059)
.1575	**4.0**	195 (150—260)	.0047 (.0031—.0071)	165 (130—195)	.0047 (.0031—.0071)
.1969	**5.0**	195 (150—260)	.0047 (.0031—.0071)	165 (130—195)	.0047 (.0031—.0071)
.2480	**6.3**	195 (150—260)	.0059 (.0039—.0079)	165 (130—195)	.0059 (.0039—.0079)
.3150	**8.0**	195 (150—260)	.0067 (.0047—.0087)	165 (130—195)	.0067 (.0047—.0087)
.3937	**10.0**	165 (130—195)	.0071 (.0051—.0091)	130 (100—165)	.0071 (.0051—.0091)
.4724	**12.0**	165 (130—195)	.0075 (.0055—.0094)	130 (100—165)	.0075 (.0055—.0094)
.6299	**16.0**	165 (130—195)	.0079 (.0059—.0098)	130 (100—165)	.0079 (.0059—.0098)
.7874	**20.0**	165 (130—195)	.0083 (.0063—.0102)	130 (100—165)	.0083 (.0063—.0102)

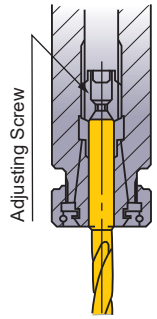
Note 1) For stable machining, internal coolant supply with high pressure is recommended.
Note 2) Emulsion type of water coolant is recommended.
Note 3) Recommended cutting conditions are for machining under the conditions of favorable machining environment and coolant. Please lower the cutting conditions if there is a problem in the rigidity of machine and workpiece, and coolant property or discharge amount.
Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

STAINLESS STEEL CROSS REFERENCE LIST

Workpiece Material	No	USA	Japan	Germany	
		AISI/SAE	**JIS**	W-no.	DIN
Ferritic, Martensitic Stainless Steel	**1**	416	SUS416	1.4005	X12CrS3
		410	SUS410	1.4006	X10Cr13
		430	SUS430	1.4016	X6Cr17
		434	SUS434	1.4113	X6CrMo17
		430Ti	SUS430LX	1.4510	X6CrTi17
		409	—	1.4512	X6CrTi12
	2	420	SUS420J1	1.4021	X20Cr13
		431	SUS431	1.4057	X20CrNi17-2
		420	SUS420J2	1.4028	X30Cr13
		440C	SUS440C	1.4125	X10CrMo17
PH Stainless Steel	**3**	630 (17-4PH)	SUS630	1.4542	X5CrNiCuNb16 4
		S15500 (15-5PH)	—	1.4545	—
		631 (17-7PH)	SUS631	1.4568	X7CrNiAl17 7
Austenitic Stainless Steel	**4**	304	SUS304	1.4301	X5CrNi18 10
		305	SUS305	1.4303	X5CrNi8-12
		303	SUS303	1.4305	X12CrNiS18-9
		304L	SUS304L	1.4307	X2CrNi19-11
		316	SUS316	1.4401	X5CrNiMo17 12 2
	5	304LN	SUS304LN	1.4311	X2CrNiN18 10
		316L	SUS316L	1.4404	X2CrNiMo17 12 2
		316LN	SUS316LN	1.4406	X2CrNiMoN17 12 2
		—	SUS316L	1.4435	X2CrNiMo18 14 3
		317L	SUS317L	1.4438	X2CrNiMo18 15 4
		N08926	—	1.4529	X1NiCrMoCuN25 20 7
		321	SUS321	1.4541	X6CrNiTi18-10
		347	SUS347	1.4550	X6CrNiNb18-10
		316Ti	SUS316Ti	1.4571	X6CrNiMoTi17 12 2
Duplex Steel	**6**	—	—	1.4362	X2CrNiN23 4
		S32750	SCS14A	1.4410	X2CrNiMoN25 7 4
		329	SUS329J1	1.4460	X3CrNiMoN27 5 2
		S31803	SUS329J3L	1.4462	X2CrNiMoN22 5 3

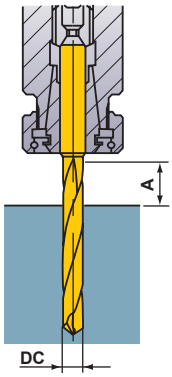
■OPERATIONAL GUIDANCE FOR THE MMS DRILL

Drill Holding



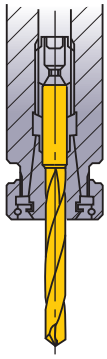
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 1.5

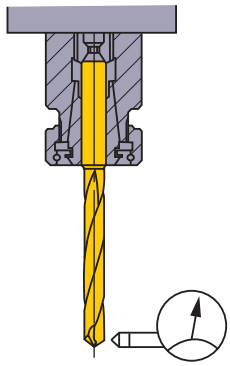
Drill Installation



NG

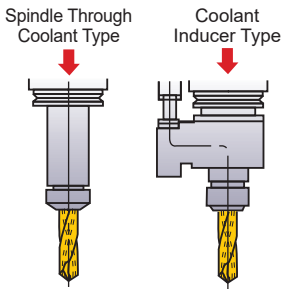
Do not clamp on the flutes.

Installation Tolerance



Runout ≤ .001"

Through Coolant Type



Coolant pressure is approx. 70 - 1015 PSI (0.5 - 7MPa).

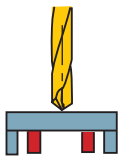
Coolant Handling

< MMS type >

1) Dirt and dust particles in old coolant can clog the oil hole and prevent effective flow. Regular coolant exchange is recommended.

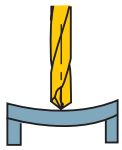
2) Small particles of swarf will jam in the oil hole. Use a filter as a preventative measure. When using small diameter drills, use a fine mesh filter.

Thin Workpiece



Support the Workpiece

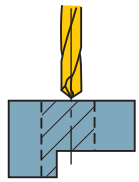
OK



If bending Occurs

NG

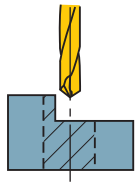
Interrupted Cutting



One Process

OK

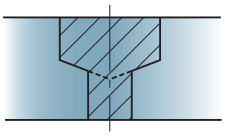
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

①Spot face with an end mill prior to drilling.

Stepped Holes

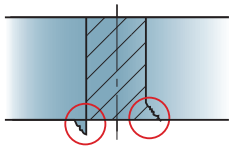


①Divide the machining into two processes.

②Drill the larger hole first.

*Tools for chamfering and spot facing can be produced to order.

Burring and Workpiece Chipping



①Lower the feed rate when breaking through.

②Add a chamfer.

③Change the point angle.

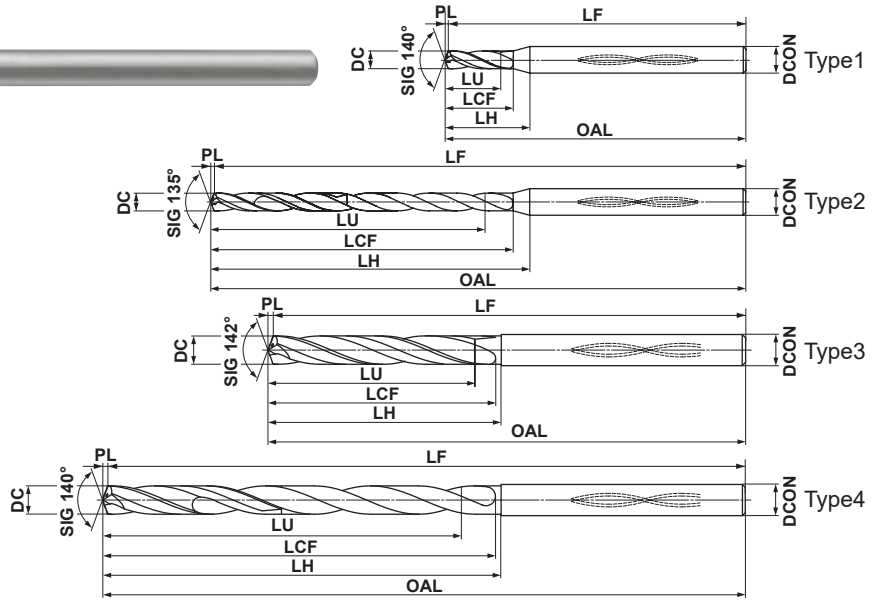
MHS

- Solid carbide drills for die & mold machining
- High buckling strength and unique double margin.
- Non-step drilling with long tool life for hardened steel, 35HRC-55HRC

P | M | K | N | S | H

METRIC STANDARD

Internal Coolant



DC≤3	3<DC≤6	6<DC≤10	10<DC≤12
+0.010 −0.002	+0.010 −0.002	+0.010 −0.005	+0.010 −0.008
DCON=3	3<DCON≤6	6<DCON≤10	10<DCON≤12
0 −0.006	0 −0.008	0 −0.009	0 −0.011

Note 1) MHS drills are suitable for use with shrink fit holders.
Note 2) For L/D ≥ 10 recommend use of smallest L/D available in respective DC as pilot drill.

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.950	.0374				3	★	MHS0095L006B	3.0	.118	6.17	.243	9.97	.393	60.17	2.369	60	2.362	0.17	.007	3	.118	1
					6	★	MHS0095L009B	5.9	.232	9.20	.362	13.00	.512	60.20	2.370	60	2.362	0.20	.008	3	.118	2
					13	★	MHS0095L015B	12.5	.492	15.20	.598	19.00	.748	60.20	2.370	60	2.362	0.20	.008	3	.118	2
					23	★	MHS0095L025B	22.0	.866	25.20	.992	29.00	1.142	60.20	2.370	60	2.362	0.20	.008	3	.118	2
					30	★	MHS0095L035B	28.7	1.130	35.20	1.386	39.00	1.535	80.20	3.157	80	3.150	0.20	.008	3	.118	2
1.000	.0394				3	★	MHS0100L006B	3.2	.126	6.2	.244	9.9	.390	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					6	★	MHS0100L009B	6.2	.244	9.2	.362	12.9	.508	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					12	★	MHS0100L015B	12.2	.480	15.2	.598	18.9	.744	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					22	★	MHS0100L025B	22.2	.874	25.2	.992	28.9	1.138	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					30	★	MHS0100L035B	30.2	1.189	35.2	1.386	38.9	1.531	80.2	3.157	80	3.150	0.2	.008	3	.118	2
1.100	.0433				2	★	MHS0110L006B	2.4	.094	6.2	.244	9.7	.382	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					5	★	MHS0110L009B	5.7	.224	9.2	.362	12.7	.500	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					11	★	MHS0110L015B	12.3	.484	15.2	.598	18.7	.736	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					20	★	MHS0110L025B	22.2	.874	25.2	.992	28.7	1.130	60.2	2.370	60	2.362	0.2	.008	3	.118	2
					29	★	MHS0110L035B	32.1	1.264	35.2	1.386	38.7	1.524	80.2	3.157	80	3.150	0.2	.008	3	.118	2
1.200	.0472				2	★	MHS0120L006B	2.6	.102	6.2	.244	9.6	.378	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					5	★	MHS0120L009B	6.2	.244	9.3	.366	12.7	.500	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					10	★	MHS0120L015B	12.2	.480	15.3	.602	18.7	.736	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					18	★	MHS0120L025B	21.8	.858	25.3	.996	28.7	1.130	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					26	★	MHS0120L035B	31.4	1.236	35.3	1.390	38.7	1.524	80.3	3.161	80	3.150	0.3	.012	3	.118	2
1.300	.0512				2	★	MHS0130L007B	2.8	.110	7.2	.283	10.4	.409	60.2	2.370	60	2.362	0.2	.008	3	.118	1
					5	★	MHS0130L011B	6.8	.268	11.3	.445	14.5	.571	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					12	★	MHS0130L020B	15.9	.626	20.3	.799	23.5	.925	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					20	★	MHS0130L030B	26.3	1.035	30.3	1.193	33.5	1.319	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	MHS0130L045B	39.3	1.547	45.3	1.783	48.5	1.909	80.3	3.161	80	3.150	0.3	.012	3	.118	2

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					2	★	**MHS0140L007B**	3.1	.122	7.3	.287	10.3	.406	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	**MHS0140L011B**	7.3	.287	11.3	.445	14.3	.563	60.3	2.374	60	2.362	0.3	.012	3	.118	2
1.400	**.0551**				11	★	**MHS0140L020B**	15.7	.618	20.3	.799	23.3	.917	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					18	★	**MHS0140L030B**	25.5	1.004	30.3	1.193	33.3	1.311	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					29	★	**MHS0140L045B**	40.9	1.610	45.3	1.783	48.3	1.902	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					3	★	**MHS0145L008B**	4.7	.185	8.3	.327	11.2	.441	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					6	★	**MHS0145L013B**	9.0	.354	13.3	.524	16.2	.638	60.3	2.374	60	2.362	0.3	.012	3	.118	2
1.450	**.0571**				11	★	**MHS0145L020B**	16.3	.642	20.3	.799	23.2	.913	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					21	★	**MHS0145L035B**	30.8	1.213	35.3	1.390	38.2	1.504	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	**MHS0145L055B**	43.8	1.724	55.3	2.177	58.2	2.291	100.3	3.949	100	3.937	0.3	.012	3	.118	2
					2	★	**MHS0150L008B**	3.3	.130	8.3	.327	11.1	.437	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					6	★	**MHS0150L013B**	9.3	.366	13.3	.524	16.1	.634	60.3	2.374	60	2.362	0.3	.012	3	.118	2
1.500	**.0591**			**#1-64**	10	★	**MHS0150L020B**	15.3	.602	20.3	.799	23.1	.909	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					20	★	**MHS0150L035B**	30.3	1.193	35.3	1.390	38.1	1.500	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	**MHS0150L055B**	45.3	1.783	55.3	2.177	58.1	2.287	100.3	3.949	100	3.937	0.3	.012	3	.118	2
					2	★	**MHS0160L008B**	3.5	.138	8.3	.327	10.9	.429	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	**MHS0160L013B**	8.3	.327	13.3	.524	15.9	.626	60.3	2.374	60	2.362	0.3	.012	3	.118	2
1.600	**.0630**				10	★	**MHS0160L020B**	16.3	.642	20.3	.799	22.9	.902	60.3	2.374	60	2.362	0.3	.012	3	.118	2
					19	★	**MHS0160L035B**	30.7	1.209	35.3	1.390	37.9	1.492	80.3	3.161	80	3.150	0.3	.012	3	.118	2
					30	★	**MHS0160L055B**	48.3	1.902	55.3	2.177	57.9	2.280	100.3	3.949	100	3.937	0.3	.012	3	.118	2
					2	★	**MHS0170L008B**	3.7	.146	8.3	.327	10.7	.421	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	**MHS0170L013B**	8.9	.350	13.4	.528	15.8	.622	60.4	2.378	60	2.362	0.4	.016	3	.118	2
1.700	**.0669**				9	★	**MHS0170L020B**	15.7	.618	20.4	.803	22.8	.898	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					18	★	**MHS0170L035B**	31.0	1.220	35.4	1.394	37.8	1.488	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					29	★	**MHS0170L055B**	49.7	1.957	55.4	2.181	57.8	2.276	100.4	3.953	100	3.937	0.4	.016	3	.118	2
					3	★	**MHS0180L010B**	5.7	.224	10.3	.406	12.5	.492	60.3	2.374	60	2.362	0.3	.012	3	.118	1
					5	★	**MHS0180L015B**	9.4	.370	15.4	.606	17.6	.693	60.4	2.378	60	2.362	0.4	.016	3	.118	2
1.800	**.0709**				11	★	**MHS0180L025B**	20.2	.795	25.4	1.000	27.6	1.087	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					22	★	**MHS0180L045B**	40.0	1.575	45.4	1.787	47.6	1.874	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	**MHS0180L065B**	54.4	2.142	65.4	2.575	67.6	2.661	100.4	3.953	100	3.937	0.4	.016	3	.118	2
					2	★	**MHS0190L010B**	4.1	.161	10.4	.409	12.5	.492	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	**MHS0190L015B**	9.9	.390	15.4	.606	17.5	.689	60.4	2.378	60	2.362	0.4	.016	3	.118	2
1.900	**.0748**				10	★	**MHS0190L025B**	19.4	.764	25.4	1.000	27.5	1.083	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					21	★	**MHS0190L045B**	40.3	1.587	45.4	1.787	47.5	1.870	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	**MHS0190L065B**	57.4	2.260	65.4	2.575	67.5	2.657	100.4	3.953	100	3.937	0.4	.016	3	.118	2
					2	★	**MHS0195L010B**	4.3	.169	10.4	.409	12.4	.488	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	**MHS0195L015B**	10.2	.402	15.4	.606	17.4	.685	60.4	2.378	60	2.362	0.4	.016	3	.118	2
1.950	**.0768**				10	★	**MHS0195L025B**	19.9	.783	25.4	1.000	27.4	1.079	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					20	★	**MHS0195L045B**	39.4	1.551	45.4	1.787	47.4	1.866	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	**MHS0195L065B**	58.9	2.319	65.4	2.575	67.4	2.654	100.4	3.953	100	3.937	0.4	.016	3	.118	2
					2	★	**MHS0200L010B**	4.4	.173	10.4	.409	12.3	.484	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	**MHS0200L015B**	10.4	.409	15.4	.606	17.3	.681	60.4	2.378	60	2.362	0.4	.016	3	.118	2
2.000	**.0787**			**#3-48**	9	★	**MHS0200L025B**	18.4	.724	25.4	1.000	27.3	1.075	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					20	★	**MHS0200L045B**	40.4	1.591	45.4	1.787	47.3	1.862	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					30	★	**MHS0200L065B**	60.4	2.378	65.4	2.575	67.3	2.650	100.4	3.953	100	3.937	0.4	.016	3	.118	2

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.100	.0827				3	★	MHS0210L012B	6.7	.264	12.4	.488	14.1	.555	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					7	★	MHS0210L020B	15.1	.594	20.4	.803	22.1	.870	60.4	2.378	60	2.362	0.4	.016	3	.118	2
					11	★	MHS0210L030B	23.5	.925	30.4	1.197	32.1	1.264	80.4	3.165	80	3.150	0.4	.016	3	.118	2
					23	★	MHS0210L055B	48.7	1.917	55.4	2.181	57.1	2.248	100.4	3.953	100	3.937	0.4	.016	3	.118	2
					30	★	MHS0210L075B	63.4	2.496	75.4	2.969	77.1	3.035	120.4	4.740	120	4.724	0.4	.016	3	.118	2
2.200	.0866				2	★	MHS0220L012B	4.8	.189	12.4	.488	13.9	.547	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					6	★	MHS0220L020B	13.7	.539	20.5	.807	22.0	.866	60.5	2.382	60	2.362	0.5	.020	3	.118	2
					11	★	MHS0220L030B	24.7	.972	30.5	1.201	32.0	1.260	80.5	3.169	80	3.150	0.5	.020	3	.118	2
					22	★	MHS0220L055B	48.9	1.925	55.5	2.185	57.0	2.244	100.5	3.957	100	3.937	0.5	.020	3	.118	2
					30	★	MHS0220L075B	66.5	2.618	75.5	2.972	77.0	3.031	120.5	4.744	120	4.724	0.5	.020	3	.118	2
2.300	.0906				2	★	MHS0230L012B	5.0	.197	12.4	.488	13.7	.539	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					6	★	MHS0230L020B	14.3	.563	20.5	.807	21.8	.858	60.5	2.382	60	2.362	0.5	.020	3	.118	2
					10	★	MHS0230L030B	23.5	.925	30.5	1.201	31.8	1.252	80.5	3.169	80	3.150	0.5	.020	3	.118	2
					21	★	MHS0230L055B	48.8	1.921	55.5	2.185	56.8	2.236	100.5	3.957	100	3.937	0.5	.020	3	.118	2
					30	★	MHS0230L075B	69.5	2.736	75.5	2.972	76.8	3.024	120.5	4.744	120	4.724	0.5	.020	3	.118	2
2.400	.0945				2	★	MHS0240L012B	5.2	.205	12.4	.488	13.5	.531	60.4	2.378	60	2.362	0.4	.016	3	.118	1
					5	★	MHS0240L020B	12.5	.492	20.5	.807	21.6	.850	60.5	2.382	60	2.362	0.5	.020	3	.118	2
					9	★	MHS0240L030B	22.1	.870	30.5	1.201	31.6	1.244	80.5	3.169	80	3.150	0.5	.020	3	.118	2
					20	★	MHS0240L055B	48.5	1.909	55.5	2.185	56.6	2.228	100.5	3.957	100	3.937	0.5	.020	3	.118	2
					28	★	MHS0240L075B	67.7	2.665	75.5	2.972	76.6	3.016	120.5	4.744	120	4.724	0.5	.020	3	.118	2
2.450	.0965				2	★	MHS0245L013B	5.3	.209	13.5	.531	14.5	.571	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					5	★	MHS0245L020B	12.8	.504	20.5	.807	21.5	.846	70.5	2.776	70	2.756	0.5	.020	4	.157	2
					11	★	MHS0245L035B	27.5	1.083	35.5	1.398	36.5	1.437	90.5	3.563	90	3.543	0.5	.020	4	.157	2
					24	★	MHS0245L065B	59.3	2.335	65.5	2.579	66.5	2.618	110.5	4.350	110	4.331	0.5	.020	4	.157	2
					30	★	MHS0245L090B	74.0	2.913	90.5	3.563	91.5	3.602	140.5	5.531	140	5.512	0.5	.020	4	.157	2
2.500	.0984				2	★	MHS0250L013B	5.5	.217	13.5	.531	16.3	.642	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					5	★	MHS0250L020B	13.0	.512	20.5	.807	23.3	.917	70.5	2.776	70	2.756	0.5	.020	4	.157	2
					11	★	MHS0250L035B	28.0	1.102	35.5	1.398	38.3	1.508	90.5	3.563	90	3.543	0.5	.020	4	.157	2
					23	★	MHS0250L065B	58.0	2.283	65.5	2.579	68.3	2.689	110.5	4.350	110	4.331	0.5	.020	4	.157	2
					30	★	MHS0250L090B	75.5	2.972	90.5	3.563	93.3	3.673	140.5	5.531	140	5.512	0.5	.020	4	.157	2
2.600	.1024				2	★	MHS0260L013B	5.7	.224	13.5	.531	16.1	.634	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					5	★	MHS0260L020B	13.5	.531	20.5	.807	23.1	.909	70.5	2.776	70	2.756	0.5	.020	4	.157	2
					10	★	MHS0260L035B	26.5	1.043	35.5	1.398	38.1	1.500	90.5	3.563	90	3.543	0.5	.020	4	.157	2
					22	★	MHS0260L065B	57.7	2.272	65.5	2.579	68.1	2.681	110.5	4.350	110	4.331	0.5	.020	4	.157	2
					30	★	MHS0260L090B	78.5	3.091	90.5	3.563	93.1	3.665	140.5	5.531	140	5.512	0.5	.020	4	.157	2
2.700	.1063		36	#6-32	2	★	MHS0270L013B	5.9	.232	13.5	.531	15.9	.626	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0270L020B	11.4	.449	20.6	.811	23.0	.906	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					10	★	MHS0270L035B	27.6	1.087	35.6	1.402	38.0	1.496	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					21	★	MHS0270L065B	57.3	2.256	65.6	2.583	68.0	2.677	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					30	★	MHS0270L090B	81.6	3.213	90.6	3.567	93.0	3.661	140.6	5.535	140	5.512	0.6	.024	4	.157	2
2.800	.1102		35		2	★	MHS0280L014B	6.1	.240	14.5	.571	16.7	.657	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0280L020B	11.8	.465	20.6	.811	22.8	.898	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					9	★	MHS0280L035B	25.8	1.016	35.6	1.402	37.8	1.488	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					20	★	MHS0280L065B	56.6	2.228	65.6	2.583	67.8	2.669	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					29	★	MHS0280L090B	81.8	3.220	90.6	3.567	92.8	3.654	140.6	5.535	140	5.512	0.6	.024	4	.157	2

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.900	.1142				2	★	MHS0290L014B	6.3	.248	14.5	.571	16.6	.654	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0290L020B	12.2	.480	20.6	.811	22.7	.894	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					9	★	MHS0290L035B	26.7	1.051	35.6	1.402	37.7	1.484	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					19	★	MHS0290L065B	55.7	2.193	65.6	2.583	67.7	2.665	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					28	★	MHS0290L090B	81.8	3.220	90.6	3.567	92.7	3.650	140.6	5.535	140	5.512	0.6	.024	4	.157	2
2.950	.1161		32		2	★	MHS0295L014B	6.4	.252	14.5	.571	16.5	.650	70.5	2.776	70	2.756	0.5	.020	4	.157	1
					4	★	MHS0295L020B	12.4	.488	20.6	.811	22.6	.890	70.6	2.780	70	2.756	0.6	.024	4	.157	2
					9	★	MHS0295L035B	27.2	1.071	35.6	1.402	37.6	1.480	90.6	3.567	90	3.543	0.6	.024	4	.157	2
					19	★	MHS0295L065B	56.7	2.232	65.6	2.583	67.6	2.661	110.6	4.354	110	4.331	0.6	.024	4	.157	2
					28	★	MHS0295L090B	83.2	3.276	90.6	3.567	92.6	3.646	140.6	5.535	140	5.512	0.6	.024	4	.157	2
3.000	.1181				4	★	MHS0300L020B	12.5	.492	19.6	.772	20.6	.811	70.6	2.780	70	2.756	0.6	.024	4	.157	3
					10	★	MHS0300L040B	30.5	1.201	39.6	1.559	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					17	★	MHS0300L060B	51.5	2.028	59.6	2.346	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					27	★	MHS0300L090B	81.5	3.209	89.6	3.528	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.100	.1220				4	□	MHS0310L020B	12.9	.508	20.1	.791	20.6	.811	70.6	2.780	70	2.756	0.6	.024	4	.157	3
					10	□	MHS0310L040B	31.6	1.244	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					17	□	MHS0310L060B	53.3	2.098	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					26	□	MHS0310L090B	81.2	3.197	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.200	.1260				4	□	MHS0320L020B	13.4	.528	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					10	□	MHS0320L040B	32.6	1.283	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					16	□	MHS0320L060B	51.8	2.039	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					25	□	MHS0320L090B	80.6	3.173	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.300	.1299			M4x.7	3	□	MHS0330L020B	10.5	.413	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					9	□	MHS0330L040B	30.3	1.193	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					16	□	MHS0330L060B	53.4	2.102	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					25	□	MHS0330L090B	83.1	3.272	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.400	.1339				3	□	MHS0340L020B	10.8	.425	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					9	□	MHS0340L040B	31.2	1.228	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					15	□	MHS0340L060B	51.6	2.031	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					24	□	MHS0340L090B	82.2	3.236	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.500	.1378				3	★	MHS0350L020B	11.1	.437	20.2	.795	20.7	.815	70.7	2.783	70	2.756	0.7	.028	4	.157	3
					9	★	MHS0350L040B	32.1	1.264	40.1	1.579	40.6	1.598	90.6	3.567	90	3.543	0.6	.024	4	.157	4
					14	★	MHS0350L060B	49.6	1.953	60.1	2.366	60.6	2.386	110.6	4.354	110	4.331	0.6	.024	4	.157	4
					23	★	MHS0350L090B	81.1	3.193	90.1	3.547	90.6	3.567	140.6	5.535	140	5.512	0.6	.024	4	.157	4
3.600	.1417				3	□	MHS0360L020B	11.4	.449	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					9	□	MHS0360L040B	33.1	1.303	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					14	□	MHS0360L060B	51.1	2.012	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					22	□	MHS0360L090B	79.9	3.146	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					30	□	MHS0360L120B	108.7	4.280	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
3.700	.1457			M4.5x.75	3	□	MHS0370L020B	11.7	.461	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					8	□	MHS0370L040B	30.3	1.193	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					14	□	MHS0370L060B	52.5	2.067	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					22	□	MHS0370L090B	82.1	3.232	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					30	□	MHS0370L120B	111.7	4.398	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.800	.1496		25	#10-24	3	★	MHS0380L020B	12.1	.476	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					8	★	MHS0380L040B	31.1	1.224	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					13	★	MHS0380L060B	50.1	1.972	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					21	★	MHS0380L090B	80.5	3.169	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					29	★	MHS0380L120B	110.9	4.366	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
3.900	.1535				3	★	MHS0390L020B	12.4	.488	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					8	★	MHS0390L040B	31.9	1.256	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					13	★	MHS0390L060B	51.4	2.024	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					21	□	MHS0390L090B	82.6	3.252	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					28	□	MHS0390L120B	109.9	4.327	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
4.000	.1575				2	★	MHS0400L020B	8.7	.343	20.8	.819	20.8	.819	70.8	2.787	70	2.756	0.8	.031	4	.157	3
					7	★	MHS0400L040B	28.7	1.130	40.7	1.602	40.7	1.602	90.7	3.571	90	3.543	0.7	.028	4	.157	4
					12	★	MHS0400L060B	48.7	1.917	60.7	2.390	60.7	2.390	110.7	4.358	110	4.331	0.7	.028	4	.157	4
					20	★	MHS0400L090B	80.7	3.177	90.7	3.571	90.7	3.571	140.7	5.539	140	5.512	0.7	.028	4	.157	4
					27	★	MHS0400L120B	108.7	4.280	120.7	4.752	120.7	4.752	170.7	6.720	170	6.693	0.7	.028	4	.157	4
4.100	.1614				2	□	MHS0410L020B	8.9	.350	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					7	□	MHS0410L040B	29.4	1.157	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					12	□	MHS0410L060B	49.9	1.965	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					19	□	MHS0410L090B	78.6	3.094	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					26	□	MHS0410L120B	107.3	4.224	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
4.200	.1654			M5x.8	2	□	MHS0420L020B	9.1	.358	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					7	□	MHS0420L040B	30.2	1.189	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					11	□	MHS0420L060B	47.0	1.850	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					19	□	MHS0420L090B	80.6	3.173	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					26	□	MHS0420L120B	110.0	4.331	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
4.300	.1693				2	□	MHS0430L020B	9.3	.366	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					6	□	MHS0430L040B	26.6	1.047	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					11	□	MHS0430L060B	48.1	1.894	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					18	□	MHS0430L090B	78.2	3.079	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					25	□	MHS0430L120B	108.3	4.264	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
4.400	.1732		17		2	★	MHS0440L020B	9.6	.378	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					6	□	MHS0440L040B	27.2	1.071	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					11	□	MHS0440L060B	49.2	1.937	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					18	□	MHS0440L090B	80.0	3.150	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					24	□	MHS0440L120B	106.4	4.189	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
4.500	.1772		16	#12-24	2	★	MHS0450L020B	9.8	.386	19.4	.764	20.9	.823	70.9	2.791	70	2.756	0.9	.035	6	.236	3
					6	★	MHS0450L040B	27.8	1.094	39.3	1.547	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					10	★	MHS0450L060B	45.8	1.803	59.3	2.335	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					17	★	MHS0450L090B	77.3	3.043	89.3	3.516	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					24	★	MHS0450L120B	108.8	4.283	119.3	4.697	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
4.600	.1811				2	□	MHS0460L020B	10.0	.394	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					6	□	MHS0460L040B	28.4	1.118	39.8	1.567	40.8	1.606	90.8	3.575	90	3.543	0.8	.031	6	.236	4
					10	□	MHS0460L060B	46.8	1.843	59.8	2.354	60.8	2.394	110.8	4.362	110	4.331	0.8	.031	6	.236	4
					17	□	MHS0460L090B	79.0	3.110	89.8	3.535	90.8	3.575	140.8	5.543	140	5.512	0.8	.031	6	.236	4
					23	□	MHS0460L120B	106.6	4.197	119.8	4.717	120.8	4.756	170.8	6.724	170	6.693	0.8	.031	6	.236	4
					30	□	MHS0460L150B	138.8	5.465	149.8	5.898	150.8	5.937	200.8	7.906	200	7.874	0.8	.031	6	.236	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.700	.1850		13		2	□	MHS0470L020B	10.2	.402	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					6	□	MHS0470L040B	29.1	1.146	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					10	□	MHS0470L060B	47.9	1.886	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					16	□	MHS0470L090B	76.1	2.996	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					23	□	MHS0470L120B	109.0	4.291	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					29	□	MHS0470L150B	137.2	5.402	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
4.800	.1890		12		1	★	MHS0480L020B	5.6	.220	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					6	★	MHS0480L040B	29.7	1.169	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					10	★	MHS0480L060B	48.9	1.925	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					16	★	MHS0480L090B	77.7	3.059	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					22	★	MHS0480L120B	106.5	4.193	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					29	★	MHS0480L150B	140.1	5.516	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
4.900	.1929				1	□	MHS0490L020B	5.7	.224	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					5	□	MHS0490L040B	25.4	1.000	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					10	□	MHS0490L060B	49.9	1.965	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					16	□	MHS0490L090B	79.3	3.122	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					22	□	MHS0490L120B	108.7	4.280	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					28	□	MHS0490L150B	138.1	5.437	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
5.000	.1969			M6x10	1	★	MHS0500L020B	5.9	.232	20.0	.787	21.0	.827	71.0	2.795	70	2.756	1.0	.039	6	.236	3
					5	★	MHS0500L040B	25.9	1.020	39.9	1.571	40.9	1.610	90.9	3.579	90	3.543	0.9	.035	6	.236	4
					9	★	MHS0500L060B	45.9	1.807	59.9	2.358	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					15	★	MHS0500L090B	75.9	2.988	89.9	3.539	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					21	★	MHS0500L120B	105.9	4.169	119.9	4.720	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					27	★	MHS0500L150B	135.9	5.350	149.9	5.902	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
5.100	.2008		7	1/4-20	3	□	MHS0510L030B	16.2	.638	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0510L060B	46.8	1.843	60.4	2.378	60.9	2.398	110.9	4.366	110	4.331	0.9	.035	6	.236	4
					15	□	MHS0510L090B	77.4	3.047	90.4	3.559	90.9	3.579	140.9	5.547	140	5.512	0.9	.035	6	.236	4
					21	□	MHS0510L120B	108.0	4.252	120.4	4.740	120.9	4.760	170.9	6.728	170	6.693	0.9	.035	6	.236	4
					27	□	MHS0510L150B	138.6	5.457	150.4	5.921	150.9	5.941	200.9	7.909	200	7.874	0.9	.035	6	.236	4
5.200	.2047				3	□	MHS0520L030B	16.5	.650	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0520L060B	47.7	1.878	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					15	□	MHS0520L090B	78.9	3.106	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					20	□	MHS0520L120B	104.9	4.130	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					26	□	MHS0520L150B	136.1	5.358	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.300	.2087		4		3	□	MHS0530L030B	16.8	.661	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0530L060B	48.7	1.917	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					14	★	MHS0530L090B	75.2	2.961	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					20	□	MHS0530L120B	107.0	4.213	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					26	□	MHS0530L150B	138.8	5.465	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.400	.2126		3	1/4-28	3	□	MHS0540L030B	17.1	.673	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					9	□	MHS0540L060B	49.6	1.953	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					14	□	MHS0540L090B	76.6	3.016	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					20	□	MHS0540L120B	109.0	4.291	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					25	□	MHS0540L150B	136.0	5.354	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
5.500	.2165				3	★	MHS0550L030B	17.4	.685	30.6	1.205	31.1	1.224	81.1	3.193	80	3.150	1.1	.043	6	.236	3
					8	★	MHS0550L060B	45.0	1.772	60.5	2.382	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					14	★	MHS0550L090B	78.0	3.071	90.5	3.563	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					19	★	MHS0550L120B	105.5	4.154	120.5	4.744	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					25	★	MHS0550L150B	138.5	5.453	150.5	5.925	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.600	.2205		2		3	□	MHS0560L030B	17.8	.701	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	□	MHS0560L060B	45.8	1.803	61.0	2.402	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					14	□	MHS0560L090B	79.4	3.126	91.0	3.583	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					19	□	MHS0560L120B	107.4	4.228	121.0	4.764	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					24	□	MHS0560L150B	135.4	5.331	151.0	5.945	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.700	.2244				3	□	MHS0570L030B	18.1	.713	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	□	MHS0570L060B	46.6	1.835	61.0	2.402	61.0	2.402	111.0	4.370	110	4.331	1.0	.039	6	.236	4
					13	□	MHS0570L090B	75.1	2.957	91.0	3.583	91.0	3.583	141.0	5.551	140	5.512	1.0	.039	6	.236	4
					19	□	MHS0570L120B	109.3	4.303	121.0	4.764	121.0	4.764	171.0	6.732	170	6.693	1.0	.039	6	.236	4
					24	□	MHS0570L150B	137.8	5.425	151.0	5.945	151.0	5.945	201.0	7.913	200	7.874	1.0	.039	6	.236	4
5.800	.2283		1		3	★	MHS0580L030B	18.4	.724	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	★	MHS0580L060B	47.5	1.870	61.1	2.406	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	6	.236	4
					13	★	MHS0580L090B	76.5	3.012	91.1	3.587	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	6	.236	4
					18	★	MHS0580L120B	105.5	4.154	121.1	4.768	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	6	.236	4
					23	★	MHS0580L150B	134.5	5.295	151.1	5.949	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	6	.236	4
5.900	.2323				3	□	MHS0590L030B	18.7	.736	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					8	□	MHS0590L060B	48.3	1.902	61.1	2.406	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	6	.236	4
					13	□	MHS0590L090B	77.8	3.063	91.1	3.587	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	6	.236	4
					18	□	MHS0590L120B	107.3	4.224	121.1	4.768	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	6	.236	4
					23	□	MHS0590L150B	136.8	5.386	151.1	5.949	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	6	.236	4
6.000	.2362			M7x1.0	2	★	MHS0600L030B	13.0	.512	31.2	1.228	31.2	1.228	81.2	3.197	80	3.150	1.2	.047	6	.236	3
					7	★	MHS0600L060B	43.1	1.697	61.1	2.406	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	6	.236	4
					12	★	MHS0600L090B	73.1	2.878	91.1	3.587	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	6	.236	4
					17	★	MHS0600L120B	103.1	4.059	121.1	4.768	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	6	.236	4
					22	★	MHS0600L150B	133.1	5.240	151.1	5.949	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	6	.236	4
6.100	.2402				2	□	MHS0610L030B	13.3	.524	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0610L060B	43.8	1.724	59.6	2.346	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	8	.315	4
					12	□	MHS0610L090B	74.3	2.925	89.6	3.528	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	8	.315	4
					17	□	MHS0610L120B	104.8	4.126	119.6	4.709	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	8	.315	4
					22	□	MHS0610L150B	135.3	5.327	149.6	5.890	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	8	.315	4
6.200	.2441				2	□	MHS0620L030B	13.5	.531	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0620L060B	44.5	1.752	59.6	2.346	61.1	2.406	111.1	4.374	110	4.331	1.1	.043	8	.315	4
					12	□	MHS0620L090B	75.5	2.972	89.6	3.528	91.1	3.587	141.1	5.555	140	5.512	1.1	.043	8	.315	4
					17	□	MHS0620L120B	106.5	4.193	119.6	4.709	121.1	4.768	171.1	6.736	170	6.693	1.1	.043	8	.315	4
					21	□	MHS0620L150B	131.3	5.169	149.6	5.890	151.1	5.949	201.1	7.917	200	7.874	1.1	.043	8	.315	4
6.300	.2480				2	□	MHS0630L030B	13.7	.539	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0630L060B	45.2	1.780	59.7	2.350	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					12	□	MHS0630L090B	76.7	3.020	89.7	3.531	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	□	MHS0630L120B	101.9	4.012	119.7	4.713	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					21	□	MHS0630L150B	133.4	5.252	149.7	5.894	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
6.400	.2520				2	□	MHS0640L030B	13.9	.547	29.8	1.173	31.3	1.232	81.3	3.201	80	3.150	1.3	.051	8	.315	3
					7	□	MHS0640L060B	46.0	1.811	59.7	2.350	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	□	MHS0640L090B	71.6	2.819	89.7	3.531	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	□	MHS0640L120B	103.6	4.079	119.7	4.713	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					21	□	MHS0640L150B	135.6	5.339	149.7	5.894	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
6.500	.2559				2	★	MHS0650L030B	14.1	.555	29.9	1.177	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	★	MHS0650L060B	40.2	1.583	59.7	2.350	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	★	MHS0650L090B	72.7	2.862	89.7	3.531	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	★	MHS0650L120B	105.2	4.142	119.7	4.713	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					20	★	MHS0650L150B	131.2	5.165	149.7	5.894	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
6.600	.2598				2	□	MHS0660L030B	14.3	.563	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	□	MHS0660L060B	40.8	1.606	60.2	2.370	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	□	MHS0660L090B	73.8	2.906	90.2	3.551	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					16	□	MHS0660L120B	106.8	4.205	120.2	4.732	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					20	□	MHS0660L150B	133.2	5.244	150.2	5.913	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
					28	□	MHS0660L200B	186.0	7.323	200.2	7.882	201.2	7.921	251.2	9.890	250	9.843	1.2	.047	8	.315	4
6.700	.2638			M8x1.25	2	□	MHS0670L030B	14.6	.575	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	□	MHS0670L060B	41.4	1.630	60.2	2.370	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	□	MHS0670L090B	74.9	2.949	90.2	3.551	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					15	□	MHS0670L120B	101.7	4.004	120.2	4.732	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					20	□	MHS0670L150B	135.2	5.323	150.2	5.913	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
					27	□	MHS0670L200B	182.1	7.169	200.2	7.882	201.2	7.921	251.2	9.890	250	9.843	1.2	.047	8	.315	4
6.800	.2677				2	★	MHS0680L030B	14.8	.583	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	★	MHS0680L060B	42.0	1.654	60.2	2.370	61.2	2.409	111.2	4.378	110	4.331	1.2	.047	8	.315	4
					11	★	MHS0680L090B	76.0	2.992	90.2	3.551	91.2	3.591	141.2	5.559	140	5.512	1.2	.047	8	.315	4
					15	★	MHS0680L120B	103.2	4.063	120.2	4.732	121.2	4.772	171.2	6.740	170	6.693	1.2	.047	8	.315	4
					19	★	MHS0680L150B	130.4	5.134	150.2	5.913	151.2	5.953	201.2	7.921	200	7.874	1.2	.047	8	.315	4
					27	★	MHS0680L200B	184.8	7.276	200.2	7.882	201.2	7.921	251.2	9.890	250	9.843	1.2	.047	8	.315	4
6.900	.2717		I	5/16-24	2	□	MHS0690L030B	15.0	.591	30.4	1.197	31.4	1.236	81.4	3.205	80	3.150	1.4	.055	8	.315	3
					6	□	MHS0690L060B	42.7	1.681	60.3	2.374	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0690L090B	70.3	2.768	90.3	3.555	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					15	□	MHS0690L120B	104.8	4.126	120.3	4.736	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					19	□	MHS0690L150B	132.4	5.213	150.3	5.917	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					26	□	MHS0690L200B	180.7	7.114	200.3	7.886	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.000	.2756			M8x1.0	2	★	MHS0700L030B	15.2	.598	30.5	1.201	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	★	MHS0700L060B	43.3	1.705	60.3	2.374	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	★	MHS0700L090B	71.3	2.807	90.3	3.555	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	★	MHS0700L120B	99.3	3.909	120.3	4.736	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					19	★	MHS0700L150B	134.3	5.287	150.3	5.917	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					26	★	MHS0700L200B	183.3	7.217	200.3	7.886	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.100	.2795				2	□	MHS0710L030B	15.4	.606	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0710L060B	43.9	1.728	60.8	2.394	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0710L090B	72.3	2.846	90.8	3.575	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	□	MHS0710L120B	100.7	3.965	120.8	4.756	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					19	□	MHS0710L150B	136.2	5.362	150.8	5.937	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					26	□	MHS0710L200B	185.9	7.319	200.8	7.906	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.200	.2835				2	□	MHS0720L030B	15.6	.614	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0720L060B	44.5	1.752	60.8	2.394	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0720L090B	73.3	2.886	90.8	3.575	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	□	MHS0720L120B	102.1	4.020	120.8	4.756	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					18	□	MHS0720L150B	130.9	5.154	150.8	5.937	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					25	□	MHS0720L200B	181.3	7.138	200.8	7.906	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.300	.2874				2	□	MHS0730L030B	15.9	.626	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0730L060B	45.1	1.776	60.8	2.394	61.3	2.413	111.3	4.382	110	4.331	1.3	.051	8	.315	4
					10	□	MHS0730L090B	74.3	2.925	90.8	3.575	91.3	3.594	141.3	5.563	140	5.512	1.3	.051	8	.315	4
					14	□	MHS0730L120B	103.5	4.075	120.8	4.756	121.3	4.776	171.3	6.744	170	6.693	1.3	.051	8	.315	4
					18	□	MHS0730L150B	132.7	5.224	150.8	5.937	151.3	5.957	201.3	7.925	200	7.874	1.3	.051	8	.315	4
					25	□	MHS0730L200B	183.8	7.236	200.8	7.906	201.3	7.925	251.3	9.894	250	9.843	1.3	.051	8	.315	4
7.400	.2913				1	□	MHS0740L030B	8.7	.343	31.0	1.220	31.5	1.240	81.5	3.209	80	3.150	1.5	.059	8	.315	3
					6	□	MHS0740L060B	45.7	1.799	60.9	2.398	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					10	□	MHS0740L090B	75.3	2.965	90.9	3.579	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					14	□	MHS0740L120B	104.9	4.130	120.9	4.760	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					18	□	MHS0740L150B	134.5	5.295	150.9	5.941	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					24	□	MHS0740L200B	178.9	7.043	200.9	7.909	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
7.500	.2953		M		1	★	MHS0750L030B	8.8	.346	31.1	1.224	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	★	MHS0750L060B	38.9	1.531	60.9	2.398	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	★	MHS0750L090B	68.9	2.713	90.9	3.579	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	★	MHS0750L120B	98.9	3.894	120.9	4.760	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	★	MHS0750L150B	128.9	5.075	150.9	5.941	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					24	★	MHS0750L200B	181.4	7.142	200.9	7.909	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
7.600	.2992				1	□	MHS0760L030B	8.9	.350	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	□	MHS0760L060B	39.4	1.551	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	□	MHS0760L090B	69.8	2.748	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	□	MHS0760L120B	100.2	3.945	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	□	MHS0760L150B	130.6	5.142	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					24	□	MHS0760L200B	183.8	7.236	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					30	□	MHS0760L250B	229.4	9.031	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4
7.700	.3031				1	□	MHS0770L030B	9.0	.354	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	□	MHS0770L060B	39.9	1.571	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	□	MHS0770L090B	70.7	2.783	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	□	MHS0770L120B	101.5	3.996	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	□	MHS0770L150B	132.3	5.209	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					23	□	MHS0770L200B	178.5	7.028	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					30	□	MHS0770L250B	232.4	9.150	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4
7.800	.3071				1	★	MHS0780L030B	9.1	.358	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	★	MHS0780L060B	40.4	1.591	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	★	MHS0780L090B	71.6	2.819	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	★	MHS0780L120B	102.8	4.047	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					17	★	MHS0780L150B	134.0	5.276	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					23	★	MHS0780L200B	180.8	7.118	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					30	★	MHS0780L250B	235.4	9.268	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.900	.3110				1	□	MHS0790L030B	9.3	.366	31.6	1.244	31.6	1.244	81.6	3.213	80	3.150	1.6	.063	8	.315	3
					5	□	MHS0790L060B	40.9	1.610	61.4	2.417	61.4	2.417	111.4	4.386	110	4.331	1.4	.055	8	.315	4
					9	□	MHS0790L090B	72.5	2.854	91.4	3.598	91.4	3.598	141.4	5.567	140	5.512	1.4	.055	8	.315	4
					13	□	MHS0790L120B	104.1	4.098	121.4	4.780	121.4	4.780	171.4	6.748	170	6.693	1.4	.055	8	.315	4
					16	□	MHS0790L150B	127.8	5.031	151.4	5.961	151.4	5.961	201.4	7.929	200	7.874	1.4	.055	8	.315	4
					23	□	MHS0790L200B	183.1	7.209	201.4	7.929	201.4	7.929	251.4	9.898	250	9.843	1.4	.055	8	.315	4
					29	□	MHS0790L250B	230.5	9.075	251.4	9.898	251.4	9.898	301.4	11.866	300	11.811	1.4	.055	8	.315	4
8.000	.3150				1	★	MHS0800L030B	9.4	.370	31.7	1.248	31.7	1.248	81.7	3.217	80	3.150	1.7	.067	8	.315	3
					5	★	MHS0800L060B	41.5	1.634	61.5	2.421	61.5	2.421	111.5	4.390	110	4.331	1.5	.059	8	.315	4
					9	★	MHS0800L090B	73.5	2.894	91.5	3.602	91.5	3.602	141.5	5.571	140	5.512	1.5	.059	8	.315	4
					12	★	MHS0800L120B	97.5	3.839	121.5	4.783	121.5	4.783	171.5	6.752	170	6.693	1.5	.059	8	.315	4
					16	★	MHS0800L150B	129.5	5.098	151.5	5.965	151.5	5.965	201.5	7.933	200	7.874	1.5	.059	8	.315	4
					22	★	MHS0800L200B	177.5	6.988	201.5	7.933	201.5	7.933	251.5	9.902	250	9.843	1.5	.059	8	.315	4
					29	★	MHS0800L250B	233.5	9.193	251.5	9.902	251.5	9.902	301.5	11.870	300	11.811	1.5	.059	8	.315	4
8.100	.3189				2	□	MHS0810L040B	17.6	.693	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0810L090B	66.3	2.610	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0810L120B	98.7	3.886	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					16	□	MHS0810L150B	131.1	5.161	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					22	□	MHS0810L200B	179.7	7.075	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					28	□	MHS0810L250B	228.3	8.988	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.200	.3228		P		2	□	MHS0820L040B	17.8	.701	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0820L090B	67.1	2.642	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0820L120B	99.9	3.933	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					16	□	MHS0820L150B	132.7	5.224	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					22	□	MHS0820L200B	181.9	7.161	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					28	□	MHS0820L250B	231.1	9.098	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.300	.3268				2	□	MHS0830L040B	18.0	.709	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0830L090B	67.9	2.673	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0830L120B	101.1	3.980	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					15	□	MHS0830L150B	126.0	4.961	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					21	□	MHS0830L200B	175.8	6.921	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					27	□	MHS0830L250B	225.6	8.882	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.400	.3307				2	□	MHS0840L040B	18.2	.717	40.2	1.583	41.7	1.642	101.7	4.004	100	3.937	1.7	.067	10	.394	3
					8	□	MHS0840L090B	68.7	2.705	90.0	3.543	91.5	3.602	151.5	5.965	150	5.906	1.5	.059	10	.394	4
					12	□	MHS0840L120B	102.3	4.028	120.0	4.724	121.5	4.783	181.5	7.146	180	7.087	1.5	.059	10	.394	4
					15	□	MHS0840L150B	127.5	5.020	150.0	5.906	151.5	5.965	211.5	8.327	210	8.268	1.5	.059	10	.394	4
					21	□	MHS0840L200B	177.9	7.004	200.0	7.874	201.5	7.933	261.5	10.295	260	10.236	1.5	.059	10	.394	4
					27	□	MHS0840L250B	228.3	8.988	250.0	9.843	251.5	9.902	311.5	12.264	310	12.205	1.5	.059	10	.394	4
8.500	.3346			M10x1.5	2	★	MHS0850L040B	18.5	.728	40.3	1.587	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	★	MHS0850L090B	69.5	2.736	90.1	3.547	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	★	MHS0850L120B	95.0	3.740	120.1	4.728	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					15	★	MHS0850L150B	129.0	5.079	150.1	5.909	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					21	★	MHS0850L200B	180.0	7.087	200.1	7.878	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					27	★	MHS0850L250B	231.0	9.094	250.1	9.846	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.600	.3386		R		2	□	MHS0860L040B	18.7	.736	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	□	MHS0860L090B	70.4	2.772	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	□	MHS0860L120B	96.2	3.787	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					15	□	MHS0860L150B	130.6	5.142	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					21	□	MHS0860L200B	182.2	7.173	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					26	□	MHS0860L250B	225.2	8.866	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
8.700	.3425			M10x1.25	2	□	MHS0870L040B	18.9	.744	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	□	MHS0870L090B	71.2	2.803	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	□	MHS0870L120B	97.3	3.831	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					15	□	MHS0870L150B	132.1	5.201	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	□	MHS0870L200B	175.6	6.913	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					26	□	MHS0870L250B	227.8	8.969	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
8.800	.3465				2	★	MHS0880L040B	19.1	.752	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					8	★	MHS0880L090B	72.0	2.835	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	★	MHS0880L120B	98.4	3.874	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					14	★	MHS0880L150B	124.8	4.913	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	★	MHS0880L200B	177.6	6.992	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					26	★	MHS0880L250B	230.4	9.071	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
8.900	.3504				2	□	MHS0890L040B	19.3	.760	40.8	1.606	41.8	1.646	101.8	4.008	100	3.937	1.8	.071	10	.394	3
					7	□	MHS0890L090B	63.9	2.516	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	□	MHS0890L120B	99.5	3.917	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					14	□	MHS0890L150B	126.2	4.969	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	□	MHS0890L200B	179.6	7.071	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					25	□	MHS0890L250B	224.1	8.823	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
9.000	.3543				2	★	MHS0900L040B	19.5	.768	40.9	1.610	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	★	MHS0900L090B	64.6	2.543	90.6	3.567	91.6	3.606	151.6	5.969	150	5.906	1.6	.063	10	.394	4
					11	★	MHS0900L120B	100.6	3.961	120.6	4.748	121.6	4.787	181.6	7.150	180	7.087	1.6	.063	10	.394	4
					14	★	MHS0900L150B	127.6	5.024	150.6	5.929	151.6	5.969	211.6	8.331	210	8.268	1.6	.063	10	.394	4
					20	★	MHS0900L200B	181.6	7.150	200.6	7.898	201.6	7.937	261.6	10.299	260	10.236	1.6	.063	10	.394	4
					25	★	MHS0900L250B	226.6	8.921	250.6	9.866	251.6	9.906	311.6	12.268	310	12.205	1.6	.063	10	.394	4
9.100	.3583		T		2	□	MHS0910L040B	19.8	.780	41.4	1.630	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	□	MHS0910L090B	65.4	2.575	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					11	□	MHS0910L120B	101.8	4.008	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					14	□	MHS0910L150B	129.1	5.083	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0910L200B	174.6	6.874	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					25	□	MHS0910L250B	229.2	9.024	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					30	□	MHS0910L300B	274.7	10.815	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.200	.3622				2	□	MHS0920L040B	20.0	.787	41.4	1.630	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	□	MHS0920L090B	66.1	2.602	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	□	MHS0920L120B	93.7	3.689	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					14	□	MHS0920L150B	130.5	5.138	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0920L200B	176.5	6.949	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					25	□	MHS0920L250B	231.7	9.122	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					30	□	MHS0920L300B	277.7	10.933	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.300	.3661				2	□	MHS0930L040B	20.2	.795	41.4	1.630	41.9	1.650	101.9	4.012	100	3.937	1.9	.075	10	.394	3
					7	□	MHS0930L090B	66.8	2.630	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	□	MHS0930L120B	94.7	3.728	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					14	□	MHS0930L150B	131.9	5.193	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0930L200B	178.4	7.024	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					24	□	MHS0930L250B	224.9	8.854	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					30	□	MHS0930L300B	280.7	11.051	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.400	.3701				2	□	MHS0940L040B	20.4	.803	41.5	1.634	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	□	MHS0940L090B	67.5	2.657	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	□	MHS0940L120B	95.7	3.768	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					13	□	MHS0940L150B	123.9	4.878	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					19	□	MHS0940L200B	180.3	7.098	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					24	□	MHS0940L250B	227.3	8.949	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					29	□	MHS0940L300B	274.3	10.799	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.500	.3740				2	★	MHS0950L040B	20.6	.811	41.5	1.634	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	★	MHS0950L090B	68.2	2.685	91.2	3.591	91.7	3.610	151.7	5.972	150	5.906	1.7	.067	10	.394	4
					10	★	MHS0950L120B	96.7	3.807	121.2	4.772	121.7	4.791	181.7	7.154	180	7.087	1.7	.067	10	.394	4
					13	★	MHS0950L150B	125.2	4.929	151.2	5.953	151.7	5.972	211.7	8.335	210	8.268	1.7	.067	10	.394	4
					18	★	MHS0950L200B	172.7	6.799	201.2	7.921	201.7	7.941	261.7	10.303	260	10.236	1.7	.067	10	.394	4
					24	★	MHS0950L250B	229.7	9.043	251.2	9.890	251.7	9.909	311.7	12.272	310	12.205	1.7	.067	10	.394	4
					29	★	MHS0950L300B	277.2	10.913	301.2	11.858	301.7	11.878	361.7	14.240	360	14.173	1.7	.067	10	.394	4
9.600	.3780				2	□	MHS0960L040B	20.9	.823	42.0	1.654	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	□	MHS0960L090B	68.9	2.713	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	□	MHS0960L120B	97.7	3.846	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	□	MHS0960L150B	126.5	4.980	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	□	MHS0960L200B	174.5	6.870	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					24	□	MHS0960L250B	232.1	9.138	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					29	□	MHS0960L300B	280.1	11.028	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
9.700	.3819		Tube Sheet		2	□	MHS0970L040B	21.1	.831	42.0	1.654	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	□	MHS0970L090B	69.7	2.744	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	□	MHS0970L120B	98.8	3.890	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	□	MHS0970L150B	127.9	5.035	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	□	MHS0970L200B	176.4	6.945	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					23	□	MHS0970L250B	224.9	8.854	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					28	□	MHS0970L300B	273.4	10.764	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
9.800	.3858		W		2	★	MHS0980L040B	21.3	.839	42.0	1.654	42.0	1.654	102.0	4.016	100	3.937	2.0	.079	10	.394	3
					7	★	MHS0980L090B	70.4	2.772	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	★	MHS0980L120B	99.8	3.929	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	★	MHS0980L150B	129.2	5.087	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	★	MHS0980L200B	178.2	7.016	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					23	★	MHS0980L250B	227.2	8.945	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					28	★	MHS0980L300B	276.2	10.874	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.900	.3898				2	□	MHS0990L040B	21.5	.846	42.1	1.657	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	10	.394	3
					7	□	MHS0990L090B	71.1	2.799	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					10	□	MHS0990L120B	100.8	3.969	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					13	□	MHS0990L150B	130.5	5.138	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					18	□	MHS0990L200B	180.0	7.087	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					23	□	MHS0990L250B	229.5	9.035	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					28	□	MHS0990L300B	279.0	10.984	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
10.000	.3937				1	★	MHS1000L040B	11.7	.461	42.1	1.657	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	10	.394	3
					6	★	MHS1000L090B	61.8	2.433	91.8	3.614	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	10	.394	4
					9	★	MHS1000L120B	91.8	3.614	121.8	4.795	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	10	.394	4
					12	★	MHS1000L150B	121.8	4.795	151.8	5.976	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	10	.394	4
					17	★	MHS1000L200B	171.8	6.764	201.8	7.945	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	10	.394	4
					22	★	MHS1000L250B	221.8	8.732	251.8	9.913	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	10	.394	4
					27	★	MHS1000L300B	271.8	10.701	301.8	11.882	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	10	.394	4
10.100	.3976				1	□	MHS1010L040B	11.8	.465	40.6	1.598	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	12	.472	3
					6	□	MHS1010L090B	62.4	2.457	90.3	3.555	91.8	3.614	151.8	5.976	150	5.906	1.8	.071	12	.472	4
					9	□	MHS1010L120B	92.7	3.650	120.3	4.736	121.8	4.795	181.8	7.157	180	7.087	1.8	.071	12	.472	4
					12	□	MHS1010L150B	123.0	4.843	150.3	5.917	151.8	5.976	211.8	8.339	210	8.268	1.8	.071	12	.472	4
					17	□	MHS1010L200B	173.5	6.831	200.3	7.886	201.8	7.945	261.8	10.307	260	10.236	1.8	.071	12	.472	4
					22	□	MHS1010L250B	224.0	8.819	250.3	9.854	251.8	9.913	311.8	12.276	310	12.205	1.8	.071	12	.472	4
					27	□	MHS1010L300B	274.5	10.807	300.3	11.823	301.8	11.882	361.8	14.244	360	14.173	1.8	.071	12	.472	4
10.200	.4016			M12x1.75	1	□	MHS1020L040B	12.0	.472	40.6	1.598	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	12	.472	3
					6	□	MHS1020L090B	63.1	2.484	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1020L120B	93.7	3.689	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1020L150B	124.3	4.894	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					17	□	MHS1020L200B	175.3	6.902	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					22	□	MHS1020L250B	226.3	8.909	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					27	□	MHS1020L300B	277.3	10.917	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.300	.4055				1	□	MHS1030L040B	12.1	.476	40.6	1.598	42.1	1.657	102.1	4.020	100	3.937	2.1	.083	12	.472	3
					6	□	MHS1030L090B	63.7	2.508	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1030L120B	94.6	3.724	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1030L150B	125.5	4.941	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					17	□	MHS1030L200B	177.0	6.969	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					22	□	MHS1030L250B	228.5	8.996	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	□	MHS1030L300B	269.7	10.618	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.400	.4094				1	□	MHS1040L040B	12.2	.480	40.7	1.602	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	□	MHS1040L090B	64.3	2.531	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1040L120B	95.5	3.760	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1040L150B	126.7	4.988	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					17	□	MHS1040L200B	178.7	7.035	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					21	□	MHS1040L250B	220.3	8.673	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	□	MHS1040L300B	272.3	10.720	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.500	.4134		Z		1	★	MHS1050L040B	12.3	.484	40.7	1.602	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	★	MHS1050L090B	64.9	2.555	90.4	3.559	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	★	MHS1050L120B	96.4	3.795	120.4	4.740	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	★	MHS1050L150B	127.9	5.035	150.4	5.921	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					16	★	MHS1050L200B	169.9	6.689	200.4	7.890	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					21	★	MHS1050L250B	222.4	8.756	250.4	9.858	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	★	MHS1050L300B	274.9	10.823	300.4	11.827	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.600	.4173				1	□	MHS1060L040B	12.4	.488	41.2	1.622	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	□	MHS1060L090B	65.5	2.579	90.9	3.579	91.9	3.618	151.9	5.980	150	5.906	1.9	.075	12	.472	4
					9	□	MHS1060L120B	97.3	3.831	120.9	4.760	121.9	4.799	181.9	7.161	180	7.087	1.9	.075	12	.472	4
					12	□	MHS1060L150B	129.1	5.083	150.9	5.941	151.9	5.980	211.9	8.343	210	8.268	1.9	.075	12	.472	4
					16	□	MHS1060L200B	171.5	6.752	200.9	7.909	201.9	7.949	261.9	10.311	260	10.236	1.9	.075	12	.472	4
					21	□	MHS1060L250B	224.5	8.839	250.9	9.878	251.9	9.917	311.9	12.280	310	12.205	1.9	.075	12	.472	4
					26	□	MHS1060L300B	277.5	10.925	300.9	11.846	301.9	11.886	361.9	14.248	360	14.173	1.9	.075	12	.472	4
10.700	.4213				1	□	MHS1070L040B	12.5	.492	41.2	1.622	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	□	MHS1070L090B	66.1	2.602	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					9	□	MHS1070L120B	98.2	3.866	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1070L150B	119.6	4.709	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	□	MHS1070L200B	173.1	6.815	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					21	□	MHS1070L250B	226.6	8.921	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	□	MHS1070L300B	269.4	10.606	301.0	11.850	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4
10.800	.4252			M12x1.25	1	★	MHS1080L040B	12.7	.500	41.2	1.622	42.2	1.661	102.2	4.024	100	3.937	2.2	.087	12	.472	3
					6	★	MHS1080L090B	66.8	2.630	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					9	★	MHS1080L120B	99.2	3.906	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	★	MHS1080L150B	120.8	4.756	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	★	MHS1080L200B	174.8	6.882	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					21	★	MHS1080L250B	228.8	9.008	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	★	MHS1080L300B	272.0	10.709	301.0	11.850	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4
10.900	.4291				1	□	MHS1090L040B	12.8	.504	41.3	1.626	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					6	□	MHS1090L090B	67.4	2.654	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	□	MHS1090L120B	89.2	3.512	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1090L150B	121.9	4.799	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	□	MHS1090L200B	176.4	6.945	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	□	MHS1090L250B	220.0	8.661	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	□	MHS1090L300B	274.5	10.807	301.0	11.850	302.0	11.890	362	14.252	360	14.173	2.0	.079	12	.472	4
11.000	.4331				1	★	MHS1100L040B	12.9	.508	41.3	1.626	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					6	★	MHS1100L090B	68.0	2.677	91.0	3.583	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	★	MHS1100L120B	90.0	3.543	121.0	4.764	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	★	MHS1100L150B	123.0	4.843	151.0	5.945	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					16	★	MHS1100L200B	178.0	7.008	201.0	7.913	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	★	MHS1100L250B	222.0	8.740	251.0	9.882	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					25	★	MHS1100L300B	277.0	10.906	301.0	11.850	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

Drill Diameter DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.100	.4370				1	□	MHS1110L040B	13.0	.512	41.8	1.646	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					6	□	MHS1110L090B	68.6	2.701	91.5	3.602	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	□	MHS1110L120B	90.8	3.575	121.5	4.783	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1110L150B	124.1	4.886	151.5	5.965	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					15	□	MHS1110L200B	168.5	6.634	201.5	7.933	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	□	MHS1110L250B	224.0	8.819	251.5	9.902	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					24	□	MHS1110L300B	268.4	10.567	301.5	11.870	302.0	11.890	362.0	14.252	360	14.173	2.0	.079	12	.472	4
11.200	.4409				1	□	MHS1120L040B	13.1	.516	41.8	1.646	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					5	□	MHS1120L090B	58.0	2.283	91.5	3.602	92.0	3.622	152.0	5.984	150	5.906	2.0	.079	12	.472	4
					8	□	MHS1120L120B	91.6	3.606	121.5	4.783	122.0	4.803	182.0	7.165	180	7.087	2.0	.079	12	.472	4
					11	□	MHS1120L150B	125.2	4.929	151.5	5.965	152.0	5.984	212.0	8.346	210	8.268	2.0	.079	12	.472	4
					15	□	MHS1120L200B	170.0	6.693	201.5	7.933	202.0	7.953	262.0	10.315	260	10.236	2.0	.079	12	.472	4
					20	□	MHS1120L250B	226.0	8.898	251.5	9.902	252.0	9.921	312.0	12.283	310	12.205	2.0	.079	12	.472	4
					24	□	MHS1120L300B	270.8	10.661	301.5	11.870	302.0	11.890	362	14.252	360	14.173	2.0	.079	12	.472	4
11.300	.4449				1	□	MHS1130L040B	13.2	.520	41.8	1.646	42.3	1.665	102.3	4.028	100	3.937	2.3	.091	12	.472	3
					5	□	MHS1130L090B	58.6	2.307	91.6	3.606	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS1130L120B	92.5	3.642	121.6	4.787	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					11	□	MHS1130L150B	126.4	4.976	151.6	5.969	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS1130L200B	171.6	6.756	201.6	7.937	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					20	□	MHS1130L250B	228.1	8.980	251.6	9.906	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					24	□	MHS1130L300B	273.3	10.760	301.6	11.874	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.400	.4488				1	□	MHS1140L040B	13.4	.528	41.9	1.650	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	□	MHS1140L090B	59.1	2.327	91.6	3.606	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS1140L120B	93.3	3.673	121.6	4.787	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					11	□	MHS1140L150B	127.5	5.020	151.6	5.969	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS1140L200B	173.1	6.815	201.6	7.937	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	□	MHS1140L250B	218.7	8.610	251.6	9.906	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					24	□	MHS1140L300B	275.7	10.854	301.6	11.874	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.500	.4528				1	★	MHS1150L040B	13.5	.531	41.9	1.650	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	★	MHS1150L090B	59.6	2.346	91.6	3.606	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	★	MHS1150L120B	94.1	3.705	121.6	4.787	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					10	★	MHS1150L150B	117.1	4.610	151.6	5.969	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	★	MHS1150L200B	174.6	6.874	201.6	7.937	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	★	MHS1150L250B	220.6	8.685	251.6	9.906	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					24	★	MHS1150L300B	278.1	10.949	301.6	11.874	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.600	.4567				1	□	MHS1160L040B	13.6	.535	42.4	1.669	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	□	MHS1160L090B	60.1	2.366	92.1	3.626	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	MHS1160L120B	94.9	3.736	122.1	4.807	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					10	□	MHS1160L150B	118.1	4.650	152.1	5.988	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	MHS1160L200B	176.1	6.933	202.1	7.957	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	□	MHS1160L250B	222.5	8.760	252.1	9.925	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					23	□	MHS1160L300B	268.9	10.587	302.1	11.894	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

Drill Diameter **DC**					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread size		VP15TF		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.700	**.4606**				1	□	**MHS1170L040B**	13.7	.539	42.4	1.669	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	□	**MHS1170L090B**	60.6	2.386	92.1	3.626	92.1	3.626	152.1	5.988	150	5.906	2.1	.083	12	.472	4
					8	□	**MHS1170L120B**	95.7	3.768	122.1	4.807	122.1	4.807	182.1	7.169	180	7.087	2.1	.083	12	.472	4
					10	□	**MHS1170L150B**	119.1	4.689	152.1	5.988	152.1	5.988	212.1	8.350	210	8.268	2.1	.083	12	.472	4
					15	□	**MHS1170L200B**	177.6	6.992	202.1	7.957	202.1	7.957	262.1	10.319	260	10.236	2.1	.083	12	.472	4
					19	□	**MHS1170L250B**	224.4	8.835	252.1	9.925	252.1	9.925	312.1	12.287	310	12.205	2.1	.083	12	.472	4
					23	□	**MHS1170L300B**	271.2	10.677	302.1	11.894	302.1	11.894	362.1	14.256	360	14.173	2.1	.083	12	.472	4
11.800	**.4646**				1	★	**MHS1180L040B**	13.8	.543	42.4	1.669	42.4	1.669	102.4	4.031	100	3.937	2.4	.094	12	.472	3
					5	★	**MHS1180L090B**	61.1	2.406	92.2	3.630	92.2	3.630	152.2	5.992	150	5.906	2.2	.087	12	.472	4
					8	★	**MHS1180L120B**	96.5	3.799	122.2	4.811	122.2	4.811	182.2	7.173	180	7.087	2.2	.087	12	.472	4
					10	★	**MHS1180L150B**	120.1	4.728	152.2	5.992	152.2	5.992	212.2	8.354	210	8.268	2.2	.087	12	.472	4
					14	★	**MHS1180L200B**	167.3	6.587	202.2	7.961	202.2	7.961	262.2	10.323	260	10.236	2.2	.087	12	.472	4
					19	★	**MHS1180L250B**	226.3	8.909	252.2	9.929	252.2	9.929	312.2	12.291	310	12.205	2.2	.087	12	.472	4
					23	★	**MHS1180L300B**	273.5	10.768	302.2	11.898	302.2	11.898	362.2	14.260	360	14.173	2.2	.087	12	.472	4
11.900	**.4685**				1	□	**MHS1190L040B**	13.9	.547	42.5	1.673	42.5	1.673	102.5	4.035	100	3.937	2.5	.098	12	.472	3
					5	□	**MHS1190L090B**	61.7	2.429	92.2	3.630	92.2	3.630	152.2	5.992	150	5.906	2.2	.087	12	.472	4
					8	□	**MHS1190L120B**	97.4	3.835	122.2	4.811	122.2	4.811	182.2	7.173	180	7.087	2.2	.087	12	.472	4
					10	□	**MHS1190L150B**	121.2	4.772	152.2	5.992	152.2	5.992	212.2	8.354	210	8.268	2.2	.087	12	.472	4
					14	□	**MHS1190L200B**	168.8	6.646	202.2	7.961	202.2	7.961	262.2	10.323	260	10.236	2.2	.087	12	.472	4
					19	□	**MHS1190L250B**	228.3	8.988	252.2	9.929	252.2	9.929	312.2	12.291	310	12.205	2.2	.087	12	.472	4
					23	□	**MHS1190L300B**	275.9	10.862	302.2	11.898	302.2	11.898	362.2	14.260	360	14.173	2.2	.087	12	.472	4
12.000	**.4724**			M14x2.0	1	★	**MHS1200L040B**	14.1	.555	42.5	1.673	42.5	1.673	102.5	4.035	100	3.937	2.5	.098	12	.472	3
					5	★	**MHS1200L090B**	62.2	2.449	92.2	3.630	92.2	3.630	152.2	5.992	150	5.906	2.2	.087	12	.472	4
					7	★	**MHS1200L120B**	86.2	3.394	122.2	4.811	122.2	4.811	182.2	7.173	180	7.087	2.2	.087	12	.472	4
					10	★	**MHS1200L150B**	122.2	4.811	152.2	5.992	152.2	5.992	212.2	8.354	210	8.268	2.2	.087	12	.472	4
					14	★	**MHS1200L200B**	170.2	6.701	202.2	7.961	202.2	7.961	262.2	10.323	260	10.236	2.2	.087	12	.472	4
					18	★	**MHS1200L250B**	218.2	8.591	252.2	9.929	252.2	9.929	312.2	12.291	310	12.205	2.2	.087	12	.472	4
					22	★	**MHS1200L300B**	266.2	10.480	302.2	11.898	302.2	11.898	362.2	14.260	360	14.173	2.2	.087	12	.472	4

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L136
OPERATIONAL GUIDANCE ➤ L137

MHS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Mild Steel (≤180HB) Carbon Steel, Alloy Steel (180-280HB) AISI 1010, 1045, 4140 etc.			Austenitic Stainless Steel (≤200HB) Ferritic, Martensitic Stainless Steel (>200HB) AISI 304, 316 AISI 431, 420 etc.		
Drill Dia.		Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Feed **fr** (Min.—Max.) (IPR)
inch	mm						
.0394	**1.0**	130	12700	.0012 (.0008—.0016)	65	6400	.0012 (.0008—.0016)
.0472	**1.2**	160	13200	.0014 (.0010—.0020)	95	8000	.0014 (.0010—.0020)
.0630	**1.6**	195	11900	.0020 (.0012—.0026)	130	8000	.0020 (.0012—.0026)
.0787	**2.0**	230	11100	.0024 (.0016—.0031)	160	8000	.0024 (.0016—.0031)
.0984	**2.5**	260	10200	.0030 (.0020—.0039)	195	7600	.0030 (.0020—.0039)
.1260	**3.2**	260	8000	.0039 (.0028—.0051)	195	6000	.0039 (.0028—.0051)
.1575	**4.0**	260	6400	.0039 (.0035—.0043)	190	4800	.0035 (.0031—.0035)
.1969	**5.0**	260	5100	.0051 (.0043—.0055)	195	3800	.0043 (.0039—.0047)
.2480	**6.3**	260	4000	.0063 (.0055—.0071)	195	3000	.0055 (.0051—.0059)
.3150	**8.0**	255	3200	.0079 (.0071—.0091)	190	2400	.0067 (.0063—.0075)
.3937	**10.0**	255	2600	.0098 (.0087—.0110)	195	1900	.0087 (.0079—.0091)
.4724	**12.0**	260	2100	.0118 (.0106—.0134)	185	1600	.0102 (.0094—.0110)

Workpiece Materiall		Pre-hardened Steel (35-45HRC) Alloy Tool Steel (≤350HB) AISI P21, P20 ASTM H13, AISI L6 etc.			Hardened Steel (40-55HRC) Precipitation Hardening Martensitic Stainless Steel (<450HB) AISI 431, 420 S17400, S17700 etc.		
Drill Dia.		Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Feed **fr** (Min.—Max.) (IPR)
inch	mm						
.0394	**1.0**	65	6400	.0010 (.0008—.0012)	65	6400	.0008 (.0006—.0010)
.0472	**1.2**	95	8000	.0012 (.0008—.0014)	95	8000	.0010 (.0008—.0012)
.0630	**1.6**	130	8000	.0016 (.0012—.0018)	130	8000	.0014 (.0010—.0016)
.0787	**2.0**	160	8000	.0018 (.0014—.0024)	160	8000	.0016 (.0012—.0020)
.0984	**2.5**	195	7600	.0024 (.0018—.0030)	195	7600	.0020 (.0016—.0026)
.1260	**3.2**	195	6000	.0031 (.0024—.0035)	195	6000	.0024 (.0020—.0031)
.1575	**4.0**	190	4800	.0031 (.0028—.0039)	190	4800	.0031 (.0024—.0039)
.1969	**5.0**	195	3800	.0043 (.0035—.0051)	195	3800	.0039 (.0031—.0051)
.2480	**6.3**	195	3000	.0051 (.0043—.0063)	195	3000	.0043 (.0035—.0051)
.3150	**8.0**	190	2400	.0067 (.0055—.0079)	190	2400	.0055 (.0047—.0063)
.3937	**10.0**	195	1900	.0083 (.0067—.0098)	195	1900	.0067 (.0055—.0079)
.4724	**12.0**	185	1600	.0098 (.0083—.0118)	185	1600	.0083 (.0067—.0094)

Workpiece Material		Hardened Steel (40-55HRC) Heat Resistant Alloy ASTM H13, AISI L6 Inconel718 etc.		
Drill Dia.		Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Feed **fr** (Min.—Max.) (IPR)
inch	mm			
.0394	**1.0**	30	3200	.0006 (.0006—.0008)
.0472	**1.2**	30	2700	.0008 (.0006—.0010)
.0630	**1.6**	30	2000	.0010 (.0008—.0012)
.0787	**2.0**	60	3200	.0014 (.0010—.0016)
.0984	**2.5**	65	2600	.0016 (.0012—.0020)
.1260	**3.2**	60	2000	.0020 (.0016—.0028)
.1575	**4.0**	95	2400	.0028 (.0020—.0031)
.1969	**5.0**	95	1900	.0031 (.0024—.0039)
.2480	**6.3**	95	1500	.0035 (.0031—.0043)
.3150	**8.0**	120	1500	.0047 (.0039—.0051)
.3937	**10.0**	120	1300	.0059 (.0051—.0067)
.4724	**12.0**	120	1100	.0071 (.0059—.0079)

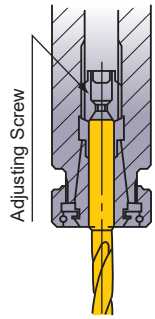
Note 1) When using the drill with a length over L/D 10, it is necessary to use a pilot hole as a guide. (If no pilot hole is used then drill breakage can occur)

Note 2) Use the shortest drill with L/D<10 available in respective DC as a pilot drill.

Note 3) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

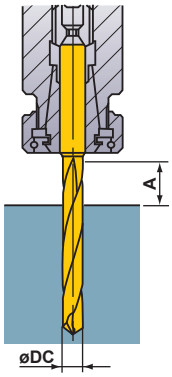
OPERATIONAL GUIDANCE FOR THE MHS DRILL

Drill Holding



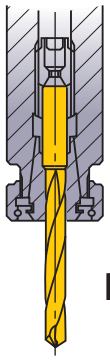
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 2

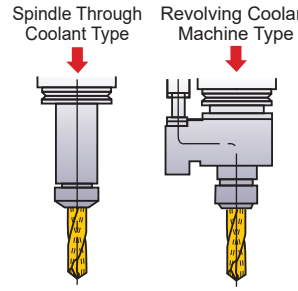
Drill Installation



NG

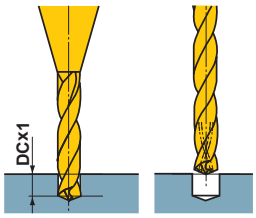
Do not clamp on the flutes.

Through Coolant Type



Less than ø.118 : 1.5MPa-7MP
More than ø.118 : 0.5MPa-7MPa
More than 3MPa is recommended.

Drill Installation



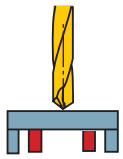
① Drill a prepared hole about 1DC using the shortest flute length of MHS. (DC=drill diameter)
② Use the prepared hole as a guide when using a drill with an oil hole. Depending on the cutting conditions, peck feed is recommended.

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

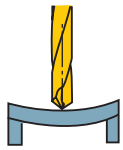
2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



Support the Workpiece

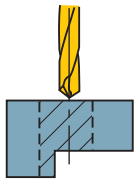
OK



If Bending Occurs

NG

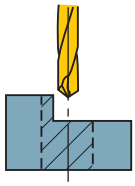
Interrupted Cutting



One Process

OK

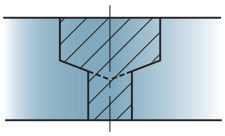
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

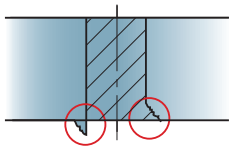
①Spot face with an end mill prior to drilling.

Stepped Holes



①Divide the two processes.
②Drill the larger hole first.
*A tool for machining both chamfer and spot face can be produced to order.

Burring and Workpiece Chipping



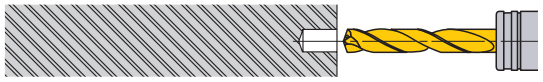
①Lower the feed rate by 50% at the end of through cutting.
②Change the point angle.

MHS

■ OPERATIONAL GUIDANCE FOR THE MHS LONG TYPE DRILL (L/D≥10)

Flat Face Drilling ●Drilling a blind hole

■ 1. Drilling a Pilot Hole

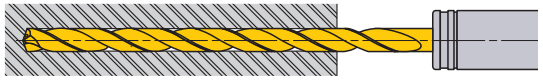


①Use a drill with the same or larger point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

■ 2. Initial Cutting with the Long Type Drill

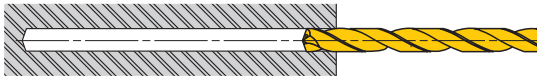
①Penetrate the guide hole at low revolution.
(Revolution 1000 min^{-1}, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

■ 3. Drill the Deep Hole



①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

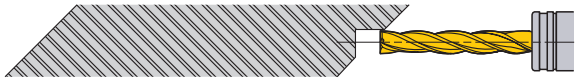
■ 4. Drill Retraction



①After drilling, lower the cutting revolution about .020—.039 inch short of the hole end. (Revolution 1000 min^{-1})
②Retract the drill to the pilot hole depth starting point at a feed rate of 118.1 IPM.
③Finally, clear the hole at a cutting speed of 66—98 SFM and feed rate of .008—.012 IPR.

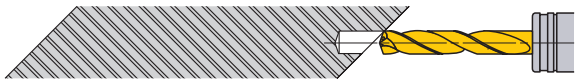
Interruped Drilling ●Drilling and breaking through on irregular faces or angles

■ 1. Spot Facing



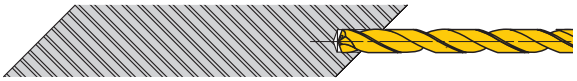
①Machine a flat on the irregular face by using an MFE (flat bottom drill) or an end mill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

■ 2. Drilling a Pilot Hole



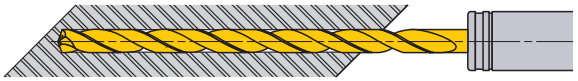
①Use a drill with the same or larger point angle than the super long type. Use the shortest flute possible.
②Ensure a high precision hole is drilled for the guide.
③Drill depth : Approx 1DC.
(Adjust the pilot hole depth according to the length of the long type drill.)

■ 3. Initial Cutting with the Long Type Drill



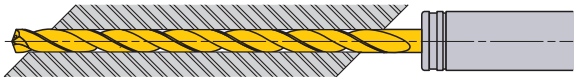
①Penetrate the guide hole at a low revolution.
(Revolution 1000 min^{-1}, feed rate .008—.012 IPR)
②Stop the long type drill .020—.039 inch short of the guide hole bottom.

■ 4. Drill the Deep Hole



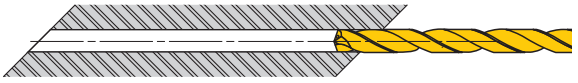
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.
②Feed as usual until breaking through.

■ 5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②Recommend about half rate of the usual feed rate after breaking through.

■ 6. Drill Retraction



①Finally clear the hole at a revolution speed 1000 min^{-1} and feed rate of .008—.012 IPR.
②Retract the drill to the pilot hole depth starting point at a feed rate of 118.1 IPM.

Memo

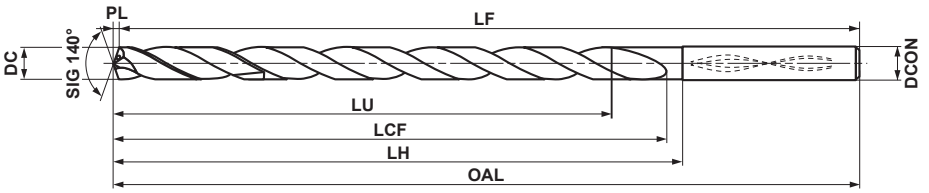
MNS

- Unique 4 hole, high flow, coolant delivery system prevents built-up-edge.
- Long drill life and highly efficient drilling of holes in aluminum.

P | M | K | **N** | S | H

METRIC STANDARD

Internal Coolant



DC=3	3<DC≤6	6<DC≤10	10<DC≤14
0 −0.014	0 −0.018	0 −0.022	0 −0.027
DCON=3	**3<DCON≤6**	**6<DCON≤10**	**10<DCON≤14**
0 −0.006	0 −0.008	0 −0.009	0 −0.011

Note 1) MNS drills are suitable for use with shrink fit holders.
Note 2) 4.5 or smaller diameter drills are designed with 2 colant holes.

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
3.0	5	★	MNS0300LB	15.5	33.5	33.5	81.5	81	0.5	3
	10	★	MNS0300X10DB	30.5	39.5	42.5	90.5	90	0.5	3
	20	★	MNS0300X20DB	60.5	69.5	72.5	120.5	120	0.5	3
	30	★	MNS0300X30DB	90.5	99.5	102.5	150.5	150	0.5	3
3.1	5	★	MNS0310LB	16.1	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0310X10DB	31.6	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0310X20DB	62.6	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0310X30DB	93.6	116.6	119.6	167.6	167	0.6	4
3.2	5	★	MNS0320LB	16.6	39.6	39.6	87.6	87	0.6	4
	10	★	MNS0320X10DB	32.6	46.6	49.6	97.6	97	0.6	4
	20	★	MNS0320X20DB	64.6	81.6	84.6	132.6	132	0.6	4
	30	★	MNS0320X30DB	96.6	116.6	119.6	167.6	167	0.6	4
3.3	5	★	MNS0330LB	17.1	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0330X10DB	33.6	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0330X20DB	66.6	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0330X30DB	99.6	116.6	119.6	167.6	167	0.6	4
3.4	5	★	MNS0340LB	17.6	39.6	39.6	87.6	87	0.6	4
	10	★	MNS0340X10DB	34.6	46.6	49.6	97.6	97	0.6	4
	20	★	MNS0340X20DB	68.6	81.6	84.6	132.6	132	0.6	4
	30	★	MNS0340X30DB	102.6	116.6	119.6	167.6	167	0.6	4
3.5	5	★	MNS0350LB	18.1	39.6	39.6	87.6	87	0.6	4
	10	□	MNS0350X10DB	35.6	46.6	49.6	97.6	97	0.6	4
	20	□	MNS0350X20DB	70.6	81.6	84.6	132.6	132	0.6	4
	30	□	MNS0350X30DB	105.6	116.6	119.6	167.6	167	0.6	4
3.6	5	★	MNS0360LB	18.7	44.7	44.7	92.7	92	0.7	4
	10	★	MNS0360X10DB	36.7	52.7	55.7	103.7	103	0.7	4
	20	★	MNS0360X20DB	72.7	92.7	95.7	143.7	143	0.7	4
	30	★	MNS0360X30DB	108.7	132.7	135.7	183.7	183	0.7	4
3.7	5	★	MNS0370LB	19.2	44.7	44.7	92.7	92	0.7	4
	10	□	MNS0370X10DB	37.7	52.7	55.7	103.7	103	0.7	4
	20	□	MNS0370X20DB	74.7	92.7	95.7	143.7	143	0.7	4
	30	□	MNS0370X30DB	111.7	132.7	135.7	183.7	183	0.7	4
3.8	5	★	MNS0380LB	19.7	44.7	44.7	92.7	92	0.7	4
	10	□	MNS0380X10DB	38.7	52.7	55.7	103.7	103	0.7	4
	20	□	MNS0380X20DB	76.7	92.7	95.7	143.7	143	0.7	4
	30	□	MNS0380X30DB	114.7	132.7	135.7	183.7	183	0.7	4
3.9	5	★	MNS0390LB	20.2	44.7	44.7	92.7	92	0.7	4
	10	★	MNS0390X10DB	39.7	52.7	55.7	103.7	103	0.7	4
	20	★	MNS0390X20DB	78.7	92.7	95.7	143.7	143	0.7	4
	30	★	MNS0390X30DB	117.7	132.7	135.7	183.7	183	0.7	4
4.0	5	★	MNS0400LB	20.7	44.7	44.7	92.7	92	0.7	4
	10	★	MNS0400X10DB	40.7	52.7	55.7	103.7	103	0.7	4
	20	★	MNS0400X20DB	80.7	92.7	95.7	143.7	143	0.7	4
	30	★	MNS0400X30DB	120.7	132.7	135.7	183.7	183	0.7	4
4.1	5	★	MNS0410LB	21.2	50.7	50.7	100.7	100	0.7	5
	10	□	MNS0410X10DB	41.7	59.7	62.7	112.7	112	0.7	5
	20	□	MNS0410X20DB	82.7	104.7	107.7	157.7	157	0.7	5
	30	□	MNS0410X30DB	123.7	149.7	152.7	202.7	202	0.7	5
4.2	5	★	MNS0420LB	21.8	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0420X10DB	42.8	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0420X20DB	84.8	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0420X30DB	126.8	149.8	152.8	202.8	202	0.8	5
4.3	5	★	MNS0430LB	22.3	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0430X10DB	43.8	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0430X20DB	86.8	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0430X30DB	129.8	149.8	152.8	202.8	202	0.8	5

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).
★ : Stock in Japan □ : Made to Order

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
4.4	5	★	MNS0440LB	22.8	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0440X10DB	44.8	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0440X20DB	88.8	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0440X30DB	132.8	149.8	152.8	202.8	202	0.8	5
4.5	5	★	MNS0450LB	23.3	50.8	50.8	100.8	100	0.8	5
	10	□	MNS0450X10DB	45.8	59.8	62.8	112.8	112	0.8	5
	20	□	MNS0450X20DB	90.8	104.8	107.8	157.8	157	0.8	5
	30	□	MNS0450X30DB	135.8	149.8	152.8	202.8	202	0.8	5
4.6	5	★	MNS0460LB	23.8	55.8	55.8	105.8	105	0.8	5
	10	□	MNS0460X10DB	46.8	65.8	68.8	118.8	118	0.8	5
	20	□	MNS0460X20DB	92.8	115.8	118.8	168.8	168	0.8	5
	30	□	MNS0460X30DB	138.8	165.8	168.8	218.8	218	0.8	5
4.7	5	★	MNS0470LB	24.4	55.9	55.9	105.9	105	0.9	5
	10	□	MNS0470X10DB	47.9	65.9	68.9	118.9	118	0.9	5
	20	□	MNS0470X20DB	94.9	115.9	118.9	168.9	168	0.9	5
	30	□	MNS0470X30DB	141.9	165.9	168.9	218.9	218	0.9	5
4.8	5	★	MNS0480LB	24.9	55.9	55.9	105.9	105	0.9	5
	10	□	MNS0480X10DB	48.9	65.9	68.9	118.9	118	0.9	5
	20	□	MNS0480X20DB	96.9	115.9	118.9	168.9	168	0.9	5
	30	□	MNS0480X30DB	144.9	165.9	168.9	218.9	218	0.9	5
4.9	5	★	MNS0490LB	25.4	55.9	55.9	105.9	105	0.9	5
	10	★	MNS0490X10DB	49.9	65.9	68.9	118.9	118	0.9	5
	20	★	MNS0490X20DB	98.9	115.9	118.9	168.9	168	0.9	5
	30	★	MNS0490X30DB	147.9	165.9	168.9	218.9	218	0.9	5
5.0	5	★	MNS0500LB	25.9	44.9	44.9	100.9	100	0.9	6
	10	★	MNS0500X10DB	50.9	65.9	68.9	118.9	118	0.9	5
	20	★	MNS0500X20DB	100.9	115.9	118.9	168.9	168	0.9	5
	30	★	MNS0500X30DB	150.9	165.9	168.9	218.9	218	0.9	5
5.1	5	★	MNS0510LB	26.4	44.9	44.9	100.9	100	0.9	6
	10	★	MNS0510X10DB	51.9	72.9	75.9	127.9	127	0.9	6
	20	★	MNS0510X20DB	102.9	127.9	130.9	182.9	182	0.9	6
	30	★	MNS0510X30DB	153.9	182.9	185.9	237.9	237	0.9	6
5.2	5	★	MNS0520LB	26.9	44.9	44.9	100.9	100	0.9	6
	10	□	MNS0520X10DB	52.9	72.9	75.9	127.9	127	0.9	6
	20	□	MNS0520X20DB	104.9	127.9	130.9	182.9	182	0.9	6
	30	□	MNS0520X30DB	156.9	182.9	185.9	237.9	237	0.9	6
5.3	5	★	MNS0530LB	27.5	45.0	45.0	101.0	100	1.0	6
	10	□	MNS0530X10DB	54.0	73.0	76.0	128.0	127	1.0	6
	20	□	MNS0530X20DB	107.0	128.0	131.0	183.0	182	1.0	6
	30	□	MNS0530X30DB	160.0	183.0	186.0	238.0	237	1.0	6
5.4	5	★	MNS0540LB	28.0	45.0	45.0	101.0	100	1.0	6
	10	□	MNS0540X10DB	55.0	73.0	76.0	128.0	127	1.0	6
	20	□	MNS0540X20DB	109.0	128.0	131.0	183.0	182	1.0	6
	30	□	MNS0540X30DB	163.0	183.0	186.0	238.0	237	1.0	6

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
5.5	5	★	MNS0550LB	28.5	45.0	45.0	101.0	100	1.0	6
	10	★	MNS0550X10DB	56.0	73.0	76.0	128.0	127	1.0	6
	20	★	MNS0550X20DB	111.0	128.0	131.0	183.0	182	1.0	6
	30	★	MNS0550X30DB	166.0	183.0	186.0	238.0	237	1.0	6
5.6	5	★	MNS0560LB	29.0	49.0	49.0	101.0	100	1.0	6
	10	□	MNS0560X10DB	57.0	79.0	82.0	134.0	133	1.0	6
	20	□	MNS0560X20DB	113.0	139.0	142.0	194.0	193	1.0	6
	30	□	MNS0560X30DB	169.0	199.0	202.0	254.0	253	1.0	6
5.7	5	★	MNS0570LB	29.5	49.0	49.0	101.0	100	1.0	6
	10	□	MNS0570X10DB	58.0	79.0	82.0	134.0	133	1.0	6
	20	□	MNS0570X20DB	115.0	139.0	142.0	194.0	193	1.0	6
	30	□	MNS0570X30DB	172.0	199.0	202.0	254.0	253	1.0	6
5.8	5	★	MNS0580LB	30.1	49.1	49.1	101.1	100	1.1	6
	10	□	MNS0580X10DB	59.1	79.1	82.1	134.1	133	1.1	6
	20	□	MNS0580X20DB	117.1	139.1	142.1	194.1	193	1.1	6
	30	□	MNS0580X30DB	175.1	199.1	202.1	254.1	253	1.1	6
5.9	5	★	MNS0590LB	30.6	49.1	49.1	101.1	100	1.1	6
	10	□	MNS0590X10DB	60.1	79.1	82.1	134.1	133	1.1	6
	20	□	MNS0590X20DB	119.1	139.1	142.1	194.1	193	1.1	6
	30	□	MNS0590X30DB	178.1	199.1	202.1	254.1	253	1.1	6
6.0	5	★	MNS0600LB	31.1	49.1	49.1	101.1	100	1.1	6
	10	★	MNS0600X10DB	61.1	79.1	82.1	134.1	133	1.1	6
	20	★	MNS0600X20DB	121.1	139.1	142.1	194.1	193	1.1	6
	30	★	MNS0600X30DB	181.1	199.1	202.1	254.1	253	1.1	6
6.1	5	★	MNS0610LB	31.6	53.1	53.1	110.1	109	1.1	7
	10	★	MNS0610X10DB	62.1	86.1	89.1	142.1	141	1.1	7
	20	★	MNS0610X20DB	123.1	151.1	154.1	207.1	206	1.1	7
	30	★	MNS0610X30DB	184.1	216.1	219.1	272.1	271	1.1	7
6.2	5	★	MNS0620LB	32.1	53.1	53.1	110.1	109	1.1	7
	10	□	MNS0620X10DB	63.1	86.1	89.1	142.1	141	1.1	7
	20	□	MNS0620X20DB	125.1	151.1	154.1	207.1	206	1.1	7
	30	□	MNS0620X30DB	187.1	216.1	219.1	272.1	271	1.1	7
6.3	5	★	MNS0630LB	32.6	53.1	53.1	110.1	109	1.1	7
	10	□	MNS0630X10DB	64.1	86.1	89.1	142.1	141	1.1	7
	20	□	MNS0630X20DB	127.1	151.1	154.1	207.1	206	1.1	7
	30	□	MNS0630X30DB	190.1	216.1	219.1	272.1	271	1.1	7
6.4	5	★	MNS0640LB	33.2	53.2	53.2	110.2	109	1.2	7
	10	□	MNS0640X10DB	65.2	86.2	89.2	142.2	141	1.2	7
	20	□	MNS0640X20DB	129.2	151.2	154.2	207.2	206	1.2	7
	30	□	MNS0640X30DB	193.2	216.2	219.2	272.2	271	1.2	7
6.5	5	★	MNS0650LB	33.7	53.2	53.2	110.2	109	1.2	7
	10	★	MNS0650X10DB	66.2	86.2	89.2	142.2	141	1.2	7
	20	★	MNS0650X20DB	131.2	151.2	154.2	207.2	206	1.2	7
	30	★	MNS0650X30DB	196.2	216.2	219.2	272.2	271	1.2	7

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L145
OPERATIONAL GUIDANCE ➤ L147

MNS

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
6.6	5	★	MNS0660LB	34.2	57.2	57.2	110.2	109	1.2	7
	10	□	MNS0660X10DB	67.2	92.2	95.2	148.2	147	1.2	7
	20	□	MNS0660X20DB	133.2	162.2	165.2	218.2	217	1.2	7
	30	□	MNS0660X30DB	199.2	232.2	235.2	288.2	287	1.2	7
6.7	5	★	MNS0670LB	34.7	57.2	57.2	110.2	109	1.2	7
	10	★	MNS0670X10DB	68.2	92.2	95.2	148.2	147	1.2	7
	20	★	MNS0670X20DB	135.2	162.2	165.2	218.2	217	1.2	7
	30	★	MNS0670X30DB	202.2	232.2	235.2	288.2	287	1.2	7
6.8	5	★	MNS0680LB	35.2	57.2	57.2	110.2	109	1.2	7
	10	□	MNS0680X10DB	69.2	92.2	95.2	148.2	147	1.2	7
	20	□	MNS0680X20DB	137.2	162.2	165.2	218.2	217	1.2	7
	30	□	MNS0680X30DB	205.2	232.2	235.2	288.2	287	1.2	7
6.9	5	★	MNS0690LB	35.8	57.3	57.3	110.3	109	1.3	7
	10	□	MNS0690X10DB	70.3	92.3	95.3	148.3	147	1.3	7
	20	□	MNS0690X20DB	139.3	162.3	165.3	218.3	217	1.3	7
	30	□	MNS0690X30DB	208.3	232.3	235.3	288.3	287	1.3	7
7.0	5	★	MNS0700LB	36.3	57.3	57.3	110.3	109	1.3	7
	10	★	MNS0700X10DB	71.3	92.3	95.3	148.3	147	1.3	7
	20	★	MNS0700X20DB	141.3	162.3	165.3	218.3	217	1.3	7
	30	★	MNS0700X30DB	211.3	232.3	235.3	288.3	287	1.3	7
7.1	5	★	MNS0710LB	36.8	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0710X10DB	72.3	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0710X20DB	143.3	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0710X30DB	214.3	249.3	252.3	306.3	305	1.3	8
7.2	5	★	MNS0720LB	37.3	61.3	65.3	119.3	118	1.3	8
	10	★	MNS0720X10DB	73.3	99.3	102.3	156.3	155	1.3	8
	20	★	MNS0720X20DB	145.3	174.3	177.3	231.3	230	1.3	8
	30	★	MNS0720X30DB	217.3	249.3	252.3	306.3	305	1.3	8
7.3	5	★	MNS0730LB	37.8	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0730X10DB	74.3	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0730X20DB	147.3	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0730X30DB	220.3	249.3	252.3	306.3	305	1.3	8
7.4	5	★	MNS0740LB	38.3	61.3	65.3	119.3	118	1.3	8
	10	□	MNS0740X10DB	75.3	99.3	102.3	156.3	155	1.3	8
	20	□	MNS0740X20DB	149.3	174.3	177.3	231.3	230	1.3	8
	30	□	MNS0740X30DB	223.3	249.3	252.3	306.3	305	1.3	8
7.5	5	★	MNS0750LB	38.9	61.4	65.4	119.4	118	1.4	8
	10	□	MNS0750X10DB	76.4	99.4	102.4	156.4	155	1.4	8
	20	□	MNS0750X20DB	151.4	174.4	177.4	231.4	230	1.4	8
	30	□	MNS0750X30DB	226.4	249.4	252.4	306.4	305	1.4	8
7.6	5	★	MNS0760LB	39.4	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0760X10DB	77.4	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0760X20DB	153.4	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0760X30DB	229.4	265.4	268.4	322.4	321	1.4	8
7.7	5	★	MNS0770LB	39.9	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0770X10DB	78.4	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0770X20DB	155.4	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0770X30DB	232.4	265.4	268.4	322.4	321	1.4	8
7.8	5	★	MNS0780LB	40.4	65.4	65.4	119.4	118	1.4	8
	10	★	MNS0780X10DB	79.4	105.4	108.4	162.4	161	1.4	8
	20	★	MNS0780X20DB	157.4	185.4	188.4	242.4	241	1.4	8
	30	★	MNS0780X30DB	235.4	265.4	268.4	322.4	321	1.4	8
7.9	5	★	MNS0790LB	40.9	65.4	65.4	119.4	118	1.4	8
	10	□	MNS0790X10DB	80.4	105.4	108.4	162.4	161	1.4	8
	20	□	MNS0790X20DB	159.4	185.4	188.4	242.4	241	1.4	8
	30	□	MNS0790X30DB	238.4	265.4	268.4	322.4	321	1.4	8
8.0	5	★	MNS0800LB	41.5	65.5	65.5	119.5	118	1.5	8
	10	★	MNS0800X10DB	81.5	105.5	108.5	162.5	161	1.5	8
	20	★	MNS0800X20DB	161.5	185.5	188.5	242.5	241	1.5	8
	30	★	MNS0800X30DB	241.5	265.5	268.5	322.5	321	1.5	8
8.1	5	★	MNS0810LB	42.0	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0810X10DB	82.5	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0810X20DB	163.5	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0810X30DB	244.5	282.5	285.5	340.5	339	1.5	9
8.2	5	★	MNS0820LB	42.5	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0820X10DB	83.5	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0820X20DB	165.5	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0820X30DB	247.5	282.5	285.5	340.5	339	1.5	9
8.3	5	★	MNS0830LB	43.0	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0830X10DB	84.5	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0830X20DB	167.5	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0830X30DB	250.5	282.5	285.5	340.5	339	1.5	9
8.4	5	★	MNS0840LB	43.5	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0840X10DB	85.5	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0840X20DB	169.5	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0840X30DB	253.5	282.5	285.5	340.5	339	1.5	9
8.5	5	★	MNS0850LB	44.0	69.5	73.5	128.5	127	1.5	9
	10	□	MNS0850X10DB	86.5	112.5	115.5	170.5	169	1.5	9
	20	□	MNS0850X20DB	171.5	197.5	200.5	255.5	254	1.5	9
	30	□	MNS0850X30DB	256.5	282.5	285.5	340.5	339	1.5	9
8.6	5	★	MNS0860LB	44.6	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0860X10DB	87.6	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0860X20DB	173.6	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0860X30DB	259.6	298.6	301.6	356.6	355	1.6	9
8.7	5	★	MNS0870LB	45.1	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0870X10DB	88.6	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0870X20DB	175.6	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0870X30DB	262.6	298.6	301.6	356.6	355	1.6	9

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stock in Japan □ : Made to Order

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
8.8	5	★	MNS0880LB	45.6	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0880X10DB	89.6	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0880X20DB	177.6	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0880X30DB	265.6	298.6	301.6	356.6	355	1.6	9
8.9	5	★	MNS0890LB	46.1	73.6	73.6	128.6	127	1.6	9
	10	□	MNS0890X10DB	90.6	118.6	121.6	176.6	175	1.6	9
	20	□	MNS0890X20DB	179.6	208.6	211.6	266.6	265	1.6	9
	30	□	MNS0890X30DB	268.6	298.6	301.6	356.6	355	1.6	9
9.0	5	★	MNS0900LB	46.6	73.6	73.6	128.6	127	1.6	9
	10	★	MNS0900X10DB	91.6	118.6	121.6	176.6	175	1.6	9
	20	★	MNS0900X20DB	181.6	208.6	211.6	266.6	265	1.6	9
	30	★	MNS0900X30DB	271.6	298.6	301.6	356.6	355	1.6	9
9.1	5	★	MNS0910LB	47.2	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0910X10DB	92.7	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0910X20DB	183.7	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0910X30DB	274.7	315.7	318.7	373.7	372	1.7	10
9.2	5	★	MNS0920LB	47.7	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0920X10DB	93.7	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0920X20DB	185.7	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0920X30DB	277.7	315.7	318.7	373.7	372	1.7	10
9.3	5	★	MNS0930LB	48.2	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0930X10DB	94.7	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0930X20DB	187.7	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0930X30DB	280.7	315.7	318.7	373.7	372	1.7	10
9.4	5	★	MNS0940LB	48.7	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0940X10DB	95.7	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0940X20DB	189.7	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0940X30DB	283.7	315.7	318.7	373.7	372	1.7	10
9.5	5	★	MNS0950LB	49.2	77.7	81.7	137.7	136	1.7	10
	10	□	MNS0950X10DB	96.7	125.7	128.7	183.7	182	1.7	10
	20	□	MNS0950X20DB	191.7	220.7	223.7	278.7	277	1.7	10
	30	□	MNS0950X30DB	286.7	315.7	318.7	373.7	372	1.7	10
9.6	5	★	MNS0960LB	49.7	81.7	81.7	137.7	136	1.7	10
	10	□	MNS0960X10DB	97.7	131.7	134.7	189.7	188	1.7	10
	20	□	MNS0960X20DB	193.7	231.7	234.7	289.7	288	1.7	10
	30	□	MNS0960X30DB	289.7	331.7	334.7	389.7	388	1.7	10
9.7	5	★	MNS0970LB	50.3	81.8	81.8	137.8	136	1.8	10
	10	□	MNS0970X10DB	98.8	131.8	134.8	189.8	188	1.8	10
	20	□	MNS0970X20DB	195.8	231.8	234.8	289.8	288	1.8	10
	30	□	MNS0970X30DB	292.8	331.8	334.8	389.8	388	1.8	10
9.8	5	★	MNS0980LB	50.8	81.8	81.8	137.8	136	1.8	10
	10	★	MNS0980X10DB	99.8	131.8	134.8	189.8	188	1.8	10
	20	★	MNS0980X20DB	197.8	231.8	234.8	289.8	288	1.8	10
	30	★	MNS0980X30DB	295.8	331.8	334.8	389.8	388	1.8	10

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
9.9	5	★	MNS0990LB	51.3	81.8	81.8	137.8	136	1.8	10
	10	□	MNS0990X10DB	100.8	131.8	134.8	189.8	188	1.8	10
	20	□	MNS0990X20DB	199.8	231.8	234.8	289.8	288	1.8	10
	30	□	MNS0990X30DB	298.8	331.8	334.8	389.8	388	1.8	10
10.0	5	★	MNS1000LB	51.8	81.8	81.8	137.8	136	1.8	10
	10	★	MNS1000X10DB	101.8	131.8	134.8	189.8	188	1.8	10
	20	★	MNS1000X20DB	201.8	231.8	234.8	289.8	288	1.8	10
	30	★	MNS1000X30DB	301.8	331.8	334.8	389.8	388	1.8	10
10.1	5	★	MNS1010LB	52.3	85.8	89.8	150.8	149	1.8	11
	10	□	MNS1010X10DB	102.8	138.8	141.8	202.8	201	1.8	11
	20	□	MNS1010X20DB	203.8	243.8	246.8	307.8	306	1.8	11
10.2	5	★	MNS1020LB	52.9	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1020X10DB	103.9	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1020X20DB	205.9	243.9	246.9	307.9	306	1.9	11
10.3	5	★	MNS1030LB	53.4	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1030X10DB	104.9	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1030X20DB	207.9	243.9	246.9	307.9	306	1.9	11
10.4	5	★	MNS1040LB	53.9	85.9	89.9	150.9	149	1.9	11
	10	□	MNS1040X10DB	105.9	138.9	141.9	202.9	201	1.9	11
	20	□	MNS1040X20DB	209.9	243.9	246.9	307.9	306	1.9	11
10.5	5	★	MNS1050LB	54.4	85.9	89.9	150.9	149	1.9	11
	10	★	MNS1050X10DB	106.9	138.9	141.9	202.9	201	1.9	11
	20	★	MNS1050X20DB	211.9	243.9	246.9	307.9	306	1.9	11
10.6	5	★	MNS1060LB	54.9	89.9	89.9	150.9	149	1.9	11
	10	□	MNS1060X10DB	107.9	144.9	147.9	208.9	207	1.9	11
	20	□	MNS1060X20DB	213.9	254.9	257.9	318.9	317	1.9	11
10.7	5	★	MNS1070LB	55.4	89.9	89.9	150.9	149	1.9	11
	10	□	MNS1070X10DB	108.9	144.9	147.9	208.9	207	1.9	11
	20	□	MNS1070X20DB	215.9	254.9	257.9	318.9	317	1.9	11
10.8	5	★	MNS1080LB	56.0	90.0	90.0	151.0	149	2.0	11
	10	□	MNS1080X10DB	110.0	145.0	148.0	209.0	207	2.0	11
	20	□	MNS1080X20DB	218.0	255.0	258.0	319.0	317	2.0	11
10.9	5	★	MNS1090LB	56.5	90.0	90.0	151.0	149	2.0	11
	10	□	MNS1090X10DB	111.0	145.0	148.0	209.0	207	2.0	11
	20	□	MNS1090X20DB	220.0	255.0	258.0	319.0	317	2.0	11
11.0	5	★	MNS1100LB	57.0	90.0	90.0	151.0	149	2.0	11
	10	★	MNS1100X10DB	112.0	145.0	148.0	209.0	207	2.0	11
	20	★	MNS1100X20DB	222.0	255.0	258.0	319.0	317	2.0	11
11.1	5	★	MNS1110LB	57.5	94.0	98.0	160.0	158	2.0	12
	10	□	MNS1110X10DB	113.0	152.0	155.0	217.0	215	2.0	12
	20	□	MNS1110X20DB	224.0	267.0	270.0	332.0	330	2.0	12
11.2	5	★	MNS1120LB	58.0	94.0	98.0	160.0	158	2.0	12
	10	□	MNS1120X10DB	114.0	152.0	155.0	217.0	215	2.0	12
	20	□	MNS1120X20DB	226.0	267.0	270.0	332.0	330	2.0	12

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L145
OPERATIONAL GUIDANCE ➤ L147

MNS

DC (mm)	L/D	Stock TF15	Order Number	Dimensions (mm) LU	LCF	LH	OAL	LF	PL	DCON
11.3	5	★	MNS1130LB	58.6	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1130X10DB	115.1	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1130X20DB	228.1	267.1	270.1	332.1	330	2.1	12
11.4	5	★	MNS1140LB	59.1	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1140X10DB	116.1	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1140X20DB	230.1	267.1	270.1	332.1	330	2.1	12
11.5	5	★	MNS1150LB	59.6	94.1	98.1	160.1	158	2.1	12
	10	□	MNS1150X10DB	117.1	152.1	155.1	217.1	215	2.1	12
	20	□	MNS1150X20DB	232.1	267.1	270.1	332.1	330	2.1	12
11.6	5	★	MNS1160LB	60.1	98.1	98.1	160.1	158	2.1	12
	10	□	MNS1160X10DB	118.1	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1160X20DB	234.1	278.1	281.1	343.1	341	2.1	12
11.7	5	★	MNS1170LB	60.6	98.1	98.1	160.1	158	2.1	12
	10	□	MNS1170X10DB	119.1	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1170X20DB	236.1	278.1	281.1	343.1	341	2.1	12
11.8	5	★	MNS1180LB	61.1	98.1	98.1	160.1	158	2.1	12
	10	□	MNS1180X10DB	120.1	158.1	161.1	223.1	221	2.1	12
	20	□	MNS1180X20DB	238.1	278.1	281.1	343.1	341	2.1	12
11.9	5	★	MNS1190LB	61.7	98.2	98.2	160.2	158	2.2	12
	10	□	MNS1190X10DB	121.2	158.2	161.2	223.2	221	2.2	12
	20	□	MNS1190X20DB	240.2	278.2	281.2	343.2	341	2.2	12
12.0	5	★	MNS1200LB	62.2	98.2	98.2	160.2	158	2.2	12
	10	★	MNS1200X10DB	122.2	158.2	161.2	223.2	221	2.2	12
	20	★	MNS1200X20DB	242.2	278.2	281.2	343.2	341	2.2	12
12.1	5	★	MNS1210LB	62.7	102.2	106.2	169.2	167	2.2	13
	10	□	MNS1210X10DB	123.2	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1210X20DB	244.2	290.2	293.2	356.2	354	2.2	13
12.2	5	★	MNS1220LB	63.2	102.2	106.2	169.2	167	2.2	13
	10	□	MNS1220X10DB	124.2	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1220X20DB	246.2	290.2	293.2	356.2	354	2.2	13
12.3	5	★	MNS1230LB	63.7	102.2	106.2	169.2	167	2.2	13
	10	□	MNS1230X10DB	125.2	165.2	168.2	231.2	229	2.2	13
	20	□	MNS1230X20DB	248.2	290.2	293.2	356.2	354	2.2	13
12.4	5	★	MNS1240LB	64.3	102.3	106.3	169.3	167	2.3	13
	10	□	MNS1240X10DB	126.3	165.3	168.3	231.3	229	2.3	13
	20	□	MNS1240X20DB	250.3	290.3	293.3	356.3	354	2.3	13
12.5	5	★	MNS1250LB	64.8	102.3	106.3	169.3	167	2.3	13
	10	□	MNS1250X10DB	127.3	165.3	168.3	231.3	229	2.3	13
	20	□	MNS1250X20DB	252.3	290.3	293.3	356.3	354	2.3	13
12.6	5	★	MNS1260LB	65.3	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1260X10DB	128.3	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1260X20DB	254.3	301.3	304.3	367.3	365	2.3	13
12.7	5	★	MNS1270LB	65.8	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1270X10DB	129.3	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1270X20DB	256.3	301.3	304.3	367.3	365	2.3	13
12.8	5	★	MNS1280LB	66.3	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1280X10DB	130.3	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1280X20DB	258.3	301.3	304.3	367.3	365	2.3	13
12.9	5	★	MNS1290LB	66.8	106.3	106.3	169.3	167	2.3	13
	10	□	MNS1290X10DB	131.3	171.3	174.3	237.3	235	2.3	13
	20	□	MNS1290X20DB	260.3	301.3	304.3	367.3	365	2.3	13
13.0	5	★	MNS1300LB	67.4	106.4	106.4	169.4	167	2.4	13
	10	★	MNS1300X10DB	132.4	171.4	174.4	237.4	235	2.4	13
	20	★	MNS1300X20DB	262.4	301.4	304.4	367.4	365	2.4	13
13.1	5	★	MNS1310LB	67.9	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1310X10DB	133.4	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1310X20DB	264.4	313.4	316.4	380.4	378	2.4	14
13.2	5	★	MNS1320LB	68.4	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1320X10DB	134.4	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1320X20DB	266.4	313.4	316.4	380.4	378	2.4	14
13.3	5	★	MNS1330LB	68.9	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1330X10DB	135.4	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1330X20DB	268.4	313.4	316.4	380.4	378	2.4	14
13.4	5	★	MNS1340LB	69.4	110.4	114.4	178.4	176	2.4	14
	10	□	MNS1340X10DB	136.4	178.4	181.4	245.4	243	2.4	14
	20	□	MNS1340X20DB	270.4	313.4	316.4	380.4	378	2.4	14
13.5	5	★	MNS1350LB	70.0	110.5	114.5	178.5	176	2.5	14
	10	□	MNS1350X10DB	137.5	178.5	181.5	245.5	243	2.5	14
	20	□	MNS1350X20DB	272.5	313.5	316.5	380.5	378	2.5	14
13.6	5	★	MNS1360LB	70.5	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1360X10DB	138.5	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1360X20DB	274.5	324.5	327.5	391.5	389	2.5	14
13.7	5	★	MNS1370LB	71.0	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1370X10DB	139.5	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1370X20DB	276.5	324.5	327.5	391.5	389	2.5	14
13.8	5	★	MNS1380LB	71.5	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1380X10DB	140.5	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1380X20DB	278.5	324.5	327.5	391.5	389	2.5	14
13.9	5	★	MNS1390LB	72.0	114.5	114.5	178.5	176	2.5	14
	10	□	MNS1390X10DB	141.5	184.5	187.5	251.5	249	2.5	14
	20	□	MNS1390X20DB	280.5	324.5	327.5	391.5	389	2.5	14
14.0	5	★	MNS1400LB	72.5	114.5	114.5	178.5	176	2.5	14
	10	★	MNS1400X10DB	142.5	184.5	187.5	251.5	249	2.5	14
	20	★	MNS1400X20DB	282.5	324.5	327.5	391.5	389	2.5	14

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stock in Japan □ : Made to Order

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L147

RECOMMENDED CUTTING CONDITIONS

■ LB Type

Workpiece		Aluminum Alloy (Si<5%) AISI A6061, A7075 etc.		Austenitic Stainless Steel (5%≤Si≤10%) ASTM 333.0 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1181	**3.0**	395 (310—460)	.0039 (.0043—.0063)	395 (310—460)	.0059 (.0063—.0083)
.1575	**4.0**	395 (310—460)	.0059 (.0051—.0079)	395 (310—460)	.0079 (.0079—.0106)
.1969	**5.0**	395 (310—460)	.0079 (.0067—.0098)	395 (310—460)	.0098 (.0098—.0130)
.2480	**6.3**	490 (395—560)	.0098 (.0083—.0126)	490 (395—560)	.0138 (.0126—.0165)
.3150	**8.0**	490 (395—560)	.0118 (.0106—.0157)	490 (395—560)	.0177 (.0157—.0209)
.3937	**10.0**	490 (395—560)	.0157 (.0130—.0197)	490 (395—560)	.0217 (.0197—.0264)
.4724	**12.0**	655 (525—755)	.0197 (.0157—.0236)	655 (525—755)	.0276 (.0236—.0315)
.5512	**14.0**	655 (525—755)	.0197 (.0157—.0236)	655 (525—755)	.0276 (.0236—.0315)

Workpiece		Aluminum Alloy (Si>10%) ASTM 380.0, A390.0 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm		
.1181	**3.0**	395 (310—460)	.0059 (.0063—.0083)
.1575	**4.0**	395 (310—460)	.0079 (.0079—.0106)
.1969	**5.0**	395 (310—460)	.0098 (.0098—.0130)
.2480	**6.3**	490 (395—560)	.0138 (.0126—.0165)
.3150	**8.0**	490 (395—560)	.0177 (.0157—.0209)
.3937	**10.0**	490 (395—560)	.0217 (.0197—.0264)
.4724	**12.0**	655 (525—755)	.0276 (.0236—.0315)
.5512	**14.0**	655 (525—755)	.0276 (.0236—.0315)

Note 1) When using the drill with a length over L/D 10, it is necessary to use a prep hole as the pilot. (If no prep-hole is used then drill breakage can occur)
Note 2) For pilot hole drilling, Mitsubishi Materials MNS-LB, MAE-MB or MAS-MB drill is recommended.

MNS

RECOMMENDED CUTTING CONDITIONS

■ DB Type

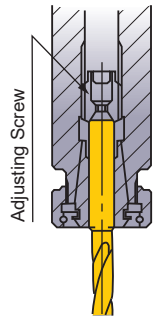
Workpiece		Aluminum Alloy (Si<5%) AISI A6061, A7075 etc.		Austenitic Stainless Steel (5%≤Si≤10%) ASTM 333.0 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.1181	**3.0**	295 (230—330)	.0039 (.0043—.0063)	295 (230—330)	.0059 (.0063—.0083)
.1575	**4.0**	295 (230—330)	.0059 (.0051—.0079)	295 (230—330)	.0079 (.0079—.0106)
.1969	**5.0**	295 (230—330)	.0079 (.0067—.0098)	295 (230—330)	.0098 (.0098—.0130)
.2480	**6.3**	395 (310—460)	.0098 (.0083—.0126)	395 (310—460)	.0138 (.0126—.0165)
.3150	**8.0**	395 (310—460)	.0118 (.0106—.0157)	395 (310—460)	.0177 (.0157—.0209)
.3937	**10.0**	395 (310—460)	.0157 (.0130—.0197)	395 (310—460)	.0217 (.0197—.0264)
.4724	**12.0**	525 (410—590)	.0197 (.0157—.0236)	525 (410—590)	.0276 (.0236—.0315)
.5512	**14.0**	525 (410—590)	.0197 (.0157—.0236)	525 (410—590)	.0276 (.0236—.0315)

Workpiece		Aluminum Alloy (Si>10%) ASTM 383.0, A390.0 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm		
.1181	**3.0**	295 (230—330)	.0059 (.0063—.0083)
.1575	**4.0**	295 (230—330)	.0079 (.0079—.0106)
.1969	**5.0**	295 (230—330)	.0098 (.0098—.0130)
.2480	**6.3**	395 (310—460)	.0138 (.0126—.0165)
.3150	**8.0**	395 (310—460)	.0177 (.0157—.0209)
.3937	**10.0**	395 (310—460)	.0217 (.0197—.0264)
.4724	**12.0**	525 (410—590)	.0276 (.0236—.0315)
.5512	**14.0**	525 (410—590)	.0276 (.0236—.0315)

Note 1) When using the drill with a length over L/D 10, it is necessary to use a prep hole as the pilot. (If no prep-hole is used then drill breakage can occur)
Note 2) For pilot hole drilling, Mitsubishi Materials MNS-LB, MAE-MB or MAS-MB drill is recommended.
Note 3) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

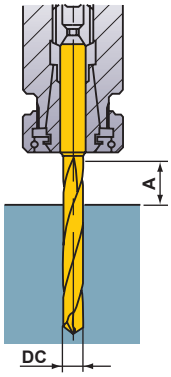
■ OPERATIONAL GUIDANCE FOR THE MNS...LB DRILL

Drill Holding



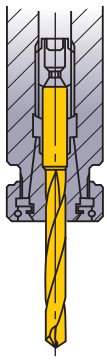
Thrust bearing type collet chuck holds the drill securely.

Drill Length



A ≥ DC x 1.5

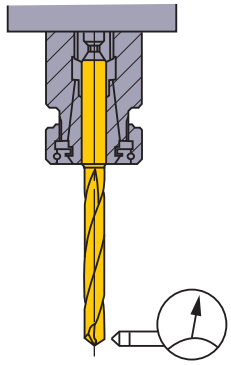
Drill Installation



NG

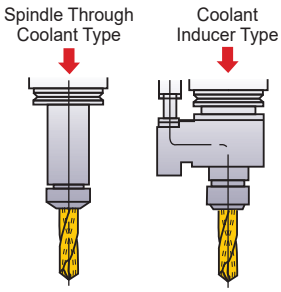
Do not clamp on the flutes.

Installation Tolerance



Runout ≤ .001″

Through Coolant Type



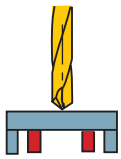
Recommended coolant pressure: 70 - 1015 PSI (0.5 - 7MPa).

Coolant Handling

1) Small particles of swarf will jam in the oil hole of small diameter drills. Always use a fine mesh filter as a preventative measure.

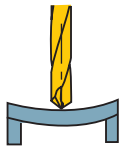
2) Dirt and dust particles adhere to the oil in old coolant and prevent an efficient flow. Regular coolant exchange is recommended.

Thin Workpiece



Support the Workpiece

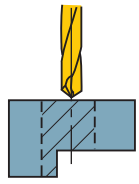
OK



If Bending Occurs

NG

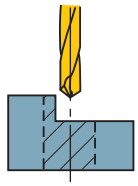
Interrupted Cutting



One Process

OK

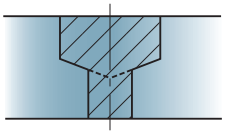
①Lower the feed when drilling the interrupted part.



Requires Prior Machining

①Spot face with an end mill prior to drilling.

Stepped Holes

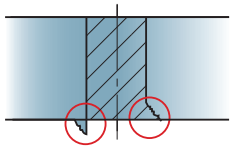


①Divide the machining into two processes.

②Drill the larger hole first.

*Tools for chamfering and spot facing can be produced to order.

Burring and Workpiece Chipping



①Lower the feed rate when breaking through.

②Add a chamfer.

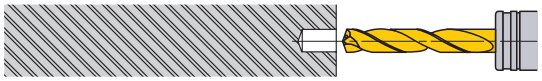
③Change the point angle.

MNS...DB

■ OPERATIONAL GUIDANCE FOR THE MNS...DB DRILL

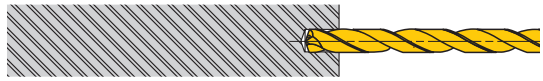
Flat Face Drilling ●Drilling a blind hole

■ 1. Drilling a Pilot Hole



①Use a drill with the same or larger point angle than the MNS...DB type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC or deeper.
(Adjust the pilot hole depth according to the length of the MNS...DB type.)

■ 2. Initial Cutting with the Long Type Drill

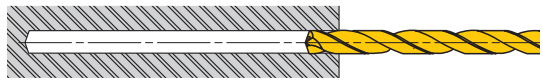


①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

■ 3. Drill the Deep Hole

①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

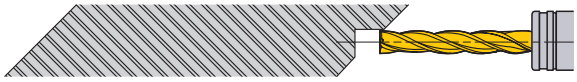
■ 4. Drill Retraction



①After drilling, lower the cutting revolution about .039-.079 inch short of the hole end. (Cutting speed of around 65-100 SFM)
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 inch/min.
③Finally clear the hole at a cutting speed of 65-100 SFM and feed rate of .008-.012 IPR.

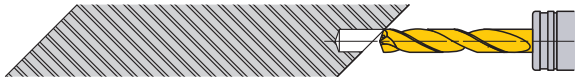
Irregular Face Drilling ●Drilling and breaking through on irregular faces or angles

■ 1. Spot Facing



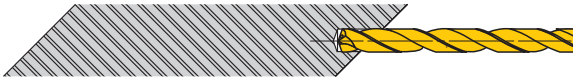
①Machine a flat on the irregular face by using an MFE (flat bottom drill) or an end mill capable of spot facing. Make the spot face diameter the same size as the required deep hole diameter.

■ 2. Drilling a Pilot Hole



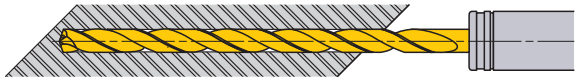
①Use a drill with the same or larger point angle than the super long type. Mitsubishi type MNS-LB, MAE-MB or MAS-MB drill is recommended.
②Ensure a high precision hole is drilled for the pilot.
③Drill depth : Approx 1DC or deeper.
(Adjust the pilot hole depth according to the length of the super long type.)

■ 3. Initial Cutting with the Long Type Drill



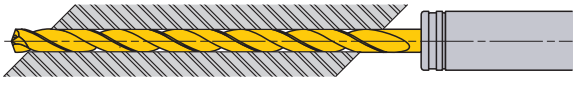
①Penetrate the pilot hole at a low revolution. (Cutting speed 65-100 SFM, feed rate .008-.012 IPR)
②Stop the long type drill .039-.118 inch short of the pilot hole bottom.

■ 4. Drill the Deep Hole



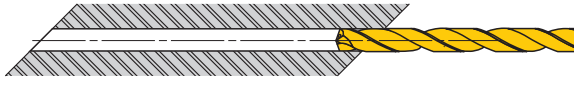
①Start cutting at the recommended speed and feed with a non-peck (continuous feed) cycle.

■ 5. Breaking Through



①When breaking through, the cutting edge can be damaged.
②A feed rate of .002-.004 IPR is recommended.

■ 6. Drill Retraction



①Finally clear the hole at a cutting speed of 65-100 SFM.
②Retract the drill to the pilot hole depth starting point at a feed rate of 120 IPM.

Memo

MAS

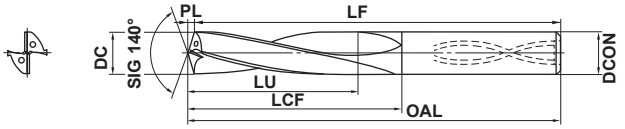
- Specialized in aluminum and cast iron drilling.
- High hole accuracy.
- Pre-hole drilling for rolled tap.
- Helical coolant hole enables high speed machining.

P | M | **K** | **N** | S | H

INCH STANDARD

L/D=3

Internal Coolant



.1250≤DC≤.2344	.2500≤DC≤.3906	.4062≤DC≤.7031	.7188≤DC≤.7812
+0.00020 0	+0.00020 0	+0.00020 0	+0.00020 0
.1250≤DCON≤.2362	**.2500≤DCON≤.3937**	**.4062≤DCON≤.7087**	**.7188≤DCON≤.7874**
0 −0.00031	0 −0.00035	0 −0.00043	0 −0.00051

Note 1) MAS drills bigger than .2031" have a recess in the end face.
Note 2) MAS drills are suitable for use with shrink fit holders.

DC (inch)	Order Number	Stock HTi10	LU	LCF	OAL	LF	PL	DCON	Rolled Thread Tap Size
.1250	MAS01250MB	●	.398	.968	2.543	2.520	.023	.1575	
.1406	MAS01406MB	●	.447	1.128	2.703	2.677	.026	.1575	
.1495	MAS01495MB	●	.475	1.129	2.704	2.677	.027	.1575	10-24NC
.1563	MAS01563MB	●	.497	1.130	2.705	2.677	.028	.1575	
.1590	MAS01590MB	●	.506	1.249	2.824	2.795	.029	.1969	10-32NF
.1719	MAS01719MB	●	.547	1.251	2.826	2.795	.031	.1969	
.1875	MAS01875MB	●	.596	1.333	2.908	2.874	.034	.1969	
.2031	MAS02031MB	●	.646	1.454	3.029	2.992	.037	.2362	
.2165	MAS02165MB	●	.688	1.456	3.031	2.992	.039	.2362	
.2188	MAS02188MB	●	.696	1.575	3.150	3.110	.040	.2362	
.2344	MAS02344MB	●	.745	1.578	3.153	3.110	.043	.2362	
.2500	MAS02500MB	●	.795	1.700	3.353	3.307	.046	.2756	1/16-27NS
.2570	MAS02570MB	●	.817	1.701	3.354	3.307	.047	.2756	5/16-18NC
.2656	MAS02656MB	●	.845	1.702	3.355	3.307	.048	.2756	
.2720	MAS02720MB	●	.865	1.704	3.357	3.307	.050	.2756	5/16-24NF
.2812	MAS02812MB	●	.894	1.941	3.594	3.543	.051	.3150	
.2969	MAS02969MB	●	.944	1.944	3.597	3.543	.054	.3150	
.3125	MAS03125MB	●	.994	1.947	3.600	3.543	.057	.3150	3/8-16NC
.3281	MAS03281MB	●	1.043	2.029	3.761	3.701	.060	.3543	1/8-27NPT
.3320	MAS03320MB	●	1.056	2.029	3.761	3.701	.060	.3543	3/8-24NF
.3438	MAS03438MB	●	1.093	2.032	3.764	3.701	.063	.3543	
.3594	MAS03594MB	●	1.143	2.152	3.884	3.819	.065	.3937	
.3680	MAS03680MB	●	1.170	2.154	3.886	3.819	.067	.3937	7/16-14NC
.3750	MAS03750MB	●	1.193	2.155	3.887	3.819	.068	.3937	
.3906	MAS03906MB	●	1.242	2.158	3.890	3.819	.071	.3937	7/16-20NF
.4062	MAS04062MB	●	1.292	2.239	4.050	3.976	.074	.4331	
.4219	MAS04219MB	●	1.342	2.242	4.053	3.976	.077	.4331	1/2-13, 1/2-12
.4375	MAS04375MB	●	1.391	2.442	4.253	4.173	.080	.4724	1/4-18NPT
.4531	MAS04531MB	●	1.441	2.444	4.255	4.173	.082	.4724	1/2-20, 1/4-18NS
.4688	MAS04688MB	●	1.491	2.447	4.258	4.173	.085	.4724	
.4844	MAS04844MB	●	1.540	2.647	4.616	4.528	.088	.5118	9/16-12NC
.5000	MAS05000MB	●	1.590	2.650	4.619	4.528	.091	.5118	
.5118	MAS05118MB	●	1.628	2.652	4.621	4.528	.093	.5118	
.5156	MAS05156MB	●	1.640	2.850	4.818	4.724	.094	.5512	9/16-18NF
.5312	MAS05312MB	●	1.689	2.853	4.821	4.724	.097	.5512	5/8-11NC
.5469	MAS05469MB	●	1.739	2.856	4.824	4.724	.100	.5512	
.5625	MAS05625MB	●	1.789	2.937	5.220	5.118	.102	.5906	3/8-18NPT
.5781	MAS05781MB	●	1.838	2.940	5.223	5.118	.105	.5906	5/8-18NF
.5937	MAS05937MB	●	1.888	3.100	5.384	5.276	.108	.6299	3/8-18NS
.6094	MAS06094MB	●	1.938	3.103	5.387	5.276	.111	.6299	
.6250	MAS06250MB	●	1.988	3.106	5.390	5.276	.114	.6299	
.6406	MAS06406MB	●	2.037	3.267	5.550	5.433	.117	.6693	
.6563	MAS06563MB	●	2.087	3.269	5.552	5.433	.119	.6693	3/4-10NC
.6718	MAS06718MB	●	2.136	3.468	5.752	5.630	.122	.7087	
.6875	MAS06875MB	●	2.186	3.471	5.755	5.630	.125	.7087	3/4-16NF
.7031	MAS07031MB	●	2.236	3.474	5.758	5.630	.128	.7087	1/2-14NPT
.7188	MAS07188MB	●	2.286	3.674	5.958	5.827	.131	.7480	
.7344	MAS07344MB	●	2.335	3.677	5.961	5.827	.134	.7480	7/8-9, 1/2-14NS
.7500	MAS07500MB	●	2.385	3.877	6.161	6.024	.137	.7874	
.7656	MAS07656MB	●	2.435	3.879	6.163	6.024	.139	.7874	
.7812	MAS07812MB	●	2.484	3.882	6.166	6.024	.142	.7874	

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

● : USA Stock

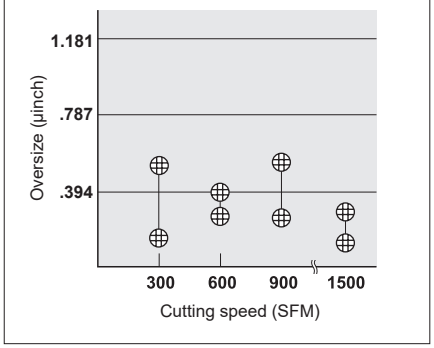
RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Drill Dia. **ϕ.1250" – ϕ.2344"**		Drill Dia. **ϕ.2500" – ϕ.3906"**		Drill Dia. **ϕ.4062" – ϕ.7812"**	
		Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)
N	Aluminum Alloy Casting	330 (195—490)	.006 (.002—.012)	390 (260—555)	.008 (.004—.012)	490 (330—655)	.010 (.004—.016)
	Aluminum Alloy Die Casting	390 (260—555)	.005 (.002—.010)	490 (330—590)	.006 (.002—.010)	525 (390—655)	.008 (.004—.012)
K	Gray Cast Iron	195 (130—260)	.006 (.004—.008)	260 (195—360)	.008 (.004—.012)	330 (230—425)	.012 (.008—.016)
	Ductile Cast Iron	145 (100—195)	.004 (.002—.006)	195 (130—260)	.005 (.002—.008)	260 (195—330)	.008 (.004—.012)

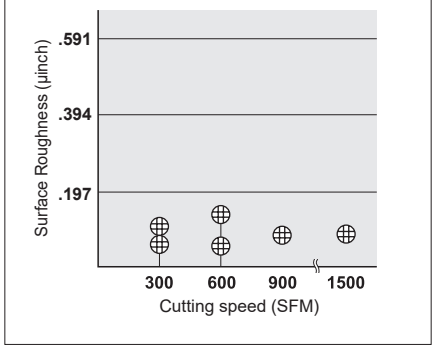
■ MACHINED HOLE ACCURACY

Tool : MAS1000MB Workpiece Material : 330 Aluminum Feed : .008 IPR Drilled Depth : 1.18 inch (Through hole) WSO (10%)

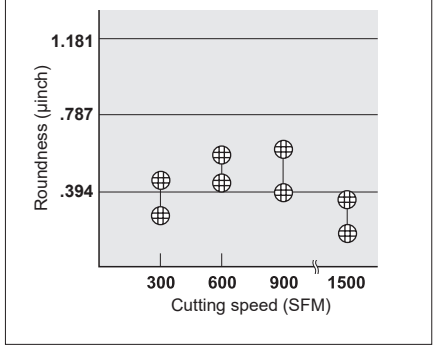
Oversize



Surface Roughness



Roundness



MAE/MAS

- Specialized in aluminum and cast iron drilling.
- High hole accuracy.
- Pre-hole drilling for rolled tap.
- Helical coolant hole enables high speed machining.

UWC | 140° | N

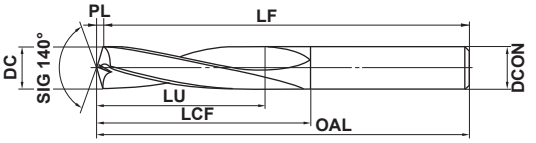
MAS only

P | M | K | N | S | H

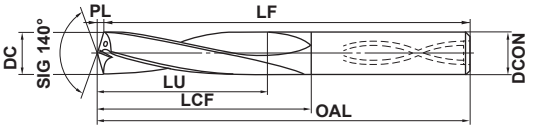
DC=3	3<DC≤6	6<DC≤10	10<DC≤16
+0.005 0	+0.005 0	+0.005 0	+0.005 0
DCON=3	**3<DCON≤6**	**6<DCON≤10**	**10<DCON≤16**
0 −0.006	0 −0.008	0 −0.009	0 −0.011

METRIC STANDARD

MAE (External Coolant)



MAS (Internal Coolant)



Note 1) MAS type larger than ϕ5.0mm have a recess in the shank end face.
Note 2) MAE/MAS type can be used for shrink fit holders.

DC (mm)	L/D	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
3.0	3	Ext.	★	MAE0300MB	9.5	21.5	61.5	61	0.5	3
	3	Int.	□	MAS0300MB	9.9	21.5	61.5	61	0.5	3
	6	Int.	★	MAS0300LB	10.2	30.5	70.5	70	0.5	3
3.1	3	Ext.	★	MAE0310MB	10.5	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0310MB	10.8	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0310LB	11.1	34.6	74.6	74	0.6	4
3.2	3	Ext.	★	MAE0320MB	11.5	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0320MB	11.7	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0320LB	11.8	34.6	74.6	74	0.6	4
3.3	3	Ext.	★	MAE0330MB	12.1	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0330MB	12.4	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0330LB	12.7	34.6	74.6	74	0.6	4
3.4	3	Ext.	★	MAE0340MB	13.0	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0340MB	13.4	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0340LB	13.7	34.6	74.6	74	0.6	4
3.5	3	Ext.	★	MAE0350MB	14.0	24.6	64.6	64	0.6	4
	3	Int.	□	MAS0350MB	14.3	24.6	64.6	64	0.6	4
	6	Int.	★	MAS0350LB	14.6	34.6	74.6	74	0.6	4
3.6	3	Ext.	★	MAE0360MB	15.0	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0360MB	15.3	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0360LB	15.6	40.7	80.7	80	0.7	4
3.65	3	Ext.	★	*MAE0365MB	15.9	28.7	68.7	68	0.7	4
	3	Int.	□	*MAS0365MB	16.2	28.7	68.7	68	0.7	4
	6	Int.	★	*MAS0365LB	16.5	40.7	80.7	80	0.7	4
3.7	3	Ext.	★	MAE0370MB	16.9	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0370MB	17.2	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0370LB	17.5	40.7	80.7	80	0.7	4
3.8	3	Ext.	★	MAE0380MB	17.8	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0380MB	18.1	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0380LB	18.5	40.7	80.7	80	0.7	4
3.9	3	Ext.	★	MAE0390MB	18.8	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0390MB	19.1	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0390LB	19.4	40.7	80.7	80	0.7	4
4.0	3	Ext.	★	MAE0400MB	19.7	28.7	68.7	68	0.7	4
	3	Int.	□	MAS0400MB	20.0	28.7	68.7	68	0.7	4
	6	Int.	★	MAS0400LB	20.4	40.7	80.7	80	0.7	4
4.1	3	Ext.	★	MAE0410MB	20.7	31.7	71.7	71	0.7	5
	3	Int.	□	MAS0410MB	21.0	31.7	71.7	71	0.7	5
	6	Int.	★	MAS0410LB	21.3	44.7	84.7	84	0.7	5
4.2	3	Ext.	★	MAE0420MB	21.6	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0420MB	22.0	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0420LB	22.3	44.8	84.8	84	0.8	5
4.3	3	Ext.	★	MAE0430MB	22.6	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0430MB	22.9	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0430LB	23.2	44.8	84.8	84	0.8	5
4.4	3	Ext.	★	MAE0440MB	23.4	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0440MB	23.5	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0440LB	23.9	44.8	84.8	84	0.8	5
4.5	3	Ext.	★	MAE0450MB	24.2	31.8	71.8	71	0.8	5
	3	Int.	□	MAS0450MB	24.5	31.8	71.8	71	0.8	5
	6	Int.	★	MAS0450LB	24.8	44.8	84.8	84	0.8	5
4.6	3	Ext.	★	*MAE0460MB	25.1	33.8	73.8	73	0.8	5
	3	Int.	□	*MAS0460MB	25.5	33.8	73.8	73	0.8	5
	6	Int.	★	*MAS0460LB	25.8	48.8	88.8	88	0.8	5
4.7	3	Ext.	★	MAE0470MB	26.1	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0470MB	26.4	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0470LB	26.7	48.9	88.9	88	0.9	5
4.8	3	Ext.	★	MAE0480MB	27.0	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0480MB	27.4	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0480LB	27.7	48.9	88.9	88	0.9	5

★ : Standard hole size for rolled thread tap.

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

DC (mm)	L/D	Coolant (Int./Ext.)	Stock	Order Number	Dimensions (mm)					
			HTi10		LU	LCF	OAL	LF	PL	DCON
4.9	3	Ext.	★	MAE0490MB	28.0	33.9	73.9	73	0.9	5
	3	Int.	□	MAS0490MB	28.3	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0490LB	28.6	48.9	88.9	88	0.9	5
5.0	3	Ext.	★	MAE0500MB	29.0	33.9	73.9	73	0.9	5
	3	Int.	★	MAS0500MB	29.3	33.9	73.9	73	0.9	5
	6	Int.	★	MAS0500LB	29.3	48.9	88.9	88	0.9	5
5.1	3	Ext.	★	MAE0510MB	29.6	36.9	76.9	76	0.9	6
	3	Int.	□	MAS0510MB	29.9	36.9	76.9	76	0.9	6
	6	Int.	★	MAS0510LB	30.2	52.9	92.9	92	0.9	6
5.2	3	Ext.	★	MAE0520MB	30.5	36.9	76.9	76	0.9	6
	3	Int.	□	MAS0520MB	30.9	36.9	76.9	76	0.9	6
	6	Int.	★	MAS0520LB	31.2	52.9	92.9	92	0.9	6
5.3	3	Ext.	★	MAE0530MB	31.5	37.0	77.0	76	1.0	6
	3	Int.	□	MAS0530MB	31.8	37.0	77.0	76	1.0	6
	6	Int.	★	MAS0530LB	32.1	53.0	93.0	92	1.0	6
5.4	3	Ext.	★	MAE0540MB	32.5	37.0	77.0	76	1.0	6
	3	Int.	□	MAS0540MB	32.8	37.0	77.0	76	1.0	6
	6	Int.	★	MAS0540LB	33.1	53.0	93.0	92	1.0	6
5.5	3	Ext.	★	*MAE0550MB	33.4	37.0	77.0	76	1.0	6
	3	Int.	★	*MAS0550MB	33.7	37.0	77.0	76	1.0	6
	6	Int.	★	*MAS0550LB	34.0	53.0	93.0	92	1.0	6
5.6	3	Ext.	★	MAE0560MB	34.4	40.0	80.0	79	1.0	6
	3	Int.	□	MAS0560MB	34.7	40.0	80.0	79	1.0	6
	6	Int.	★	MAS0560LB	35.0	58.0	98.0	97	1.0	6
5.7	3	Ext.	★	MAE0570MB	35.2	40.0	80.0	79	1.0	6
	3	Int.	□	MAS0570MB	35.3	40.0	80.0	79	1.0	6
	6	Int.	★	MAS0570LB	35.6	58.0	98.0	97	1.0	6
5.8	3	Ext.	★	MAE0580MB	36.0	40.1	80.1	79	1.1	6
	3	Int.	□	MAS0580MB	36.3	40.1	80.1	79	1.1	6
	6	Int.	★	MAS0580LB	36.6	58.1	98.1	97	1.1	6
5.9	3	Ext.	★	MAE0590MB	36.9	40.1	80.1	79	1.1	6
	3	Int.	□	MAS0590MB	37.2	40.1	80.1	79	1.1	6
	6	Int.	★	MAS0590LB	37.5	58.1	98.1	97	1.1	6
6.0	3	Ext.	★	MAE0600MB	37.9	40.1	80.1	79	1.1	6
	3	Int.	★	MAS0600MB	38.2	40.1	80.1	79	1.1	6
	6	Int.	★	MAS0600LB	38.5	58.1	98.1	97	1.1	6
6.1	3	Ext.	★	MAE0610MB	38.8	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0610MB	39.1	43.1	85.1	84	1.1	7
	6	Int.	★	MAS0610LB	39.5	63.1	105.1	104	1.1	7
6.2	3	Ext.	★	MAE0620MB	39.8	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0620MB	40.1	43.1	85.1	84	1.1	7
	6	Int.	★	MAS0620LB	40.4	63.1	105.1	104	1.1	7
6.3	3	Ext.	★	MAE0630MB	40.7	43.1	85.1	84	1.1	7
	3	Int.	□	MAS0630MB	41.0	43.1	85.1	84	1.1	7
	6	Int.	★	MAS0630LB	41.3	63.1	105.1	104	1.1	7
6.4	3	Ext.	★	MAE0640MB	41.4	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0640MB	41.7	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0640LB	42.0	63.2	105.2	104	1.2	7
6.5	3	Ext.	★	MAE0650MB	42.3	43.2	85.2	84	1.2	7
	3	Int.	★	MAS0650MB	42.6	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0650LB	43.0	63.2	105.2	104	1.2	7
6.6	3	Ext.	★	MAE0660MB	43.3	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0660MB	43.6	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0660LB	43.9	66.2	108.2	107	1.2	7
6.7	3	Ext.	★	MAE0670MB	44.2	43.2	85.2	84	1.2	7
	3	Int.	□	MAS0670MB	44.5	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0670LB	44.9	66.2	108.2	107	1.2	7
6.8	3	Ext.	★	MAE0680MB	45.2	43.2	85.2	84	1.2	7
	3	Int.	★	MAS0680MB	45.5	43.2	85.2	84	1.2	7
	6	Int.	★	MAS0680LB	45.8	66.2	108.2	107	1.2	7
6.9	3	Ext.	★	MAE0690MB	46.1	43.3	85.3	84	1.3	7
	3	Int.	□	MAS0690MB	46.5	43.3	85.3	84	1.3	7
	6	Int.	★	MAS0690LB	46.8	66.3	108.3	107	1.3	7
7.0	3	Ext.	★	MAE0700MB	47.1	43.3	85.3	84	1.3	7
	3	Int.	★	MAS0700MB	47.4	43.3	85.3	84	1.3	7
	6	Int.	★	MAS0700LB	47.6	66.3	108.3	107	1.3	7
7.1	3	Ext.	★	MAE0710MB	47.7	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0710MB	48.0	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0710LB	48.4	69.3	111.3	110	1.3	8
7.2	3	Ext.	★	MAE0720MB	48.7	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0720MB	49.0	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0720LB	49.3	69.3	111.3	110	1.3	8
7.3	3	Ext.	★	MAE0730MB	49.6	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0730MB	50.0	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0730LB	50.3	69.3	111.3	110	1.3	8
7.35	3	Ext.	★	*MAE0735MB	50.6	49.3	91.3	90	1.3	8
	3	Int.	★	*MAS0735MB	50.9	49.3	91.3	90	1.3	8
	6	Int.	★	*MAS0735LB	18.5	69.3	111.3	110	1.3	8
7.4	3	Ext.	★	MAE0740MB	9.5	49.3	91.3	90	1.3	8
	3	Int.	□	MAS0740MB	19.2	49.3	91.3	90	1.3	8
	6	Int.	★	MAS0740LB	9.9	69.3	111.3	110	1.3	8
7.5	3	Ext.	★	MAE0750MB	19.8	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0750MB	10.2	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0750LB	20.4	69.4	111.4	110	1.4	8
7.6	3	Ext.	★	MAE0760MB	10.5	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0760MB	21.0	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0760LB	10.8	73.4	115.4	114	1.4	8
7.7	3	Ext.	★	MAE0770MB	21.6	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0770MB	11.1	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0770LB	22.3	73.4	115.4	114	1.4	8

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L157

MAE/MAS

DC (mm)	L/D	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
7.8	3	Ext.	★	MAE0780MB	11.5	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0780MB	22.6	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0780LB	11.7	73.4	115.4	114	1.4	8
7.9	3	Ext.	★	MAE0790MB	22.9	49.4	91.4	90	1.4	8
	3	Int.	□	MAS0790MB	11.8	49.4	91.4	90	1.4	8
	6	Int.	★	MAS0790LB	23.5	73.4	115.4	114	1.4	8
8.0	3	Ext.	★	MAE0800MB	12.1	49.5	91.5	90	1.5	8
	3	Int.	★	MAS0800MB	24.1	49.5	91.5	90	1.5	8
	6	Int.	★	MAS0800LB	12.4	73.5	115.5	114	1.5	8
8.1	3	Ext.	★	MAE0810MB	24.7	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0810MB	12.7	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0810LB	25.3	76.5	120.5	119	1.5	9
8.2	3	Ext.	★	MAE0820MB	13.0	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0820MB	26.0	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0820LB	13.4	76.5	120.5	119	1.5	9
8.3	3	Ext.	★	MAE0830MB	26.6	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0830MB	13.7	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0830LB	27.2	76.5	120.5	119	1.5	9
8.4	3	Ext.	★	MAE0840MB	14.0	51.5	95.5	94	1.5	9
	3	Int.	□	MAS0840MB	27.8	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0840LB	14.3	76.5	120.5	119	1.5	9
8.5	3	Ext.	★	MAE0850MB	28.4	51.5	95.5	94	1.5	9
	3	Int.	★	MAS0850MB	14.6	51.5	95.5	94	1.5	9
	6	Int.	★	MAS0850LB	29.1	76.5	120.5	119	1.5	9
8.6	3	Ext.	★	MAE0860MB	15.0	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0860MB	29.7	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0860LB	15.3	78.6	122.6	121	1.6	9
8.7	3	Ext.	★	MAE0870MB	30.3	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0870MB	15.6	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0870LB	30.9	78.6	122.6	121	1.6	9
8.8	3	Ext.	★	MAE0880MB	15.9	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0880MB	31.5	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0880LB	16.2	78.6	122.6	121	1.6	9
8.9	3	Ext.	★	MAE0890MB	32.1	51.6	95.6	94	1.6	9
	3	Int.	□	MAS0890MB	16.5	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0890LB	32.8	78.6	122.6	121	1.6	9
9.0	3	Ext.	★	MAE0900MB	16.9	51.6	95.6	94	1.6	9
	3	Int.	★	MAS0900MB	33.4	51.6	95.6	94	1.6	9
	6	Int.	★	MAS0900LB	17.2	78.6	122.6	121	1.6	9
9.1	3	Ext.	★	MAE0910MB	34.0	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0910MB	17.5	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0910LB	34.6	82.7	126.7	125	1.7	10
9.2	3	Ext.	★	MAE0920MB	17.8	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0920MB	35.2	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0920LB	18.1	82.7	126.7	125	1.7	10
9.21	3	Ext.	★	*MAE0921MB	35.9	54.7	98.7	97	1.7	10
	3	Int.	★	*MAS0921MB	18.5	54.7	98.7	97	1.7	10
	6	Int.	★	*MAS0921LB	36.5	82.7	126.7	125	1.7	10
9.3	3	Ext.	★	MAE0930MB	18.8	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0930MB	37.1	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0930LB	19.1	82.7	126.7	125	1.7	10
9.4	3	Ext.	★	MAE0940MB	37.7	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0940MB	19.4	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0940LB	38.3	82.7	126.7	125	1.7	10
9.5	3	Ext.	★	MAE0950MB	19.7	54.7	98.7	97	1.7	10
	3	Int.	★	MAS0950MB	38.9	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0950LB	20.0	82.7	126.7	125	1.7	10
9.6	3	Ext.	★	MAE0960MB	39.6	54.7	98.7	97	1.7	10
	3	Int.	□	MAS0960MB	20.4	54.7	98.7	97	1.7	10
	6	Int.	★	MAS0960LB	40.2	82.7	126.7	125	1.7	10
9.7	3	Ext.	★	MAE0970MB	20.7	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0970MB	40.8	54.8	98.8	97	1.8	10
	6	Int.	★	MAS0970LB	21.0	82.8	126.8	125	1.8	10
9.8	3	Ext.	★	MAE0980MB	41.4	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0980MB	21.3	54.8	98.8	97	1.8	10
	6	Int.	★	MAS0980LB	42.0	82.8	126.8	125	1.8	10
9.9	3	Ext.	★	MAE0990MB	21.6	54.8	98.8	97	1.8	10
	3	Int.	□	MAS0990MB	42.7	54.8	98.8	97	1.8	10
	6	Int.	★	MAS0990LB	22.0	82.8	126.8	125	1.8	10
10.0	3	Ext.	★	MAE1000MB	43.3	54.8	98.8	97	1.8	10
	3	Int.	★	MAS1000MB	22.3	54.8	98.8	97	1.8	10
	6	Int.	★	MAS1000LB	43.9	82.8	126.8	125	1.8	10
10.1	3	Ext.	□	MAE1010MB	22.6	56.8	102.8	101	1.8	11
	3	Int.	□	MAS1010MB	44.5	56.8	102.8	101	1.8	11
	6	Int.	□	MAS1010LB	22.9	90.8	136.8	135	1.8	11
10.2	3	Ext.	□	MAE1020MB	45.1	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1020MB	23.2	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1020LB	45.4	90.9	136.9	135	1.9	11
10.3	3	Ext.	★	MAE1030MB	23.4	56.9	102.9	101	1.9	11
	3	Int.	★	MAS1030MB	45.7	56.9	102.9	101	1.9	11
	6	Int.	★	MAS1030LB	23.5	90.9	136.9	135	1.9	11
10.4	3	Ext.	□	MAE1040MB	46.4	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1040MB	23.9	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1040LB	47.0	90.9	136.9	135	1.9	11
10.5	3	Ext.	★	MAE1050MB	24.2	56.9	102.9	101	1.9	11
	3	Int.	★	MAS1050MB	47.6	56.9	102.9	101	1.9	11
	6	Int.	★	MAS1050LB	24.5	90.9	136.9	135	1.9	11
10.6	3	Ext.	□	MAE1060MB	48.2	56.9	102.9	101	1.9	11
	3	Int.	□	MAS1060MB	24.8	56.9	102.9	101	1.9	11
	6	Int.	□	MAS1060LB	48.8	90.9	136.9	135	1.9	11

★ : Standard hole size for rolled thread tap.

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

DC (mm)	L/D	Coolant (Int./Ext.)	Stock	Order Number	Dimensions (mm)					
			HTi10		LU	LCF	OAL	LF	PL	DCON
	3	Ext.	□	**MAE1070MB**	25.1	56.9	102.9	101	1.9	11
10.7	3	Int.	□	**MAS1070MB**	49.5	56.9	102.9	101	1.9	11
	6	Int.	□	**MAS1070LB**	25.5	90.9	136.9	135	1.9	11
	3	Ext.	□	**MAE1080MB**	50.1	57.0	103.0	101	2.0	11
10.8	3	Int.	□	**MAS1080MB**	25.8	57.0	103.0	101	2.0	11
	6	Int.	□	**MAS1080LB**	50.7	91.0	137.0	135	2.0	11
	3	Ext.	□	**MAE1090MB**	26.1	57.0	103.0	101	2.0	11
10.9	3	Int.	□	**MAS1090MB**	51.3	57.0	103.0	101	2.0	11
	6	Int.	□	**MAS1090LB**	26.4	91.0	137.0	135	2.0	11
	3	Ext.	★	**MAE1100MB**	51.9	57.0	103.0	101	2.0	11
11.0	3	Int.	★	**MAS1100MB**	26.7	57.0	103.0	101	2.0	11
	6	Int.	★	**MAS1100LB**	52.5	91.0	137.0	135	2.0	11
	3	Ext.	★	***MAE1108MB**	27.0	62.0	108.0	106	2.0	12
11.08	3	Int.	★	***MAS1108MB**	53.2	62.0	108.0	106	2.0	12
	6	Int.	★	***MAS1108LB**	27.4	96.0	142.0	140	2.0	12
	3	Ext.	□	**MAE1110MB**	53.8	62.0	108.0	106	2.0	12
11.1	3	Int.	□	**MAS1110MB**	27.7	62.0	108.0	106	2.0	12
	6	Int.	□	**MAS1110LB**	54.4	96.0	142.0	140	2.0	12
	3	Ext.	□	**MAE1120MB**	28.0	62.0	108.0	106	2.0	12
11.2	3	Int.	□	**MAS1120MB**	55.0	62.0	108.0	106	2.0	12
	6	Int.	□	**MAS1120LB**	28.3	96.0	142.0	140	2.0	12
	3	Ext.	□	**MAE1130MB**	55.6	62.1	108.1	106	2.1	12
11.3	3	Int.	□	**MAS1130MB**	28.6	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1130LB**	56.3	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1140MB**	29.0	62.1	108.1	106	2.1	12
11.4	3	Int.	□	**MAS1140MB**	56.9	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1140LB**	29.3	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1150MB**	57.0	62.1	108.1	106	2.1	12
11.5	3	Int.	□	**MAS1150MB**	29.3	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1150LB**	57.5	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1160MB**	29.6	62.1	108.1	106	2.1	12
11.6	3	Int.	□	**MAS1160MB**	58.1	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1160LB**	29.9	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1170MB**	58.7	62.1	108.1	106	2.1	12
11.7	3	Int.	□	**MAS1170MB**	30.2	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1170LB**	59.3	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1180MB**	30.5	62.1	108.1	106	2.1	12
11.8	3	Int.	□	**MAS1180MB**	60.0	62.1	108.1	106	2.1	12
	6	Int.	□	**MAS1180LB**	30.9	96.1	142.1	140	2.1	12
	3	Ext.	□	**MAE1190MB**	60.6	62.2	108.2	106	2.2	12
11.9	3	Int.	□	**MAS1190MB**	31.2	62.2	108.2	106	2.2	12
	6	Int.	□	**MAS1190LB**	61.2	96.2	142.2	140	2.2	12
	3	Ext.	★	**MAE1200MB**	31.5	62.2	108.2	106	2.2	12
12.0	3	Int.	★	**MAS1200MB**	61.8	62.2	108.2	106	2.2	12
	6	Int.	★	**MAS1200LB**	31.8	96.2	142.2	140	2.2	12

DC (mm)	L/D	Coolant (Int./Ext.)	Stock	Order Number	Dimensions (mm)					
			HTi10		LU	LCF	OAL	LF	PL	DCON
	3	Ext.	□	**MAE1210MB**	62.4	67.2	117.2	115	2.2	13
12.1	3	Int.	□	**MAS1210MB**	32.1	67.2	117.2	115	2.2	13
	6	Int.	□	**MAS1210LB**	63.1	102.2	152.2	150	2.2	13
	3	Ext.	□	**MAE1220MB**	32.5	67.2	117.2	115	2.2	13
12.2	3	Int.	□	**MAS1220MB**	63.7	67.2	117.2	115	2.2	13
	6	Int.	□	**MAS1220LB**	32.8	102.2	152.2	150	2.2	13
	3	Ext.	□	**MAE1230MB**	64.3	67.2	117.2	115	2.2	13
12.3	3	Int.	□	**MAS1230MB**	33.1	67.2	117.2	115	2.2	13
	6	Int.	□	**MAS1230LB**	64.9	102.2	152.2	150	2.2	13
	3	Ext.	□	**MAE1240MB**	33.4	67.3	117.3	115	2.3	13
12.4	3	Int.	□	**MAS1240MB**	65.5	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1240LB**	33.7	102.3	152.3	150	2.3	13
	3	Ext.	★	**MAE1250MB**	66.1	67.3	117.3	115	2.3	13
12.5	3	Int.	★	**MAS1250MB**	34.0	67.3	117.3	115	2.3	13
	6	Int.	★	**MAS1250LB**	66.8	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1260MB**	34.4	67.3	117.3	115	2.3	13
12.6	3	Int.	□	**MAS1260MB**	67.4	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1260LB**	34.7	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1270MB**	68.0	67.3	117.3	115	2.3	13
12.7	3	Int.	□	**MAS1270MB**	35.0	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1270LB**	68.5	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1280MB**	35.2	67.3	117.3	115	2.3	13
12.8	3	Int.	□	**MAS1280MB**	68.6	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1280LB**	35.3	102.3	152.3	150	2.3	13
	3	Ext.	□	**MAE1290MB**	69.2	67.3	117.3	115	2.3	13
12.9	3	Int.	□	**MAS1290MB**	35.6	67.3	117.3	115	2.3	13
	6	Int.	□	**MAS1290LB**	69.9	102.3	152.3	150	2.3	13
	3	Ext.	★	***MAE1296MB**	36.0	67.4	117.4	115	2.4	13
12.96	3	Int.	★	***MAS1296MB**	70.5	67.4	117.4	115	2.4	13
	6	Int.	★	***MAS1296LB**	36.3	102.4	152.4	150	2.4	13
	3	Ext.	★	**MAE1300MB**	71.1	67.4	117.4	115	2.4	13
13.0	3	Int.	★	**MAS1300MB**	36.6	67.4	117.4	115	2.4	13
	6	Int.	★	**MAS1300LB**	71.7	102.4	152.4	150	2.4	13
	3	Ext.	□	**MAE1310MB**	36.9	72.4	122.4	120	2.4	14
13.1	3	Int.	□	**MAS1310MB**	72.3	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1310LB**	37.2	112.4	162.4	160	2.4	14
	3	Ext.	□	**MAE1320MB**	72.9	72.4	122.4	120	2.4	14
13.2	3	Int.	□	**MAS1320MB**	37.5	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1320LB**	73.6	112.4	162.4	160	2.4	14
	3	Ext.	□	**MAE1330MB**	37.9	72.4	122.4	120	2.4	14
13.3	3	Int.	□	**MAS1330MB**	74.2	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1330LB**	38.2	112.4	162.4	160	2.4	14
	3	Ext.	□	**MAE1340MB**	74.8	72.4	122.4	120	2.4	14
13.4	3	Int.	□	**MAS1340MB**	38.5	72.4	122.4	120	2.4	14
	6	Int.	□	**MAS1340LB**	75.4	112.4	162.4	160	2.4	14

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L157

MAE/MAS

DC (mm)	L/D	Coolant (Int./Ext.)	Stock HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	LF	PL	DCON
13.5	3	Ext.	★	MAE1350MB	38.8	72.5	122.5	120	2.5	14
	3	Int.	★	MAS1350MB	76.0	72.5	122.5	120	2.5	14
	6	Int.	★	MAS1350LB	39.1	112.5	162.5	160	2.5	14
13.6	3	Ext.	□	MAE1360MB	76.7	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1360MB	39.5	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1360LB	77.3	112.5	162.5	160	2.5	14
13.7	3	Ext.	□	MAE1370MB	39.8	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1370MB	77.9	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1370LB	40.1	112.5	162.5	160	2.5	14
13.8	3	Ext.	□	MAE1380MB	78.5	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1380MB	40.4	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1380LB	79.1	112.5	162.5	160	2.5	14
13.9	3	Ext.	□	MAE1390MB	40.7	72.5	122.5	120	2.5	14
	3	Int.	□	MAS1390MB	79.7	72.5	122.5	120	2.5	14
	6	Int.	□	MAS1390LB	41.0	112.5	162.5	160	2.5	14
14.0	3	Ext.	★	*MAE1400MB	80.2	72.5	122.5	120	2.5	14
	3	Int.	★	*MAS1400MB	41.3	72.5	122.5	120	2.5	14
	6	Int.	★	*MAS1400LB	80.4	112.5	162.5	160	2.5	14
14.1	3	Ext.	□	MAE1410MB	41.4	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1410MB	81.0	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1410LB	41.7	117.6	175.6	173	2.6	15
14.2	3	Ext.	□	MAE1420MB	81.6	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1420MB	42.0	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1420LB	82.2	117.6	175.6	173	2.6	15
14.3	3	Ext.	□	MAE1430MB	42.3	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1430MB	82.8	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1430LB	42.6	117.6	175.6	173	2.6	15
14.4	3	Ext.	□	MAE1440MB	83.5	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1440MB	43.0	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1440LB	84.1	117.6	175.6	173	2.6	15
14.5	3	Ext.	□	MAE1450MB	43.3	74.6	132.6	130	2.6	15
	3	Int.	□	MAS1450MB	84.7	74.6	132.6	130	2.6	15
	6	Int.	□	MAS1450LB	43.6	117.6	175.6	173	2.6	15
14.6	3	Ext.	□	MAE1460MB	85.3	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1460MB	43.9	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1460LB	85.9	117.7	175.7	173	2.7	15
14.7	3	Ext.	□	MAE1470MB	44.2	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1470MB	86.5	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1470LB	44.5	117.7	175.7	173	2.7	15
14.8	3	Ext.	□	MAE1480MB	87.2	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1480MB	44.9	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1480LB	87.8	117.7	175.7	173	2.7	15
14.9	3	Ext.	□	MAE1490MB	45.2	74.7	132.7	130	2.7	15
	3	Int.	□	MAS1490MB	88.4	74.7	132.7	130	2.7	15
	6	Int.	□	MAS1490LB	45.5	117.7	175.7	173	2.7	15
14.96	3	Ext.	★	*MAE1496MB	89.0	74.7	132.7	130	2.7	15
	3	Int.	★	*MAS1496MB	45.8	74.7	132.7	130	2.7	15
	6	Int.	★	*MAS1496LB	89.6	117.7	175.7	173	2.7	15
15.0	3	Ext.	★	MAE1500MB	46.1	74.7	132.7	130	2.7	15
	3	Int.	★	MAS1500MB	90.3	74.7	132.7	130	2.7	15
	6	Int.	★	MAS1500LB	46.5	117.7	175.7	173	2.7	15
15.1	3	Ext.	□	MAE1510MB	90.9	78.7	136.7	134	2.7	16
	3	Int.	□	MAS1510MB	46.8	78.7	136.7	134	2.7	16
	6	Int.	□	MAS1510LB	91.5	122.7	180.7	178	2.7	16
15.2	3	Ext.	□	MAE1520MB	47.1	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1520MB	92.1	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1520LB	47.4	122.8	180.8	178	2.8	16
15.3	3	Ext.	□	MAE1530MB	92.5	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1530MB	47.6	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1530LB	92.7	122.8	180.8	178	2.8	16
15.4	3	Ext.	□	MAE1540MB	47.7	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1540MB	93.3	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1540LB	48.0	122.8	180.8	178	2.8	16
15.5	3	Ext.	□	MAE1550MB	94.0	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1550MB	48.4	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1550LB	94.6	122.8	180.8	178	2.8	16
15.6	3	Ext.	□	MAE1560MB	48.7	78.8	136.8	134	2.8	16
	3	Int.	□	MAS1560MB	95.2	78.8	136.8	134	2.8	16
	6	Int.	□	MAS1560LB	49.0	122.8	180.8	178	2.8	16
15.7	3	Ext.	□	MAE1570MB	95.8	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1570MB	49.3	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1570LB	96.4	122.9	180.9	178	2.9	16
15.8	3	Ext.	□	*MAE1580MB	49.6	78.9	136.9	134	2.9	16
	3	Int.	□	*MAS1580MB	97.1	78.9	136.9	134	2.9	16
	6	Int.	□	*MAS1580LB	50.0	122.9	180.9	178	2.9	16
15.9	3	Ext.	□	MAE1590MB	97.7	78.9	136.9	134	2.9	16
	3	Int.	□	MAS1590MB	50.3	78.9	136.9	134	2.9	16
	6	Int.	□	MAS1590LB	98.3	122.9	180.9	178	2.9	16
16.0	3	Ext.	★	MAE1600MB	50.6	78.9	136.9	134	2.9	16
	3	Int.	★	MAS1600MB	98.9	78.9	136.9	134	2.9	16
	6	Int.	★	MAS1600LB	50.9	122.9	180.9	178	2.9	16

★ : Standard hole size for rolled thread tap.
Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

★ : Stocked in Japan □ : Made to Order

RECOMMENDED CUTTING CONDITIONS

Tool		Workpiece Material	Drill Diameter ø3.0—ø6.0 mm ø.118"—ø.236"		Drill Diameter ø6.0—ø10.0 mm ø.240"—ø.394"		Drill Diameter ø10.0—ø16.0 mm ø.398"—ø.630"	
			Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)
MAE	N	Cast Aluminum Alloy	295 (130—460)	.006 (.002—.012)	330 (165—490)	.008 (.002—.012)	395 (195—560)	.010 (.004—.016)
		Die Cast Aluminum Alloy	330 (195—490)	.005 (.002—.010)	360 (230—525)	.006 (.002—.010)	425 (260—590)	.008 (.004—.012)
	K	Gray Cast Iron	130 (65—195)	.006 (.004—.008)	195 (130—260)	.008 (.004—.012)	260 (195—330)	.012 (.008—.016)
		Ductile Cast Iron	100 (65—130)	.004 (.002—.006)	130 (65—195)	.005 (.002—.008)	195 (130—260)	.008 (.004—.012)
MAS	N	Cast Aluminum Alloy	300 (195—490)	.006 (.002—.012)	390 (260—555)	.008 (.004—.012)	490 (330—655)	.010 (.004—.016)
		Die Cast Aluminum Alloy	390 (260—555)	.005 (.002—.010)	490 (330—590)	.006 (.002—.010)	525 (390—655)	.008 (.004—.012)
	K	Gray Cast Iron	195 (130—260)	.006 (.004—.008)	260 (195—360)	.008 (.004—.012)	330 (230—425)	.012 (.008—.016)
		Ductile Cast Iron	145 (100—195)	.004 (.002—.006)	195 (130—260)	.005 (.002—.008)	260 (195—330)	.008 (.004—.012)

■HOLE AND DRILL DIAMETERS FOR THREAD

Thread Size	Thread Tapping			Roll Thread Tapping		
	Super Burnish Drill Diameter (**DC**mm)	Hole Diameter Tolerance (ømm)		Super Burnish Drill Diameter (**DC**mm)	Hole Diameter Tolerance (ømm)	
		Max.	Min.		Max.	Min.
M4x0.7	**3.3**	3.242	3.422	**3.65**	3.65	3.70
M5x0.8	**4.2**	4.134	4.334	**4.60**	4.59	4.66
M6x1.0	**5.0**	4.917	5.153	**5.50**	5.48	5.57
M8x1.25	**6.8**	6.647	6.912	**7.35**	7.34	7.41
M10x1.5	**8.5**	8.376	8.676	**9.21**	9.18	9.28
M12x1.75	**10.3**	10.106	10.441	**11.08**	11.05	11.15
M14x2	**12.0**	11.835	12.210	**12.96**	12.92	13.04
M16x2	**14.0**	13.835	14.210	**14.96**	14.92	15.04

MSE

- Wide flute prevents chip packing.
- Stable, small diameter machining.

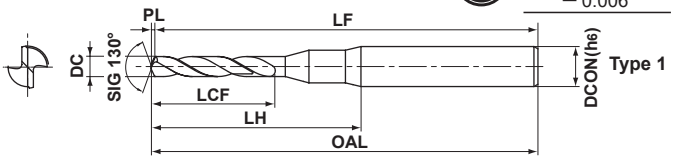
P M K N S H

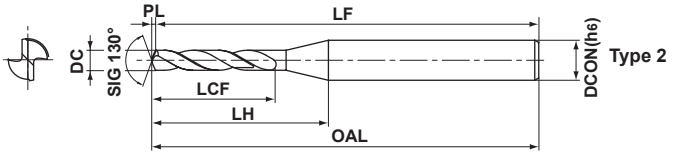
0.10≤DC≤0.99 0 −0.009

DCON=3 h6 0 −0.006

METRIC STANDARD

External Coolant





Note 1) MSE type can be used for shrink fit holders.

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.10	★		MSE0010SB	1.22	9.72	38.02	38	0.02	3	1
0.11	★		MSE0011SB	1.23	9.73	38.03	38	0.03	3	1
0.12	★		MSE0012SB	1.43	9.73	38.03	38	0.03	3	1
0.13	★		MSE0013SB	1.43	9.73	38.03	38	0.03	3	1
0.14	★		MSE0014SB	2.03	9.73	38.03	38	0.03	3	1
0.15	★		MSE0015SB	2.03	9.73	38.03	38	0.03	3	1
0.16	★		MSE0016SB	2.04	9.74	38.04	38	0.04	3	1
0.17	★		MSE0017SB	2.04	9.74	38.04	38	0.04	3	1
0.18	★		MSE0018SB	2.04	9.74	38.04	38	0.04	3	1
0.19	★		MSE0019SB	2.04	9.74	38.04	38	0.04	3	1
0.20	★		MSE0020SB	2.55	9.75	38.05	38	0.05	3	1
0.21	★		MSE0021SB	2.55	9.75	38.05	38	0.05	3	1
0.22	★		MSE0022SB	2.55	9.75	38.05	38	0.05	3	1
0.23	★		MSE0023SB	2.55	9.75	38.05	38	0.05	3	1
0.24	★		MSE0024SB	3.06	9.76	38.06	38	0.06	3	1
0.25	★		MSE0025SB	3.06	9.76	38.06	38	0.06	3	1
0.26	★		MSE0026SB	3.06	9.76	38.06	38	0.06	3	1
0.27	★		MSE0027SB	3.06	9.76	38.06	38	0.06	3	1
0.28	★		MSE0028SB	3.07	9.77	38.07	38	0.07	3	1
0.29	★		MSE0029SB	3.07	9.77	38.07	38	0.07	3	1
0.30		★	MSE0030SB	5.07	10.27	38.07	38	0.07	3	2
0.31		★	MSE0031SB	5.07	10.27	38.07	38	0.07	3	2
0.32		★	MSE0032SB	5.07	10.27	38.07	38	0.07	3	2
0.33		★	MSE0033SB	5.08	10.28	38.08	38	0.08	3	2
0.34		★	MSE0034SB	6.08	11.28	38.08	38	0.08	3	2
0.35		★	MSE0035SB	6.08	11.18	38.08	38	0.08	3	2
0.36		★	MSE0036SB	6.08	11.18	38.08	38	0.08	3	2
0.37		★	MSE0037SB	6.09	11.19	38.09	38	0.09	3	2
0.38		★	MSE0038SB	6.09	11.19	38.09	38	0.09	3	2
0.39		★	MSE0039SB	6.09	11.19	38.09	38	0.09	3	2
0.40		★	MSE0040SB	7.09	12.19	38.09	38	0.09	3	2
0.41		★	MSE0041SB	7.10	12.10	38.10	38	0.10	3	2

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.42		★	MSE0042SB	7.10	12.10	38.10	38	0.10	3	2
0.43		★	MSE0043SB	7.10	12.10	38.10	38	0.10	3	2
0.44		★	MSE0044SB	7.10	12.10	38.10	38	0.10	3	2
0.45		★	MSE0045SB	7.10	12.10	38.10	38	0.10	3	2
0.46		★	MSE0046SB	7.11	12.01	38.11	38	0.11	3	2
0.47		★	MSE0047SB	7.11	12.01	38.11	38	0.11	3	2
0.48		★	MSE0048SB	7.11	12.01	38.11	38	0.11	3	2
0.49		★	MSE0049SB	7.11	12.01	38.11	38	0.11	3	2
0.50		★	MSE0050SB	7.12	12.02	38.12	38	0.12	3	2
0.51		★	MSE0051SB	7.12	11.92	38.12	38	0.12	3	2
0.52		★	MSE0052SB	7.12	11.92	38.12	38	0.12	3	2
0.53		★	MSE0053SB	7.12	11.92	38.12	38	0.12	3	2
0.54		★	MSE0054SB	7.13	11.93	38.13	38	0.13	3	2
0.55		★	MSE0055SB	7.13	11.93	38.13	38	0.13	3	2
0.56		★	MSE0056SB	7.13	11.93	38.13	38	0.13	3	2
0.57		★	MSE0057SB	7.13	11.83	38.13	38	0.13	3	2
0.58		★	MSE0058SB	7.14	11.84	38.14	38	0.14	3	2
0.59		★	MSE0059SB	7.14	11.84	38.14	38	0.14	3	2
0.60		★	MSE0060SB	7.14	11.84	38.14	38	0.14	3	2
0.61		★	MSE0061SB	7.14	11.84	38.14	38	0.14	3	2
0.62		★	MSE0062SB	7.14	11.74	38.14	38	0.14	3	2
0.63		★	MSE0063SB	7.15	11.75	38.15	38	0.15	3	2
0.64		★	MSE0064SB	7.15	11.75	38.15	38	0.15	3	2
0.65		★	MSE0065SB	7.15	11.75	38.15	38	0.15	3	2
0.66		★	MSE0066SB	7.15	11.75	38.15	38	0.15	3	2
0.67		★	MSE0067SB	7.16	11.66	38.16	38	0.16	3	2
0.68		★	MSE0068SB	7.16	11.66	38.16	38	0.16	3	2
0.69		★	MSE0069SB	7.16	11.66	38.16	38	0.16	3	2
0.70		★	MSE0070SB	8.16	12.66	38.16	38	0.16	3	2
0.71		★	MSE0071SB	8.17	12.67	38.17	38	0.17	3	2
0.72		★	MSE0072SB	8.17	12.67	38.17	38	0.17	3	2
0.73		★	MSE0073SB	8.17	12.57	38.17	38	0.17	3	2

Note 1) Please contact Mitsubishi Materials for any geometry that is not in the catalog (e.g. different dia. and length).

DC (mm)	Stock VP20MF	Stock VP15TF	Order Number	Dimensions (mm) LCF	LH	OAL	LF	PL	DCON	Type
0.74		★	**MSE0074SB**	8.17	12.57	38.17	38	0.17	3	2
0.75		★	**MSE0075SB**	8.17	12.57	38.17	38	0.17	3	2
0.76		★	**MSE0076SB**	8.18	12.58	38.18	38	0.18	3	2
0.77		★	**MSE0077SB**	8.18	12.58	38.18	38	0.18	3	2
0.78		★	**MSE0078SB**	8.18	12.48	38.18	38	0.18	3	2
0.79		★	**MSE0079SB**	8.18	12.48	38.18	38	0.18	3	2
0.80		★	**MSE0080SB**	10.19	14.49	38.19	38	0.19	3	2
0.81		★	**MSE0081SB**	10.19	14.49	38.19	38	0.19	3	2
0.82		★	**MSE0082SB**	10.19	14.49	38.19	38	0.19	3	2
0.83		★	**MSE0083SB**	10.19	14.49	38.19	38	0.19	3	2
0.84		★	**MSE0084SB**	10.20	14.40	38.20	38	0.20	3	2
0.85		★	**MSE0085SB**	10.20	14.40	38.20	38	0.20	3	2
0.86		★	**MSE0086SB**	10.20	14.40	38.20	38	0.20	3	2
0.87		★	**MSE0087SB**	10.20	14.40	38.20	38	0.20	3	2
0.88		★	**MSE0088SB**	10.21	14.41	38.21	38	0.21	3	2
0.89		★	**MSE0089SB**	10.21	14.31	38.21	38	0.21	3	2
0.90		★	**MSE0090SB**	10.21	14.31	38.21	38	0.21	3	2
0.91		★	**MSE0091SB**	10.21	14.31	38.21	38	0.21	3	2
0.92		★	**MSE0092SB**	10.21	14.31	38.21	38	0.21	3	2
0.93		★	**MSE0093SB**	10.22	14.32	38.22	38	0.22	3	2
0.94		★	**MSE0094SB**	10.22	14.22	38.22	38	0.22	3	2
0.95		★	**MSE0095SB**	10.22	14.22	38.22	38	0.22	3	2
0.96		★	**MSE0096SB**	10.22	14.22	38.22	38	0.22	3	2
0.97		★	**MSE0097SB**	10.23	14.23	38.23	38	0.23	3	2
0.98		★	**MSE0098SB**	10.23	14.23	38.23	38	0.23	3	2
0.99		★	**MSE0099SB**	10.23	14.23	38.23	38	0.23	3	2

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc.			Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.		
Drill Dia. **DC** inch	Drill Dia. **DC** mm	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)
.00394	**0.10**	20 (15—25)	.0001 (.00004—.0001)	.0008	20 (15—25)	.0001 (.00004—.0001)	.0008
.00472	**0.12**	25 (15—35)	.0001 (.00004—.0001)	.0008	25 (15—35)	.0001 (.00004—.0001)	.0008
.00630	**0.16**	35 (20—45)	.0001 (.00004—.0001)	.0008	35 (20—45)	.0001 (.00004—.0001)	.0008
.00787	**0.20**	40 (25—50)	.0001 (.0001—.0002)	.0016	40 (25—50)	.0001 (.0001—.0002)	.0016
.00984	**0.25**	50 (35—65)	.0001 (.0001—.0002)	.0016	50 (35—65)	.0001 (.0001—.0002)	.0016
.01260	**0.32**	65 (45—85)	.0002 (.0001—.0002)	.0020	65 (45—85)	.0002 (.0001—.0002)	.0020
.01575	**0.40**	80 (50—105)	.0002 (.0001—.0002)	.0020	80 (50—105)	.0002 (.0001—.0002)	.0020
.01969	**0.50**	105 (65—115)	.0002 (.0002—.0003)	.0039	105 (65—115)	.0002 (.0002—.0003)	.0039
.02480	**0.63**	130 (80—150)	.0003 (.0002—.0004)	.0039	130 (80—150)	.0003 (.0002—.0004)	.0039
.03150	**0.80**	165 (115—195)	.0008 (.0006—.0010)	.0118	165 (115—195)	.0006 (.0005—.0007)	.0118
.03937	**0.99**	205 (130—230)	.0016 (.0012—.0020)	.0118	205 (130—230)	.0008 (.0006—.0010)	.0118

Note 1) You must use the MSP starter drill when using the MSE drill. (Order number : MSP0300SB, Cutting conditions on page L162.)
Note 2) Change cutting conditions depending on your machine and workpiece material rigidity.
Note 3) When machining holes over DCx5, reduce the step stated above.
Note 4) The use of water-soluble fluid (diluted by 20 times) is recommended for drilling under the cutting conditions above. Lower the revolutions if you use oil fluid or mist.
Note 5) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

MSE

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.			Pre-hardened Steel AISI P21, P20 etc.		
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)
inch	mm						
.00394	**0.10**	20 (15—25)	.0001 (.00004—.0001)	.0008	20 (15—25)	.0001 (.00004—.0001)	.0008
.00472	**0.12**	25 (15—35)	.0001 (.00004—.0001)	.0008	25 (15—35)	.0001 (.00004—.0001)	.0008
.00630	**0.16**	35 (20—45)	.0001 (.00004—.0001)	.0008	35 (20—45)	.0001 (.00004—.0001)	.0008
.00787	**0.20**	40 (25—50)	.0001 (.00008—.0002)	.0016	40 (25—50)	.0001 (.00008—.0002)	.0016
.00984	**0.25**	50 (35—65)	.0001 (.00008—.0002)	.0016	50 (35—65)	.0001 (.00008—.0002)	.0016
.01260	**0.32**	65 (45—85)	.0002 (.00012—.0002)	.0020	65 (45—85)	.0002 (.00012—.0002)	.0020
.01575	**0.40**	80 (50—105)	.0002 (.00012—.0002)	.0020	80 (50—105)	.0002 (.00012—.0002)	.0020
.01969	**0.50**	105 (65—115)	.0002 (.00020—.0003)	.0039	105 (65—115)	.0002 (.00020—.0003)	.0039
.02480	**0.63**	130 (80—150)	.0003 (.00024—.0004)	.0039	130 (80—150)	.0003 (.00024—.0004)	.0039
.03150	**0.80**	165 (115—195)	.0006 (.00047—.0007)	.0118	165 (115—195)	.0006 (.00047—.0007)	.0118
.03937	**0.99**	205 (130—230)	.0008 (.00059—.0010)	.0118	205 (130—230)	.0008 (.00059—.0010)	.0118

Workpiece Material		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.			Gray Cast Iron (≤350MPa) No45B etc.		
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)
inch	mm						
.00394	**0.10**	20 (15—25)	.0001 (.00004—.0001)	.0008	20 (15—25)	.0001 (.00004—.0001)	.0008
.00472	**0.12**	25 (15—35)	.0001 (.00004—.0001)	.0008	25 (15—35)	.0001 (.00004—.0001)	.0008
.00630	**0.16**	35 (20—45)	.0001 (.00004—.0001)	.0008	35 (20—45)	.0001 (.00004—.0001)	.0008
.00787	**0.20**	35 (20—45)	.0001 (.00008—.0002)	.0016	40 (25—50)	.0001 (.00008—.0002)	.0016
.00984	**0.25**	45 (25—60)	.0001 (.00008—.0002)	.0016	50 (35—65)	.0001 (.00008—.0002)	.0016
.01260	**0.32**	50 (35—65)	.0002 (.00012—.0002)	.0020	65 (45—85)	.0002 (.00012—.0002)	.0020
.01575	**0.40**	50 (35—60)	.0002 (.00012—.0002)	.0020	80 (50—105)	.0002 (.00012—.0002)	.0020
.01969	**0.50**	50 (35—65)	.0002 (.00020—.0003)	.0039	105 (65—115)	.0002 (.00020—.0003)	.0039
.02480	**0.63**	50 (35—65)	.0003 (.00024—.0004)	.0039	130 (80—150)	.0003 (.00024—.0004)	.0039
.03150	**0.80**	50 (35—65)	.0006 (.00047—.0007)	.0079	165 (115—195)	.0008 (.00059—.0010)	.0118
.03937	**0.99**	50 (35—65)	.0008 (.00059—.0010)	.0079	205 (130—230)	.0016 (.00118—.0020)	.0118

Workpiece Material		Aluminum Alloy (Si<5%) ASTM A6061, A7075 etc.			Heat Resistant Alloy Inconel718 etc.		
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Peck (inch)
inch	mm						
.00394	**0.10**	20 (15—25)	.0001 (.00004—.0001)	.0020	5 (5—15)	.00004 (.00002—.00004)	.0008
.00472	**0.12**	25 (15—35)	.0001 (.00008—.0002)	.0020	10 (5—15)	.00004 (.00002—.00004)	.0008
.00630	**0.16**	35 (20—45)	.0002 (.00012—.0002)	.0020	15 (10—20)	.00004 (.00002—.00004)	.0008
.00787	**0.20**	40 (25—50)	.0002 (.00020—.0003)	.0039	15 (10—20)	.00008 (.00004—.00008)	.0016
.00984	**0.25**	50 (35—65)	.0003 (.00024—.0004)	.0039	15 (10—20)	.00008 (.00004—.00008)	.0016
.01260	**0.32**	65 (45—85)	.0004 (.00031—.0005)	.0118	15 (10—20)	.00008 (.00004—.00008)	.0020
.01575	**0.40**	80 (50—105)	.0008 (.00059—.0010)	.0118	15 (15—20)	.00008 (.00004—.00008)	.0020
.01969	**0.50**	105 (65—115)	.0012 (.00098—.0014)	.0197	15 (15—35)	.00012 (.00004—.00012)	.0039
.02480	**0.63**	130 (80—150)	.0016 (.00138—.0018)	.0197	20 (15—35)	.00016 (.00008—.00016)	.0039
.03150	**0.80**	165 (115—195)	.0020 (.00177—.0022)	.0315	20 (15—35)	.00024 (.00016—.00024)	.0079
.03937	**0.99**	205 (130—230)	.0024 (.00217—.0026)	.0315	20 (15—35)	.00039 (.00031—.00039)	.0079

Note 1) You must use the MSP starter drill when using the MSE drill. (Order number : MSP0300SB, Cutting conditions on page L162.)
Note 2) Change cutting conditions depending on your machine and workpiece material rigidity.
Note 3) When machining holes over DCx5, reduce the step stated above.
Note 4) The use of water-soluble fluid (diluted by 20 times) is recommended for drilling under the cutting conditions above. Lower the revolutions if you use oil fluid or mist.
Note 5) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

REFERENCE TABLE OF PRE-HOLE DIMENSIONS

Unit : mm

Description	Cutting Dia.	Pre-hole Diameter	Pre-hole Depth
MSE0010SB	0.10	0.060—0.080	0.030—0.040
MSE0011SB	0.11	0.066—0.088	0.033—0.044
MSE0012SB	0.12	0.072—0.096	0.036—0.048
MSE0013SB	0.13	0.078—0.104	0.039—0.052
MSE0014SB	0.14	0.084—0.112	0.042—0.056
MSE0015SB	0.15	0.090—0.120	0.045—0.060
MSE0016SB	0.16	0.096—0.128	0.048—0.064
MSE0017SB	0.17	0.102—0.136	0.051—0.068
MSE0018SB	0.18	0.108—0.144	0.054—0.072
MSE0019SB	0.19	0.114—0.152	0.057—0.076
MSE0020SB	0.20	0.120—0.160	0.060—0.080
MSE0021SB	0.21	0.126—0.168	0.063—0.084
MSE0022SB	0.22	0.132—0.176	0.066—0.088
MSE0023SB	0.23	0.138—0.184	0.069—0.092
MSE0024SB	0.24	0.144—0.192	0.072—0.096
MSE0025SB	0.25	0.150—0.200	0.075—0.100
MSE0026SB	0.26	0.156—0.208	0.078—0.104
MSE0027SB	0.27	0.162—0.216	0.081—0.108
MSE0028SB	0.28	0.168—0.224	0.084—0.112
MSE0029SB	0.29	0.174—0.232	0.087—0.116
MSE0030SB	0.30	0.180—0.240	0.090—0.120
MSE0031SB	0.31	0.186—0.248	0.093—0.124
MSE0032SB	0.32	0.192—0.256	0.096—0.128
MSE0033SB	0.33	0.198—0.264	0.099—0.132
MSE0034SB	0.34	0.204—0.272	0.102—0.136
MSE0035SB	0.35	0.210—0.280	0.105—0.140
MSE0036SB	0.36	0.216—0.288	0.108—0.144
MSE0037SB	0.37	0.222—0.296	0.111—0.148
MSE0038SB	0.38	0.228—0.304	0.114—0.152
MSE0039SB	0.39	0.234—0.312	0.117—0.156
MSE0040SB	0.40	0.240—0.320	0.120—0.160
MSE0041SB	0.41	0.246—0.328	0.123—0.164
MSE0042SB	0.42	0.252—0.336	0.126—0.168
MSE0043SB	0.43	0.258—0.344	0.129—0.172
MSE0044SB	0.44	0.264—0.352	0.132—0.176
MSE0045SB	0.45	0.270—0.360	0.135—0.180
MSE0046SB	0.46	0.276—0.368	0.138—0.184
MSE0047SB	0.47	0.282—0.376	0.141—0.188
MSE0048SB	0.48	0.288—0.384	0.144—0.192
MSE0049SB	0.49	0.294—0.392	0.147—0.196
MSE0050SB	0.50	0.300—0.400	0.150—0.200
MSE0051SB	0.51	0.306—0.408	0.153—0.204
MSE0052SB	0.52	0.312—0.416	0.156—0.208
MSE0053SB	0.53	0.318—0.424	0.159—0.212
MSE0054SB	0.54	0.324—0.432	0.162—0.216

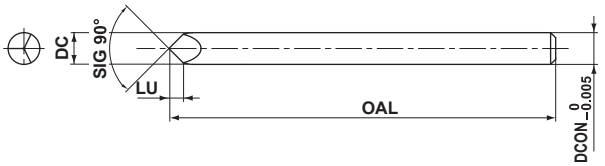
Description	Cutting Dia.	Pre-hole Diameter	Pre-hole Depth
MSE0055SB	0.55	0.330—0.440	0.165—0.220
MSE0056SB	0.56	0.336—0.448	0.168—0.224
MSE0057SB	0.57	0.342—0.456	0.171—0.228
MSE0058SB	0.58	0.348—0.464	0.174—0.232
MSE0059SB	0.59	0.354—0.472	0.177—0.236
MSE0060SB	0.60	0.360—0.480	0.180—0.240
MSE0061SB	0.61	0.366—0.488	0.183—0.244
MSE0062SB	0.62	0.372—0.496	0.186—0.248
MSE0063SB	0.63	0.378—0.504	0.189—0.252
MSE0064SB	0.64	0.384—0.512	0.192—0.256
MSE0065SB	0.65	0.390—0.520	0.195—0.260
MSE0066SB	0.66	0.396—0.528	0.198—0.264
MSE0067SB	0.67	0.402—0.536	0.201—0.268
MSE0068SB	0.68	0.408—0.544	0.204—0.272
MSE0069SB	0.69	0.414—0.552	0.207—0.276
MSE0070SB	0.70	0.420—0.560	0.210—0.280
MSE0071SB	0.71	0.426—0.568	0.213—0.284
MSE0072SB	0.72	0.432—0.576	0.216—0.288
MSE0073SB	0.73	0.438—0.584	0.219—0.292
MSE0074SB	0.74	0.444—0.592	0.222—0.296
MSE0075SB	0.75	0.450—0.600	0.225—0.300
MSE0076SB	0.76	0.456—0.608	0.228—0.304
MSE0077SB	0.77	0.462—0.616	0.231—0.308
MSE0078SB	0.78	0.468—0.624	0.234—0.312
MSE0079SB	0.79	0.474—0.632	0.237—0.316
MSE0080SB	0.80	0.480—0.640	0.240—0.320
MSE0081SB	0.81	0.486—0.648	0.243—0.324
MSE0082SB	0.82	0.492—0.656	0.246—0.328
MSE0083SB	0.83	0.498—0.664	0.249—0.332
MSE0084SB	0.84	0.504—0.672	0.252—0.336
MSE0085SB	0.85	0.510—0.680	0.255—0.340
MSE0086SB	0.86	0.516—0.688	0.258—0.344
MSE0087SB	0.87	0.522—0.696	0.261—0.348
MSE0088SB	0.88	0.528—0.704	0.264—0.352
MSE0089SB	0.89	0.534—0.712	0.267—0.356
MSE0090SB	0.90	0.540—0.720	0.270—0.360
MSE0091SB	0.91	0.546—0.728	0.273—0.364
MSE0092SB	0.92	0.552—0.736	0.276—0.368
MSE0093SB	0.93	0.558—0.744	0.279—0.372
MSE0094SB	0.94	0.564—0.752	0.282—0.376
MSE0095SB	0.95	0.570—0.760	0.285—0.380
MSE0096SB	0.96	0.576—0.768	0.288—0.384
MSE0097SB	0.97	0.582—0.776	0.291—0.388
MSE0098SB	0.98	0.588—0.784	0.294—0.392
MSE0099SB	0.99	0.594—0.792	0.297—0.396

MSP
STARTER Drill

●For use with MSE Type drill only.

P M K N S H

METRIC STANDARD
External Coolant



Note 1) MSP type can be used for shrink fit holders.

Order Number	Grade	Stock	Dimensions (mm)				Range of Diameter (mm)
			DC	OAL	DCON	LU	
MSP0300SB	**VP15TF**	●	3.0	38	3.0	1.5	**0.1—3.0**

RECOMMENDED CUTTING CONDITIONS

DC (mm)	Cutting Speed **vc** (SFM)	Revolution **n** (min^{-1})	Feed **fr** (Min.—Max.) (IPR)
0.1—3.0	10—310	10000	.00002 (.00001—.00004)

L
DRILLING

● : USA Stock

ISO13399 ➤ L003

Memo

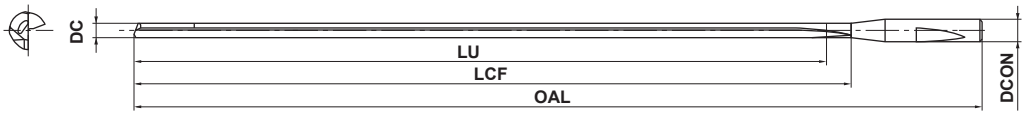
MICRO-MGS

- Small diameter deep hole drilling.
- High hole accuracy is possible.
- Can be used with machining and turning center.

P M K N S H

METRIC STANDARD

Internal Coolant



DC≤3
0 −0.005

Note 1) MGS type can be used for shrink fit holders.

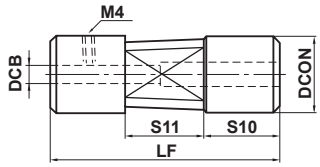
DC (mm)	L/D	Stock HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	DCON
0.7	50	★	MGS0070L040B	35.0	40	80	3
	80	★	MGS0070L060B	56.0	60	100	3
0.8	45	★	MGS0080L040B	36.0	40	80	3
	70	★	MGS0080L060B	56.0	60	100	3
0.9	40	★	MGS0090L040B	36.0	40	80	3
	60	★	MGS0090L060B	54.0	60	100	3
1.0	35	★	MGS0100L040B	35.0	40	80	3
	55	★	MGS0100L060B	55.0	60	100	3
	75	★	MGS0100L080B	75.0	80	120	3
1.1	30	★	MGS0110L040B	33.0	40	80	3
	50	★	MGS0110L060B	55.0	60	100	3
	65	★	MGS0110L080B	71.5	80	120	3
1.2	30	★	MGS0120L040B	36.0	40	80	3
	45	★	MGS0120L060B	54.0	60	100	3
	60	★	MGS0120L080B	72.0	80	120	3
1.3	40	★	MGS0130L060B	52.0	60	100	3
	55	★	MGS0130L080B	71.5	80	120	3
	70	★	MGS0130L100B	91.0	100	140	3
1.4	35	★	MGS0140L060B	49.0	60	100	3
	50	★	MGS0140L080B	70.0	80	120	3
	65	★	MGS0140L100B	91.0	100	140	3
1.5	35	★	MGS0150L060B	52.5	60	100	3
	50	★	MGS0150L080B	75.0	80	120	3
	60	★	MGS0150L100B	90.0	100	140	3
1.6	30	★	MGS0160L060B	48.0	60	100	3
	45	★	MGS0160L080B	72.0	80	120	3
	55	★	MGS0160L100B	88.0	100	140	3
1.7	30	★	MGS0170L060B	51.0	60	100	3
	40	★	MGS0170L080B	68.0	80	120	3
	55	★	MGS0170L100B	93.5	100	140	3

DC (mm)	L/D	Stock HTi10	Order Number	Dimensions (mm) LU	LCF	OAL	DCON
1.8	30	★	MGS0180L060B	54.0	60	100	3
	40	★	MGS0180L080B	72.0	80	120	3
	50	★	MGS0180L100B	90.0	100	140	3
1.9	25	★	MGS0190L060B	47.5	60	100	3
	35	★	MGS0190L080B	66.5	80	120	3
	45	★	MGS0190L100B	85.5	100	140	3
2.0	25	★	MGS0200L060B	50.0	60	100	3
	35	★	MGS0200L080B	70.0	80	120	3
	45	★	MGS0200L100B	90.0	100	140	3
2.1	35	★	MGS0210L080B	73.5	80	120	3
	40	★	MGS0210L100B	84.0	100	140	3
2.2	30	★	MGS0220L080B	66.0	80	120	3
	40	★	MGS0220L100B	88.0	100	140	3
2.3	30	★	MGS0230L080B	69.0	80	120	3
	40	★	MGS0230L100B	92.0	100	140	3
2.4	30	★	MGS0240L080B	72.0	80	120	3
	35	★	MGS0240L100B	84.0	100	140	3
2.5	25	★	MGS0250L080B	62.5	80	120	3
	35	★	MGS0250L100B	87.5	100	140	3
2.6	25	★	MGS0260L080B	65.0	80	120	3
	35	★	MGS0260L100B	91.0	100	140	3
2.7	25	★	MGS0270L080B	67.5	80	120	3
	30	★	MGS0270L100B	81.0	100	140	3
2.8	25	★	MGS0280L080B	70.0	80	120	3
	30	★	MGS0280L100B	84.0	100	140	3
2.9	20	★	MGS0290L080B	58.0	80	120	3
	30	★	MGS0290L100B	87.0	100	140	3
3.0	20	★	MGS0300L080B	60.0	80	120	3
	30	★	MGS0300L100B	90.0	100	140	3

Note 1) Contact Mitsubishi Materials regarding coated products.

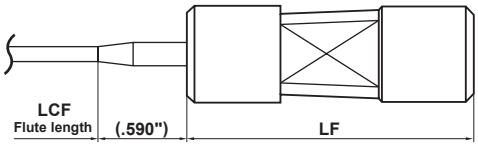
★ : Stocked in Japan

■ DRIVER



Order Number	Stock	Dimensions (inch)						
		DCON	DCB	LF	S10	S11	Clamp Screw	Wrench
MGD38	★	.500	.118	1.500	.496	.500	HSS04004	HKY20F
MGD70	★	.500	.118	2.756	.984	.787	HSS04004	HKY20F

■ When connected with a driver.



RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0315	**0.8**	165 (130—195)	.0004 (.0002—.0006)	130 (100—165)	.0004 (.0002—.0006)
.0394	**1.0**	165 (130—195)	.0004 (.0003—.0008)	130 (100—165)	.0004 (.0003—.0008)
.0472	**1.2**	195 (150—245)	.0006 (.0003—.0009)	165 (130—195)	.0006 (.0003—.0009)
.0630	**1.6**	195 (150—245)	.0008 (.0004—.0013)	165 (130—195)	.0008 (.0004—.0013)
.0787	**2.0**	195 (150—245)	.0010 (.0005—.0016)	165 (130—195)	.0010 (.0005—.0016)
.0984	**2.5**	230 (180—280)	.0012 (.0007—.0020)	195 (150—245)	.0012 (.0007—.0020)
.1181	**3.0**	230 (180—280)	.0016 (.0008—.0024)	195 (150—245)	.0016 (.0008—.0024)

Workpiece Material		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0315	**0.8**	100 (65—130)	.0002 (.0002—.0002)	100 (65—130)	.0004 (.0002—.0006)
.0394	**1.0**	100 (65—130)	.0002 (.0002—.0003)	100 (65—130)	.0004 (.0003—.0008)
.0472	**1.2**	130 (100—165)	.0002 (.0002—.0003)	100 (65—130)	.0006 (.0003—.0009)
.0630	**1.6**	130 (100—165)	.0004 (.0003—.0004)	130 (100—165)	.0008 (.0004—.0013)
.0787	**2.0**	130 (100—165)	.0004 (.0004—.0005)	130 (100—165)	.0010 (.0005—.0016)
.0984	**2.5**	165 (130—195)	.0006 (.0005—.0007)	130 (100—165)	.0012 (.0007—.0020)
.1181	**3.0**	165 (130—195)	.0006 (.0006—.0008)	130 (100—165)	.0016 (.0008—.0024)

Note 1) A pilot hole or guide bushing is required.
Note 2) Coolant filter must be less than 5 microns. Fine filtration is necessary to prevent blockage of the coolant holes.
Note 3) For safety and success, high pressure coolant is required. **(Minimum coolant pressure = 1,000PSI)**
Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

ISO13399 ➤ L003
HOW TO USE ➤ L166

MICRO-MGS

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		Gray Cast Iron (≤350MPa) No45B etc.		Ductile Cast Iron (≤450MPa) 60-40-8 etc.	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0315	**0.8**	165 (130—195)	.0004 (.0003—.0006)	130 (100—165)	.0002 (.0002—.0003)
.0394	**1.0**	165 (130—195)	.0006 (.0004—.0008)	130 (100—165)	.0002 (.0003—.0004)
.0472	**1.2**	195 (150—245)	.0006 (.0005—.0009)	165 (130—195)	.0004 (.0003—.0005)
.0630	**1.6**	195 (150—245)	.0008 (.0006—.0013)	165 (130—195)	.0004 (.0004—.0006)
.0787	**2.0**	195 (150—245)	.0012 (.0008—.0016)	165 (130—195)	.0006 (.0005—.0008)
.0984	**2.5**	230 (180—280)	.0014 (.0010—.0020)	195 (150—245)	.0008 (.0007—.0010)
.1181	**3.0**	230 (180—280)	.0018 (.0012—.0024)	195 (150—245)	.0010 (.0008—.0012)

Workpiece Material		Aluminum Alloy (Si<5%) ASTM A6061, 7075 etc.		Copper, Copper alloy	
Drill Dia. **DC**		Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (Min.—Max.) (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm				
.0315	**0.8**	165 (130—195)	.0004 (.0003—.0006)	130 (100—165)	.0004 (.0003—.0006)
.0394	**1.0**	195 (150—245)	.0006 (.0004—.0008)	165 (130—195)	.0006 (.0004—.0008)
.0472	**1.2**	230 (180—280)	.0006 (.0005—.0009)	195 (150—245)	.0006 (.0005—.0009)
.0630	**1.6**	260 (195—330)	.0008 (.0006—.0013)	230 (180—280)	.0008 (.0006—.0013)
.0787	**2.0**	295 (230—360)	.0012 (.0008—.0016)	260 (195—330)	.0012 (.0008—.0016)
.0984	**2.5**	330 (260—395)	.0014 (.0010—.0020)	295 (230—360)	.0014 (.0010—.0020)
.1181	**3.0**	330 (260—395)	.0018 (.0012—.0024)	330 (260—395)	.0018 (.0012—.0024)

Note 1) A pilot hole or guide bushing is required.
Note 2) Coolant filter must be less than **5 microns**. Fine filtration is necessary to prevent blockage of the coolant holes.
Note 3) For safety and success, high pressure coolant is required. **(Minimum coolant pressure = 1,000PSI)**
Note 4) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.

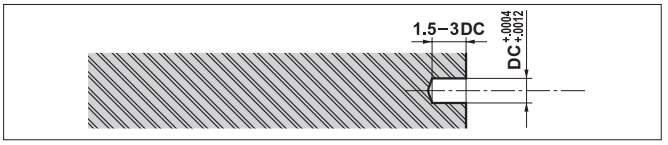
■ Special Application Notes :

- For safety and success, high pressure coolant is required. **(Minimum coolant pressure = 1000PSI)**
- Coolant filter must be less than **5 microns**. Fine filtration is necessary to prevent blockage of the coolant holes.
- A pilot hole or guide bushing is required.

HOW TO USE

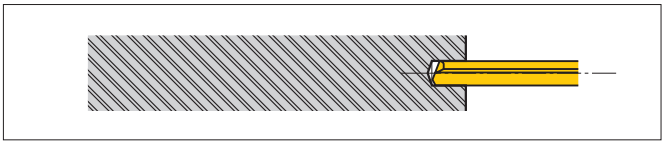
■ 1. Pilot hole drilling.

(Mitsubishi's MICRO-MVS/MICRO-MWS Drill is recommended.)

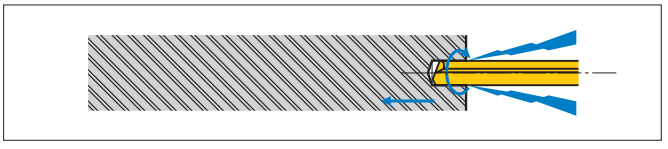


■ 2. Drill is inserted into the pilot hole with the MGS drill rotation stopped or rotating CCW at 300 min-1 or less.

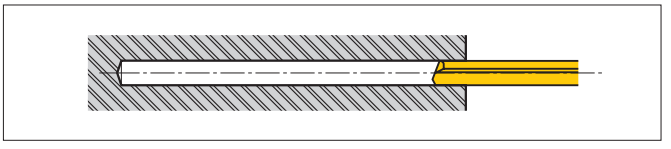
(Drill is not rotating.)



■ 3. Coolant is turned ON, raise cutting speed and feed to the recommended cutting condition.



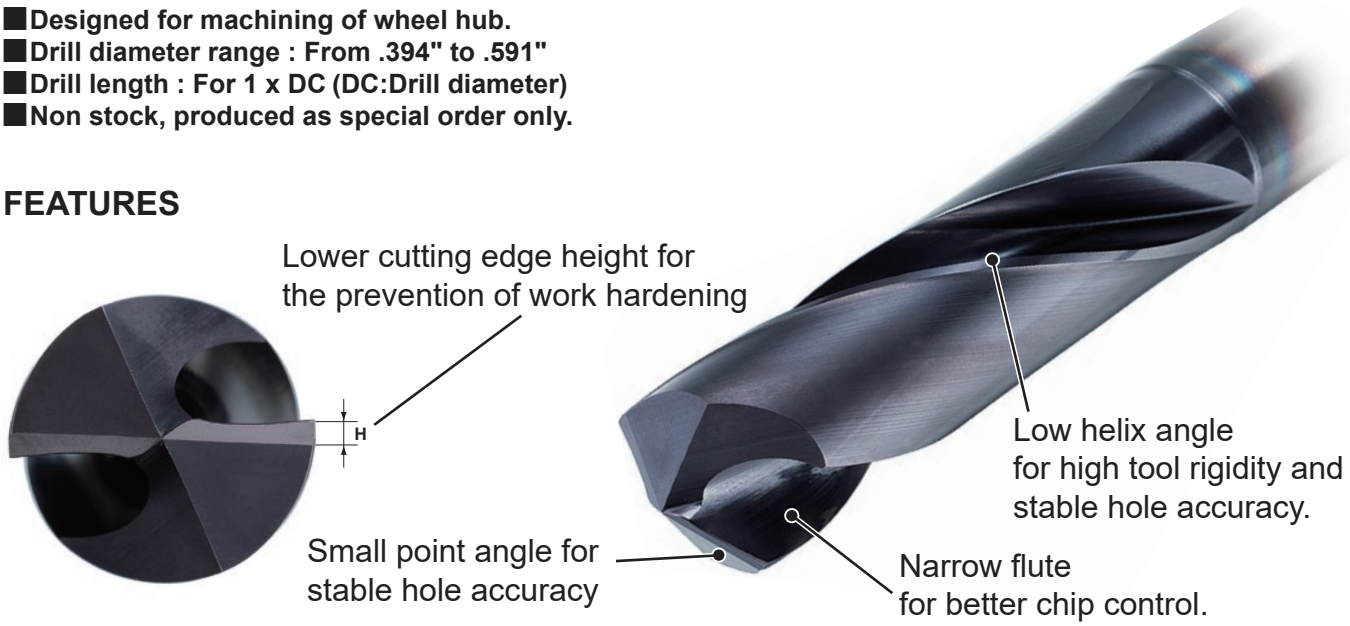
■ 4. Return to "Pos 2" after drilling end, coolant turned OFF and drill rotation is stopped.



MHE (Drill for WHEEL HUB)

- Designed for machining of wheel hub.
- Drill diameter range : From .394" to .591"
- Drill length : For 1 x DC (DC:Drill diameter)
- Non stock, produced as special order only.

FEATURES

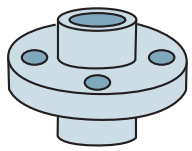


RECOMMENDED CUTTING CONDITIONS

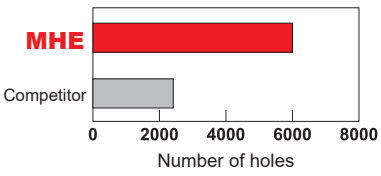
Workpiece Material		Hardness	ϕ.394" – ϕ.591"	
			Cutting Speed **vc** (SFM)	Feed **fr** (IPR)
P	Carbon Steel	<180HB	245 (195—295)	.010 (.006—.012)

Note 1) The above cutting conditions should be used as a guide and need to be adjusted according to the machine rigidity, workpiece material clamping and shape.

APPLICATION EXAMPLES

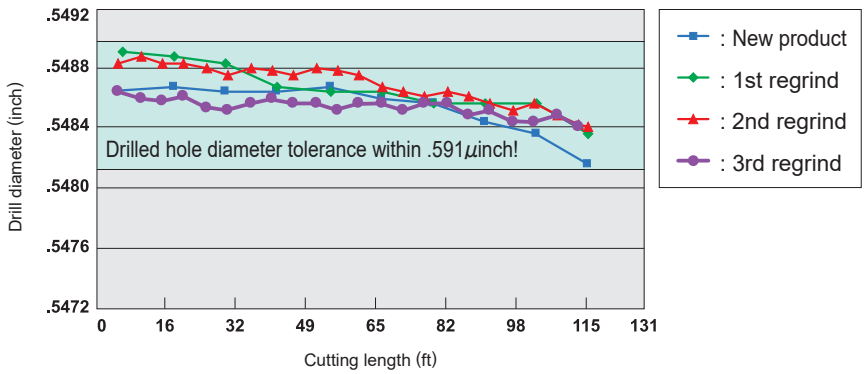


Tool : ϕ.500" x 4" x ϕ.500"
Component : Hub
Workpiece Material : Carbon steel
Cutting speed : 195 SFM
Feed : .006 IPR
Coolant : WSO



CUTTING PERFORMANCE

Hole Accuracy



Chip Geometry

Chip breaking properties
The workpiece material surface is not damaged due to the fine chips that were generated.

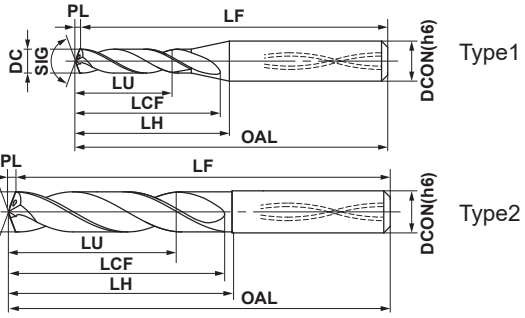
DSA

- Solid carbide drill for machining heat resistant alloys.
- The specially designed thin margin minimizes contact area with hole surface.

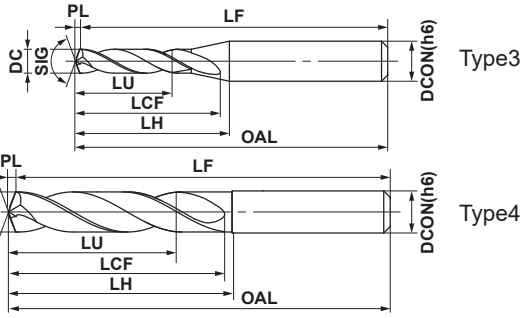
UWC | DP9 | only DSAS | 140° | X

P | M | K | N | **S** | H

DSAS (Internal Coolant)



DSAE (External Coolant)



* When looking at coating the color can vary depending on the direction of viewing.This does not have any effect on the performance of the drill.

(inch)

Type	Tolerance	DC=.1181	.1181<DC≤.2362	.2362<DC≤.3937	.3937<DC≤.5906
Type1,2,3,4	DC	0 −.00071	0 −.00071	0 −.00087	0 −.00106
	DCON	0 −.00031	0 −.00031	0 −.00035	0 −.00043

(mm)

Type	Tolerance	DC=3	3<DC≤6	6<DC≤10	10<DC≤15
Type1,2,3,4	DC	0 −0.018	0 −0.018	0 −0.022	0 −0.027
	DCON	0 −0.008	0 −0.008	0 −0.009	0 −0.011

DC Metric (mm)	DC Decimal (inch)	DC Fraction (inch)	Wire / Letter	Thread Size	L/D	Coolant (Int./Ext.)	Stock DP9020	Order Number	LU mm	LU inch	LCF mm	LCF inch	LH mm	LH inch	OAL mm	OAL inch	LF mm	LF inch	PL mm	PL inch	DCON mm	DCON inch	Type
3.000	**.1181**				3	Ext.	★	**DSAE0300X03S060**	9.5	.374	21.5	.846	23.5	.925	70.5	2.776	70	2.756	0.5	.020	6	.236	3
					3	Int.	●	**DSAS0300X03S060**	9.5	.374	21.5	.846	23.5	.925	70.5	2.776	70	2.756	0.5	.020	6	.236	1
					5	Int.	●	**DSAS0300X05S060**	15.5	.610	28.5	1.122	31.5	1.240	78.5	3.091	78	3.071	0.5	.020	6	.236	1
3.100	**.1220**				3	Int.	●	**DSAS0310X03S060**	9.9	.390	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	●	**DSAS0310X05S060**	16.1	.634	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1
3.175	**.1250**	**1/8**			3	Int.	●	**DSAS0318X03S060**	10.1	.398	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	●	**DSAS0318X05S060**	16.5	.650	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1
3.200	**.1260**				3	Int.	●	**DSAS0320X03S060**	10.2	.402	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	●	**DSAS0320X05S060**	16.6	.654	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1
3.260	**.1283**				3	Int.	●	**DSAS0326X03S060**	10.4	.409	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	★	**DSAS0326X05S060**	16.9	.665	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1
3.300	**.1299**			**M4x.7**	3	Int.	●	**DSAS0330X03S060**	10.5	.413	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	●	**DSAS0330X05S060**	17.1	.673	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1
3.400	**.1339**				3	Ext.	★	**DSAE0340X03S060**	10.8	.425	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	3
					3	Int.	●	**DSAS0340X03S060**	10.8	.425	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	●	**DSAS0340X05S060**	17.6	.693	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1
3.500	**.1378**				3	Int.	●	**DSAS0350X03S060**	11.1	.437	21.6	.850	23.6	.929	70.6	2.780	70	2.756	0.6	.024	6	.236	1
					5	Int.	●	**DSAS0350X05S060**	18.1	.713	28.6	1.126	31.6	1.244	78.6	3.094	78	3.071	0.6	.024	6	.236	1

Note 1) The coolant hole of ø.1875" (ø4.763mm) or less will be round shape.

● = NEW

● : USA Stock ★ : Stocked in Japan

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread Size			DP9020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.572	.1407	9/64			3	Int.	●	DSAS0357X03S060	11.4	.449	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	●	DSAS0357X05S060	18.6	.732	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
3.600	.1417				3	Int.	●	DSAS0360X03S060	11.5	.453	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	★	DSAS0360X05S060	18.7	.736	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
3.700	.1457			M4.5x.75	3	Int.	●	DSAS0370X03S060	11.8	.465	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	●	DSAS0370X05S060	19.2	.756	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
3.800	.1496		25	#10-24	3	Int.	●	DSAS0380X03S060	12.1	.476	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	●	DSAS0380X05S060	19.7	.776	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
3.900	.1535				3	Int.	●	DSAS0390X03S060	12.4	.488	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	●	DSAS0390X05S060	20.2	.795	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
3.969	.1563	5/32			3	Int.	●	DSAS0397X03S060	12.6	.496	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	●	DSAS0397X05S060	20.5	.807	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
4.000	.1575				3	Ext.	★	DSAE0400X03S060	12.7	.500	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	3
					3	Int.	●	DSAS0400X03S060	12.7	.500	22.7	.894	23.7	.933	70.7	2.783	70	2.756	0.7	.028	6	.236	1
					5	Int.	●	DSAS0400X05S060	20.7	.815	30.7	1.209	31.7	1.248	78.7	3.098	78	3.071	0.7	.028	6	.236	1
4.100	.1614				3	Int.	●	DSAS0410X03S060	13.0	.512	24.7	.972	26.7	1.051	73.7	2.902	73	2.874	0.7	.028	6	.236	1
					5	Int.	●	DSAS0410X05S060	21.2	.835	33.7	1.327	35.7	1.406	82.7	3.256	82	3.228	0.7	.028	6	.236	1
4.200	.1654			M5x.8	3	Int.	●	DSAS0420X03S060	13.4	.528	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	1
					5	Int.	●	DSAS0420X05S060	21.8	.858	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	1
4.300	.1693				3	Ext.	★	DSAE0430X03S060	13.7	.539	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	3
					3	Int.	●	DSAS0430X03S060	13.7	.539	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	1
					5	Int.	●	DSAS0430X05S060	22.3	.878	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	1
4.366	.1719	11/64			3	Int.	●	DSAS0437X03S060	13.9	.547	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	1
					5	Int.	●	DSAS0437X05S060	22.6	.890	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	1
4.400	.1732		17		3	Int.	●	DSAS0440X03S060	14.0	.551	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	1
					5	Int.	●	DSAS0440X05S060	22.8	.898	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	1
4.500	.1772		16	#12-24	3	Ext.	★	DSAE0450X03S060	14.3	.563	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	3
					3	Int.	●	DSAS0450X03S060	14.3	.563	24.8	.976	26.8	1.055	73.8	2.906	73	2.874	0.8	.031	6	.236	1
					5	Int.	●	DSAS0450X05S060	23.3	.917	33.8	1.331	35.8	1.409	82.8	3.260	82	3.228	0.8	.031	6	.236	1
4.600	.1811				3	Int.	●	DSAS0460X03S060	14.6	.575	25.8	1.016	28.8	1.134	75.8	2.984	75	2.953	0.8	.031	6	.236	1
					5	Int.	●	DSAS0460X05S060	23.8	.937	35.8	1.409	38.8	1.528	85.8	3.378	85	3.346	0.8	.031	6	.236	1
4.700	.1850		13		3	Int.	●	DSAS0470X03S060	15.0	.591	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	Int.	●	DSAS0470X05S060	24.4	.961	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.763	.1875	3/16			3	Int.	●	DSAS0476X03S060	15.2	.598	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	Int.	●	DSAS0476X05S060	24.7	.972	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.800	.1890		12		3	Int.	●	DSAS0480X03S060	15.3	.602	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	Int.	●	DSAS0480X05S060	24.9	.980	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.865	.1915				3	Int.	●	DSAS0486X03S060	15.5	.610	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	Int.	★	DSAS0486X05S060	25.2	.992	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
4.900	.1929				3	Int.	●	DSAS0490X03S060	15.6	.614	25.9	1.020	28.9	1.138	75.9	2.988	75	2.953	0.9	.035	6	.236	1
					5	Int.	★	DSAS0490X05S060	25.4	1.000	35.9	1.413	38.9	1.531	85.9	3.382	85	3.346	0.9	.035	6	.236	1
5.000	.1969			M6x1.0	3	Ext.	★	DSAE0500X03S060	15.9	.626	28.9	1.138	29.9	1.177	81.9	3.224	81	3.189	0.9	.035	6	.236	4
					3	Int.	●	DSAS0500X03S060	15.9	.626	28.9	1.138	29.9	1.177	81.9	3.224	81	3.189	0.9	.035	6	.236	2
					5	Int.	●	DSAS0500X05S060	25.9	1.020	39.9	1.571	42.9	1.689	89.9	3.539	89	3.504	0.9	.035	6	.236	2
5.100	.2008		7	1/4-20	3	Ext.	★	DSAE0510X03S060	16.2	.638	28.9	1.138	29.9	1.177	81.9	3.224	81	3.189	0.9	.035	6	.236	4
					3	Int.	●	DSAS0510X03S060	16.2	.638	28.9	1.138	29.9	1.177	81.9	3.224	81	3.189	0.9	.035	6	.236	2
					5	Int.	●	DSAS0510X05S060	26.4	1.039	39.9	1.571	42.9	1.689	89.9	3.539	89	3.504	0.9	.035	6	.236	2
5.160	.2032	13/64			3	Int.	●	DSAS0516X03S060	16.5	.650	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	2
					5	Int.	●	DSAS0516X05S060	26.8	1.055	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	2
5.200	.2047				3	Int.	●	DSAS0520X03S060	16.6	.654	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	2
					5	Int.	●	DSAS0520X05S060	27.0	1.063	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	2
5.300	.2087		4		3	Int.	●	DSAS0530X03S060	16.9	.665	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	2
					5	Int.	●	DSAS0530X05S060	27.5	1.083	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	2

Note 1) The coolant hole of ø.1875" (ø4.763mm) or less will be round shape.

● = NEW

DSA

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP9020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					3	Ext.	★	DSAE0540X03S060	17.2	.677	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	4
5.400	.2126		3	1/4-28	3	Int.	●	DSAS0540X03S060	17.2	.677	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	2
					5	Int.	●	DSAS0540X05S060	28.0	1.102	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	2
					3	Ext.	★	DSAE0550X03S060	17.5	.689	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	4
5.500	.2165				3	Int.	●	DSAS0550X03S060	17.5	.689	29.0	1.142	30.0	1.181	82.0	3.228	81	3.189	1.0	.039	6	.236	2
					5	Int.	●	DSAS0550X05S060	28.5	1.122	40.0	1.575	43.0	1.693	90.0	3.543	89	3.504	1.0	.039	6	.236	2
					3	Int.	●	DSAS0556X03S060	17.8	.701	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
5.557	.2188	7/32			5	Int.	●	DSAS0556X05S060	28.9	1.138	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Ext.	★	DSAE0560X03S060	17.9	.705	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	4
5.600	.2205		2		3	Int.	●	DSAS0560X03S060	17.9	.705	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
					5	Int.	●	DSAS0560X05S060	29.1	1.146	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Int.	●	DSAS0570X03S060	18.2	.717	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
5.700	.2244				5	Int.	●	DSAS0570X05S060	29.6	1.165	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Int.	●	DSAS0580X03S060	18.5	.728	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
5.800	.2283		1		5	Int.	●	DSAS0580X05S060	30.1	1.185	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Ext.	★	DSAE0590X03S060	18.8	.740	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	4
5.900	.2323				3	Int.	●	DSAS0590X03S060	18.8	.740	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
					5	Int.	●	DSAS0590X05S060	30.6	1.205	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Int.	●	DSAS0595X03S060	19.0	.748	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
5.954	.2344	15/64	A		5	Int.	●	DSAS0595X05S060	30.9	1.217	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Ext.	★	DSAE0600X03S060	19.1	.752	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	4
6.000	.2362			M7x1.0	3	Int.	●	DSAS0600X03S060	19.1	.752	31.1	1.224	31.1	1.224	82.1	3.232	81	3.189	1.1	.043	6	.236	2
					5	Int.	●	DSAS0600X05S060	31.1	1.224	43.1	1.697	43.1	1.697	90.1	3.547	89	3.504	1.1	.043	6	.236	2
					3	Ext.	★	DSAE0610X03S080	19.5	.768	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	4
6.100	.2402				3	Int.	●	DSAS0610X03S080	19.5	.768	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	2
					5	Int.	●	DSAS0610X05S080	31.7	1.248	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	2
					3	Ext.	★	DSAE0620X03S080	19.8	.780	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	4
6.200	.2441				3	Int.	●	DSAS0620X03S080	19.8	.780	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	2
					5	Int.	●	DSAS0620X05S080	32.2	1.268	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	2
					3	Int.	●	DSAS0630X03S080	20.1	.791	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	2
6.300	.2480				5	Int.	★	DSAS0630X05S080	32.7	1.287	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	2
					3	Int.	●	DSAS0635X03S080	20.3	.799	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	2
6.350	.2500	1/4	E		5	Int.	●	DSAS0635X05S080	33.0	1.299	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	2
					3	Ext.	★	DSAE0640X03S080	20.4	.803	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	4
6.400	.2520				3	Int.	●	DSAS0640X03S080	20.4	.803	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	2
					5	Int.	●	DSAS0640X05S080	33.2	1.307	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	2
					3	Int.	●	DSAS0650X03S080	20.7	.815	34.2	1.346	37.2	1.465	87.2	3.433	86	3.386	1.2	.047	8	.315	2
6.500	.2559				5	Int.	●	DSAS0650X05S080	33.7	1.327	47.2	1.858	49.2	1.937	96.2	3.787	95	3.740	1.2	.047	8	.315	2
					3	Int.	●	DSAS0660X03S080	21.1	.831	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
6.600	.2598				5	Int.	●	DSAS0660X05S080	34.3	1.350	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2
					3	Int.	●	DSAS0670X03S080	21.4	.843	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
6.700	.2638			M8x1.25	5	Int.	★	DSAS0670X05S080	34.8	1.370	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2
					3	Int.	●	DSAS0675X03S080	21.5	.846	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
6.747	.2657	17/64			5	Int.	●	DSAS0675X05S080	35.0	1.378	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2
					3	Ext.	★	DSAE0680X03S080	21.7	.854	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	4
6.800	.2677				3	Int.	●	DSAS0680X03S080	21.7	.854	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					5	Int.	●	DSAS0680X05S080	35.3	1.390	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2
					3	Ext.	★	DSAE0690X03S080	22.0	.866	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	4
6.900	.2717		I	5/16-24	3	Int.	●	DSAS0690X03S080	22.0	.866	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					5	Int.	●	DSAS0690X05S080	35.8	1.409	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2
					3	Int.	●	DSAS0695X03S080	22.2	.874	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
6.950	.2736				5	Int.	★	DSAS0695X05S080	36.1	1.421	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2

● = NEW

● : USA Stock ★ : Stocked in Japan

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP9020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
					3	Ext.	★	DSAE0700X03S080	22.3	.878	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	4
7.000	.2756			M8x1.0	3	Int.	●	DSAS0700X03S080	22.3	.878	36.3	1.429	38.3	1.508	91.3	3.594	90	3.543	1.3	.051	8	.315	2
					5	Int.	●	DSAS0700X05S080	36.3	1.429	50.3	1.980	52.3	2.059	99.3	3.909	98	3.858	1.3	.051	8	.315	2
					3	Ext.	★	DSAE0710X03S080	22.7	.894	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	4
7.100	.2795				3	Int.	●	DSAS0710X03S080	22.7	.894	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	2
					5	Int.	●	DSAS0710X05S080	36.9	1.453	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	2
					3	Int.	●	DSAS0714X03S080	22.8	.898	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	2
7.144	.2813	9/32	K		5	Int.	●	DSAS0714X05S080	37.1	1.461	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	2
					3	Int.	●	DSAS0720X03S080	23.0	.906	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	2
7.200	.2835				5	Int.	●	DSAS0720X05S080	37.4	1.472	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	2
					3	Int.	●	DSAS0730X03S080	23.3	.917	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	2
7.300	.2874				5	Int.	★	DSAS0730X05S080	37.9	1.492	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	2
					3	Int.	●	DSAS0740X03S080	23.6	.929	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	2
7.400	.2913				5	Int.	●	DSAS0740X05S080	38.4	1.512	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	2
					3	Int.	●	DSAS0750X03S080	23.9	.941	39.4	1.551	40.4	1.591	91.4	3.598	90	3.543	1.4	.055	8	.315	2
7.500	.2953		M		5	Int.	●	DSAS0750X05S080	38.9	1.531	54.4	2.142	57.4	2.260	104.4	4.110	103	4.055	1.4	.055	8	.315	2
					3	Int.	●	DSAS0754X03S080	24.1	.949	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
7.541	.2969	19/64			5	Int.	●	DSAS0754X05S080	39.2	1.543	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Int.	●	DSAS0760X03S080	24.3	.957	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
7.600	.2992				5	Int.	★	DSAS0760X05S080	39.5	1.555	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Int.	●	DSAS0770X03S080	24.6	.969	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
7.700	.3031				5	Int.	●	DSAS0770X05S080	40.0	1.575	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Ext.	★	DSAE0780X03S080	24.9	.980	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	4
7.800	.3071				3	Int.	●	DSAS0780X03S080	24.9	.980	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
					5	Int.	●	DSAS0780X05S080	40.5	1.594	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Int.	●	DSAS0790X03S080	25.2	.992	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
7.900	.3110				5	Int.	●	DSAS0790X05S080	41.0	1.614	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Int.	●	DSAS0794X03S080	25.3	.996	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
7.938	.3125	5/16		3/8-16	5	Int.	●	DSAS0794X05S080	41.2	1.622	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Ext.	★	DSAE0800X03S080	25.5	1.004	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	4
8.000	.3150				3	Int.	●	DSAS0800X03S080	25.5	1.004	41.5	1.634	41.5	1.634	91.5	3.602	90	3.543	1.5	.059	8	.315	2
					5	Int.	●	DSAS0800X05S080	41.5	1.634	57.5	2.264	57.5	2.264	104.5	4.114	103	4.055	1.5	.059	8	.315	2
					3	Ext.	★	DSAE0810X03S100	25.8	1.016	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	4
8.100	.3189				3	Int.	●	DSAS0810X03S100	25.8	1.016	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	2
					5	Int.	★	DSAS0810X05S100	42.0	1.654	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	2
					3	Ext.	★	DSAE0820X03S100	26.1	1.028	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	4
8.200	.3228		P		3	Int.	●	DSAS0820X03S100	26.1	1.028	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	2
					5	Int.	★	DSAS0820X05S100	42.5	1.673	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	2
					3	Int.	●	DSAS0830X03S100	26.4	1.039	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	2
8.300	.3268				5	Int.	●	DSAS0830X05S100	43.0	1.693	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	2
					3	Int.	●	DSAS0833X03S100	26.5	1.043	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	2
8.335	.3282	21/64			5	Int.	●	DSAS0833X05S100	43.2	1.701	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	2
					3	Ext.	★	DSAE0840X03S100	26.7	1.051	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	4
8.400	.3307				3	Int.	●	DSAS0840X03S100	26.7	1.051	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	2
					5	Int.	★	DSAS0840X05S100	43.5	1.713	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	2
					3	Ext.	★	DSAE0850X03S100	27.0	1.063	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	4
8.500	.3346			M10x1.5	3	Int.	●	DSAS0850X03S100	27.0	1.063	44.5	1.752	47.5	1.870	97.5	3.839	96	3.780	1.5	.059	10	.394	2
					5	Int.	●	DSAS0850X05S100	44.0	1.732	61.5	2.421	63.5	2.500	114.5	4.508	113	4.449	1.5	.059	10	.394	2
					3	Int.	●	DSAS0860X03S100	27.4	1.079	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	2
8.600	.3386		R		5	Int.	●	DSAS0860X05S100	44.6	1.756	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	2
					3	Int.	●	DSAS0870X03S100	27.7	1.091	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	2
8.700	.3425			M10x1.25	5	Int.	●	DSAS0870X05S100	45.1	1.776	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	2

● = NEW

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L174

DSA

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP9020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.732	.3438	11/32			3	Int.	●	DSAS0873X03S100	27.8	1.094	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	2
					5	Int.	●	DSAS0873X05S100	45.3	1.783	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	2
8.800	.3465				3	Int.	●	DSAS0880X03S100	28.0	1.102	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	2
					5	Int.	●	DSAS0880X05S100	45.6	1.795	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	2
8.900	.3504				3	Int.	●	DSAS0890X03S100	28.3	1.114	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	2
					5	Int.	●	DSAS0890X05S100	46.1	1.815	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	2
9.000	.3543				3	Ext.	★	DSAE0900X03S100	28.6	1.126	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	4
					3	Int.	●	DSAS0900X03S100	28.6	1.126	46.6	1.835	48.6	1.913	102.6	4.039	101	3.976	1.6	.063	10	.394	2
					5	Int.	●	DSAS0900X05S100	46.6	1.835	64.6	2.543	66.6	2.622	117.6	4.630	116	4.567	1.6	.063	10	.394	2
9.100	.3583		T		3	Int.	●	DSAS0910X03S100	29.1	1.146	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0910X05S100	47.3	1.862	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.200	.3622				3	Int.	●	DSAS0920X03S100	29.4	1.157	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0920X05S100	47.8	1.882	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.300	.3661				3	Int.	●	DSAS0930X03S100	29.7	1.169	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0930X05S100	48.3	1.902	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.400	.3701				3	Int.	●	DSAS0940X03S100	30.0	1.181	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0940X05S100	48.8	1.921	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.500	.3740				3	Int.	●	DSAS0950X03S100	30.3	1.193	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	●	DSAS0950X05S100	49.3	1.941	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.525	.3750	3/8			3	Int.	●	DSAS0953X03S100	30.4	1.197	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	●	DSAS0953X05S100	49.4	1.945	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.600	.3780				3	Int.	●	DSAS0960X03S100	30.6	1.205	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0960X05S100	49.8	1.961	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.700	.3819		Tube Sheet		3	Int.	●	DSAS0970X03S100	30.9	1.217	49.8	1.961	50.8	2.000	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0970X05S100	50.3	1.980	68.8	2.709	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.800	.3858		W		3	Int.	●	DSAS0980X03S100	31.2	1.228	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	●	DSAS0980X05S100	50.8	2.000	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.900	.3898				3	Int.	●	DSAS0990X03S100	31.5	1.240	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	★	DSAS0990X05S100	51.3	2.020	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
9.922	.3907	25/64		7/16-20	3	Int.	●	DSAS0992X03S100	31.6	1.244	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	●	DSAS0992X05S100	51.4	2.024	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
10.000	.3937				3	Ext.	★	DSAE1000X03S100	31.8	1.252	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	4
					3	Int.	●	DSAS1000X03S100	31.8	1.252	51.8	2.039	51.8	2.039	102.8	4.047	101	3.976	1.8	.071	10	.394	2
					5	Int.	●	DSAS1000X05S100	51.8	2.039	71.8	2.827	71.8	2.827	122.8	4.835	121	4.764	1.8	.071	10	.394	2
10.100	.3976				3	Int.	●	DSAS1010X03S120	32.2	1.268	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	★	DSAS1010X05S120	52.4	2.063	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.200	.4016			M12x1.75	3	Int.	●	DSAS1020X03S120	32.5	1.280	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	★	DSAS1020X05S120	52.9	2.083	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.300	.4055				3	Int.	●	DSAS1030X03S120	32.8	1.291	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	★	DSAS1030X05S120	53.4	2.102	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.319	.4063	13/32			3	Int.	●	DSAS1032X03S120	32.9	1.295	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	●	DSAS1032X05S120	53.5	2.106	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.400	.4094				3	Int.	●	DSAS1040X03S120	33.1	1.303	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	★	DSAS1040X05S120	53.9	2.122	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.500	.4134		Z		3	Ext.	★	DSAE1050X03S120	33.4	1.315	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	4
					3	Int.	●	DSAS1050X03S120	33.4	1.315	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	●	DSAS1050X05S120	54.4	2.142	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.600	.4173				3	Int.	●	DSAS1060X03S120	33.7	1.327	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	★	DSAS1060X05S120	54.9	2.161	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2
10.700	.4213				3	Ext.	★	DSAE1070X03S120	34.0	1.339	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	4
					3	Int.	●	DSAS1070X03S120	34.0	1.339	54.9	2.161	57.9	2.280	112.9	4.445	111	4.370	1.9	.075	12	.472	2
					5	Int.	★	DSAS1070X05S120	55.4	2.181	75.9	2.988	79.9	3.146	135.9	5.350	134	5.276	1.9	.075	12	.472	2

● = NEW

● : USA Stock ★ : Stocked in Japan

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP9020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
10.716	.4219	27/64		1/2-13	3	Int.	●	DSAS1072X03S120	34.1	1.343	57.0	2.244	59.0	2.323	118.0	4.646	116	4.567	2.0	.079	12	.472	2
					5	Int.	●	DSAS1072X05S120	55.6	2.189	79.0	3.110	80.0	3.150	142.0	5.591	140	5.512	2.0	.079	12	.472	2
10.800	.4252			M12x1.25	3	Int.	●	DSAS1080X03S120	34.4	1.354	57.0	2.244	59.0	2.323	118.0	4.646	116	4.567	2.0	.079	12	.472	2
					5	Int.	★	DSAS1080X05S120	56.0	2.205	79.0	3.110	80.0	3.150	142.0	5.591	140	5.512	2.0	.079	12	.472	2
10.900	.4291				3	Int.	●	DSAS1090X03S120	34.7	1.366	57.0	2.244	59.0	2.323	118.0	4.646	116	4.567	2.0	.079	12	.472	2
					5	Int.	★	DSAS1090X05S120	56.5	2.224	79.0	3.110	80.0	3.150	142.0	5.591	140	5.512	2.0	.079	12	.472	2
11.000	.4331				3	Ext.	★	DSAE1100X03S120	35.0	1.378	57.0	2.244	59.0	2.323	118.0	4.646	116	4.567	2.0	.079	12	.472	4
					3	Int.	●	DSAS1100X03S120	35.0	1.378	57.0	2.244	59.0	2.323	118.0	4.646	116	4.567	2.0	.079	12	.472	2
					5	Int.	●	DSAS1100X05S120	57.0	2.244	79.0	3.110	80.0	3.150	142.0	5.591	140	5.512	2.0	.079	12	.472	2
11.100	.4370				3	Int.	●	DSAS1110X03S120	35.4	1.394	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	2
					5	Int.	★	DSAS1110X05S120	57.6	2.268	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	2
11.113	.4375	7/16			3	Int.	●	DSAS1111X03S120	35.4	1.394	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	2
					5	Int.	●	DSAS1111X05S120	57.7	2.272	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	2
11.200	.4409				3	Int.	●	DSAS1120X03S120	35.7	1.406	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	2
					5	Int.	★	DSAS1120X05S120	58.1	2.287	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	2
11.300	.4449				3	Int.	●	DSAS1130X03S120	36.0	1.417	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	2
					5	Int.	★	DSAS1130X05S120	58.6	2.307	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	2
11.400	.4488				3	Int.	●	DSAS1140X03S120	36.3	1.429	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	2
					5	Int.	★	DSAS1140X05S120	59.1	2.327	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	2
11.500	.4528				3	Ext.	★	DSAE1150X03S120	36.6	1.441	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	4
					3	Int.	●	DSAS1150X03S120	36.6	1.441	60.1	2.366	61.1	2.406	118.1	4.650	116	4.567	2.1	.083	12	.472	2
					5	Int.	●	DSAS1150X05S120	59.6	2.346	83.1	3.272	86.1	3.390	142.1	5.594	140	5.512	2.1	.083	12	.472	2
11.510	.4532	29/64		1/2-20	3	Int.	●	DSAS1151X03S120	36.7	1.445	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	2
					5	Int.	★	DSAS1151X05S120	59.7	2.350	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	2
11.600	.4567				3	Int.	●	DSAS1160X03S120	37.0	1.457	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	2
					5	Int.	★	DSAS1160X05S120	60.2	2.370	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	2
11.700	.4606				3	Int.	●	DSAS1170X03S120	37.3	1.469	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	2
					5	Int.	★	DSAS1170X05S120	60.7	2.390	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	2
11.800	.4646				3	Int.	●	DSAS1180X03S120	37.6	1.480	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	2
					5	Int.	★	DSAS1180X05S120	61.2	2.409	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	2
11.900	.4685				3	Int.	●	DSAS1190X03S120	37.9	1.492	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	2
					5	Int.	★	DSAS1190X05S120	61.7	2.429	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	2
12.000	.4724			M14x2.0	3	Ext.	★	DSAE1200X03S120	38.2	1.504	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	4
					3	Int.	●	DSAS1200X03S120	38.2	1.504	62.2	2.449	62.2	2.449	118.2	4.654	116	4.567	2.2	.087	12	.472	2
					5	Int.	●	DSAS1200X05S120	62.2	2.449	86.2	3.394	86.2	3.394	142.2	5.598	140	5.512	2.2	.087	12	.472	2
12.300	.4843				3	Int.	●	DSAS1230X03S140	39.1	1.539	65.2	2.567	68.2	2.685	124.2	4.890	122	4.803	2.2	.087	14	.551	2
					5	Int.	●	DSAS1230X05S140	63.7	2.508	90.2	3.551	94.2	3.709	150.2	5.913	148	5.827	2.2	.087	14	.551	2
12.400	.4882				3	Int.	●	DSAS1240X03S140	39.5	1.555	65.3	2.571	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	2
					5	Int.	●	DSAS1240X05S140	64.3	2.531	90.3	3.555	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	2
12.500	.4921			M14x1.5	3	Int.	●	DSAS1250X03S140	39.8	1.567	65.3	2.571	68.3	2.689	124.3	4.894	122	4.803	2.3	.091	14	.551	2
					5	Int.	●	DSAS1250X05S140	64.8	2.551	90.3	3.555	94.3	3.713	150.3	5.917	148	5.827	2.3	.091	14	.551	2
12.700	.5000	1/2			3	Int.	●	DSAS1270X03S140	40.4	1.591	67.3	2.650	68.3	2.689	128.3	5.051	126	4.961	2.3	.091	14	.551	2
					5	Int.	●	DSAS1270X05S140	65.8	2.591	93.3	3.673	94.3	3.713	156.3	6.154	154	6.063	2.3	.091	14	.551	2
13.000	.5118				3	Int.	●	DSAS1300X03S140	41.4	1.630	67.4	2.654	68.4	2.693	128.4	5.055	126	4.961	2.4	.094	14	.551	2
					5	Int.	●	DSAS1300X05S140	67.4	2.654	93.4	3.677	94.4	3.717	156.4	6.157	154	6.063	2.4	.094	14	.551	2
13.100	.5157			9/16-18	3	Int.	●	DSAS1310X03S140	41.7	1.642	70.4	2.772	72.4	2.850	128.4	5.055	126	4.961	2.4	.094	14	.551	2
					5	Int.	●	DSAS1310X05S140	67.9	2.673	97.4	3.835	100.4	3.953	156.4	6.157	154	6.063	2.4	.094	14	.551	2
13.500	.5315			5/8-11	3	Int.	●	DSAS1350X03S140	43.0	1.693	70.5	2.776	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	2
					5	Int.	●	DSAS1350X05S140	70.0	2.756	97.5	3.839	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	2
14.000	.5512			M16x2.0	3	Int.	●	DSAS1400X03S140	44.5	1.752	72.5	2.854	72.5	2.854	128.5	5.059	126	4.961	2.5	.098	14	.551	2
					5	Int.	●	DSAS1400X05S140	72.5	2.854	100.5	3.957	100.5	3.957	156.5	6.161	154	6.063	2.5	.098	14	.551	2

● = NEW

DSA

DC					L/D	Coolant (Int./Ext.)	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size			DP9020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
14.500	**.5709**			**M16x1.5**	3	Int.	●	**DSAS1450X03S160**	46.1	1.815	75.6	2.976	78.6	3.094	137.6	5.417	135	5.315	2.6	.102	16	.630	2
					5	Int.	●	**DSAS1450X05S160**	75.1	2.957	104.6	4.118	108.6	4.276	167.6	6.598	165	6.496	2.6	.102	16	.630	2
14.600	**.5748**				3	Int.	●	**DSAS1460X03S160**	46.5	1.831	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	2
					5	Int.	●	**DSAS1460X05S160**	75.7	2.980	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	2
14.700	**.5787**				3	Int.	●	**DSAS1470X03S160**	46.8	1.843	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	2
					5	Int.	●	**DSAS1470X05S160**	76.2	3.000	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	2
15.000	**.5906**				3	Int.	●	**DSAS1500X03S160**	47.7	1.878	77.7	3.059	78.7	3.098	137.7	5.421	135	5.315	2.7	.106	16	.630	2
					5	Int.	●	**DSAS1500X05S160**	77.7	3.059	107.7	4.240	108.7	4.280	167.7	6.602	165	6.496	2.7	.106	16	.630	2

● = NEW

RECOMMENDED CUTTING CONDITIONS

(inch)

Workpiece Material			Heat Resistant Alloys Inconel718 etc.		Titanium Alloys Ti-6Al-4V etc.	
DC inch	DC mm	L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
.1181	**3.000**	**≦ 5**	30	.002 (.002—.004)	130	.003 (.002—.005)
.1575	**4.000**	**≦ 5**	30	.002 (.002—.004)	130	.004 (.003—.006)
.1969	**5.000**	**≦ 5**	40	.003 (.002—.005)	130	.005 (.003—.008)
.2362	**6.000**	**≦ 5**	50	.004 (.003—.006)	130	.006 (.004—.008)
.3150	**8.000**	**≦ 5**	50	.004 (.003—.006)	130	.007 (.006—.010)
.3937	**10.000**	**≦ 5**	60	.004 (.003—.006)	130	.009 (.007—.011)
.4724	**12.000**	**≦ 5**	65	.005 (.003—.006)	130	.009 (.008—.012)
.5512	**14.000**	**≦ 5**	65	.005 (.003—.006)	130	.009 (.008—.012)

Note 1) Spindle through & high pressure coolant system is recommended to make stable holes.
Note 2) Emulsion type of water-soluble coolant is recommended.
Note 3) In non water-insoluble coolant, reduce the cutting speed by 10%-20%.
Note 4) When drilling length of DCx1 or more with the use of external coolant system, step drilling is recommended in every DCx0.5 to encourage chips to break.

DWAE

NEW
Mini Size

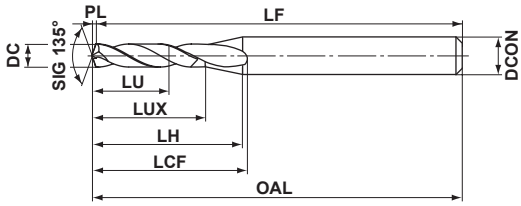
UWC | DP1A | 135° | XR DC<.0787 | X DC≥.0787

P | M | K | N | S | H

METRIC STANDARD

External Coolant

DC<.0787 DC≥.0787



Type1

	DC≤.1181			
	0 −.00055			
h6	DCON=.1181	DCON=.1575		
	0 −.00024	0 −.00031		

DC Metric (mm)	DC Decimal (inch)	DC Wire / Letter	DC Thread Size	L/D	Stock DP102A	Order Number	LU mm	LU inch	LUX mm	LUX inch	LCF mm	LCF inch	LH mm	LH inch	OAL mm	OAL inch	LF mm	LF inch	PL mm	PL inch	DCON mm	DCON inch	Type
1.0	.0394			2	●	DWAE0100X02S030	2.2	.087	5.0	.197	7.7	.303	8.7	.343	45	1.772	44.8	1.764	0.2	.008	3	.118	1
				4	●	DWAE0100X04S030	4.2	.165	7.0	.276	9.9	.390	10.7	.421	45	1.772	44.8	1.764	0.2	.008	3	.118	1
1.1	.0433			2	●	DWAE0110X02S030	2.4	.094	5.4	.213	8.1	.319	8.9	.350	45	1.772	44.8	1.764	0.2	.008	3	.118	1
				4	★	DWAE0110X04S030	4.6	.181	7.6	.299	10.5	.413	11.1	.437	45	1.772	44.8	1.764	0.2	.008	3	.118	1
1.2	.0472			2	●	DWAE0120X02S030	2.6	.102	5.8	.228	8.5	.335	9.2	.362	45	1.772	44.8	1.764	0.2	.008	3	.118	1
				4	●	DWAE0120X04S030	5.0	.197	8.2	.323	11.1	.437	11.6	.457	45	1.772	44.8	1.764	0.2	.008	3	.118	1
1.3	.0512			2	●	DWAE0130X02S030	2.9	.114	6.3	.248	9.0	.354	9.5	.374	45	1.772	44.7	1.760	0.3	.012	3	.118	1
				4	★	DWAE0130X04S030	5.5	.217	8.9	.350	11.9	.469	12.1	.476	45	1.772	44.7	1.760	0.3	.012	3	.118	1
1.4	.0551			2	★	DWAE0140X02S030	3.1	.122	6.7	.264	9.4	.370	9.7	.382	45	1.772	44.7	1.760	0.3	.012	3	.118	1
				4	★	DWAE0140X04S030	5.9	.232	9.5	.374	12.5	.492	12.5	.492	45	1.772	44.7	1.760	0.3	.012	3	.118	1
1.5	.0591		#1-64	2	●	DWAE0150X02S030	3.3	.130	7.1	.280	9.8	.386	9.9	.390	45	1.772	44.7	1.760	0.3	.012	3	.118	1
				4	●	DWAE0150X04S030	6.3	.248	10.1	.398	13.1	.516	12.9	.508	45	1.772	44.7	1.760	0.3	.012	3	.118	1
1.6	.0630			2	●	DWAE0160X02S030	3.5	.138	7.5	.295	10.2	.402	10.1	.398	45	1.772	44.7	1.760	0.3	.012	3	.118	1
				4	●	DWAE0160X04S030	6.7	.264	10.7	.421	13.7	.539	13.3	.524	45	1.772	44.7	1.760	0.3	.012	3	.118	1
1.7	.0669			2	●	DWAE0170X02S030	3.8	.150	8.0	.315	10.7	.421	10.4	.409	45	1.772	44.6	1.756	0.4	.016	3	.118	1
				4	★	DWAE0170X04S030	7.2	.283	11.4	.449	14.4	.567	13.8	.543	45	1.772	44.6	1.756	0.4	.016	3	.118	1
1.8	.0709			2	●	DWAE0180X02S030	4.0	.157	8.4	.331	11.1	.437	10.6	.417	45	1.772	44.6	1.756	0.4	.016	3	.118	1
				4	★	DWAE0180X04S030	7.6	.299	12.0	.472	15.1	.594	14.2	.559	45	1.772	44.6	1.756	0.4	.016	3	.118	1
1.9	.0748			2	★	DWAE0190X02S030	4.2	.165	8.8	.346	11.5	.453	10.9	.429	45	1.772	44.6	1.756	0.4	.016	3	.118	1
				4	★	DWAE0190X04S030	8.0	.315	12.6	.496	15.7	.618	14.7	.579	45	1.772	44.6	1.756	0.4	.016	3	.118	1
2.0	.0787		#3-48	2	●	DWAE0200X02S040	4.4	.173	9.2	.362	12.8	.504	12.9	.508	50	1.969	49.6	1.953	0.4	.016	4	.157	1
				4	●	DWAE0200X04S040	8.4	.331	13.2	.520	17.2	.677	16.9	.665	50	1.969	49.6	1.953	0.4	.016	4	.157	1
2.1	.0827			2	●	DWAE0210X02S040	4.6	.181	9.6	.378	13.2	.520	13.1	.516	50	1.969	49.6	1.953	0.4	.016	4	.157	1
				4	★	DWAE0210X04S040	8.8	.346	13.8	.543	17.8	.701	17.3	.681	50	1.969	49.6	1.953	0.4	.016	4	.157	1
2.2	.0866			2	●	DWAE0220X02S040	4.9	.193	10.1	.398	13.7	.539	13.5	.531	50	1.969	49.5	1.949	0.5	.020	4	.157	1
				4	★	DWAE0220X04S040	9.3	.366	14.5	.571	18.5	.728	17.9	.705	50	1.969	49.5	1.949	0.5	.020	4	.157	1
2.3	.0906			2	●	DWAE0230X02S040	5.1	.201	10.5	.413	14.1	.555	13.7	.539	50	1.969	49.5	1.949	0.5	.020	4	.157	1
				4	★	DWAE0230X04S040	9.7	.382	15.1	.594	19.2	.756	18.3	.720	50	1.969	49.5	1.949	0.5	.020	4	.157	1
2.4	.0945			2	●	DWAE0240X02S040	5.3	.209	10.9	.429	14.5	.571	13.9	.547	50	1.969	49.5	1.949	0.5	.020	4	.157	1
				4	●	DWAE0240X04S040	10.1	.398	15.7	.618	19.8	.780	18.7	.736	50	1.969	49.5	1.949	0.5	.020	4	.157	1
2.5	.0984			2	●	DWAE0250X02S040	5.5	.217	11.3	.445	14.9	.587	14.1	.555	50	1.969	49.5	1.949	0.5	.020	4	.157	1
				4	●	DWAE0250X04S040	10.5	.413	16.3	.642	20.4	.803	19.1	.752	50	1.969	49.5	1.949	0.5	.020	4	.157	1
2.6	.1024			2	●	DWAE0260X02S040	5.7	.224	11.7	.461	15.3	.602	14.3	.563	50	1.969	49.5	1.949	0.5	.020	4	.157	1
				4	★	DWAE0260X04S040	10.9	.429	16.9	.665	21.0	.827	19.5	.768	50	1.969	49.5	1.949	0.5	.020	4	.157	1
2.7	.1063	36	#6-32	2	★	DWAE0270X02S040	6.0	.236	12.2	.480	15.8	.622	14.6	.575	50	1.969	49.4	1.945	0.6	.024	4	.157	1
				4	●	DWAE0270X04S040	11.4	.449	17.6	.693	21.7	.854	20.0	.787	50	1.969	49.4	1.945	0.6	.024	4	.157	1
2.8	.1102	35		2	●	DWAE0280X02S040	6.2	.244	12.6	.496	16.2	.638	14.8	.583	50	1.969	49.4	1.945	0.6	.024	4	.157	1
				4	●	DWAE0280X04S040	11.8	.465	18.2	.717	22.4	.882	20.4	.803	50	1.969	49.4	1.945	0.6	.024	4	.157	1
2.9	.1142			2	●	DWAE0290X02S040	6.4	.252	13.0	.512	16.6	.654	15.1	.594	50	1.969	49.4	1.945	0.6	.024	4	.157	1
				4	●	DWAE0290X04S040	12.2	.480	18.8	.740	23.0	.906	20.9	.823	50	1.969	49.4	1.945	0.6	.024	4	.157	1

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L181

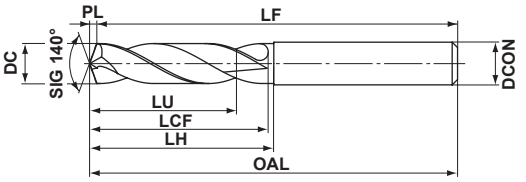
DWAE

NEW

P M K N S H

METRIC STANDARD

External Coolant



Type1

DC=.1181	.1181<DC≤.2362	.2362<DC≤.3937	.3937<DC≤.5512
0 −.00055	0 −.00071	0 −.00087	0 −.00106
DCON=.1181	.1181<DCON≤.2362	.2362<DCON≤.3937	.3937<DCON≤.5512
0 −.00024	0 −.00031	0 −.00035	0 −.00043

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.0	.1181				2	●	DWAE0300X02S030	6.5	.256	12.5	.492	14.5	.571	45.5	1.791	45	1.772	0.5	.020	3	.118	1
					4	★	DWAE0300X04S030	12.5	.492	21.5	.846	23.5	.925	55.5	2.185	55	2.165	0.5	.020	3	.118	1
3.1	.1220				2	●	DWAE0310X02S040	6.8	.268	12.6	.496	14.6	.575	55.6	2.189	55	2.165	0.6	.024	4	.157	1
					4	★	DWAE0310X04S040	13.0	.512	21.6	.850	23.6	.929	60.6	2.386	60	2.362	0.6	.024	4	.157	1
3.2	.1260				2	●	DWAE0320X02S040	7.0	.276	13.6	.535	15.6	.614	55.6	2.189	55	2.165	0.6	.024	4	.157	1
					4	★	DWAE0320X04S040	13.4	.528	22.6	.890	24.6	.969	60.6	2.386	60	2.362	0.6	.024	4	.157	1
3.3	.1299			M4x.7	2	●	DWAE0330X02S040	7.2	.283	13.6	.535	15.6	.614	55.6	2.189	55	2.165	0.6	.024	4	.157	1
					4	●	DWAE0330X04S040	13.8	.543	23.6	.929	25.6	1.008	60.6	2.386	60	2.362	0.6	.024	4	.157	1
3.4	.1339				2	●	DWAE0340X02S040	7.4	.291	13.6	.535	15.6	.614	55.6	2.189	55	2.165	0.6	.024	4	.157	1
					4	★	DWAE0340X04S040	14.2	.559	23.6	.929	25.6	1.008	60.6	2.386	60	2.362	0.6	.024	4	.157	1
3.5	.1378				2	●	DWAE0350X02S040	7.6	.299	14.6	.575	16.6	.654	55.6	2.189	55	2.165	0.6	.024	4	.157	1
					4	●	DWAE0350X04S040	14.6	.575	24.6	.969	26.6	1.047	60.6	2.386	60	2.362	0.6	.024	4	.157	1
3.6	.1417				2	●	DWAE0360X02S040	7.9	.311	14.7	.579	16.7	.657	55.7	2.193	55	2.165	0.7	.028	4	.157	1
					4	★	DWAE0360X04S040	15.1	.594	25.7	1.012	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	1
3.7	.1457			M4.5x.75	2	●	DWAE0370X02S040	8.1	.319	14.7	.579	16.7	.657	55.7	2.193	55	2.165	0.7	.028	4	.157	1
					4	★	DWAE0370X04S040	15.5	.610	25.7	1.012	27.7	1.091	60.7	2.390	60	2.362	0.7	.028	4	.157	1
3.8	.1496		25	#10-24	2	●	DWAE0380X02S040	8.3	.327	15.7	.618	17.7	.697	55.7	2.193	55	2.165	0.7	.028	4	.157	1
					4	●	DWAE0380X04S040	15.9	.626	26.7	1.051	28.7	1.130	60.7	2.390	60	2.362	0.7	.028	4	.157	1
3.9	.1535				2	●	DWAE0390X02S040	8.5	.335	15.7	.618	17.7	.697	55.7	2.193	55	2.165	0.7	.028	4	.157	1
					4	●	DWAE0390X04S040	16.3	.642	27.7	1.091	29.7	1.169	60.7	2.390	60	2.362	0.7	.028	4	.157	1
4.0	.1575				2	●	DWAE0400X02S040	8.7	.343	15.7	.618	17.7	.697	55.7	2.193	55	2.165	0.7	.028	4	.157	1
					4	●	DWAE0400X04S040	16.7	.657	27.7	1.091	29.7	1.169	60.7	2.390	60	2.362	0.7	.028	4	.157	1
4.1	.1614				2	●	DWAE0410X02S050	8.9	.350	16.7	.657	18.7	.736	62.7	2.469	62	2.441	0.7	.028	5	.197	1
					4	★	DWAE0410X04S050	17.1	.673	28.7	1.130	30.7	1.209	80.7	3.177	80	3.150	0.7	.028	5	.197	1
4.2	.1654			M5x.8	2	●	DWAE0420X02S050	9.2	.362	16.8	.661	18.8	.740	62.8	2.472	62	2.441	0.8	.031	5	.197	1
					4	●	DWAE0420X04S050	17.6	.693	29.8	1.173	31.8	1.252	80.8	3.181	80	3.150	0.8	.031	5	.197	1
4.3	.1693				2	●	DWAE0430X02S050	9.4	.370	17.8	.701	19.8	.780	62.8	2.472	62	2.441	0.8	.031	5	.197	1
					4	★	DWAE0430X04S050	18.0	.709	30.8	1.213	32.8	1.291	80.8	3.181	80	3.150	0.8	.031	5	.197	1
4.4	.1732		17		2	●	DWAE0440X02S050	9.6	.378	17.8	.701	19.8	.780	62.8	2.472	62	2.441	0.8	.031	5	.197	1
					4	★	DWAE0440X04S050	18.4	.724	30.8	1.213	32.8	1.291	80.8	3.181	80	3.150	0.8	.031	5	.197	1
4.5	.1772		16	#12-24	2	●	DWAE0450X02S050	9.8	.386	17.8	.701	19.8	.780	62.8	2.472	62	2.441	0.8	.031	5	.197	1
					4	★	DWAE0450X04S050	18.8	.740	31.8	1.252	33.8	1.331	80.8	3.181	80	3.150	0.8	.031	5	.197	1

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
4.6	.1811				2	●	DWAE0460X02S050	10.0	.394	18.8	.740	20.8	.819	62.8	2.472	62	2.441	0.8	.031	5	.197	1
					4	★	DWAE0460X04S050	19.2	.756	32.8	1.291	34.8	1.370	80.8	3.181	80	3.150	0.8	.031	5	.197	1
4.7	.1850		13		2	●	DWAE0470X02S050	10.3	.406	18.9	.744	20.9	.823	62.9	2.476	62	2.441	0.9	.035	5	.197	1
					4	★	DWAE0470X04S050	19.7	.776	32.9	1.295	34.9	1.374	80.9	3.185	80	3.150	0.9	.035	5	.197	1
4.8	.1890		12		2	●	DWAE0480X02S050	10.5	.413	18.9	.744	20.9	.823	62.9	2.476	62	2.441	0.9	.035	5	.197	1
					4	●	DWAE0480X04S050	20.1	.791	33.9	1.335	35.9	1.413	80.9	3.185	80	3.150	0.9	.035	5	.197	1
4.9	.1929				2	●	DWAE0490X02S050	10.7	.421	19.9	.783	21.9	.862	62.9	2.476	62	2.441	0.9	.035	5	.197	1
					4	★	DWAE0490X04S050	20.5	.807	34.9	1.374	36.9	1.453	80.9	3.185	80	3.150	0.9	.035	5	.197	1
5.0	.1969			M6x1.0	2	●	DWAE0500X02S050	10.9	.429	19.9	.783	21.9	.862	62.9	2.476	62	2.441	0.9	.035	5	.197	1
					4	●	DWAE0500X04S050	20.9	.823	34.9	1.374	36.9	1.453	80.9	3.185	80	3.150	0.9	.035	5	.197	1
5.1	.2008		7	1/4-20	2	●	DWAE0510X02S060	11.1	.437	21.9	.862	23.9	.941	66.9	2.634	66	2.598	0.9	.035	6	.236	1
					4	★	DWAE0510X04S060	21.3	.839	35.9	1.413	37.9	1.492	80.9	3.185	80	3.150	0.9	.035	6	.236	1
5.2	.2047				2	●	DWAE0520X02S060	11.3	.445	21.9	.862	23.9	.941	66.9	2.634	66	2.598	0.9	.035	6	.236	1
					4	●	DWAE0520X04S060	21.7	.854	36.9	1.453	38.9	1.531	80.9	3.185	80	3.150	0.9	.035	6	.236	1
5.3	.2087		4		2	●	DWAE0530X02S060	11.6	.457	22.0	.866	24.0	.945	67.0	2.638	66	2.598	1.0	.039	6	.236	1
					4	★	DWAE0530X04S060	22.2	.874	37.0	1.457	39.0	1.535	81.0	3.189	80	3.150	1.0	.039	6	.236	1
5.4	.2126		3	1/4-28	2	●	DWAE0540X02S060	11.8	.465	22.0	.866	24.0	.945	67.0	2.638	66	2.598	1.0	.039	6	.236	1
					4	★	DWAE0540X04S060	22.6	.890	38.0	1.496	40.0	1.575	81.0	3.189	80	3.150	1.0	.039	6	.236	1
5.5	.2165				2	●	DWAE0550X02S060	12.0	.472	22.0	.866	24.0	.945	67.0	2.638	66	2.598	1.0	.039	6	.236	1
					4	★	DWAE0550X04S060	23.0	.906	39.0	1.535	41.0	1.614	81.0	3.189	80	3.150	1.0	.039	6	.236	1
5.6	.2205		2		2	●	DWAE0560X02S060	12.2	.480	24.0	.945	26.0	1.024	67.0	2.638	66	2.598	1.0	.039	6	.236	1
					4	★	DWAE0560X04S060	23.4	.921	39.0	1.535	41.0	1.614	81.0	3.189	80	3.150	1.0	.039	6	.236	1
5.7	.2244				2	●	DWAE0570X02S060	12.4	.488	24.0	.945	26.0	1.024	67.0	2.638	66	2.598	1.0	.039	6	.236	1
					4	★	DWAE0570X04S060	23.8	.937	39.0	1.535	41.0	1.614	81.0	3.189	80	3.150	1.0	.039	6	.236	1
5.8	.2283		1		2	●	DWAE0580X02S060	12.7	.500	24.1	.949	26.1	1.028	67.1	2.642	66	2.598	1.1	.043	6	.236	1
					4	★	DWAE0580X04S060	24.3	.957	41.1	1.618	43.1	1.697	81.1	3.193	80	3.150	1.1	.043	6	.236	1
5.9	.2323				2	●	DWAE0590X02S060	12.9	.508	24.1	.949	26.1	1.028	67.1	2.642	66	2.598	1.1	.043	6	.236	1
					4	●	DWAE0590X04S060	24.7	.972	41.1	1.618	43.1	1.697	81.1	3.193	80	3.150	1.1	.043	6	.236	1
6.0	.2362			M7x1.0	2	●	DWAE0600X02S060	13.1	.516	24.1	.949	26.1	1.028	67.1	2.642	66	2.598	1.1	.043	6	.236	1
					4	●	DWAE0600X04S060	25.1	.988	42.1	1.657	44.1	1.736	81.1	3.193	80	3.150	1.1	.043	6	.236	1
6.1	.2402				2	★	DWAE0610X02S070	13.3	.524	26.1	1.028	28.1	1.106	75.1	2.957	74	2.913	1.1	.043	7	.276	1
					4	★	DWAE0610X04S070	25.5	1.004	44.1	1.736	46.1	1.815	84.1	3.311	83	3.268	1.1	.043	7	.276	1
6.2	.2441				2	●	DWAE0620X02S070	13.5	.531	26.1	1.028	28.1	1.106	75.1	2.957	74	2.913	1.1	.043	7	.276	1
					4	★	DWAE0620X04S070	25.9	1.020	44.1	1.736	46.1	1.815	84.1	3.311	83	3.268	1.1	.043	7	.276	1
6.3	.2480				2	●	DWAE0630X02S070	13.7	.539	26.1	1.028	28.1	1.106	75.1	2.957	74	2.913	1.1	.043	7	.276	1
					4	●	DWAE0630X04S070	26.3	1.035	44.1	1.736	46.1	1.815	84.1	3.311	83	3.268	1.1	.043	7	.276	1
6.4	.2520				2	●	DWAE0640X02S070	14.0	.551	26.2	1.031	28.2	1.110	75.2	2.961	74	2.913	1.2	.047	7	.276	1
					4	★	DWAE0640X04S070	26.8	1.055	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	7	.276	1
6.5	.2559				2	●	DWAE0650X02S070	14.2	.559	26.2	1.031	28.2	1.110	75.2	2.961	74	2.913	1.2	.047	7	.276	1
					4	★	DWAE0650X04S070	27.2	1.071	44.2	1.740	46.2	1.819	84.2	3.315	83	3.268	1.2	.047	7	.276	1
6.6	.2598				2	●	DWAE0660X02S070	14.4	.567	28.2	1.110	30.2	1.189	75.2	2.961	74	2.913	1.2	.047	7	.276	1
					4	★	DWAE0660X04S070	27.6	1.087	46.2	1.819	48.2	1.898	84.2	3.315	83	3.268	1.2	.047	7	.276	1
6.7	.2638				2	●	DWAE0670X02S070	14.6	.575	28.2	1.110	30.2	1.189	75.2	2.961	74	2.913	1.2	.047	7	.276	1
					4	●	DWAE0670X04S070	28.0	1.102	46.2	1.819	48.2	1.898	84.2	3.315	83	3.268	1.2	.047	7	.276	1
6.8	.2677				2	●	DWAE0680X02S070	14.8	.583	28.2	1.110	30.2	1.189	75.2	2.961	74	2.913	1.2	.047	7	.276	1
					4	●	DWAE0680X04S070	28.4	1.118	46.2	1.819	48.2	1.898	84.2	3.315	83	3.268	1.2	.047	7	.276	1
6.9	.2717		I	5/16-24	2	●	DWAE0690X02S070	15.1	.594	28.3	1.114	30.3	1.193	75.3	2.965	74	2.913	1.3	.051	7	.276	1
					4	★	DWAE0690X04S070	28.9	1.138	46.3	1.823	48.3	1.902	84.3	3.319	83	3.268	1.3	.051	7	.276	1
7.0	.2756			M8x1.0	2	●	DWAE0700X02S070	15.3	.602	28.3	1.114	30.3	1.193	75.3	2.965	74	2.913	1.3	.051	7	.276	1
					4	★	DWAE0700X04S070	29.3	1.154	46.3	1.823	48.3	1.902	84.3	3.319	83	3.268	1.3	.051	7	.276	1

DWAE

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
7.1	.2795				2	●	DWAE0710X02S080	15.5	.610	29.3	1.154	31.3	1.232	80.3	3.161	79	3.110	1.3	.051	8	.315	1
					4	★	DWAE0710X04S080	29.7	1.169	51.3	2.020	53.3	2.098	91.3	3.594	90	3.543	1.3	.051	8	.315	1
7.2	.2835				2	●	DWAE0720X02S080	15.7	.618	29.3	1.154	31.3	1.232	80.3	3.161	79	3.110	1.3	.051	8	.315	1
					4	★	DWAE0720X04S080	30.1	1.185	51.3	2.020	53.3	2.098	91.3	3.594	90	3.543	1.3	.051	8	.315	1
7.3	.2874				2	●	DWAE0730X02S080	15.9	.626	29.3	1.154	31.3	1.232	80.3	3.161	79	3.110	1.3	.051	8	.315	1
					4	★	DWAE0730X04S080	30.5	1.201	51.3	2.020	53.3	2.098	91.3	3.594	90	3.543	1.3	.051	8	.315	1
7.4	.2913				2	●	DWAE0740X02S080	16.1	.634	29.3	1.154	31.3	1.232	80.3	3.161	79	3.110	1.3	.051	8	.315	1
					4	●	DWAE0740X04S080	30.9	1.217	51.3	2.020	53.3	2.098	91.3	3.594	90	3.543	1.3	.051	8	.315	1
7.5	.2953		M		2	★	DWAE0750X02S080	16.4	.646	29.4	1.157	31.4	1.236	80.4	3.165	79	3.110	1.4	.055	8	.315	1
					4	★	DWAE0750X04S080	31.4	1.236	51.4	2.024	53.4	2.102	91.4	3.598	90	3.543	1.4	.055	8	.315	1
7.6	.2992				2	●	DWAE0760X02S080	16.6	.654	31.4	1.236	33.4	1.315	80.4	3.165	79	3.110	1.4	.055	8	.315	1
					4	★	DWAE0760X04S080	31.8	1.252	53.4	2.102	55.4	2.181	91.4	3.598	90	3.543	1.4	.055	8	.315	1
7.7	.3031				2	●	DWAE0770X02S080	16.8	.661	31.4	1.236	33.4	1.315	80.4	3.165	79	3.110	1.4	.055	8	.315	1
					4	★	DWAE0770X04S080	32.2	1.268	53.4	2.102	55.4	2.181	91.4	3.598	90	3.543	1.4	.055	8	.315	1
7.8	.3071				2	★	DWAE0780X02S080	17.0	.669	31.4	1.236	33.4	1.315	80.4	3.165	79	3.110	1.4	.055	8	.315	1
					4	★	DWAE0780X04S080	32.6	1.283	53.4	2.102	55.4	2.181	91.4	3.598	90	3.543	1.4	.055	8	.315	1
7.9	.3110				2	★	DWAE0790X02S080	17.2	.677	31.4	1.236	33.4	1.315	80.4	3.165	79	3.110	1.4	.055	8	.315	1
					4	★	DWAE0790X04S080	33.0	1.299	53.4	2.102	55.4	2.181	91.4	3.598	90	3.543	1.4	.055	8	.315	1
8.0	.3150				2	●	DWAE0800X02S080	17.5	.689	31.5	1.240	33.5	1.319	80.5	3.169	79	3.110	1.5	.059	8	.315	1
					4	●	DWAE0800X04S080	33.5	1.319	53.5	2.106	55.5	2.185	91.5	3.602	90	3.543	1.5	.059	8	.315	1
8.1	.3189				2	●	DWAE0810X02S090	17.7	.697	33.5	1.319	35.5	1.398	85.5	3.366	84	3.307	1.5	.059	9	.354	1
					4	★	DWAE0810X04S090	33.9	1.335	57.5	2.264	59.5	2.343	99.5	3.917	98	3.858	1.5	.059	9	.354	1
8.2	.3228		P		2	●	DWAE0820X02S090	17.9	.705	33.5	1.319	35.5	1.398	85.5	3.366	84	3.307	1.5	.059	9	.354	1
					4	★	DWAE0820X04S090	34.3	1.350	57.5	2.264	59.5	2.343	99.5	3.917	98	3.858	1.5	.059	9	.354	1
8.3	.3268				2	★	DWAE0830X02S090	18.1	.713	33.5	1.319	35.5	1.398	85.5	3.366	84	3.307	1.5	.059	9	.354	1
					4	★	DWAE0830X04S090	34.7	1.366	57.5	2.264	59.5	2.343	99.5	3.917	98	3.858	1.5	.059	9	.354	1
8.4	.3307				2	●	DWAE0840X02S090	18.3	.720	33.5	1.319	35.5	1.398	85.5	3.366	84	3.307	1.5	.059	9	.354	1
					4	★	DWAE0840X04S090	35.1	1.382	57.5	2.264	59.5	2.343	99.5	3.917	98	3.858	1.5	.059	9	.354	1
8.5	.3346			M10x1.5	2	●	DWAE0850X02S090	18.5	.728	33.5	1.319	35.5	1.398	85.5	3.366	84	3.307	1.5	.059	9	.354	1
					4	●	DWAE0850X04S090	35.5	1.398	57.5	2.264	59.5	2.343	99.5	3.917	98	3.858	1.5	.059	9	.354	1
8.6	.3386		R		2	●	DWAE0860X02S090	18.8	.740	34.6	1.362	36.6	1.441	85.6	3.370	84	3.307	1.6	.063	9	.354	1
					4	★	DWAE0860X04S090	36.0	1.417	61.6	2.425	63.6	2.504	99.6	3.921	98	3.858	1.6	.063	9	.354	1
8.7	.3425			M10x1.25	2	●	DWAE0870X02S090	19.0	.748	34.6	1.362	36.6	1.441	85.6	3.370	84	3.307	1.6	.063	9	.354	1
					4	★	DWAE0870X04S090	36.4	1.433	61.6	2.425	63.6	2.504	99.6	3.921	98	3.858	1.6	.063	9	.354	1
8.8	.3465				2	●	DWAE0880X02S090	19.2	.756	34.6	1.362	36.6	1.441	85.6	3.370	84	3.307	1.6	.063	9	.354	1
					4	★	DWAE0880X04S090	36.8	1.449	61.6	2.425	63.6	2.504	99.6	3.921	98	3.858	1.6	.063	9	.354	1
8.9	.3504				2	●	DWAE0890X02S090	19.4	.764	34.6	1.362	36.6	1.441	85.6	3.370	84	3.307	1.6	.063	9	.354	1
					4	★	DWAE0890X04S090	37.2	1.465	61.6	2.425	63.6	2.504	99.6	3.921	98	3.858	1.6	.063	9	.354	1
9.0	.3543				2	●	DWAE0900X02S090	19.6	.772	34.6	1.362	36.6	1.441	85.6	3.370	84	3.307	1.6	.063	9	.354	1
					4	●	DWAE0900X04S090	37.6	1.480	61.6	2.425	63.6	2.504	99.6	3.921	98	3.858	1.6	.063	9	.354	1
9.1	.3583		T		2	★	DWAE0910X02S100	19.9	.783	36.7	1.445	38.7	1.524	90.7	3.571	89	3.504	1.7	.067	10	.394	1
					4	★	DWAE0910X04S100	38.1	1.500	63.7	2.508	65.7	2.587	106.7	4.201	105	4.134	1.7	.067	10	.394	1
9.2	.3622				2	★	DWAE0920X02S100	20.1	.791	36.7	1.445	38.7	1.524	90.7	3.571	89	3.504	1.7	.067	10	.394	1
					4	★	DWAE0920X04S100	38.5	1.516	63.7	2.508	65.7	2.587	106.7	4.201	105	4.134	1.7	.067	10	.394	1
9.3	.3661				2	★	DWAE0930X02S100	20.3	.799	36.7	1.445	38.7	1.524	90.7	3.571	89	3.504	1.7	.067	10	.394	1
					4	★	DWAE0930X04S100	38.9	1.531	63.7	2.508	65.7	2.587	106.7	4.201	105	4.134	1.7	.067	10	.394	1
9.4	.3701				2	●	DWAE0940X02S100	20.5	.807	36.7	1.445	38.7	1.524	90.7	3.571	89	3.504	1.7	.067	10	.394	1
					4	★	DWAE0940X04S100	39.3	1.547	63.7	2.508	65.7	2.587	106.7	4.201	105	4.134	1.7	.067	10	.394	1
9.5	.3740				2	★	DWAE0950X02S100	20.7	.815	36.7	1.445	38.7	1.524	90.7	3.571	89	3.504	1.7	.067	10	.394	1
					4	★	DWAE0950X04S100	39.7	1.563	63.7	2.508	65.7	2.587	106.7	4.201	105	4.134	1.7	.067	10	.394	1

● : USA Stock ★ : Stocked in Japan

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9.6	.3780				2	●	DWAE0960X02S100	20.9	.823	37.7	1.484	39.7	1.563	90.7	3.571	89	3.504	1.7	.067	10	.394	1
					4	●	DWAE0960X04S100	40.1	1.579	66.7	2.626	68.7	2.705	106.7	4.201	105	4.134	1.7	.067	10	.394	1
9.7	.3819		Tube Sheet		2	●	DWAE0970X02S100	21.2	.835	37.8	1.488	39.8	1.567	90.8	3.575	89	3.504	1.8	.071	10	.394	1
					4	★	DWAE0970X04S100	40.6	1.598	66.8	2.630	68.8	2.709	106.8	4.205	105	4.134	1.8	.071	10	.394	1
9.8	.3858		W		2	●	DWAE0980X02S100	21.4	.843	37.8	1.488	39.8	1.567	90.8	3.575	89	3.504	1.8	.071	10	.394	1
					4	★	DWAE0980X04S100	41.0	1.614	66.8	2.630	68.8	2.709	106.8	4.205	105	4.134	1.8	.071	10	.394	1
9.9	.3898				2	★	DWAE0990X02S100	21.6	.850	37.8	1.488	39.8	1.567	90.8	3.575	89	3.504	1.8	.071	10	.394	1
					4	★	DWAE0990X04S100	41.4	1.630	66.8	2.630	68.8	2.709	106.8	4.205	105	4.134	1.8	.071	10	.394	1
10.0	.3937				2	●	DWAE1000X02S100	21.8	.858	37.8	1.488	39.8	1.567	90.8	3.575	89	3.504	1.8	.071	10	.394	1
					4	●	DWAE1000X04S100	41.8	1.646	66.8	2.630	68.8	2.709	106.8	4.205	105	4.134	1.8	.071	10	.394	1
10.1	.3976				2	●	DWAE1010X02S110	22.0	.866	40.8	1.606	42.8	1.685	101.8	4.008	100	3.937	1.8	.071	11	.433	1
					4	●	DWAE1010X04S110	42.2	1.661	71.8	2.827	73.8	2.906	115.8	4.559	114	4.488	1.8	.071	11	.433	1
10.2	.4016			M12x1.75	2	★	DWAE1020X02S110	22.3	.878	40.9	1.610	42.9	1.689	101.9	4.012	100	3.937	1.9	.075	11	.433	1
					4	★	DWAE1020X04S110	42.7	1.681	71.9	2.831	73.9	2.909	115.9	4.563	114	4.488	1.9	.075	11	.433	1
10.3	.4055				2	★	DWAE1030X02S110	22.5	.886	40.9	1.610	42.9	1.689	101.9	4.012	100	3.937	1.9	.075	11	.433	1
					4	●	DWAE1030X04S110	43.1	1.697	71.9	2.831	73.9	2.909	115.9	4.563	114	4.488	1.9	.075	11	.433	1
10.4	.4094				2	★	DWAE1040X02S110	22.7	.894	40.9	1.610	42.9	1.689	101.9	4.012	100	3.937	1.9	.075	11	.433	1
					4	★	DWAE1040X04S110	43.5	1.713	71.9	2.831	73.9	2.909	115.9	4.563	114	4.488	1.9	.075	11	.433	1
10.5	.4134		Z		2	●	DWAE1050X02S110	22.9	.902	40.9	1.610	42.9	1.689	101.9	4.012	100	3.937	1.9	.075	11	.433	1
					4	★	DWAE1050X04S110	43.9	1.728	71.9	2.831	73.9	2.909	115.9	4.563	114	4.488	1.9	.075	11	.433	1
10.6	.4173				2	★	DWAE1060X02S110	23.1	.909	41.9	1.650	43.9	1.728	101.9	4.012	100	3.937	1.9	.075	11	.433	1
					4	★	DWAE1060X04S110	44.3	1.744	72.9	2.870	74.9	2.949	115.9	4.563	114	4.488	1.9	.075	11	.433	1
10.7	.4213				2	●	DWAE1070X02S110	23.3	.917	41.9	1.650	43.9	1.728	101.9	4.012	100	3.937	1.9	.075	11	.433	1
					4	★	DWAE1070X04S110	44.7	1.760	72.9	2.870	74.9	2.949	115.9	4.563	114	4.488	1.9	.075	11	.433	1
10.8	.4252			M12x1.25	2	●	DWAE1080X02S110	23.6	.929	42.0	1.654	44.0	1.732	102.0	4.016	100	3.937	2.0	.079	11	.433	1
					4	★	DWAE1080X04S110	45.2	1.780	73.0	2.874	75.0	2.953	116.0	4.567	114	4.488	2.0	.079	11	.433	1
10.9	.4291				2	★	DWAE1090X02S110	23.8	.937	42.0	1.654	44.0	1.732	102.0	4.016	100	3.937	2.0	.079	11	.433	1
					4	★	DWAE1090X04S110	45.6	1.795	73.0	2.874	75.0	2.953	116.0	4.567	114	4.488	2.0	.079	11	.433	1
11.0	.4331				2	●	DWAE1100X02S110	24.0	.945	42.0	1.654	44.0	1.732	102.0	4.016	100	3.937	2.0	.079	11	.433	1
					4	●	DWAE1100X04S110	46.0	1.811	73.0	2.874	75.0	2.953	116.0	4.567	114	4.488	2.0	.079	11	.433	1
11.1	.4370				2	●	DWAE1110X02S120	24.2	.953	45.0	1.772	47.0	1.850	102.0	4.016	100	3.937	2.0	.079	12	.472	1
					4	★	DWAE1110X04S120	46.4	1.827	77.0	3.031	79.0	3.110	123.0	4.843	121	4.764	2.0	.079	12	.472	1
11.2	.4409				2	★	DWAE1120X02S120	24.4	.961	45.0	1.772	47.0	1.850	102.0	4.016	100	3.937	2.0	.079	12	.472	1
					4	★	DWAE1120X04S120	46.8	1.843	77.0	3.031	79.0	3.110	123.0	4.843	121	4.764	2.0	.079	12	.472	1
11.3	.4449				2	★	DWAE1130X02S120	24.7	.972	45.1	1.776	47.1	1.854	102.1	4.020	100	3.937	2.1	.083	12	.472	1
					4	★	DWAE1130X04S120	47.3	1.862	77.1	3.035	79.1	3.114	123.1	4.846	121	4.764	2.1	.083	12	.472	1
11.4	.4488				2	★	DWAE1140X02S120	24.9	.980	45.1	1.776	47.1	1.854	102.1	4.020	100	3.937	2.1	.083	12	.472	1
					4	★	DWAE1140X04S120	47.7	1.878	77.1	3.035	79.1	3.114	123.1	4.846	121	4.764	2.1	.083	12	.472	1
11.5	.4528				2	★	DWAE1150X02S120	25.1	.988	45.1	1.776	47.1	1.854	102.1	4.020	100	3.937	2.1	.083	12	.472	1
					4	●	DWAE1150X04S120	48.1	1.894	77.1	3.035	79.1	3.114	123.1	4.846	121	4.764	2.1	.083	12	.472	1
11.6	.4567				2	★	DWAE1160X02S120	25.3	.996	47.1	1.854	49.1	1.933	102.1	4.020	100	3.937	2.1	.083	12	.472	1
					4	★	DWAE1160X04S120	48.5	1.909	79.1	3.114	81.1	3.193	123.1	4.846	121	4.764	2.1	.083	12	.472	1
11.7	.4606				2	★	DWAE1170X02S120	25.5	1.004	47.1	1.854	49.1	1.933	102.1	4.020	100	3.937	2.1	.083	12	.472	1
					4	★	DWAE1170X04S120	48.9	1.925	79.1	3.114	81.1	3.193	123.1	4.846	121	4.764	2.1	.083	12	.472	1
11.8	.4646				2	★	DWAE1180X02S120	25.7	1.012	47.1	1.854	49.1	1.933	102.1	4.020	100	3.937	2.1	.083	12	.472	1
					4	★	DWAE1180X04S120	49.3	1.941	79.1	3.114	81.1	3.193	123.1	4.846	121	4.764	2.1	.083	12	.472	1
11.9	.4685				2	★	DWAE1190X02S120	26.0	1.024	47.2	1.858	49.2	1.937	102.2	4.024	100	3.937	2.2	.087	12	.472	1
					4	★	DWAE1190X04S120	49.8	1.961	79.2	3.118	81.2	3.197	123.2	4.850	121	4.764	2.2	.087	12	.472	1
12.0	.4724			M14x2.0	2	●	DWAE1200X02S120	26.2	1.031	47.2	1.858	49.2	1.937	102.2	4.024	100	3.937	2.2	.087	12	.472	1
					4	★	DWAE1200X04S120	50.2	1.976	79.2	3.118	81.2	3.197	123.2	4.850	121	4.764	2.2	.087	12	.472	1

DWAE

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		LF		PL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
12.1	.4764				2	★	DWAE1210X02S130	26.4	1.039	49.2	1.937	51.2	2.016	102.2	4.024	100	3.937	2.2	.087	13	.512	1
					4	★	DWAE1210X04S130	50.6	1.992	82.2	3.236	84.2	3.315	139.2	5.480	137	5.394	2.2	.087	13	.512	1
12.2	.4803				2	★	DWAE1220X02S130	26.6	1.047	49.2	1.937	51.2	2.016	102.2	4.024	100	3.937	2.2	.087	13	.512	1
					4	★	DWAE1220X04S130	51.0	2.008	82.2	3.236	84.2	3.315	139.2	5.480	137	5.394	2.2	.087	13	.512	1
12.3	.4843			9/16-12	2	●	DWAE1230X02S130	26.8	1.055	49.2	1.937	51.2	2.016	102.2	4.024	100	3.937	2.2	.087	13	.512	1
					4	★	DWAE1230X04S130	51.4	2.024	82.2	3.236	84.2	3.315	139.2	5.480	137	5.394	2.2	.087	13	.512	1
12.4	.4882				2	★	DWAE1240X02S130	27.1	1.067	49.3	1.941	51.3	2.020	102.3	4.028	100	3.937	2.3	.091	13	.512	1
					4	★	DWAE1240X04S130	51.9	2.043	82.3	3.240	84.3	3.319	139.3	5.484	137	5.394	2.3	.091	13	.512	1
12.5	.4921			M14x1.5	2	★	DWAE1250X02S130	27.3	1.075	49.3	1.941	51.3	2.020	102.3	4.028	100	3.937	2.3	.091	13	.512	1
					4	★	DWAE1250X04S130	52.3	2.059	82.3	3.240	84.3	3.319	139.3	5.484	137	5.394	2.3	.091	13	.512	1
12.6	.4961				2	★	DWAE1260X02S130	27.5	1.083	52.3	2.059	54.3	2.138	102.3	4.028	100	3.937	2.3	.091	13	.512	1
					4	★	DWAE1260X04S130	52.7	2.075	84.3	3.319	86.3	3.398	139.3	5.484	137	5.394	2.3	.091	13	.512	1
12.7	.5000	1/2			2	●	DWAE1270X02S130	27.7	1.091	52.3	2.059	54.3	2.138	102.3	4.028	100	3.937	2.3	.091	13	.512	1
					4	●	DWAE1270X04S130	53.1	2.091	84.3	3.319	86.3	3.398	139.3	5.484	137	5.394	2.3	.091	13	.512	1
12.8	.5039				2	★	DWAE1280X02S130	27.9	1.098	52.3	2.059	54.3	2.138	102.3	4.028	100	3.937	2.3	.091	13	.512	1
					4	★	DWAE1280X04S130	53.5	2.106	84.3	3.319	86.3	3.398	139.3	5.484	137	5.394	2.3	.091	13	.512	1
12.9	.5079				2	★	DWAE1290X02S130	28.1	1.106	52.3	2.059	54.3	2.138	102.3	4.028	100	3.937	2.3	.091	13	.512	1
					4	★	DWAE1290X04S130	53.9	2.122	84.3	3.319	86.3	3.398	139.3	5.484	137	5.394	2.3	.091	13	.512	1
13.0	.5118				2	★	DWAE1300X02S130	28.4	1.118	52.4	2.063	54.4	2.142	102.4	4.031	100	3.937	2.4	.094	13	.512	1
					4	★	DWAE1300X04S130	54.4	2.142	84.4	3.323	86.4	3.402	139.4	5.488	137	5.394	2.4	.094	13	.512	1
13.1	.5157			9/16-18	2	●	DWAE1310X02S140	28.6	1.126	55.4	2.181	57.4	2.260	102.4	4.031	100	3.937	2.4	.094	14	.551	1
					4	●	DWAE1310X04S140	54.8	2.157	92.4	3.638	94.4	3.717	149.4	5.882	147	5.787	2.4	.094	14	.551	1
13.2	.5197				2	★	DWAE1320X02S140	28.8	1.134	55.4	2.181	57.4	2.260	102.4	4.031	100	3.937	2.4	.094	14	.551	1
					4	★	DWAE1320X04S140	55.2	2.173	92.4	3.638	94.4	3.717	149.4	5.882	147	5.787	2.4	.094	14	.551	1
13.3	.5236				2	★	DWAE1330X02S140	29.0	1.142	55.4	2.181	57.4	2.260	102.4	4.031	100	3.937	2.4	.094	14	.551	1
					4	★	DWAE1330X04S140	55.6	2.189	92.4	3.638	94.4	3.717	149.4	5.882	147	5.787	2.4	.094	14	.551	1
13.4	.5276				2	★	DWAE1340X02S140	29.2	1.150	55.4	2.181	57.4	2.260	102.4	4.031	100	3.937	2.4	.094	14	.551	1
					4	★	DWAE1340X04S140	56.0	2.205	92.4	3.638	94.4	3.717	149.4	5.882	147	5.787	2.4	.094	14	.551	1
13.5	.5315			5/8-11	2	●	DWAE1350X02S140	29.5	1.161	55.5	2.185	57.5	2.264	102.5	4.035	100	3.937	2.5	.098	14	.551	1
					4	●	DWAE1350X04S140	56.5	2.224	92.5	3.642	94.5	3.720	149.5	5.886	147	5.787	2.5	.098	14	.551	1
13.6	.5354				2	★	DWAE1360X02S140	29.7	1.169	57.5	2.264	59.5	2.343	102.5	4.035	100	3.937	2.5	.098	14	.551	1
					4	★	DWAE1360X04S140	56.9	2.240	97.5	3.839	99.5	3.917	149.5	5.886	147	5.787	2.5	.098	14	.551	1
13.7	.5394				2	★	DWAE1370X02S140	29.9	1.177	57.5	2.264	59.5	2.343	102.5	4.035	100	3.937	2.5	.098	14	.551	1
					4	★	DWAE1370X04S140	57.3	2.256	97.5	3.839	99.5	3.917	149.5	5.886	147	5.787	2.5	.098	14	.551	1
13.8	.5433				2	★	DWAE1380X02S140	30.1	1.185	57.5	2.264	59.5	2.343	102.5	4.035	100	3.937	2.5	.098	14	.551	1
					4	★	DWAE1380X04S140	57.7	2.272	97.5	3.839	99.5	3.917	149.5	5.886	147	5.787	2.5	.098	14	.551	1
13.9	.5472				2	★	DWAE1390X02S140	30.3	1.193	57.5	2.264	59.5	2.343	102.5	4.035	100	3.937	2.5	.098	14	.551	1
					4	★	DWAE1390X04S140	58.1	2.287	97.5	3.839	99.5	3.917	149.5	5.886	147	5.787	2.5	.098	14	.551	1
14.0	.5512			M16x2.0	2	★	DWAE1400X02S140	30.5	1.201	57.5	2.264	59.5	2.343	102.5	4.035	100	3.937	2.5	.098	14	.551	1
					4	●	DWAE1400X04S140	58.5	2.303	97.5	3.839	99.5	3.917	149.5	5.886	147	5.787	2.5	.098	14	.551	1

● : USA Stock ★ : Stocked in Japan

RECOMMENDED CUTTING CONDITIONS

(inch)

Workpiece Material			Mild Steels (≤180HB) AISI 1010 etc.		Carbon Steels, Alloy Steels (180—250HB) AISI 1045,4140 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch					
1.0	**.0394**	**2, 4**	100	.0012 (.0008—.0016)	100	.0012 (.0008—.0016)
1.5	**.0591**	**2, 4**	100	.0020 (.0012—.0024)	100	.0020 (.0012—.0024)
2.0	**.0787**	**2, 4**	180	.0024 (.0016—.0031)	180	.0024 (.0016—.0031)
2.5	**.0984**	**2, 4**	180	.0031 (.0020—.0039)	180	.0031 (.0020—.0039)
3.0	**.1181**	**2, 4**	210	.0035 (.0028—.0043)	195	.0035 (.0028—.0043)
4.0	**.1575**	**2, 4**	230	.0045 (.0035—.0055)	210	.0045 (.0035—.0055)
5.0	**.1969**	**2, 4**	230	.0057 (.0043—.0071)	210	.0057 (.0043—.0071)
6.0	**.2362**	**2, 4**	260	.0069 (.0055—.0083)	245	.0069 (.0055—.0083)
7.0	**.2756**	**2, 4**	260	.0081 (.0063—.0098)	245	.0081 (.0063—.0098)
8.0	**.3150**	**2, 4**	280	.0091 (.0071—.0110)	260	.0091 (.0071—.0110)
10.0	**.3937**	**2, 4**	295	.0104 (.0083—.0126)	280	.0104 (.0083—.0126)
12.0	**.4724**	**2, 4**	310	.0110 (.0087—.0134)	295	.0110 (.0087—.0134)
14.0	**.5512**	**2, 4**	310	.0114 (.0091—.0138)	295	.0114 (.0091—.0138)

Workpiece Material			Carbon Steels, Alloy Steels (280—350HB) AISI 4340 etc.		Austenitic Stainless Steels (≤200HB) Ferritic, Precipitation Hardening Stainless Steels (>200HB) AISI 304, 431 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch					
1.0	**.0394**	**2, 4**	80	.0008 (.0004—.0012)	100	.0008 (.0004—.0012)
1.5	**.0591**	**2, 4**	80	.0016 (.0008—.0020)	100	.0016 (.0008—.0020)
2.0	**.0787**	**2, 4**	165	.0020 (.0012—.0028)	115	.0016 (.0008—.0024)
2.5	**.0984**	**2, 4**	165	.0028 (.0016—.0035)	115	.0024 (.0012—.0031)
3.0	**.1181**	**2, 4**	180	.0030 (.0024—.0035)	130	.0028 (.0016—.0039)
4.0	**.1575**	**2, 4**	195	.0041 (.0031—.0051)	130	.0030 (.0020—.0039)
5.0	**.1969**	**2, 4**	195	.0051 (.0039—.0063)	130	.0039 (.0020—.0059)
6.0	**.2362**	**2, 4**	230	.0061 (.0047—.0075)	130	.0041 (.0024—.0059)
7.0	**.2756**	**2, 4**	230	.0071 (.0055—.0087)	130	.0047 (.0024—.0071)
8.0	**.3150**	**2, 4**	245	.0081 (.0063—.0098)	130	.0051 (.0024—.0079)
10.0	**.3937**	**2, 4**	260	.0094 (.0079—.0110)	130	.0055 (.0031—.0079)
12.0	**.4724**	**2, 4**	280	.0098 (.0079—.0118)	130	.0069 (.0039—.0098)
14.0	**.5512**	**2, 4**	280	.0098 (.0079—.0118)	130	.0069 (.0039—.0098)

Note 1) The above cutting conditions are when water-soluble coolant is used. For stainless steels, water-insoluble coolant is recommended.
Note 2) When using a water-insoluble coolant, reduce the cutting speed by 20% to ensure adequate lubrication (excluding the recommended cutting conditions as with stainless steel).
Note 3) Check the condition of chips and perform step machining if necessary. * Reference of step length: DC×.2 to DC×1.0
Note 4) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
Note 5) Machining depths exceeding flute length (LU) are not recommended.
Note 6) Clamp the drill so that the drill runout is within .0012".
Note 7) Do not clamp the flute part of the drill.

DWAE

RECOMMENDED CUTTING CONDITIONS

(inch)

Workpiece Material			Gray Cast Irons (≤350MPa) AISI No.45B etc.		Ductile Cast Irons (≤450MPa) AISI 60-40-18 etc.	
DC		L/D	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
mm	inch					
1.0	**.0394**	**2, 4**	100	.0012 (.0008—.0016)	80	.0008 (.0004—.0012)
1.5	**.0591**	**2, 4**	100	.0020 (.0012—.0024)	80	.0016 (.0008—.0020)
2.0	**.0787**	**2, 4**	180	.0024 (.0016—.0031)	165	.0020 (.0012—.0028)
2.5	**.0984**	**2, 4**	180	.0031 (.0020—.0039)	165	.0028 (.0016—.0035)
3.0	**.1181**	**2, 4**	195	.0041 (.0024—.0059)	180	.0033 (.0020—.0047)
4.0	**.1575**	**2, 4**	210	.0051 (.0031—.0071)	195	.0047 (.0028—.0067)
5.0	**.1969**	**2, 4**	210	.0059 (.0039—.0079)	195	.0055 (.0031—.0079)
6.0	**.2362**	**2, 4**	245	.0069 (.0047—.0091)	230	.0059 (.0039—.0079)
7.0	**.2756**	**2, 4**	245	.0069 (.0047—.0091)	230	.0069 (.0047—.0091)
8.0	**.3150**	**2, 4**	260	.0083 (.0067—.0098)	245	.0079 (.0059—.0098)
10.0	**.3937**	**2, 4**	280	.0091 (.0071—.0110)	260	.0091 (.0071—.0110)
12.0	**.4724**	**2, 4**	295	.0098 (.0079—.0118)	280	.0098 (.0079—.0118)
14.0	**.5512**	**2, 4**	295	.0098 (.0079—.0118)	280	.0098 (.0079—.0118)

Note 1) The above cutting conditions are when water-soluble coolant is used. For stainless steels, water-insoluble coolant is recommended.
Note 2) When using a water-insoluble coolant, reduce the cutting speed by 20% to ensure adequate lubrication (excluding the recommended cutting conditions as with stainless steel).
Note 3) Check the condition of chips and perform step machining if necessary. * Reference of step length: DC×.2 to DC×1.0
Note 4) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
Note 5) Machining depths exceeding flute length (LU) are not recommended.
Note 6) Clamp the drill so that the drill runout is within .0012”.
Note 7) Do not clamp the flute part of the drill.

MFE

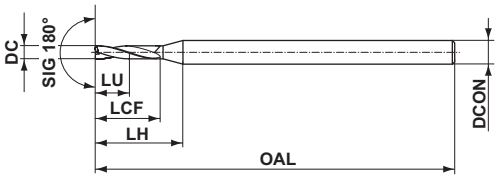
for Small Diameter

SOLID CARBIDE FLAT BOTTOM DRILLS

- Sharp cutting edges with long tool life
- Combination of different radius sizes provides strong cutting edge and excellent chip control

P M K N S H

External Coolant



Type1

(inch)

.0295≤DC≤.1161			
0 −.00055			
DCON=.118	.118< DCON≤.157		
h6 0 −.00024	0 −.00031		

(inch)

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
0.750	.0295				2	●	MFE0075X02S030	1.5	.059	3.0	.118	7.7	.303	45	1.772	3	.118	1
0.800	.0315				2	●	MFE0080X02S030	1.6	.063	3.2	.126	7.8	.307	45	1.772	3	.118	1
0.850	.0335				2	●	MFE0085X02S030	1.7	.067	3.4	.134	7.9	.311	45	1.772	3	.118	1
0.900	.0354				2	●	MFE0090X02S030	1.8	.071	3.6	.142	8.0	.315	45	1.772	3	.118	1
0.950	.0374				2	●	MFE0095X02S030	1.9	.075	3.8	.150	8.1	.319	45	1.772	3	.118	1
1.000	.0394				2	●	MFE0100X02S030	2.0	.079	4.0	.157	8.2	.323	45	1.772	3	.118	1
1.050	.0413				2	●	MFE0105X02S030	2.1	.083	4.2	.165	8.3	.327	45	1.772	3	.118	1
1.100	.0433				2	●	MFE0110X02S030	2.2	.087	4.4	.173	8.4	.331	45	1.772	3	.118	1
1.150	.0453				2	●	MFE0115X02S030	2.3	.091	4.6	.181	8.6	.339	45	1.772	3	.118	1
1.200	.0472				2	●	MFE0120X02S030	2.4	.094	4.8	.189	8.7	.343	45	1.772	3	.118	1
1.250	.0492				2	●	MFE0125X02S030	2.5	.098	5.0	.197	8.8	.346	45	1.772	3	.118	1
1.300	.0512				2	●	MFE0130X02S030	2.6	.102	5.2	.205	8.9	.350	45	1.772	3	.118	1
1.350	.0531				2	●	MFE0135X02S030	2.7	.106	5.4	.213	9.0	.354	45	1.772	3	.118	1
1.400	.0551				2	●	MFE0140X02S030	2.8	.110	5.6	.220	9.1	.358	45	1.772	3	.118	1
1.450	.0571				2	●	MFE0145X02S030	2.9	.114	5.8	.228	9.2	.362	45	1.772	3	.118	1
1.500	.0591			#1-64	2	●	MFE0150X02S030	3.0	.118	6.0	.236	9.3	.366	45	1.772	3	.118	1
1.550	.0610				2	●	MFE0155X02S030	3.1	.122	6.2	.244	9.4	.370	45	1.772	3	.118	1
1.600	.0630				2	●	MFE0160X02S030	3.2	.126	6.4	.252	9.5	.374	45	1.772	3	.118	1
1.650	.0650				2	●	MFE0165X02S030	3.3	.130	6.6	.260	9.6	.378	45	1.772	3	.118	1
1.700	.0669				2	●	MFE0170X02S030	3.4	.134	6.8	.268	9.7	.382	45	1.772	3	.118	1
1.750	.0689				2	●	MFE0175X02S030	3.5	.138	7.0	.276	9.8	.386	45	1.772	3	.118	1
1.800	.0709				2	●	MFE0180X02S030	3.6	.142	7.2	.283	9.9	.390	45	1.772	3	.118	1
1.850	.0728				2	●	MFE0185X02S030	3.7	.146	7.4	.291	10.0	.394	45	1.772	3	.118	1
1.900	.0748				2	●	MFE0190X02S030	3.8	.150	7.6	.299	10.2	.402	45	1.772	3	.118	1
1.950	.0768				2	●	MFE0195X02S030	3.9	.154	7.8	.307	10.3	.406	45	1.772	3	.118	1
2.000	.0787			#3-48	2	●	MFE0200X02S040	4.0	.157	8.0	.315	12.2	.480	50	1.969	4	.157	1
2.050	.0807				2	●	MFE0205X02S040	4.1	.161	8.2	.323	12.3	.484	50	1.969	4	.157	1
2.100	.0827				2	●	MFE0210X02S040	4.2	.165	8.4	.331	12.4	.488	50	1.969	4	.157	1
2.150	.0846				2	●	MFE0215X02S040	4.3	.169	8.6	.339	12.6	.496	50	1.969	4	.157	1
2.200	.0866				2	●	MFE0220X02S040	4.4	.173	8.8	.346	12.7	.500	50	1.969	4	.157	1
2.250	.0886				2	●	MFE0225X02S040	4.5	.177	9.0	.354	12.8	.504	50	1.969	4	.157	1
2.300	.0906				2	●	MFE0230X02S040	4.6	.181	9.2	.362	12.9	.508	50	1.969	4	.157	1

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L189
OPERATIONAL GUIDANCE ➤ L190

MFE

(inch)

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP102A		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
2.350	**.0925**				2	●	**MFE0235X02S040**	4.7	.185	9.4	.370	13.0	.512	50	1.969	4	.157	1
2.400	**.0945**				2	●	**MFE0240X02S040**	4.8	.189	9.6	.378	13.1	.516	50	1.969	4	.157	1
2.450	**.0965**				2	●	**MFE0245X02S040**	4.9	.193	9.8	.386	13.2	.520	50	1.969	4	.157	1
2.500	**.0984**				2	●	**MFE0250X02S040**	5.0	.197	10.0	.394	13.3	.524	50	1.969	4	.157	1
2.550	**.1004**				2	●	**MFE0255X02S040**	5.1	.201	10.2	.402	13.4	.528	50	1.969	4	.157	1
2.600	**.1024**				2	●	**MFE0260X02S040**	5.2	.205	10.4	.409	13.5	.531	50	1.969	4	.157	1
2.650	**.1043**				2	●	**MFE0265X02S040**	5.3	.209	10.6	.417	13.6	.535	50	1.969	4	.157	1
2.700	**.1063**		**36**	**#6-32**	2	●	**MFE0270X02S040**	5.4	.213	10.8	.425	13.7	.539	50	1.969	4	.157	1
2.750	**.1083**				2	●	**MFE0275X02S040**	5.5	.217	11.0	.433	13.8	.543	50	1.969	4	.157	1
2.800	**.1102**		**35**		2	●	**MFE0280X02S040**	5.6	.220	11.2	.441	13.9	.547	50	1.969	4	.157	1
2.850	**.1122**				2	●	**MFE0285X02S040**	5.7	.224	11.4	.449	14.0	.551	50	1.969	4	.157	1
2.900	**.1142**				2	●	**MFE0290X02S040**	5.8	.228	11.6	.457	14.2	.559	50	1.969	4	.157	1
2.950	**.1161**		**32**		2	●	**MFE0295X02S040**	5.9	.232	11.8	.465	14.3	.563	50	1.969	4	.157	1

● : USA Stock

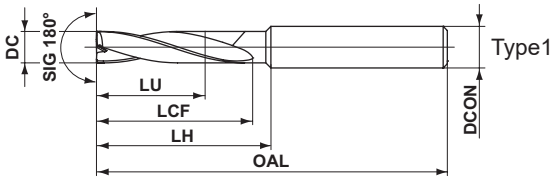
MFE

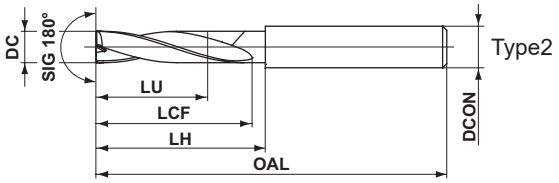
SOLID CARBIDE FLAT BOTTOM DRILLS

- Sharp cutting edges with long tool life
- Combination of different radius sizes provides strong cutting edge and excellent chip control

P | M | K | N | S | H

External Coolant





(inch)

.118≤DC≤.236	.236 < DC≤.394	.394 < DC≤.709	.709 < DC≤.787
0 −.00047	0 −.00059	0 −.00071	0 −.00083
DCON=.236	.276, .315, .394	.472, .551, .630, .709	.787
0 −.00031	0 −.00035	0 −.00043	0 −.00051

(inch)

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
3.000	.1181				2	●	MFE0300X02S060	6.0	.236	12	.472	19.6	.772	55	2.165	6	.236	1
3.048	.1200		31		2	●	MFE0305X02S060	6.1	.240	14	.551	21.5	.846	55	2.165	6	.236	1
3.100	.1220				2	●	MFE0310X02S060	6.2	.244	14	.551	21.4	.843	55	2.165	6	.236	1
3.175	.1250	1/8			2	●	MFE0318X02S060	6.4	.252	14	.551	21.3	.839	55	2.165	6	.236	1
3.200	.1260				2	●	MFE0320X02S060	6.4	.252	14	.551	21.2	.835	55	2.165	6	.236	1
3.300	.1299			M4x.7	2	●	MFE0330X02S060	6.6	.260	14	.551	21.0	.827	55	2.165	6	.236	1
3.400	.1339				2	●	MFE0340X02S060	6.8	.268	14	.551	20.9	.823	55	2.165	6	.236	1
3.500	.1378				2	●	MFE0350X02S060	7.0	.276	14	.551	20.7	.815	55	2.165	6	.236	1
3.572	.1407	9/64			2	●	MFE0357X02S060	7.1	.280	16	.630	22.5	.886	55	2.165	6	.236	1
3.600	.1417				2	●	MFE0360X02S060	7.2	.283	16	.630	22.5	.886	55	2.165	6	.236	1
3.700	.1457			M4.5x.75	2	●	MFE0370X02S060	7.4	.291	16	.630	22.3	.878	55	2.165	6	.236	1
3.800	.1496		25	#10-24	2	●	MFE0380X02S060	7.6	.299	16	.630	22.1	.870	55	2.165	6	.236	1
3.900	.1535				2	●	MFE0390X02S060	7.8	.307	16	.630	21.9	.862	55	2.165	6	.236	1
3.969	.1563	5/32			2	●	MFE0397X02S060	7.9	.311	16	.630	21.8	.858	55	2.165	6	.236	1
4.000	.1575				2	●	MFE0400X02S060	8.0	.315	16	.630	21.7	.854	55	2.165	6	.236	1
4.039	.1590		21	#10-32	2	●	MFE0404X02S060	8.1	.319	18	.709	23.7	.933	62	2.441	6	.236	1
4.100	.1614				2	●	MFE0410X02S060	8.2	.323	18	.709	23.5	.925	62	2.441	6	.236	1
4.200	.1654			M5x.8	2	●	MFE0420X02S060	8.4	.331	18	.709	23.4	.921	62	2.441	6	.236	1
4.300	.1693				2	●	MFE0430X02S060	8.6	.339	18	.709	23.2	.913	62	2.441	6	.236	1
4.366	.1719	11/64			2	●	MFE0437X02S060	8.7	.343	18	.709	23.0	.906	62	2.441	6	.236	1
4.400	.1732		17		2	●	MFE0440X02S060	8.8	.346	18	.709	23.0	.906	62	2.441	6	.236	1
4.500	.1772		16	#12-24	2	●	MFE0450X02S060	9.0	.354	18	.709	22.8	.898	62	2.441	6	.236	1
4.600	.1811				2	●	MFE0460X02S060	9.2	.362	20	.787	23.7	.933	62	2.441	6	.236	1
4.700	.1850		13		2	●	MFE0470X02S060	9.4	.370	20	.787	23.7	.933	62	2.441	6	.236	1
4.763	.1875	3/16			2	●	MFE0476X02S060	9.5	.374	20	.787	23.6	.929	62	2.441	6	.236	1
4.800	.1890		12		2	●	MFE0480X02S060	9.6	.378	20	.787	23.6	.929	62	2.441	6	.236	1
4.900	.1929				2	●	MFE0490X02S060	9.8	.386	20	.787	23.6	.929	62	2.441	6	.236	1
5.000	.1969			M6x1.0	2	●	MFE0500X02S060	10.0	.394	20	.787	23.5	.925	62	2.441	6	.236	1
5.100	.2008		7	1/4-20	2	●	MFE0510X02S060	10.2	.402	22	.866	25.5	1.004	62	2.441	6	.236	1
5.160	.2032	13/64			2	●	MFE0516X02S060	10.3	.406	22	.866	25.4	1.000	62	2.441	6	.236	1
5.200	.2047				2	●	MFE0520X02S060	10.4	.409	22	.866	25.4	1.000	62	2.441	6	.236	1
5.300	.2087				2	●	MFE0530X02S060	10.6	.417	22	.866	25.4	1.000	62	2.441	6	.236	1

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L189
OPERATIONAL GUIDANCE ➤ L190

MFE

(inch)

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
5.400	.2126		3	1/4-28	2	●	MFE0540X02S060	10.8	.425	22	.866	25.3	.996	62	2.441	6	.236	1
5.500	.2165				2	●	MFE0550X02S060	11.0	.433	22	.866	25.3	.996	62	2.441	6	.236	1
5.557	.2188	7/32			2	●	MFE0556X02S060	11.1	.437	24	.945	27.2	1.071	62	2.441	6	.236	1
5.600	.2205		2		2	●	MFE0560X02S060	11.2	.441	24	.945	27.2	1.071	62	2.441	6	.236	1
5.700	.2244				2	●	MFE0570X02S060	11.4	.449	24	.945	27.2	1.071	62	2.441	6	.236	1
5.800	.2283		1		2	●	MFE0580X02S060	11.6	.457	24	.945	27.1	1.067	62	2.441	6	.236	1
5.900	.2323				2	●	MFE0590X02S060	11.8	.465	24	.945	27.1	1.067	62	2.441	6	.236	1
5.954	.2344	15/64	A		2	●	MFE0595X02S060	11.9	.469	24	.945	27.0	1.063	62	2.441	6	.236	1
6.000	.2362			M7x1.0	2	●	MFE0600X02S060	12.0	.472	24	.945	27.0	1.063	62	2.441	6	.236	1
6.100	.2402				2	★	MFE0610X02S070	12.2	.480	26	1.024	29.5	1.161	74	2.913	7	.276	1
6.100	.2402				2	●	MFE0610X02S080	12.2	.480	26	1.024	30.0	1.181	74	2.913	8	.315	1
6.200	.2441				2	★	MFE0620X02S070	12.4	.488	26	1.024	29.4	1.157	74	2.913	7	.276	1
6.200	.2441				2	●	MFE0620X02S080	12.4	.488	26	1.024	29.9	1.177	74	2.913	8	.315	1
6.300	.2480				2	★	MFE0630X02S070	12.6	.496	26	1.024	29.4	1.157	74	2.913	7	.276	1
6.300	.2480				2	●	MFE0630X02S080	12.6	.496	26	1.024	29.9	1.177	74	2.913	8	.315	1
6.350	.2500	1/4	E		2	●	MFE0635X02S080	12.7	.500	26	1.024	29.8	1.173	74	2.913	8	.315	1
6.400	.2520				2	★	MFE0640X02S070	12.8	.504	26	1.024	29.3	1.154	74	2.913	7	.276	1
6.400	.2520				2	●	MFE0640X02S080	12.8	.504	26	1.024	29.8	1.173	74	2.913	8	.315	1
6.500	.2559				2	★	MFE0650X02S070	13.0	.512	26	1.024	29.3	1.154	74	2.913	7	.276	1
6.500	.2559				2	●	MFE0650X02S080	13.0	.512	26	1.024	29.8	1.173	74	2.913	8	.315	1
6.528	.2570		F	5/16-18	2	●	MFE0653X02S080	13.1	.516	28	1.102	31.7	1.248	74	2.913	8	.315	1
6.600	.2598				2	★	MFE0660X02S070	13.2	.520	28	1.102	31.2	1.228	74	2.913	7	.276	1
6.600	.2598				2	●	MFE0660X02S080	13.2	.520	28	1.102	31.7	1.248	74	2.913	8	.315	1
6.700	.2638			M8x1.25	2	★	MFE0670X02S070	13.4	.528	28	1.102	31.2	1.228	74	2.913	7	.276	1
6.700	.2638			M8x1.25	2	●	MFE0670X02S080	13.4	.528	28	1.102	31.7	1.248	74	2.913	8	.315	1
6.747	.2657	17/64			2	●	MFE0675X02S080	13.5	.531	28	1.102	31.6	1.244	74	2.913	8	.315	1
6.800	.2677				2	★	MFE0680X02S070	13.6	.535	28	1.102	31.1	1.224	74	2.913	7	.276	1
6.800	.2677				2	●	MFE0680X02S080	13.6	.535	28	1.102	31.6	1.244	74	2.913	8	.315	1
6.900	.2717		I	5/16-24	2	★	MFE0690X02S070	13.8	.543	28	1.102	31.1	1.224	74	2.913	7	.276	1
6.900	.2717		I	5/16-24	2	●	MFE0690X02S080	13.8	.543	28	1.102	31.6	1.244	74	2.913	8	.315	1
7.000	.2756			M8x1.0	2	★	MFE0700X02S070	14.0	.551	28	1.102	31.0	1.220	74	2.913	7	.276	1
7.000	.2756			M8x1.0	2	●	MFE0700X02S080	14.0	.551	28	1.102	31.5	1.240	74	2.913	8	.315	1
7.100	.2795				2	●	MFE0710X02S080	14.2	.559	30	1.181	33.5	1.319	74	2.913	8	.315	1
7.144	.2813	9/32	K		2	●	MFE0714X02S080	14.3	.563	30	1.181	33.4	1.315	74	2.913	8	.315	1
7.200	.2835				2	●	MFE0720X02S080	14.4	.567	30	1.181	33.4	1.315	74	2.913	8	.315	1
7.300	.2874				2	●	MFE0730X02S080	14.6	.575	30	1.181	33.4	1.315	74	2.913	8	.315	1
7.400	.2913				2	●	MFE0740X02S080	14.8	.583	30	1.181	33.3	1.311	74	2.913	8	.315	1
7.500	.2953		M		2	●	MFE0750X02S080	15.0	.591	30	1.181	33.3	1.311	74	2.913	8	.315	1
7.541	.2969	19/64			2	●	MFE0754X02S080	15.1	.594	32	1.260	35.2	1.386	74	2.913	8	.315	1
7.600	.2992				2	●	MFE0760X02S080	15.2	.598	32	1.260	35.2	1.386	74	2.913	8	.315	1
7.700	.3031				2	●	MFE0770X02S080	15.4	.606	32	1.260	35.2	1.386	74	2.913	8	.315	1
7.800	.3071				2	●	MFE0780X02S080	15.6	.614	32	1.260	35.1	1.382	74	2.913	8	.315	1
7.900	.3110				2	●	MFE0790X02S080	15.8	.622	32	1.260	35.1	1.382	74	2.913	8	.315	1
7.938	.3125	5/16		3/8-16	2	●	MFE0794X02S080	15.9	.626	32	1.260	35.0	1.378	74	2.913	8	.315	1

● : USA Stock ★ : Stocked in Japan

(inch)

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
8.000	.3150				2	●	MFE0800X02S080	16.0	.630	32	1.260	35.0	1.378	74	2.913	8	.315	1
8.100	.3189				2	●	MFE0810X02S100	16.2	.638	34	1.339	38.0	1.496	84	3.307	10	.394	1
8.200	.3228		P		2	●	MFE0820X02S100	16.4	.646	34	1.339	37.9	1.492	84	3.307	10	.394	1
8.300	.3268				2	●	MFE0830X02S100	16.6	.654	34	1.339	37.9	1.492	84	3.307	10	.394	1
8.335	.3282	21/64			2	●	MFE0833X02S100	16.7	.657	34	1.339	37.8	1.488	84	3.307	10	.394	1
8.400	.3307				2	●	MFE0840X02S100	16.8	.661	34	1.339	37.8	1.488	84	3.307	10	.394	1
8.433	.3320		Q	3/8-24	2	●	MFE0843X02S100	16.9	.665	34	1.343	37.8	1.488	84	3.307	10	.394	1
8.500	.3346			M10x1.5	2	●	MFE0850X02S100	17.0	.669	34	1.339	37.8	1.488	84	3.307	10	.394	1
8.600	.3386		R		2	●	MFE0860X02S100	17.2	.677	36	1.417	39.7	1.563	84	3.307	10	.394	1
8.700	.3425			M10x1.25	2	●	MFE0870X02S100	17.4	.685	36	1.417	39.7	1.563	84	3.307	10	.394	1
8.732	.3438	11/32			2	●	MFE0873X02S100	17.5	.689	36	1.417	39.6	1.559	84	3.307	10	.394	1
8.800	.3465				2	●	MFE0880X02S100	17.6	.693	36	1.417	39.6	1.559	84	3.307	10	.394	1
8.900	.3504				2	●	MFE0890X02S100	17.8	.701	36	1.417	39.6	1.559	84	3.307	10	.394	1
9.000	.3543				2	●	MFE0900X02S100	18.0	.709	36	1.417	39.5	1.555	84	3.307	10	.394	1
9.100	.3583		T		2	●	MFE0910X02S100	18.2	.717	38	1.496	41.5	1.634	84	3.307	10	.394	1
9.129	.3594	23/64			2	●	MFE0913X02S100	18.3	.720	38	1.496	41.4	1.630	84	3.307	10	.394	1
9.200	.3622				2	●	MFE0920X02S100	18.4	.724	38	1.496	41.4	1.630	84	3.307	10	.394	1
9.300	.3661				2	●	MFE0930X02S100	18.6	.732	38	1.496	41.4	1.630	84	3.307	10	.394	1
9.348	.3680		U	7/16-14	2	●	MFE0935X02S100	18.7	.736	38	1.496	41.3	1.626	84	3.307	10	.394	1
9.400	.3701				2	●	MFE0940X02S100	18.8	.740	38	1.496	41.3	1.626	84	3.307	10	.394	1
9.500	.3740				2	●	MFE0950X02S100	19.0	.748	38	1.496	41.3	1.626	84	3.307	10	.394	1
9.525	.3750	3/8			2	●	MFE0953X02S100	19.1	.752	40	1.575	43.2	1.701	84	3.307	10	.394	1
9.600	.3780				2	●	MFE0960X02S100	19.2	.756	40	1.575	43.2	1.701	84	3.307	10	.394	1
9.700	.3819		Tube Sheet		2	●	MFE0970X02S100	19.4	.764	40	1.575	43.2	1.701	84	3.307	10	.394	1
9.800	.3858		W		2	●	MFE0980X02S100	19.6	.772	40	1.575	43.1	1.697	84	3.307	10	.394	1
9.900	.3898				2	●	MFE0990X02S100	19.8	.780	40	1.575	43.1	1.697	84	3.307	10	.394	1
9.922	.3907	25/64		7/16-20	2	●	MFE0992X02S100	19.8	.780	40	1.575	43.0	1.693	84	3.307	10	.394	1
10.000	.3937				2	●	MFE1000X02S100	20.0	.787	40	1.575	43.0	1.693	84	3.307	10	.394	1
10.100	.3976				2	●	MFE1010X02S120	20.2	.795	42	1.654	46.0	1.811	95	3.740	12	.472	1
10.200	.4016			M12x1.75	2	●	MFE1020X02S120	20.4	.803	42	1.654	45.9	1.807	95	3.740	12	.472	1
10.300	.4055				2	●	MFE1030X02S120	20.6	.811	42	1.654	45.9	1.807	95	3.740	12	.472	1
10.319	.4063	13/32			2	●	MFE1032X02S120	20.6	.811	42	1.654	45.8	1.803	95	3.740	12	.472	1
10.400	.4094				2	●	MFE1040X02S120	20.8	.819	42	1.654	45.8	1.803	95	3.740	12	.472	1
10.500	.4134		Z		2	●	MFE1050X02S120	21.0	.827	42	1.654	45.8	1.803	95	3.740	12	.472	1
10.600	.4173				2	●	MFE1060X02S120	21.2	.835	44	1.732	47.7	1.878	95	3.740	12	.472	1
10.700	.4213				2	●	MFE1070X02S120	21.4	.843	44	1.732	47.7	1.878	95	3.740	12	.472	1
10.716	.4219	27/64		1/2-13	2	●	MFE1072X02S120	21.4	.843	44	1.732	47.6	1.874	95	3.744	12	.472	1
10.800	.4252			M12x1.25	2	●	MFE1080X02S120	21.6	.850	44	1.732	47.6	1.874	95	3.740	12	.472	1
10.900	.4291				2	●	MFE1090X02S120	21.8	.858	44	1.732	47.6	1.874	95	3.740	12	.472	1
11.000	.4331				2	●	MFE1100X02S120	22.0	.866	44	1.732	47.5	1.870	95	3.740	12	.472	1
11.100	.4370				2	●	MFE1110X02S120	22.2	.874	46	1.811	49.5	1.949	95	3.740	12	.472	1
11.113	.4375	7/16			2	●	MFE1111X02S120	22.2	.874	46	1.811	49.4	1.945	95	3.740	12	.472	1
11.200	.4409				2	●	MFE1120X02S120	22.4	.882	46	1.811	49.4	1.945	95	3.740	12	.472	1
11.300	.4449				2	●	MFE1130X02S120	22.6	.890	46	1.811	49.4	1.945	95	3.740	12	.472	1

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L189
OPERATIONAL GUIDANCE ➤ L190

MFE

(inch)

DC					L/D	Stock	Order Number	LU		LCF		LH		OAL		DCON		Type
Metric (mm)	Decimal (inch)	Fraction (inch)	Wire / Letter	Thread Size		DP1020		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
11.400	.4488				2	●	MFE1140X02S120	22.8	.898	46	1.811	49.3	1.941	95	3.740	12	.472	1
11.500	.4528				2	●	MFE1150X02S120	23.0	.906	46	1.811	49.3	1.941	95	3.740	12	.472	1
11.510	.4532	29/64		1/2-20	2	●	MFE1151X02S120	23.0	.906	48	1.890	51.2	2.016	95	3.740	12	.472	1
11.600	.4567				2	●	MFE1160X02S120	23.2	.913	48	1.890	51.2	2.016	95	3.740	12	.472	1
11.700	.4606				2	●	MFE1170X02S120	23.4	.921	48	1.890	51.2	2.016	95	3.740	12	.472	1
11.800	.4646				2	●	MFE1180X02S120	23.6	.929	48	1.890	51.1	2.012	95	3.740	12	.472	1
11.900	.4685				2	●	MFE1190X02S120	23.8	.937	48	1.890	51.1	2.012	95	3.740	12	.472	1
12.000	.4724			M14x2.0	2	●	MFE1200X02S120	24.0	.945	48	1.890	51.0	2.008	95	3.740	12	.472	1
12.304	.4844	31/64		9/16-12	2	●	MFE1230X02S140	24.6	.969	50	1.969	53.0	2.087	102	4.016	14	.551	2
12.500	.4921			M14x1.5	2	●	MFE1250X02S140	25.0	.984	50	1.969	53.0	2.087	102	4.016	14	.551	2
12.700	.5000	1/2			2	●	MFE1270X02S140	25.4	1.000	52	2.047	55.0	2.165	102	4.016	14	.551	2
13.000	.5118				2	●	MFE1300X02S140	26.0	1.024	52	2.047	55.0	2.165	102	4.016	14	.551	2
13.100	.5157			9/16-18	2	●	MFE1310X02S140	26.2	1.031	54	2.126	57.0	2.244	102	4.016	14	.551	2
13.500	.5315			5/8-11	2	●	MFE1350X02S140	27.0	1.063	54	2.126	57.0	2.244	102	4.016	14	.551	2
13.891	.5469	35/64			2	●	MFE1389X02S140	27.8	1.094	56	2.205	59.0	2.323	102	4.016	14	.551	2
14.000	.5512			M16x2.0	2	●	MFE1400X02S140	28.0	1.102	56	2.205	59.0	2.323	102	4.016	14	.551	2
14.288	.5625	9/16			2	●	MFE1429X02S160	28.6	1.126	58	2.283	61.0	2.402	111	4.370	16	.630	2
14.500	.5709			M16x1.5	2	●	MFE1450X02S160	29.0	1.142	58	2.283	61.0	2.402	111	4.370	16	.630	2
14.685	.5782	37/64		5/8-18	2	●	MFE1468X02S160	29.4	1.157	60	2.362	63.0	2.480	111	4.370	16	.630	2
15.000	.5906				2	●	MFE1500X02S160	30.0	1.181	60	2.362	63.0	2.480	111	4.370	16	.630	2
15.082	.5938	19/32			2	●	MFE1508X02S160	30.2	1.189	62	2.441	65.0	2.559	111	4.370	16	.630	2
15.479	.6094	39/64			2	●	MFE1548X02S160	31.0	1.220	62	2.441	65.0	2.559	111	4.370	16	.630	2
15.500	.6102			M18x2.5	2	●	MFE1550X02S160	31.0	1.220	62	2.441	65.0	2.559	111	4.370	16	.630	2
15.875	.6250	5/8			2	●	MFE1588X02S160	31.8	1.252	64	2.520	67.0	2.638	111	4.374	16	.630	2
16.000	.6299				2	●	MFE1600X02S160	32.0	1.260	64	2.520	67.0	2.638	111	4.370	16	.630	2
16.272	.6407	41/64			2	●	MFE1627X02S180	32.5	1.280	66	2.598	69.0	2.717	119	4.685	18	.709	2
16.500	.6496			M18x1.5	2	●	MFE1650X02S180	33.0	1.299	66	2.598	69.0	2.717	119	4.685	18	.709	2
16.669	.6563	21/32		3/4-10	2	●	MFE1667X02S180	33.3	1.311	68	2.677	71.0	2.795	119	4.685	18	.709	2
17.000	.6693		Tube Sheet		2	●	MFE1700X02S180	34.0	1.339	68	2.677	71.0	2.795	119	4.685	18	.709	2
17.066	.6719	43/64			2	●	MFE1707X02S180	34.1	1.343	70	2.756	73.0	2.874	119	4.685	18	.709	2
17.463	.6875	11/16		3/4-16	2	●	MFE1746X02S180	34.9	1.374	70	2.756	73.0	2.874	119	4.685	18	.709	2
17.500	.6890			M20x2.5	2	●	MFE1750X02S180	35.0	1.378	70	2.756	73.0	2.874	119	4.685	18	.709	2
17.860	.7032	45/64			2	●	MFE1786X02S180	35.7	1.406	72	2.835	75.0	2.953	119	4.685	18	.709	2
18.000	.7087				2	●	MFE1800X02S180	36.0	1.417	72	2.835	75.0	2.953	119	4.685	18	.709	2
18.257	.7188	23/32			2	●	MFE1826X02S200	36.5	1.437	74	2.913	77.0	3.031	127	5.000	20	.787	2
18.500	.7283			M20x1.5	2	●	MFE1850X02S200	37.0	1.457	74	2.913	77.0	3.031	127	5.000	20	.787	2
18.654	.7344	47/64			2	●	MFE1865X02S200	37.3	1.469	76	2.992	79.0	3.110	127	5.000	20	.787	2
19.000	.7480				2	●	MFE1900X02S200	38.0	1.496	76	2.992	79.0	3.110	127	5.000	20	.787	2
19.050	.7500	3/4			2	●	MFE1905X02S200	38.1	1.500	78	3.071	81.0	3.189	127	5.000	20	.787	2
19.254	.7580		Tube Sheet		2	●	MFE1925X02S200	38.5	1.516	78	3.071	81.0	3.189	127	5.000	20	.787	2
19.447	.7657	49/64		7/8-9	2	●	MFE1945X02S200	38.9	1.531	78	3.071	81.0	3.189	127	5.000	20	.787	2
19.500	.7677			M22x2.5	2	●	MFE1950X02S200	39.0	1.535	78	3.071	81.0	3.189	127	5.000	20	.787	2
19.844	.7813	25/32			2	●	MFE1984X02S200	39.7	1.563	80	3.150	83.0	3.268	127	5.000	20	.787	2
20.000	.7874				2	●	MFE2000X02S200	40.0	1.575	80	3.150	83.0	3.268	127	5.000	20	.787	2

● : USA Stock

ISO13399 ➤ L003
CUTTING CONDITIONS ➤ L189
OPERATIONAL GUIDANCE ➤ L190

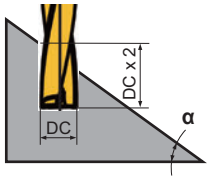
RECOMMENDED CUTTING CONDITIONS

(inch)

Workpiece Material		Mild Steel (≤180HB) AISI 1010 etc.		Carbon Steel, Alloy Steel (180—280HB) AISI 1045, 4140 etc.		Carbon Steel, Alloy Steel (280—350HB) AISI 4340 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm						
.0295	**0.75**	180	.0012 (.0004—.0020)	150	.0012 (.0004—.0020)	130	.0012 (.0004—.0020)
.0394	**1.0**	180	.0012 (.0004—.0020)	150	.0012 (.0004—.0020)	130	.0012 (.0004—.0020)
.0591	**1.5**	190	.0014 (.0006—.0022)	155	.0014 (.0006—.0022)	130	.0014 (.0006—.0020)
.0787	**2.0**	195	.0016 (.0008—.0024)	165	.0016 (.0008—.0024)	140	.0016 (.0008—.0024)
.0984	**2.5**	205	.0020 (.0012—.0028)	170	.0020 (.0012—.0028)	150	.0020 (.0012—.0028)
.1181	**3.0**	245	.0024 (.0016—.0031)	245	.0024 (.0016—.0031)	210	.0024 (.0016—.0031)
.1575	**4.0**	245	.0031 (.0024—.0039)	245	.0031 (.0024—.0039)	210	.0031 (.0024—.0039)
.1969	**5.0**	245	.0039 (.0031—.0051)	245	.0039 (.0031—.0051)	210	.0039 (.0031—.0051)
.2362	**6.0**	245	.0051 (.0039—.0059)	245	.0051 (.0039—.0059)	210	.0051 (.0039—.0059)
.3150	**8.0**	245	.0059 (.0051—.0067)	245	.0059 (.0051—.0067)	210	.0059 (.0051—.0067)
.3937	**10.0**	245	.0067 (.0059—.0079)	245	.0067 (.0059—.0079)	210	.0067 (.0059—.0079)
.4724	**12.0**	245	.0079 (.0067—.0098)	245	.0079 (.0067—.0098)	210	.0079 (.0067—.0098)
.6299	**16.0**	245	.0098 (.0079—.0118)	245	.0098 (.0079—.0118)	210	.0098 (.0079—.0118)
.7874	**20.0**	245	.0118 (.0098—.0138)	245	.0118 (.0098—.0138)	210	.0118 (.0098—.0138)

Workpiece Material		Austenitic Stainless Steel (≤200HB) AISI 304, 316 etc.		Gray Cast Iron (≤350MPa) AISI No45B etc.		Ductile Cast Iron (≤450MPa) AISI 60-40-18 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm						
.0295	**0.75**	80	.0003 (.0001—.0004)	180	.0012 (.0004—.0020)	130	.0004 (.0002—.0006)
.0394	**1.0**	80	.0003 (.0001—.0004)	180	.0012 (.0004—.0020)	130	.0004 (.0002—.0006)
.0591	**1.5**	80	.0004 (.0002—.0006)	190	.0014 (.0006—.0022)	155	.0008 (.0004—.0012)
.0787	**2.0**	100	.0006 (.0004—.0008)	195	.0016 (.0008—.0024)	180	.0012 (.0006—.0018)
.0984	**2.5**	100	.0006 (.0004—.0008)	205	.0020 (.0012—.0028)	190	.0018 (.0010—.0026)
.1181	**3.0**	100	.0008 (.0004—.0012)	245	.0024 (.0016—.0031)	210	.0020 (.0016—.0024)
.1575	**4.0**	100	.0012 (.0008—.0016)	245	.0031 (.0024—.0039)	230	.0024 (.0020—.0031)
.1969	**5.0**	100	.0016 (.0012—.0020)	245	.0039 (.0031—.0047)	230	.0031 (.0024—.0039)
.2362	**6.0**	100	.0020 (.0016—.0024)	245	.0047 (.0039—.0055)	230	.0039 (.0031—.0047)
.3150	**8.0**	100	.0024 (.0020—.0031)	245	.0055 (.0047—.0063)	230	.0047 (.0039—.0059)
.3937	**10.0**	100	.0031 (.0024—.0039)	245	.0063 (.0055—.0071)	230	.0059 (.0047—.0071)
.4724	**12.0**	100	.0039 (.0031—.0047)	245	.0071 (.0063—.0079)	230	.0071 (.0059—.0079)
.6299	**16.0**	100	.0047 (.0039—.0059)	245	.0079 (.0071—.0094)	230	.0079 (.0071—.0098)
.7874	**20.0**	100	.0059 (.0047—.0079)	245	.0094 (.0079—.0110)	230	.0098 (.0079—.0118)

Workpiece Material		Aluminum Alloy (Si<5%) AISI 6061, 7075 etc.	
DC		Cutting Speed **vc** (SFM)	Feed **fr** (Min.—Max.) (IPR)
inch	mm		
.0295	**0.75**	330	.0008 (.0004—.0012)
.0394	**1.0**	330	.0008 (.0004—.0012)
.0591	**1.5**	330	.0008 (.0004—.0012)
.0787	**2.0**	360	.0020 (.0012—.0028)
.0984	**2.5**	360	.0024 (.0016—.0035)
.1181	**3.0**	360	.0024 (.0016—.0035)
.1575	**4.0**	360	.0031 (.0024—.0039)
.1969	**5.0**	360	.0039 (.0031—.0051)
.2362	**6.0**	360	.0051 (.0039—.0063)
.3150	**8.0**	360	.0063 (.0051—.0079)
.3937	**10.0**	360	.0079 (.0063—.0094)
.4724	**12.0**	360	.0094 (.0079—.0110)
.6299	**16.0**	360	.0110 (.0094—.0126)
.7874	**20.0**	360	.0126 (.0110—.0142)

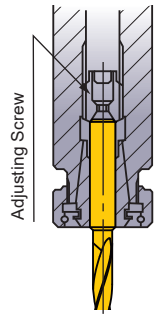


Note 1) The recommended hole depth is DCx2. This should be the depth from the uppermost surface of the workpiece when machining on an angled surface. (Refer to diagram)
Note 2) The above cutting table assumes drilling on a flat surface.
For hole drilling on an angled surface, adjust the feed rate in accordance with the inclination angle.
When the inclination angle α is 30° or less, adjust the feed rate to 70% or lower as a guideline.
When the inclination angle α is greater than 30°, adjust the feed rate to 50% or lower as a guideline.
Note 3) This product is a tool intended for hole drilling. It cannot be used for cross-feed machining or helical machining.

MFE

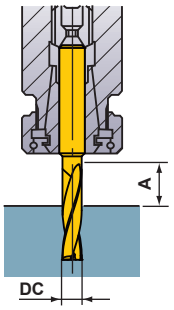
OPERATIONAL GUIDANCE FOR THE MFE DRILL

Drill Holding



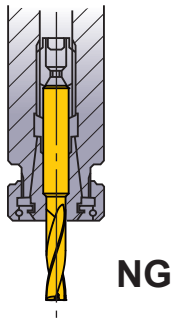
Thrust bearing type collet chuck holds the drill securely.

Drill Length



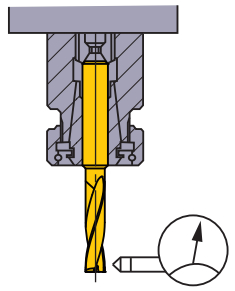
A > DC x 1.5

Drill Installation



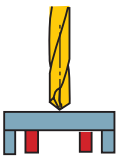
Do not clamp on the flutes.

Installation Tolerance



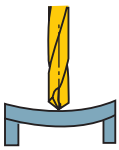
Run-out ≤ .0012 inch

Thin Workpiece



Support the Workpiece

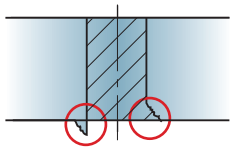
OK



If Bending Occurs

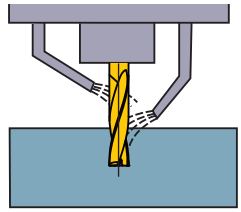
NG

Burring and Workpiece Chipping



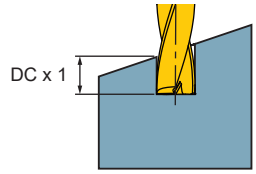
①Lower the feed rate by 50% at the end of through cutting.
②Add a chamfer.

Coolant Method (MFE)



Two coolant positions, at the end and at the center are ideal.

Inclined Face Drilling



① When machining a deep hole into an inclined surface, use MFE drill (L/D=2) as a drill for a guide hole.
② Set the drill depth at approx. DC x 1 to obtain anaccurate guide hole.

Memo

DLE
LEADING DRILL SERIES

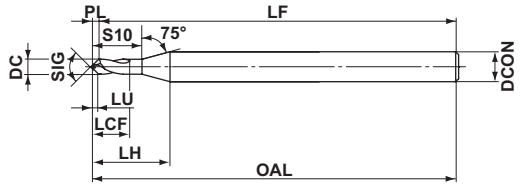
- Solid carbide drills for centering and chamfering
- Two-step point angles
- Excellent sharpness and chipping resistance and stable machining of stainless steels

P M K N S H

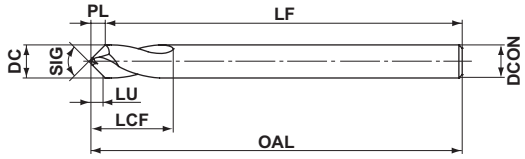
METRIC STANDARD

External Coolant

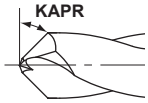
■ **Tip angle shape SIG 60º, 90º**



Type1



Type2



(mm)

DCON=3	3 < DCON ≤ 6	6 < DCON ≤ 10	10 < DCON ≤ 16
h7 0 −0.010	0 −0.012	0 −0.015	0 −0.018

(inch)

DCON=.1181	.1181 < DCON ≤ .2362	.2362 < DCON ≤ .3937	.3937 < DCON ≤ .6299
h7 0 −.0004	0 −.0005	0 −.0006	0 −.0007

	DC (mm)	DC (inch)	SIG	Stock DP1020	Stock DP102A	Order Number	LU (mm)	LU (inch)	LCF (mm)	LCF (inch)	LH (mm)	LH (inch)
NEW	3.0	.1181	60°	●		**DLE0300S030P060**	2.0	.079	9	.354	—	—
NEW	4.0	.1575	60°	●		**DLE0400S040P060**	2.7	.106	12	.472	—	—
NEW	5.0	.1969	60°	●		**DLE0500S050P060**	3.4	.134	14	.551	—	—
NEW	6.0	.2362	60°	●		**DLE0600S060P060**	4.0	.157	15	.591	—	—
NEW	7.0	.2756	60°	●		**DLE0700S070P060**	4.7	.185	18	.709	—	—
NEW	8.0	.3150	60°	●		**DLE0800S080P060**	5.4	.213	20	.787	—	—
NEW	10.0	.3937	60°	●		**DLE1000S100P060**	6.8	.268	24	.945	—	—
NEW	12.0	.4724	60°	●		**DLE1200S120P060**	8.1	.319	28	1.102		—
NEW	1.0	.0394	90°		●	**DLE0100S030P090**	0.35	.014	2	.079	6.7	.264
NEW	1.5	.0591	90°		●	**DLE0150S030P090**	0.55	.022	3	.118	7.3	.287
NEW	2.0	.0787	90°		●	**DLE0200S030P090**	0.80	.031	4	.157	7.9	.311
NEW	2.5	.0984	90°		●	**DLE0250S030P090**	1.00	.039	5	.197	7.9	.311
	3.0	.1181	90°	●		**DLE0300S030P090**	1.2	.047	9	.354	—	—
	4.0	.1575	90°	●		**DLE0400S040P090**	1.6	.063	12	.472	—	—
	5.0	.1969	90°	●		**DLE0500S050P090**	2.0	.079	14	.551	—	—
	6.0	.2362	90°	●		**DLE0600S060P090**	2.4	.094	15	.591	—	—
	7.0	.2756	90°	●		**DLE0700S070P090**	2.8	.110	18	.709	—	—
	8.0	.3150	90°	●		**DLE0800S080P090**	3.2	.126	20	.787	—	—
	10.0	.3937	90°	●		**DLE1000S100P090**	4.1	.161	24	.945	—	—
	12.0	.4724	90°	●		**DLE1200S120P090**	4.9	.193	28	1.102	—	—
	16.0	.6299	90°	●		**DLE1600S160P090**	6.6	.260	35	1.378	—	—

Note 1) In the region of roughly **DC**/4, which is the region of the two-step point angles, the central area will not have a 60°, 90° bottom hole angle. Chamfering will also not be possible in this region.

Note 2) The centering diameter should be less than the drill diameter (processing diameter) **DC** and the usable length **LU** should be referred to as a guideline.

● : **USA Stock**

S10		OAL		LF		PL		KAPR	DCON		DC/4		Fig.
(mm)	(inch)	(mm)	(inch)	(mm)	(inch)	(mm)	(inch)		(mm)	(inch)	(mm)	(inch)	
–	–	45	1.772	42.9	1.689	2.1	.083	60°	3	.118	.750	.030	2
–	–	50	1.969	47.2	1.858	2.8	.110	60°	4	.157	1.000	.039	2
–	–	60	2.362	56.5	2.224	3.5	.138	60°	5	.197	1.250	.049	2
–	–	66	2.598	61.8	2.433	4.2	.165	60°	6	.236	1.500	.059	2
–	–	74	2.913	69.1	2.720	4.9	.193	60°	7	.276	1.750	.069	2
–	–	74	2.913	68.4	2.693	5.6	.220	60°	8	.315	2.000	.079	2
–	–	84	3.307	77	3.031	7.0	.276	60°	10	.394	2.500	.098	2
–	–	95	3.740	86.6	3.409	8.4	.331	60°	12	.472	3.000	.118	2
3.0	.118	45	1.772	44.6	1.756	0.4	.016	45°	3	.118	.250	.010	1
4.5	.177	45	1.772	44.4	1.748	0.6	.024	45°	3	.118	.380	.015	1
6.1	.240	45	1.772	44.1	1.736	0.9	.035	45°	3	.118	.500	.020	1
7.1	.280	45	1.772	43.9	1.728	1.1	.043	45°	3	.118	.630	.025	1
–	–	45	1.772	43.7	1.720	1.3	.051	45°	3	.118	.750	.030	2
–	–	50	1.969	48.3	1.902	1.7	.067	45°	4	.157	1.000	.039	2
–	–	60	2.362	57.9	2.280	2.1	.083	45°	5	.197	1.250	.049	2
–	–	66	2.598	63.4	2.496	2.6	.102	45°	6	.236	1.500	.059	2
–	–	74	2.913	71.0	2.795	3.0	.118	45°	7	.276	1.750	.069	2
–	–	74	2.913	70.6	2.780	3.4	.134	45°	8	.315	2.000	.079	2
–	–	84	3.307	79.7	3.138	4.3	.169	45°	10	.394	2.500	.098	2
–	–	95	3.740	89.9	3.539	5.1	.201	45°	12	.472	3.000	.118	2
–	–	113	4.449	106.2	4.181	6.8	.268	45°	16	.630	4.000	.157	2

ISO13399 ➤ L003
OPERATIONAL GUIDANCE ➤ L197
CUTTING CONDITIONS ➤ L197

DLE
LEADING DRILL SERIES

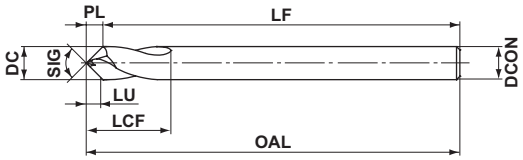
- Solid carbide drills for centering and chamfering
- Two-step point angles
- Excellent sharpness and chipping resistance and stable machining of stainless steels

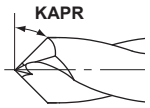
P M K N S H

METRIC STANDARD

External Coolant

■ Tip angle shape SIG 120º, 145º





(mm)

h7	DCON=3	3 < DCON≤6	6<DCON≤10	10<DCON≤16
	0 −0.010	0 −0.012	0 −0.015	0 −0.018

(inch)

h7	DCON=.1181	.1181 < DCON≤.2362	.2362 < DCON≤.3937	.3937 < DCON≤.6299
	0 −.0004	0 −.0005	0 −.0006	0 −.0007

	DC (mm)	DC (inch)	SIG	DP1020	Order Number	LU (mm)	LU (inch)	LCF (mm)	LCF (inch)	OAL (mm)	OAL (inch)	LF (mm)	LF (inch)	PL (mm)	PL (inch)	KAPR	DCON (mm)	DCON (inch)
NEW	3.0	.1181	120°	●	**DLE0300S030P120**	0.8	.031	9	.354	45	1.772	44.1	1.736	0.9	.035	30°	3	.118
NEW	4.0	.1575	120°	●	**DLE0400S040P120**	1.1	.043	12	.472	50	1.969	48.8	1.921	1.2	.047	30°	4	.157
NEW	5.0	.1969	120°	●	**DLE0500S050P120**	1.3	.051	14	.551	60	2.362	58.6	2.307	1.4	.055	30°	5	.197
NEW	6.0	.2362	120°	●	**DLE0600S060P120**	1.6	.063	15	.591	66	2.598	64.3	2.531	1.7	.067	30°	6	.236
NEW	7.0	.2756	120°	●	**DLE0700S070P120**	1.9	.075	18	.709	74	2.913	72.0	2.835	2.0	.079	30°	7	.276
NEW	8.0	.3150	120°	●	**DLE0800S080P120**	2.2	.087	20	.787	74	2.913	71.7	2.823	2.3	.091	30°	8	.315
NEW	10.0	.3937	120°	●	**DLE1000S100P120**	2.8	.110	24	.945	84	3.307	81.1	3.193	2.9	.114	30°	10	.394
NEW	12.0	.4724	120°	●	**DLE1200S120P120**	3.3	.130	28	1.102	95	3.740	91.5	3.602	3.5	.138	30°	12	.472
NEW	3.0	.1181	145°	●	**DLE0300S030P145**	0.4	.016	9	.354	45	1.772	44.5	1.752	0.5	.020	17.5°	3	.118
NEW	4.0	.1575	145°	●	**DLE0400S040P145**	0.5	.020	12	.472	50	1.969	49.4	1.945	0.6	.024	17.5°	4	.157
NEW	5.0	.1969	145°	●	**DLE0500S050P145**	0.7	.028	14	.551	60	2.362	59.2	2.331	0.8	.031	17.5°	5	.197
NEW	6.0	.2362	145°	●	**DLE0600S060P145**	0.8	.031	15	.591	66	2.598	65.1	2.563	0.9	.035	17.5°	6	.236
NEW	7.0	.2756	145°	●	**DLE0700S070P145**	1.0	.039	18	.709	74	2.913	72.9	2.870	1.1	.043	17.5°	7	.276
NEW	8.0	.3150	145°	●	**DLE0800S080P145**	1.1	.043	20	.787	74	2.913	72.7	2.862	1.3	.051	17.5°	8	.315
NEW	10.0	.3937	145°	●	**DLE1000S100P145**	1.4	.055	24	.945	84	3.307	82.4	3.244	1.6	.063	17.5°	10	.394
NEW	12.0	.4724	145°	●	**DLE1200S120P145**	1.7	.067	28	1.102	95	3.740	93.1	3.665	1.9	.075	17.5°	12	.472

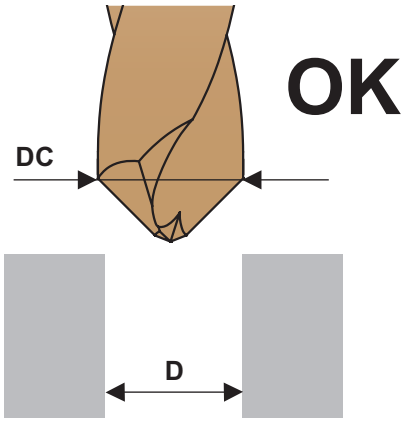
Note 1) The centering diameter should be less than the drill diameter (processing diameter) **DC** and the usable length **LU** should be referred to as a guideline.

ISO13399 ➤ L003

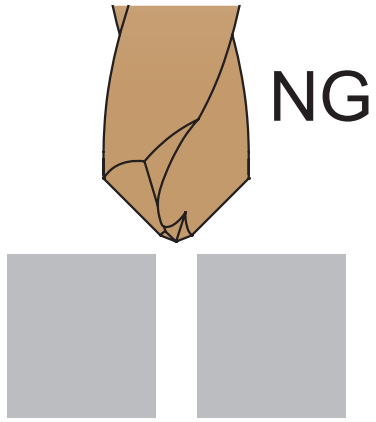
Drill Diameter Selection

When Chamfering

With respect to guide hole diameter **D**, select the drill diameter (cutting diameter) **DC** to be within the range of **D** < **DC** < 2**D**.

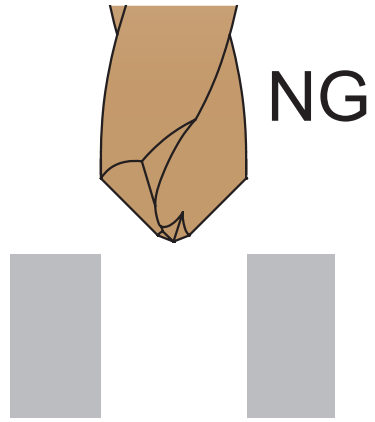


Example) If guide hole diameter **D** is .197":
Drill diameter **DC** should be equal to or greater than .236" but less than .394".
Select a **DC** of .236", .276", or .315".



If DC is equal to or greater than 2D:

If drill diameter **DC** is too large compared to guide hole diameter **D** (equal to or greater than 2**D**), chamfering cannot be performed.

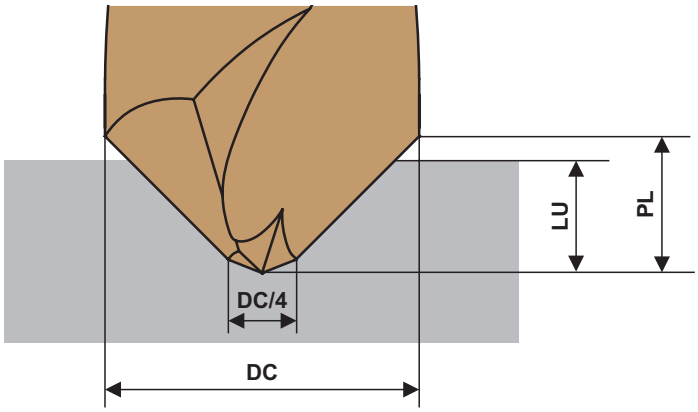


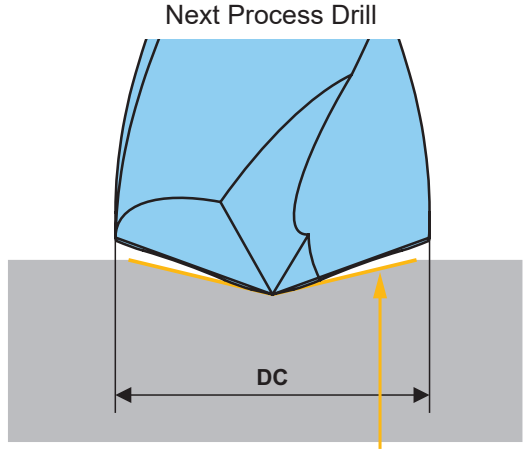
If DC is a drill diameter equal to D:

Chamfering cannot be performed if drill diameter **DC** is the same as guide hole diameter **D**.

When Centering

The centering diameter should be less than the drill diameter (processing diameter) **DC** and the usable length **LU** should be referred to as a guideline.
The central area of holes (approx 25% of the full diameter) formed by two step point angles will not have their respective 60º and 90º angles. Chamfering is also not possible in the center areas.
Select a centering drill with a larger point angle than the final hole drill if is desired to make initial contact with the center.





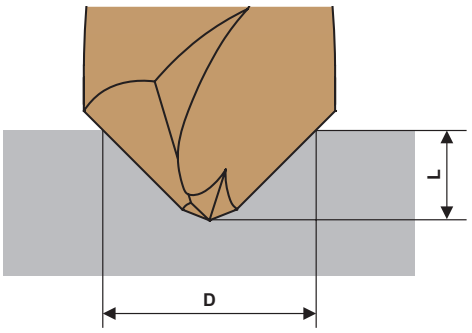
Centering of Point Angle SIG145°

OPERATIONAL GUIDANCE ➤ L197
CUTTING CONDITIONS ➤ L197

DLE

LEADING DRILL SERIES

Drilling Depth (L) Chart by Tool Diameter



(inch)

DC		SIG 90°			
		Min.		Max.	
(mm)	(inch)	D	L	D	L
1.0	**.0394**	.020	.007	.031	.013
1.5	**.0591**	.031	.011	.051	.021
2.0	**.0787**	.039	.014	.075	.031
2.5	**.0984**	.051	.019	.094	.039
3.0	**.1181**	.059	.020	.110	.047
4.0	**.1575**	.079	.028	.150	.063
5.0	**.1969**	.098	.035	.185	.079
6.0	**.2362**	.118	.043	.224	.094
7.0	**.2756**	.138	.047	.260	.110
8.0	**.3150**	.157	.055	.299	.126
10.0	**.3937**	.197	.071	.382	.161
12.0	**.4724**	.236	.083	.457	.193
16.0	**.6299**	.315	.110	.610	.260

DC		SIG 60°				SIG 120°				SIG 145°			
		Min.		Max.		Min.		Max.		Min.		Max.	
(mm)	(inch)	D	L	D	L	D	L	D	L	D	L	D	L
3.0	**.1181**	.059	.031	.114	.079	.059	.016	.110	.031	.059	.008	.098	.016
4.0	**.1575**	.079	.043	.154	.106	.079	.024	.150	.043	.079	.012	.126	.020
5.0	**.1969**	.098	.051	.193	.134	.098	.028	.177	.051	.098	.016	.173	.028
6.0	**.2362**	.118	.063	.228	.157	.118	.035	.217	.063	.118	.020	.201	.031
7.0	**.2756**	.138	.075	.268	.185	.138	.039	.260	.075	.138	.024	.248	.039
8.0	**.3150**	.157	.083	.307	.213	.157	.047	.299	.087	.157	.024	.276	.043
10.0	**.3937**	.197	.106	.386	.268	.197	.055	.382	.110	.197	.031	.350	.055
12.0	**.4724**	.236	.126	.457	.319	.236	.067	.449	.130	.236	.035	.425	.067

Point Angle SIG 60°

RECOMMENDED CUTTING CONDITIONS

(inch)

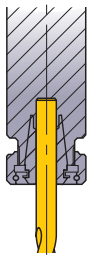
Workpiece Material		Mild Steels (≤180HB) AISI 1010 etc.		Carbon Steels, Alloy Steels (180—280HB) AISI 1045, 4140 etc.		Carbon Steels, Alloy Steels (280—350HB) AISI 4340 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)
(mm)	(inch)						
3	**.1181**	245	.0020 (.0012—.0028)	210	.0020 (.0012—.0028)	195	.0016 (.0008—.0024)
4	**.1575**	245	.0020 (.0012—.0028)	210	.0020 (.0012—.0028)	195	.0016 (.0008—.0024)
5	**.1969**	260	.0024 (.0016—.0031)	230	.0024 (.0016—.0031)	210	.0020 (.0012—.0028)
6	**.2362**	260	.0024 (.0016—.0031)	230	.0024 (.0016—.0031)	210	.0020 (.0012—.0028)
7	**.2756**	260	.0028 (.0016—.0035)	230	.0028 (.0016—.0035)	210	.0020 (.0012—.0028)
8	**.3150**	260	.0028 (.0016—.0035)	230	.0028 (.0016—.0035)	210	.0020 (.0012—.0028)
10	**.3937**	280	.0031 (.0016—.0039)	245	.0031 (.0016—.0039)	230	.0024 (.0012—.0031)
12	**.4724**	280	.0031 (.0016—.0039)	245	.0031 (.0016—.0039)	230	.0024 (.0012—.0031)

Workpiece Material		Austenitic Stainless Steels (≤200HB) AISI 304, 316 etc.		Gray Cast Irons (≤350MPa) AISI No45B etc.		Ductile Cast Irons (≤450MPa) AISI 60-40-18 etc.	
DC		Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.—Max.) (IPR)
(mm)	(inch)						
3	**.1181**	50	.0012 (.0004—.0020)	245	.0020 (.0012—.0028)	180	.0020 (.0012—.0028)
4	**.1575**	50	.0012 (.0004—.0020)	245	.0020 (.0012—.0028)	180	.0020 (.0012—.0028)
5	**.1969**	65	.0016 (.0008—.0024)	260	.0024 (.0016—.0031)	195	.0024 (.0016—.0031)
6	**.2362**	65	.0016 (.0008—.0024)	260	.0024 (.0016—.0031)	195	.0024 (.0016—.0031)
7	**.2756**	65	.0016 (.0008—.0024)	260	.0028 (.0016—.0035)	195	.0024 (.0016—.0031)
8	**.3150**	65	.0016 (.0008—.0024)	260	.0028 (.0016—.0035)	195	.0024 (.0016—.0031)
10	**.3937**	65	.0016 (.0008—.0024)	280	.0031 (.0016—.0039)	195	.0028 (.0016—.0035)
12	**.4724**	65	.0016 (.0008—.0024)	280	.0031 (.0016—.0039)	195	.0028 (.0016—.0035)

Note 1) When chamfering a circumference of a guide hole, make sure that the tool diameter(**DC**) is **D** <**DC** <2**D**.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the time of dwell program or lower the rotation speed.
Note 5) When centering, please do not exceed the **LU** (usable length).

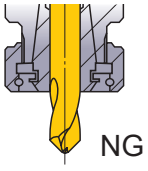
■ OPERATIONAL GUIDANCE FOR THE DLE DRILL

Drill Holding



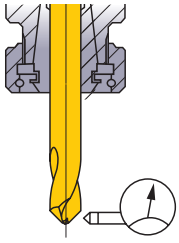
Collet chuck holds the drill securely.

Drill Installation



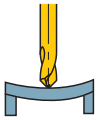
Do not clamp on the flutes.

Installation Tolerance

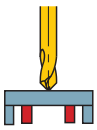


Run-out ≤ .001 inch

Thin Workpiece

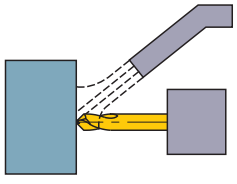


NG
If Bending Occurs



OK
Support the Workpiece

Coolant Method



Coolant positions,at the end at the center are ideal.

DLE

LEADING DRILL SERIES

Point Angle SIG 90°, 120° and 145°

RECOMMENDED CUTTING CONDITIONS

(inch)

Workpiece Material		Mild Steels (≤180HB) AISI 1010 etc.		Carbon Steels, Alloy Steels (180−280HB) AISI 1045, 4140 etc.		Carbon Steels, Alloy Steels (280−350HB) AISI 4340 etc.	
DC		Cutting Speed (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.−Max.) (IPR)
(mm)	(inch)						
1.0	**.0394**	100	.0008 (.0004—.0012)	65	.0008 (.0004—.0012)	15	.0008 (.0004—.0012)
1.5	**.0591**	150	.0008 (.0004—.0012)	115	.0008 (.0004—.0012)	30	.0008 (.0004—.0012)
2.0	**.0787**	195	.0016 (.0012—.0020)	165	.0016 (.0012—.0020)	45	.0016 (.0012—.0020)
2.5	**.0984**	245	.0016 (.0012—.0020)	210	.0016 (.0012—.0020)	195	.0016 (.0012—.0020)
3.0	**.1181**	245	.0024 (.0016—.0031)	210	.0024 (.0016—.0031)	195	.0020 (.0012—.0028)
4.0	**.1575**	245	.0024 (.0016—.0031)	210	.0024 (.0016—.0031)	195	.0020 (.0012—.0028)
5.0	**.1969**	260	.0028 (.0020—.0035)	230	.0028 (.0020—.0035)	210	.0024 (.0016—.0031)
6.0	**.2362**	260	.0028 (.0020—.0035)	230	.0028 (.0020—.0035)	210	.0024 (.0016—.0031)
7.0	**.2756**	260	.0031 (.0020—.0039)	230	.0031 (.0020—.0039)	210	.0024 (.0016—.0031)
8.0	**.3150**	260	.0031 (.0020—.0039)	230	.0031 (.0020—.0039)	210	.0024 (.0016—.0031)
10.0	**.3937**	280	.0035 (.0020—.0043)	245	.0035 (.0020—.0043)	230	.0028 (.0016—.0035)
12.0	**.4724**	280	.0035 (.0020—.0043)	245	.0035 (.0020—.0043)	230	.0028 (.0016—.0035)
16.0	**.6299**	295	.0047 (.0039—.0055)	260	.0047 (.0039—.0055)	245	.0031 (.0024—.0039)

Workpiece Material		Austenitic Stainless Steels (≤200HB) AISI 304, 316 etc.		Gray Cast Irons (≤350MPa) AISI No45B etc.		Ductile Cast Irons (≤450MPa) AISI 60-40-18 etc.	
DC		Cutting Speed (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.−Max.) (IPR)	Cutting Speed (SFM)	Feed (Min.−Max.) (IPR)
(mm)	(inch)						
1.0	**.0394**	65	.0004 (.0002—.0006)	100	.0008 (.0004—.0012)	30	.0008 (.0004—.0012)
1.5	**.0591**	65	.0004 (.0002—.0006)	150	.0008 (.0004—.0012)	80	.0008 (.0004—.0012)
2.0	**.0787**	65	.0016 (.0012—.0020)	195	.0016 (.0012—.0020)	130	.0016 (.0012—.0020)
2.5	**.0984**	65	.0016 (.0012—.0020)	245	.0016 (.0012—.0020)	180	.0016 (.0012—.0020)
3.0	**.1181**	65	.0016 (.0008—.0024)	245	.0024 (.0016—.0031)	180	.0024 (.0016—.0031)
4.0	**.1575**	65	.0016 (.0008—.0024)	245	.0024 (.0016—.0031)	180	.0024 (.0016—.0031)
5.0	**.1969**	65	.0024 (.0016—.0031)	260	.0028 (.0020—.0035)	195	.0028 (.0020—.0035)
6.0	**.2362**	65	.0024 (.0016—.0031)	260	.0028 (.0020—.0035)	195	.0028 (.0020—.0035)
7.0	**.2756**	65	.0024 (.0016—.0031)	260	.0031 (.0020—.0039)	195	.0028 (.0020—.0035)
8.0	**.3150**	65	.0024 (.0016—.0031)	260	.0031 (.0020—.0039)	195	.0028 (.0020—.0035)
10.0	**.3937**	65	.0024 (.0016—.0031)	280	.0035 (.0020—.0043)	195	.0031 (.0020—.0039)
12.0	**.4724**	65	.0024 (.0016—.0031)	280	.0035 (.0020—.0043)	195	.0031 (.0020—.0039)
16.0	**.6299**	65	.0031 (.0024—.0039)	295	.0047 (.0039—.0055)	195	.0043 (.0035—.0051)

Note 1) When chamfering a circumference of a guide hole, make sure that the tool diameter(**DC**) is **D** <**DC** <2**D**.
Note 2) When centering into curved or inclined surfaces, please reduce the feed rate.
Note 3) When V-grooving and chamfering, please reduce cutting conditions.
Note 4) When chatter vibration or abnormal noise is generated, please shorten the time of dwell program or lower the rotation speed.
Note 5) When centering, please do not exceed the **LU** (usable length).

● : **USA Stock**

MVX ø.562"—ø.656"

- Ideal combination of outer CVD insert and inner PVD insert.
- High rigidity body that enables L/D=6 deep hole machining.

P | M | K | N | S | H

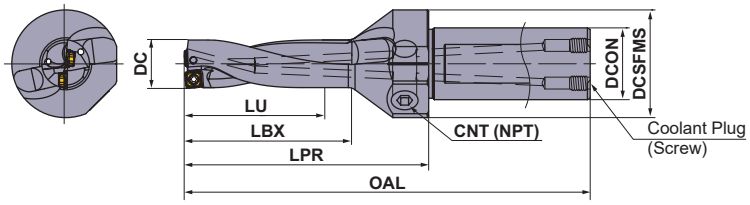
Inch Standard

Internal Coolant

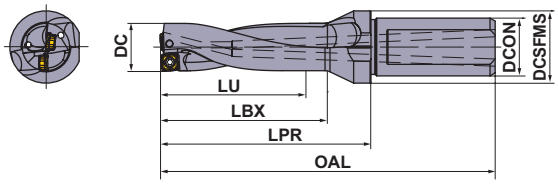
Machining Tolerance (Guide)(inch)

L/D	ø.562"—ø.656"
2, 3	$^{+.0098}_{0}$
4, 5	$^{+.0138}_{0}$

Type 1

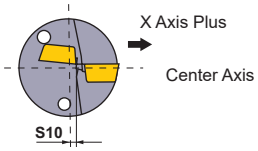


Type 2



Side Coolant Not Available.

Maximum Offset for Turning



(inch)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Type	Insert Type	*1 Clamp Screw	Wrench	NPT Plug (Side) CNT	(Back) Coolant Plug (Screw)	Coolant Plug (Wrench)
.562	2	MVX0562X2C075	●	2	1.12	1.40	2.19	4.19	.750	1.25	.026	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	3	MVX0562X3C075	●	2	1.69	1.96	2.75	4.75	.750	1.25	.026	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	4	MVX0562X4C075	●	2	2.25	2.52	3.32	5.32	.750	1.25	.026	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	5	MVX0562X5F075	●	2	2.81	3.09	3.61	5.61	.750	.98	.026	2	SO□X05	TPS20-1	TIP06F	—	—	—
.593	2	MVX0593X2C075	●	2	1.19	1.46	2.25	4.25	.750	1.25	.016	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	3	MVX0593X3C075	●	2	1.78	2.06	2.85	4.85	.750	1.25	.016	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	4	MVX0593X4C075	●	2	2.37	2.65	3.44	5.44	.750	1.25	.016	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	5	MVX0593X5F075	●	2	2.97	3.24	3.77	5.77	.750	.98	.016	2	SO□X05	TPS20-1	TIP06F	—	—	—
.625	2	MVX0625X2C075	●	2	1.25	1.53	2.32	4.32	.750	1.25	.013	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	3	MVX0625X3C075	●	2	1.88	2.15	2.94	4.94	.750	1.25	.013	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	4	MVX0625X4C075	●	2	2.50	2.78	3.57	5.57	.750	1.25	.013	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	5	MVX0625X5F075	●	2	3.13	3.40	3.93	5.93	.750	.98	.013	2	SO□X05	TPS20-1	TIP06F	—	—	—
.656	2	MVX0656X2C075	●	2	1.31	1.59	2.38	4.38	.750	1.25	.009	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	3	MVX0656X3C075	●	2	1.97	2.24	3.04	5.04	.750	1.25	.009	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	4	MVX0656X4C075	●	2	2.62	2.90	3.69	5.69	.750	1.25	.009	1	SO□X05	TPS20-1	TIP06F	1/8	HSS05006	HKY25R
	5	MVX0656X5F075	●	2	3.28	3.56	4.08	6.08	.750	.98	.009	2	SO□X05	TPS20-1	TIP06F	—	—	—

*1 Clamp Torque (lbf-in) : TPS20-1=5.3

*2 Number of Teeth

ISO13399 ➤ L003
INSERTS ➤ L203
CUTTING CONDITIONS ➤ L213
USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX ø.687"–ø2.500"

- Ideal combination of outer CVD insert and inner PVD insert.
- High rigidity body that enables L/D=6 deep hole machining.

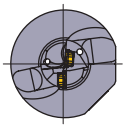
P | M | K | N | S | H

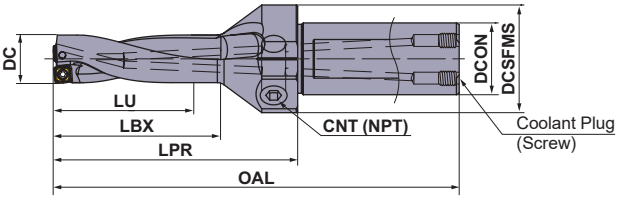
Inch Standard

Internal Coolant

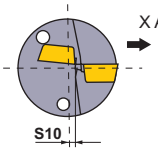
Machining Tolerance (Guide)(inch)

L/D	ø.687"–ø1.312"	ø1.375"–ø1.812"	ø1.875"–ø2.500"
2, 3	+.0098 0	+.0118 0	+.0118 0
4, 5	+.0138 0	+.0157 0	+.0177 0
6	+.0177 0	+.0236 0	–





Maximum Offset for Turning



(inch)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	F W Wrench	NPT Plug (Side) CNT	(Back) Coolant Plug (Screw)	Coolant Plug (Wrench)
.687	2	MVX0687X2C100	●	2	1.37	1.65	2.72	4.97	1.000	1.50	.023	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	3	MVX0687X3C100	●	2	2.06	2.34	3.41	5.66	1.000	1.50	.023	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	4	MVX0687X4C100	●	2	2.75	3.03	4.09	6.34	1.000	1.50	.023	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	5	MVX0687X5C100	●	2	3.44	3.71	4.78	7.03	1.000	1.50	.023	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	6	MVX0687X6C100	●	2	4.12	4.40	5.47	7.72	1.000	1.50	.023	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
.750	2	MVX0750X2C100	●	2	1.50	1.78	2.91	5.16	1.000	1.50	.016	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	3	MVX0750X3C100	●	2	2.25	2.53	3.66	5.91	1.000	1.50	.016	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	4	MVX0750X4C100	●	2	3.00	3.28	4.41	6.66	1.000	1.50	.016	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	5	MVX0750X5C100	●	2	3.75	4.03	5.16	7.41	1.000	1.50	.016	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
	6	MVX0750X6C100	●	2	4.50	4.78	5.91	8.16	1.000	1.50	.016	SO○X06	TPS25	TIP07F	1/8	HSS05006	HKY25R
.812	2	MVX0812X2C100	●	2	1.62	1.90	3.01	5.26	1.000	1.50	.027	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	3	MVX0812X3C100	●	2	2.44	2.71	3.82	6.07	1.000	1.50	.027	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	4	MVX0812X4C100	●	2	3.25	3.53	4.63	6.88	1.000	1.50	.027	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	5	MVX0812X5C100	●	2	4.06	4.34	5.44	7.69	1.000	1.50	.027	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	6	MVX0812X6C100	●	2	4.87	5.15	6.26	8.51	1.000	1.50	.027	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
.875	2	MVX0875X2C100	●	2	1.75	2.03	3.12	5.37	1.000	1.50	.020	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	3	MVX0875X3C100	●	2	2.63	2.90	4.00	6.25	1.000	1.50	.020	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	4	MVX0875X4C100	●	2	3.50	3.78	4.87	7.12	1.000	1.50	.020	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	5	MVX0875X5C100	●	2	4.38	4.65	5.75	8.00	1.000	1.50	.020	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
	6	MVX0875X6C100	●	2	5.25	5.53	6.62	8.87	1.000	1.50	.020	SO○X07	TPS3	TIP10F	1/8	HSS05006	HKY25R
.937	2	MVX0937X2C100	●	2	1.87	2.15	3.24	5.49	1.000	1.50	.037	SO○X08	TPS351	TIP10W	1/8	HSS05006	HKY25R
	3	MVX0937X3C100	●	2	2.81	3.09	4.17	6.42	1.000	1.50	.037	SO○X08	TPS351	TIP10W	1/8	HSS05006	HKY25R
	4	MVX0937X4C100	●	2	3.75	4.03	5.11	7.36	1.000	1.50	.037	SO○X08	TPS351	TIP10W	1/8	HSS05006	HKY25R
	5	MVX0937X5C100	●	2	4.69	4.96	6.05	8.30	1.000	1.50	.037	SO○X08	TPS351	TIP10W	1/8	HSS05006	HKY25R
	6	MVX0937X6C100	●	2	5.62	5.90	6.99	9.24	1.000	1.50	.037	SO○X08	TPS351	TIP10W	1/8	HSS05006	HKY25R
1.000	2	MVX1000X2C125	●	2	2.00	2.28	3.35	5.73	1.250	1.75	.030	SO○X08	TPS351	TIP10W	1/8	HSS06008	HKY30R
	3	MVX1000X3C125	●	2	3.00	3.28	4.35	6.73	1.250	1.75	.030	SO○X08	TPS351	TIP10W	1/8	HSS06008	HKY30R
	4	MVX1000X4C125	●	2	4.00	4.28	5.35	7.73	1.250	1.75	.030	SO○X08	TPS351	TIP10W	1/8	HSS06008	HKY30R
	5	MVX1000X5C125	●	2	5.00	5.28	6.35	8.73	1.250	1.75	.030	SO○X08	TPS351	TIP10W	1/8	HSS06008	HKY30R
	6	MVX1000X6C125	●	2	6.00	6.28	7.35	9.73	1.250	1.75	.030	SO○X08	TPS351	TIP10W	1/8	HSS06008	HKY30R

*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS3=17.7, TPS351=22
*2 Number of Teeth

● : USA Stock

(inch)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	Wrench	NPT Plug (Side) CNT	(Back) Coolant Plug (Screw)	Coolant Plug (Wrench)
	2	**MVX1062X2C125**	●	2	2.12	2.40	3.46	5.84	1.250	1.75	.022	**SO○X08**	TPS351	TIP10W	1/8	HSS06008	HKY30R
	3	**MVX1062X3C125**	●	2	3.19	3.46	4.53	6.90	1.250	1.75	.022	**SO○X08**	TPS351	TIP10W	1/8	HSS06008	HKY30R
1.062	4	**MVX1062X4C125**	●	2	4.25	4.53	5.59	7.96	1.250	1.75	.022	**SO○X08**	TPS351	TIP10W	1/8	HSS06008	HKY30R
	5	**MVX1062X5C125**	●	2	5.31	5.59	6.65	9.03	1.250	1.75	.022	**SO○X08**	TPS351	TIP10W	1/8	HSS06008	HKY30R
	6	**MVX1062X6C125**	●	2	6.37	6.65	7.71	10.09	1.250	1.75	.022	**SO○X08**	TPS351	TIP10W	1/8	HSS06008	HKY30R
	2	**MVX1125X2C125**	●	2	2.25	2.53	3.64	6.01	1.250	1.75	.040	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	3	**MVX1125X3C125**	●	2	3.38	3.65	4.76	7.14	1.250	1.75	.040	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
1.125	4	**MVX1125X4C125**	●	2	4.50	4.78	5.89	8.26	1.250	1.75	.040	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	5	**MVX1125X5C125**	●	2	5.63	5.90	7.01	9.39	1.250	1.75	.040	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	6	**MVX1125X6C125**	●	2	6.75	7.03	8.14	10.51	1.250	1.75	.040	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	2	**MVX1187X2C125**	●	2	2.37	2.65	3.76	6.13	1.250	1.75	.033	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	3	**MVX1187X3C125**	●	2	3.56	3.84	4.94	7.32	1.250	1.75	.033	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
1.187	4	**MVX1187X4C125**	●	2	4.75	5.03	6.13	8.51	1.250	1.75	.033	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	5	**MVX1187X5C125**	●	2	5.94	6.21	7.32	9.69	1.250	1.75	.033	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	6	**MVX1187X6C125**	●	2	7.12	7.40	8.51	10.88	1.250	1.75	.033	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	2	**MVX1250X2C150**	●	2	2.50	2.78	3.87	6.62	1.500	2.00	.025	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	3	**MVX1250X3C150**	●	2	3.75	4.03	5.12	7.87	1.500	2.00	.025	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
1.250	4	**MVX1250X4C150**	●	2	5.00	5.28	6.37	9.12	1.500	2.00	.025	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	5	**MVX1250X5C150**	●	2	6.25	6.53	7.62	10.37	1.500	2.00	.025	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	6	**MVX1250X6C150**	●	2	7.50	7.78	8.87	11.62	1.500	2.00	.025	**SO○X09**	TPS4	TIP15W	1/8	HSS06008	HKY30R
	2	**MVX1312X2C150**	●	2	2.62	2.90	4.40	7.15	1.500	2.00	.049	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	**MVX1312X3C150**	●	2	3.94	4.21	5.71	8.46	1.500	2.00	.049	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.312	4	**MVX1312X4C150**	●	2	5.25	5.53	7.02	9.77	1.500	2.00	.049	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	**MVX1312X5C150**	●	2	6.56	6.84	8.33	11.08	1.500	2.00	.049	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	**MVX1312X6C150**	●	2	7.87	8.15	9.65	12.40	1.500	2.00	.049	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	**MVX1375X2C150**	●	2	2.75	3.03	4.52	7.27	1.500	2.00	.041	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	**MVX1375X3C150**	●	2	4.13	4.40	5.90	8.65	1.500	2.00	.041	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.375	4	**MVX1375X4C150**	●	2	5.50	5.78	7.27	10.02	1.500	2.00	.041	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	**MVX1375X5C150**	●	2	6.88	7.15	8.65	11.40	1.500	2.00	.041	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	**MVX1375X6C150**	●	2	8.25	8.53	10.02	12.77	1.500	2.00	.041	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	**MVX1437X2C150**	●	2	2.87	3.15	4.65	7.40	1.500	2.00	.036	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	**MVX1437X3C150**	●	2	4.31	4.59	6.08	8.83	1.500	2.00	.036	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.437	4	**MVX1437X4C150**	●	2	5.75	6.03	7.52	10.27	1.500	2.00	.036	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	**MVX1437X5C150**	●	2	7.19	7.46	8.96	11.71	1.500	2.00	.036	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	**MVX1437X6C150**	●	2	8.62	8.90	10.40	13.15	1.500	2.00	.036	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	**MVX1500X2C150**	●	2	3.00	3.28	4.77	7.52	1.500	2.00	.031	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	**MVX1500X3C150**	●	2	4.50	4.78	6.27	9.02	1.500	2.00	.031	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.500	4	**MVX1500X4C150**	●	2	6.00	6.28	7.77	10.52	1.500	2.00	.031	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	**MVX1500X5C150**	●	2	7.50	7.78	9.27	12.02	1.500	2.00	.031	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	**MVX1500X6C150**	●	2	9.00	9.28	10.77	13.52	1.500	2.00	.031	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	2	**MVX1562X2C150**	●	2	3.12	3.40	4.90	7.65	1.500	2.00	.021	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	**MVX1562X3C150**	●	2	4.69	4.96	6.46	9.21	1.500	2.00	.021	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.562	4	**MVX1562X4C150**	●	2	6.25	6.53	8.02	10.77	1.500	2.00	.021	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	**MVX1562X5C150**	●	2	7.81	8.09	9.58	12.33	1.500	2.00	.021	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	**MVX1562X6C150**	●	2	9.37	9.65	11.15	13.90	1.500	2.00	.021	**SO○X11**	TPS43	TIP15W	1/4	HSS08010	HKY40R

*1 Clamp Torque (lbf-in) : TPS351=22, TPS4=31, TPS43=31

*2 Number of Teeth

ISO13399 ➤ L003
INSERTS ➤ L203
CUTTING CONDITIONS ➤ L213
USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX ø.687"—ø2.500"

(inch)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	W D Wrench	NPT Plug (Side) CNT	(Back) Coolant Plug (Screw)	Coolant Plug (Wrench)
1.625	2	MVX1625X2C150	●	2	3.25	3.53	5.02	7.77	1.500	2.00	.053	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX1625X3C150	●	2	4.88	5.15	6.65	9.40	1.500	2.00	.053	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	4	MVX1625X4C150	●	2	6.50	6.78	8.27	11.02	1.500	2.00	.053	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX1625X5C150	●	2	8.13	8.40	9.90	12.65	1.500	2.00	.053	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX1625X6C150	●	2	9.75	10.03	11.52	14.27	1.500	2.00	.053	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.687	2	MVX1687X2C150	●	2	3.37	3.65	5.15	7.90	1.500	2.00	.047	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX1687X3C150	●	2	5.06	5.34	6.83	9.58	1.500	2.00	.047	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	4	MVX1687X4C150	●	2	6.75	7.03	8.52	11.27	1.500	2.00	.047	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX1687X5C150	●	2	8.44	8.71	10.21	12.96	1.500	2.00	.047	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	6	MVX1687X6C150	●	2	10.12	10.40	11.90	14.65	1.500	2.00	.047	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.750	2	MVX1750X2C150	●	2	3.50	3.78	5.27	8.02	1.500	2.00	.041	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX1750X3C150	●	2	5.25	5.53	7.02	9.77	1.500	2.00	.041	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	4	MVX1750X4C150	●	2	7.00	7.28	8.77	11.52	1.500	2.00	.041	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX1750X5C150	●	2	8.75	9.03	10.52	13.27	1.500	2.00	.041	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.812	2	MVX1812X2C150	●	2	3.62	3.90	5.40	8.15	1.500	2.00	.031	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	3	MVX1812X3C150	●	2	5.44	5.71	7.21	9.96	1.500	2.00	.031	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	4	MVX1812X4C150	●	2	7.25	7.53	9.02	11.77	1.500	2.00	.031	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
	5	MVX1812X5C150	●	2	9.06	9.34	10.83	13.58	1.500	2.00	.031	SO○X13	TPS43	TIP15W	1/4	HSS08010	HKY40R
1.875	2	MVX1875X2C150	●	2	3.75	4.03	5.60	8.35	1.500	2.48	.072	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX1875X3C150	●	2	5.63	5.90	7.48	10.23	1.500	2.48	.072	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX1875X4C150	●	2	7.50	7.78	9.35	12.10	1.500	2.48	.072	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX1875X5C150	●	2	9.38	9.65	11.23	13.98	1.500	2.48	.072	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
1.937	2	MVX1937X2C150	●	2	3.87	4.15	5.73	8.48	1.500	2.48	.066	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX1937X3C150	●	2	5.81	6.09	7.66	10.41	1.500	2.48	.066	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX1937X4C150	●	2	7.75	8.03	9.60	12.35	1.500	2.48	.066	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX1937X5C150	●	2	9.69	9.96	11.54	14.29	1.500	2.48	.066	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
2.000	2	MVX2000X2C150	●	2	4.00	4.28	5.85	8.60	1.500	2.48	.060	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX2000X3C150	●	2	6.00	6.28	7.85	10.60	1.500	2.48	.060	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX2000X4C150	●	2	8.00	8.28	9.85	12.60	1.500	2.48	.060	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX2000X5C150	●	2	10.00	10.28	11.85	14.60	1.500	2.48	.060	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
2.125	2	MVX2125X2C150	●	2	4.25	4.53	6.10	8.85	1.500	2.48	.047	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX2125X3C150	●	2	6.38	6.65	8.23	10.98	1.500	2.48	.047	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX2125X4C150	●	2	8.50	8.78	10.35	13.10	1.500	2.48	.047	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX2125X5C150	●	2	10.63	10.90	12.48	15.23	1.500	2.48	.047	SO○X16	TPS54	TIP25D	1/4	HSS10012	HKY50R
2.250	2	MVX2250X2C150	●	2	4.50	4.78	6.35	9.10	1.500	2.68	.057	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX2250X3C150	●	2	6.75	7.03	8.60	11.35	1.500	2.68	.057	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX2250X4C150	●	2	9.00	9.28	10.85	13.60	1.500	2.68	.057	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX2250X5C150	●	2	11.25	11.53	13.10	15.85	1.500	2.68	.057	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
2.375	2	MVX2375X2C150	●	2	4.75	5.03	6.60	9.35	1.500	2.68	.044	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX2375X3C150	●	2	7.13	7.40	8.98	11.73	1.500	2.68	.044	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX2375X4C150	●	2	9.50	9.78	11.35	14.10	1.500	2.68	.044	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX2375X5C150	●	2	11.88	12.15	13.73	16.48	1.500	2.68	.044	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
2.500	2	MVX2500X2C150	●	2	5.00	5.28	6.85	9.60	1.500	2.68	.031	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	3	MVX2500X3C150	●	2	7.50	7.78	9.35	12.10	1.500	2.68	.031	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	4	MVX2500X4C150	●	2	10.00	10.28	11.85	14.60	1.500	2.68	.031	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R
	5	MVX2500X5C150	●	2	12.50	12.78	14.35	17.10	1.500	2.68	.031	SO○X18	TPS54	TIP25D	1/4	HSS10012	HKY50R

*1 Clamp Torque (lbf-in) : TPS43=31, TPS54=66
*2 Number of Teeth

● : USA Stock
<10 inserts in one case><CBN inserts are available in 1 piece in one case.>

INSERTS

(inch)

Shape	Drill Dia.	Order Number	IC	S	RE	Coated				Carbide		Geometry
						MC5020	MC1020	VP15TF	DP8020	TF15		
UM	ø.562"—ø.656"	**SOMX052704-UM**	.197	.106	.016	●	●	●				ø.562"—ø.656"
	ø.687"—ø.750"	**SOMX063005-UM**	.236	.118	.020	●	●	●				
	ø.812"—ø.875"	**SOMX073505-UM**	.276	.138	.020	●	●	●				
	ø.937"—ø1.062"	**SOMX084005-UM**	.327	.157	.020	●	●	●				
	ø1.125"—ø1.250"	**SOMX094506-UM**	.382	.177	.024	●	●	●				
	ø1.312"—ø1.562"	**SOMX115506-UM**	.457	.217	.024	●	●	●				ø.687"—ø2.500"
	ø1.625"—ø1.812"	**SOMX136008-UM**	.543	.236	.031	●	●	●				
	ø1.875"—ø2.125"	**SOMX166508-UM**	.650	.256	.031	●	●	●				
General Purpose	ø2.250"—ø2.500"	**SOMX187008-UM**	.717	.276	.031	●	●	●				
US	ø.687"—ø.750"	**SOMX063005-US**	.236	.118	.020			●				
	ø.812"—ø.875"	**SOMX073505-US**	.276	.138	.020			●				
	ø.937"—ø1.062"	**SOMX084005-US**	.327	.157	.020			●				
	ø1.125"—ø1.250"	**SOMX094506-US**	.382	.177	.024			●				
	ø1.312"—ø1.562"	**SOMX115506-US**	.457	.217	.024			●				
	ø1.625"—ø1.812"	**SOMX136008-US**	.543	.236	.031			●				
	ø1.875"—ø2.125"	**SOMX166508-US**	.650	.256	.031			●				
For Stainless Steel and Inner Edge	ø2.250"—ø2.500"	**SOMX187008-US**	.717	.276	.031			●				
UH	ø.687"—ø.750"	**SOMX062905-UH**	.236	.114	.020				●			
	ø.812"—ø.875"	**SOMX073405-UH**	.276	.134	.020				●			
	ø.937"—ø1.062"	**SOMX083905-UH**	.327	.154	.020				●			
	ø1.125"—ø1.250"	**SOMX094406-UH**	.382	.173	.024				●			
	ø1.312"—ø1.562"	**SOMX115406-UH**	.457	.213	.024				●			
	ø1.625"—ø1.812"	**SOMX135908-UH**	.543	.232	.031				●			
	ø1.875"—ø2.125"	**SOMX166408-UH**	.650	.252	.031				●			
Strong Cutting Edge Type and Inner Edge	ø2.250"—ø2.500"	**SOMX186908-UH**	.717	.272	.031				●			
UN	ø.687"—ø.750"	**SOGX063005-UN**	.236	.118	.020					●		
	ø.812"—ø.875"	**SOGX073505-UN**	.276	.138	.020					●		
	ø.937"—ø1.062"	**SOGX084005-UN**	.327	.157	.020					●		
	ø1.125"—ø1.250"	**SOGX094506-UN**	.382	.177	.024					●		
	ø1.312"—ø1.562"	**SOGX115506-UN**	.457	.217	.024					●		
	ø1.625"—ø1.812"	**SOGX136008-UN**	.543	.236	.031					●		
	ø1.875"—ø2.125"	**SOGX166508-UN**	.650	.256	.031					●		
For Aluminum Alloy	ø2.250"—ø2.500"	**SOGX187008-UN**	.717	.276	.031					●		

Note 1) MC1020 and MC5020 are made exclusively for use as an outer insert.

INSERT RECOMMENDATION

Workpiece Material		1st Recommendation		When outer insert fractures	
		Outer Insert	Inner Insert	Outer Insert	Inner Insert
P	Mild Steel, Alloy Steel	MC1020 **UM Breaker**	VP15TF **UM Breaker**	VP15TF **UM Breaker**	VP15TF **UM Breaker**
M	Stainless Steel	MC1020 **UM Breaker**	VP15TF **US Breaker**	VP15TF **UM Breaker**	VP15TF **US Breaker**
K	Cast Iron	MC5020 **UM Breaker**	VP15TF **UM Breaker**	VP15TF **UM Breaker**	VP15TF **UM Breaker**

Workpiece Material		1st Recommendation		When outer insert fractures	
		Outer Insert	Inner Insert	Outer Insert	Inner Insert
H	Hardened Steel	MC1020 **UM Breaker**	DP8020 **UH Breaker**	VP15TF **UM Breaker**	DP8020 **UH Breaker**
N	Aluminum Alloy	TF15 **UN Breaker**	TF15 **UN Breaker**		

USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX

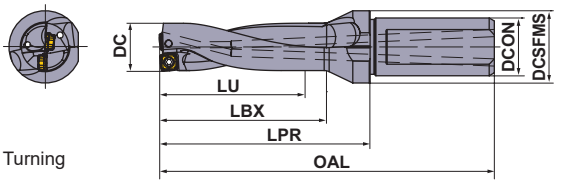
P M K N S H

Metric Standard

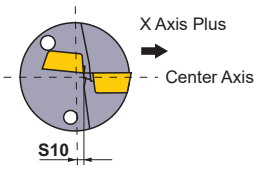
Internal Coolant

Machining Tolerance (Guide)(mm)

L/D	ø14—ø33	ø33.5—ø47	ø48—ø63
2, 3	+ 0.25 0	+ 0.3 0	+ 0.3 0
4, 5	+ 0.35 0	+ 0.4 0	+ 0.45 0
6	+ 0.45 0	+ 0.6 0	—



Maximum Offset for Turning



(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	Wrench
14.0	2	MVX1400X2F20	★	2	28	35	50	93	20	25	0.6	SO○X05	TPS20-1	TIP06F
	3	MVX1400X3F20	★	2	42	49	64	107	20	25	0.6	SO○X05	TPS20-1	TIP06F
	4	MVX1400X4F20	★	2	56	63	78	121	20	25	0.6	SO○X05	TPS20-1	TIP06F
	5	MVX1400X5F20	★	2	70	77	92	135	20	25	0.6	SO○X05	TPS20-1	TIP06F
14.5	2	MVX1450X2F20	★	2	29	36	51	94	20	25	0.5	SO○X05	TPS20-1	TIP06F
	3	MVX1450X3F20	★	2	43.5	50.5	65.5	108.5	20	25	0.5	SO○X05	TPS20-1	TIP06F
	4	MVX1450X4F20	★	2	58	65	80	123	20	25	0.5	SO○X05	TPS20-1	TIP06F
	5	MVX1450X5F20	★	2	72.5	79.5	94.5	137.5	20	25	0.5	SO○X05	TPS20-1	TIP06F
15.0	2	MVX1500X2F20	★	2	30	37	52	95	20	25	0.35	SO○X05	TPS20-1	TIP06F
	3	MVX1500X3F20	★	2	45	52	67	110	20	25	0.35	SO○X05	TPS20-1	TIP06F
	4	MVX1500X4F20	★	2	60	67	82	125	20	25	0.35	SO○X05	TPS20-1	TIP06F
	5	MVX1500X5F20	★	2	75	82	97	140	20	25	0.35	SO○X05	TPS20-1	TIP06F
15.5	2	MVX1550X2F20	★	2	31	38	53	96	20	25	0.3	SO○X05	TPS20-1	TIP06F
	3	MVX1550X3F20	★	2	46.5	53.5	68.5	111.5	20	25	0.3	SO○X05	TPS20-1	TIP06F
	4	MVX1550X4F20	★	2	62	69	84	127	20	25	0.3	SO○X05	TPS20-1	TIP06F
	5	MVX1550X5F20	★	2	77.5	84.5	99.5	142.5	20	25	0.3	SO○X05	TPS20-1	TIP06F
16.0	2	MVX1600X2F20	★	2	32	39	54	97	20	25	0.25	SO○X05	TPS20-1	TIP06F
	3	MVX1600X3F20	★	2	48	55	70	113	20	25	0.25	SO○X05	TPS20-1	TIP06F
	4	MVX1600X4F20	★	2	64	71	86	129	20	25	0.25	SO○X05	TPS20-1	TIP06F
	5	MVX1600X5F20	★	2	80	87	102	145	20	25	0.25	SO○X05	TPS20-1	TIP06F
16.5	2	MVX1650X2F20	★	2	33	40	55	98	20	25	0.25	SO○X05	TPS20-1	TIP06F
	3	MVX1650X3F20	★	2	49.5	56.5	71.5	114.5	20	25	0.25	SO○X05	TPS20-1	TIP06F
	4	MVX1650X4F20	★	2	66	73	88	131	20	25	0.25	SO○X05	TPS20-1	TIP06F
	5	MVX1650X5F20	★	2	82.5	89.5	104.5	147.5	20	25	0.25	SO○X05	TPS20-1	TIP06F
17.0	2	MVX1700X2F20	★	2	34	41	56	99	20	25	0.5	SO○X06	TPS25	TIP07F
	3	MVX1700X3F20	★	2	51	58	73	116	20	25	0.5	SO○X06	TPS25	TIP07F
	4	MVX1700X4F20	★	2	68	75	90	133	20	25	0.5	SO○X06	TPS25	TIP07F
	5	MVX1700X5F20	★	2	85	92	107	150	20	25	0.5	SO○X06	TPS25	TIP07F
	6	MVX1700X6F20	★	2	102	109	124	167	20	25	0.5	SO○X06	TPS25	TIP07F

*1 Clamp Torque (lbf-in) : TPS20-1=5.3, TPS25=8.9
*2 Number of Teeth

★ : Stocked in Japan

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	W F Wrench
17.5	2	MVX1750X2F25	★	2	35	42	62	112	25	32	0.45	SO○X06	TPS25	TIP07F
	3	MVX1750X3F25	★	2	52.5	59.5	79.5	129.5	25	32	0.45	SO○X06	TPS25	TIP07F
	4	MVX1750X4F25	★	2	70	77	97	147	25	32	0.45	SO○X06	TPS25	TIP07F
	5	MVX1750X5F25	★	2	87.5	94.5	114.5	164.5	25	32	0.45	SO○X06	TPS25	TIP07F
	6	MVX1750X6F25	★	2	105	112	132	182	25	32	0.45	SO○X06	TPS25	TIP07F
18.0	2	MVX1800X2F25	★	2	36	43	63	113	25	32	0.4	SO○X06	TPS25	TIP07F
	3	MVX1800X3F25	★	2	54	61	81	131	25	32	0.4	SO○X06	TPS25	TIP07F
	4	MVX1800X4F25	★	2	72	79	99	149	25	32	0.4	SO○X06	TPS25	TIP07F
	5	MVX1800X5F25	★	2	90	97	117	167	25	32	0.4	SO○X06	TPS25	TIP07F
	6	MVX1800X6F25	★	2	108	115	135	185	25	32	0.4	SO○X06	TPS25	TIP07F
18.5	2	MVX1850X2F25	★	2	37	44	64	114	25	32	0.35	SO○X06	TPS25	TIP07F
	3	MVX1850X3F25	★	2	55.5	62.5	82.5	132.5	25	32	0.35	SO○X06	TPS25	TIP07F
	4	MVX1850X4F25	★	2	74	81	101	151	25	32	0.35	SO○X06	TPS25	TIP07F
	5	MVX1850X5F25	★	2	92.5	99.5	119.5	169.5	25	32	0.35	SO○X06	TPS25	TIP07F
	6	MVX1850X6F25	★	2	111	118	138	188	25	32	0.35	SO○X06	TPS25	TIP07F
19.0	2	MVX1900X2F25	★	2	38	45	65	115	25	32	0.3	SO○X06	TPS25	TIP07F
	3	MVX1900X3F25	★	2	57	64	84	134	25	32	0.3	SO○X06	TPS25	TIP07F
	4	MVX1900X4F25	★	2	76	83	103	153	25	32	0.3	SO○X06	TPS25	TIP07F
	5	MVX1900X5F25	★	2	95	102	122	172	25	32	0.3	SO○X06	TPS25	TIP07F
	6	MVX1900X6F25	★	2	114	121	141	191	25	32	0.3	SO○X06	TPS25	TIP07F
19.5	2	MVX1950X2F25	★	2	39	46	66	116	25	32	0.25	SO○X06	TPS25	TIP07F
	3	MVX1950X3F25	★	2	58.5	65.5	85.5	135.5	25	32	0.25	SO○X06	TPS25	TIP07F
	4	MVX1950X4F25	★	2	78	85	105	155	25	32	0.25	SO○X06	TPS25	TIP07F
	5	MVX1950X5F25	★	2	97.5	104.5	124.5	174.5	25	32	0.25	SO○X06	TPS25	TIP07F
	6	MVX1950X6F25	★	2	117	124	144	194	25	32	0.25	SO○X06	TPS25	TIP07F
20.0	2	MVX2000X2F25	★	2	40	47	67	117	25	32	0.6	SO○X07	TPS3	TIP10W
	3	MVX2000X3F25	★	2	60	67	87	137	25	32	0.6	SO○X07	TPS3	TIP10W
	4	MVX2000X4F25	★	2	80	87	107	157	25	32	0.6	SO○X07	TPS3	TIP10W
	5	MVX2000X5F25	★	2	100	107	127	177	25	32	0.6	SO○X07	TPS3	TIP10W
	6	MVX2000X6F25	★	2	120	127	147	197	25	32	0.6	SO○X07	TPS3	TIP10W
20.5	2	MVX2050X2F25	★	2	41	48	68	118	25	32	0.55	SO○X07	TPS3	TIP10W
	3	MVX2050X3F25	★	2	61.5	68.5	88.5	138.5	25	32	0.55	SO○X07	TPS3	TIP10W
21.0	2	MVX2100X2F25	★	2	42	49	69	119	25	32	0.5	SO○X07	TPS3	TIP10W
	3	MVX2100X3F25	★	2	63	70	90	140	25	32	0.5	SO○X07	TPS3	TIP10W
	4	MVX2100X4F25	★	2	84	91	111	161	25	32	0.5	SO○X07	TPS3	TIP10W
	5	MVX2100X5F25	★	2	105	112	132	182	25	32	0.5	SO○X07	TPS3	TIP10W
	6	MVX2100X6F25	★	2	126	133	153	203	25	32	0.5	SO○X07	TPS3	TIP10W
21.5	2	MVX2150X2F25	★	2	43	50	70	120	25	32	0.45	SO○X07	TPS3	TIP10W
	3	MVX2150X3F25	★	2	64.5	71.5	91.5	141.5	25	32	0.45	SO○X07	TPS3	TIP10W
22.0	2	MVX2200X2F25	★	2	44	51	71	121	25	32	0.4	SO○X07	TPS3	TIP10W
	3	MVX2200X3F25	★	2	66	73	93	143	25	32	0.4	SO○X07	TPS3	TIP10W
	4	MVX2200X4F25	★	2	88	95	115	165	25	32	0.4	SO○X07	TPS3	TIP10W
	5	MVX2200X5F25	★	2	110	117	137	187	25	32	0.4	SO○X07	TPS3	TIP10W
	6	MVX2200X6F25	★	2	132	139	159	209	25	32	0.4	SO○X07	TPS3	TIP10W
22.5	2	MVX2250X2F25	★	2	45	52	72	122	25	32	0.35	SO○X07	TPS3	TIP10W
	3	MVX2250X3F25	★	2	67.5	74.5	94.5	144.5	25	32	0.35	SO○X07	TPS3	TIP10W

*1 Clamp Torque (lbf-in) : TPS25=8.9, TPS3=17.7

*2 Number of Teeth

ISO13399 ➤ L003

INSERTS ➤ L212

CUTTING CONDITIONS ➤ L213

USAGE NOTE ➤ L218

SPARE PARTS ➤ M001

MVX

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	*1 Wrench
23.0	2	MVX2300X2F25	★	2	46	53	73	123	25	32	0.8	SO○X08	TPS351	TIP10W
	3	MVX2300X3F25	★	2	69	76	96	146	25	32	0.8	SO○X08	TPS351	TIP10W
	4	MVX2300X4F25	★	2	92	99	119	169	25	32	0.8	SO○X08	TPS351	TIP10W
	5	MVX2300X5F25	★	2	115	122	142	192	25	32	0.8	SO○X08	TPS351	TIP10W
	6	MVX2300X6F25	★	2	138	145	165	215	25	32	0.8	SO○X08	TPS351	TIP10W
23.5	2	MVX2350X2F25	★	2	47	54	74	124	25	32	0.75	SO○X08	TPS351	TIP10W
	3	MVX2350X3F25	★	2	70.5	77.5	97.5	147.5	25	32	0.75	SO○X08	TPS351	TIP10W
24.0	2	MVX2400X2F25	★	2	48	55	75	125	25	32	0.7	SO○X08	TPS351	TIP10W
	3	MVX2400X3F25	★	2	72	79	99	149	25	32	0.7	SO○X08	TPS351	TIP10W
	4	MVX2400X4F25	★	2	96	103	123	173	25	32	0.7	SO○X08	TPS351	TIP10W
	5	MVX2400X5F25	★	2	120	127	147	197	25	32	0.7	SO○X08	TPS351	TIP10W
	6	MVX2400X6F25	★	2	144	151	171	221	25	32	0.7	SO○X08	TPS351	TIP10W
24.5	2	MVX2450X2F25	★	2	49	56	76	126	25	32	0.65	SO○X08	TPS351	TIP10W
	3	MVX2450X3F25	★	2	73.5	80.5	100.5	150.5	25	32	0.65	SO○X08	TPS351	TIP10W
25.0	2	MVX2500X2F25	★	2	50	57	77	127	25	32	0.6	SO○X08	TPS351	TIP10W
	3	MVX2500X3F25	★	2	75	82	102	152	25	32	0.6	SO○X08	TPS351	TIP10W
	4	MVX2500X4F25	★	2	100	107	127	177	25	32	0.6	SO○X08	TPS351	TIP10W
	5	MVX2500X5F25	★	2	125	132	152	202	25	32	0.6	SO○X08	TPS351	TIP10W
	6	MVX2500X6F25	★	2	150	157	177	227	25	32	0.6	SO○X08	TPS351	TIP10W
25.5	2	MVX2550X2F25	★	2	51	58	78	128	25	32	0.6	SO○X08	TPS351	TIP10W
	3	MVX2550X3F25	★	2	76.5	83.5	103.5	153.5	25	32	0.6	SO○X08	TPS351	TIP10W
26.0	2	MVX2600X2F32	★	2	52	59	79	134	32	42	0.5	SO○X08	TPS351	TIP10W
	3	MVX2600X3F32	★	2	78	85	105	160	32	42	0.5	SO○X08	TPS351	TIP10W
	4	MVX2600X4F32	★	2	104	111	131	186	32	42	0.5	SO○X08	TPS351	TIP10W
	5	MVX2600X5F32	★	2	130	137	157	212	32	42	0.5	SO○X08	TPS351	TIP10W
	6	MVX2600X6F32	★	2	156	163	183	238	32	42	0.5	SO○X08	TPS351	TIP10W
26.5	2	MVX2650X2F32	★	2	53	60	80	135	32	42	0.5	SO○X08	TPS351	TIP10W
	3	MVX2650X3F32	★	2	79.5	86.5	106.5	161.5	32	42	0.5	SO○X08	TPS351	TIP10W
27.0	2	MVX2700X2F32	★	2	54	61	81	136	32	42	0.45	SO○X08	TPS351	TIP10W
	3	MVX2700X3F32	★	2	81	88	108	163	32	42	0.45	SO○X08	TPS351	TIP10W
	4	MVX2700X4F32	★	2	108	115	135	190	32	42	0.45	SO○X08	TPS351	TIP10W
	5	MVX2700X5F32	★	2	135	142	162	217	32	42	0.45	SO○X08	TPS351	TIP10W
	6	MVX2700X6F32	★	2	162	169	189	244	32	42	0.45	SO○X08	TPS351	TIP10W
27.5	2	MVX2750X2F32	★	2	55	62	82	137	32	42	0.4	SO○X08	TPS351	TIP10W
	3	MVX2750X3F32	★	2	82.5	89.5	109.5	164.5	32	42	0.4	SO○X08	TPS351	TIP10W
28.0	2	MVX2800X2F32	★	2	56	63	83	138	32	42	0.85	SO○X09	TPS4	TIP15W
	3	MVX2800X3F32	★	2	84	91	111	166	32	42	0.85	SO○X09	TPS4	TIP15W
	4	MVX2800X4F32	★	2	112	119	139	194	32	42	0.85	SO○X09	TPS4	TIP15W
	5	MVX2800X5F32	★	2	140	147	167	222	32	42	0.85	SO○X09	TPS4	TIP15W
	6	MVX2800X6F32	★	2	168	175	195	250	32	42	0.85	SO○X09	TPS4	TIP15W
28.5	2	MVX2850X2F32	★	2	57	64	84	139	32	42	0.8	SO○X09	TPS4	TIP15W
	3	MVX2850X3F32	★	2	85.5	92.5	112.5	167.5	32	42	0.8	SO○X09	TPS4	TIP15W

*1 Clamp Torque (lbf-in) : TPS351=22, TPS4=31

*2 Number of Teeth

★ : Stocked in Japan

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	Wrench
	2	**MVX2900X2F32**	★	2	58	65	85	140	32	42	0.75	**SO○X09**	TPS4	TIP15W
	3	**MVX2900X3F32**	★	2	87	94	114	169	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.0	4	**MVX2900X4F32**	★	2	116	123	143	198	32	42	0.75	**SO○X09**	TPS4	TIP15W
	5	**MVX2900X5F32**	★	2	145	152	172	227	32	42	0.75	**SO○X09**	TPS4	TIP15W
	6	**MVX2900X6F32**	★	2	174	181	201	256	32	42	0.75	**SO○X09**	TPS4	TIP15W
29.5	2	**MVX2950X2F32**	★	2	59	66	86	141	32	42	0.7	**SO○X09**	TPS4	TIP15W
	3	**MVX2950X3F32**	★	2	88.5	95.5	115.5	170.5	32	42	0.7	**SO○X09**	TPS4	TIP15W
	2	**MVX3000X2F32**	★	2	60	67	87	142	32	42	0.65	**SO○X09**	TPS4	TIP15W
	3	**MVX3000X3F32**	★	2	90	97	117	172	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.0	4	**MVX3000X4F32**	★	2	120	127	147	202	32	42	0.65	**SO○X09**	TPS4	TIP15W
	5	**MVX3000X5F32**	★	2	150	157	177	232	32	42	0.65	**SO○X09**	TPS4	TIP15W
	6	**MVX3000X6F32**	★	2	180	187	207	262	32	42	0.65	**SO○X09**	TPS4	TIP15W
30.5	3	**MVX3050X3F32**	★	2	91.5	98.5	118.5	173.5	32	42	0.6	**SO○X09**	TPS4	TIP15W
	2	**MVX3100X2F40**	★	2	62	69	89	154	40	50	0.55	**SO○X09**	TPS4	TIP15W
	3	**MVX3100X3F40**	★	2	93	100	120	185	40	50	0.55	**SO○X09**	TPS4	TIP15W
31.0	4	**MVX3100X4F40**	★	2	124	131	151	216	40	50	0.55	**SO○X09**	TPS4	TIP15W
	5	**MVX3100X5F40**	★	2	155	162	182	247	40	50	0.55	**SO○X09**	TPS4	TIP15W
	6	**MVX3100X6F40**	★	2	186	193	213	278	40	50	0.55	**SO○X09**	TPS4	TIP15W
31.5	3	**MVX3150X3F40**	★	2	94.5	101.5	121.5	186.5	40	50	0.55	**SO○X09**	TPS4	TIP15W
	2	**MVX3200X2F40**	★	2	64	71	91	156	40	50	0.45	**SO○X09**	TPS4	TIP15W
	3	**MVX3200X3F40**	★	2	96	103	123	188	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.0	4	**MVX3200X4F40**	★	2	128	135	155	220	40	50	0.45	**SO○X09**	TPS4	TIP15W
	5	**MVX3200X5F40**	★	2	160	167	187	252	40	50	0.45	**SO○X09**	TPS4	TIP15W
	6	**MVX3200X6F40**	★	2	192	199	219	284	40	50	0.45	**SO○X09**	TPS4	TIP15W
32.5	3	**MVX3250X3F40**	★	2	97.5	104.5	124.5	189.5	40	50	0.45	**SO○X09**	TPS4	TIP15W
	2	**MVX3300X2F40**	★	2	66	73	93	158	40	50	0.4	**SO○X09**	TPS4	TIP15W
	3	**MVX3300X3F40**	★	2	99	106	126	191	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.0	4	**MVX3300X4F40**	★	2	132	139	159	224	40	50	0.4	**SO○X09**	TPS4	TIP15W
	5	**MVX3300X5F40**	★	2	165	172	192	257	40	50	0.4	**SO○X09**	TPS4	TIP15W
	6	**MVX3300X6F40**	★	2	198	205	225	290	40	50	0.4	**SO○X09**	TPS4	TIP15W
33.5	3	**MVX3350X3F40**	★	2	100.5	107.5	127.5	192.5	40	50	1.15	**SO○X11**	TPS43	TIP15W
	2	**MVX3400X2F40**	★	2	68	75	105	170	40	50	1.11	**SO○X11**	TPS43	TIP15W
	3	**MVX3400X3F40**	★	2	102	109	139	204	40	50	1.11	**SO○X11**	TPS43	TIP15W
34.0	4	**MVX3400X4F40**	★	2	136	143	173	238	40	50	1.11	**SO○X11**	TPS43	TIP15W
	5	**MVX3400X5F40**	★	2	170	177	207	272	40	50	1.11	**SO○X11**	TPS43	TIP15W
	6	**MVX3400X6F40**	★	2	204	211	241	306	40	50	1.1	**SO○X11**	TPS43	TIP15W
34.5	3	**MVX3450X3F40**	★	2	103.5	110.5	140.5	205.5	40	50	1.08	**SO○X11**	TPS43	TIP15W
	2	**MVX3500X2F40**	★	2	70	77	107	172	40	50	1.03	**SO○X11**	TPS43	TIP15W
	3	**MVX3500X3F40**	★	2	105	112	142	207	40	50	1.03	**SO○X11**	TPS43	TIP15W
35.0	4	**MVX3500X4F40**	★	2	140	147	177	242	40	50	1.03	**SO○X11**	TPS43	TIP15W
	5	**MVX3500X5F40**	★	2	175	182	212	277	40	50	1.03	**SO○X11**	TPS43	TIP15W
	6	**MVX3500X6F40**	★	2	210	217	247	312	40	50	1.02	**SO○X11**	TPS43	TIP15W

*1 Clamp Torque (lbf-in) : TPS4=31, TPS43=31

*2 Number of Teeth

ISO13399 ➤ L003
INSERTS ➤ L212
CUTTING CONDITIONS ➤ L213
USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	Wrench
35.5	3	**MVX3550X3F40**	★	2	106.5	113.5	143.5	208.5	40	50	0.99	**SO○X11**	TPS43	TIP15W
36.0	2	**MVX3600X2F40**	★	2	72	79	109	174	40	50	0.95	**SO○X11**	TPS43	TIP15W
	3	**MVX3600X3F40**	★	2	108	115	145	210	40	50	0.95	**SO○X11**	TPS43	TIP15W
	4	**MVX3600X4F40**	★	2	144	151	181	246	40	50	0.95	**SO○X11**	TPS43	TIP15W
	5	**MVX3600X5F40**	★	2	180	187	217	282	40	50	0.95	**SO○X11**	TPS43	TIP15W
	6	**MVX3600X6F40**	★	2	216	223	253	318	40	50	0.94	**SO○X11**	TPS43	TIP15W
37.0	2	**MVX3700X2F40**	★	2	74	81	111	176	40	50	0.87	**SO○X11**	TPS43	TIP15W
	3	**MVX3700X3F40**	★	2	111	118	148	213	40	50	0.87	**SO○X11**	TPS43	TIP15W
	4	**MVX3700X4F40**	★	2	148	155	185	250	40	50	0.87	**SO○X11**	TPS43	TIP15W
	5	**MVX3700X5F40**	★	2	185	192	222	287	40	50	0.87	**SO○X11**	TPS43	TIP15W
	6	**MVX3700X6F40**	★	2	222	229	259	324	40	50	0.86	**SO○X11**	TPS43	TIP15W
38.0	2	**MVX3800X2F40**	★	2	76	83	113	178	40	50	0.79	**SO○X11**	TPS43	TIP15W
	3	**MVX3800X3F40**	★	2	114	121	151	216	40	50	0.79	**SO○X11**	TPS43	TIP15W
	4	**MVX3800X4F40**	★	2	152	159	189	254	40	50	0.79	**SO○X11**	TPS43	TIP15W
	5	**MVX3800X5F40**	★	2	190	197	227	292	40	50	0.79	**SO○X11**	TPS43	TIP15W
	6	**MVX3800X6F40**	★	2	228	235	265	330	40	50	0.78	**SO○X11**	TPS43	TIP15W
39.0	2	**MVX3900X2F40**	★	2	78	85	115	180	40	50	0.71	**SO○X11**	TPS43	TIP15W
	3	**MVX3900X3F40**	★	2	117	124	154	219	40	50	0.71	**SO○X11**	TPS43	TIP15W
	4	**MVX3900X4F40**	★	2	156	163	193	258	40	50	0.71	**SO○X11**	TPS43	TIP15W
	5	**MVX3900X5F40**	★	2	195	202	232	297	40	50	0.71	**SO○X11**	TPS43	TIP15W
	6	**MVX3900X6F40**	★	2	234	241	271	336	40	50	0.7	**SO○X11**	TPS43	TIP15W
40.0	2	**MVX4000X2F40**	★	2	80	87	117	182	40	50	1.46	**SO○X13**	TPS43	TIP15W
	3	**MVX4000X3F40**	★	2	120	127	157	222	40	50	1.46	**SO○X13**	TPS43	TIP15W
	4	**MVX4000X4F40**	★	2	160	167	197	262	40	50	1.46	**SO○X13**	TPS43	TIP15W
	5	**MVX4000X5F40**	★	2	200	207	237	302	40	50	1.46	**SO○X13**	TPS43	TIP15W
	6	**MVX4000X6F40**	★	2	240	247	277	342	40	50	1.45	**SO○X13**	TPS43	TIP15W
41.0	2	**MVX4100X2F40**	★	2	82	89	119	184	40	50	1.36	**SO○X13**	TPS43	TIP15W
	3	**MVX4100X3F40**	★	2	123	130	160	225	40	50	1.36	**SO○X13**	TPS43	TIP15W
	4	**MVX4100X4F40**	★	2	164	171	201	266	40	50	1.36	**SO○X13**	TPS43	TIP15W
	5	**MVX4100X5F40**	★	2	205	212	242	307	40	50	1.36	**SO○X13**	TPS43	TIP15W
	6	**MVX4100X6F40**	★	2	246	253	283	348	40	50	1.35	**SO○X13**	TPS43	TIP15W
42.0	2	**MVX4200X2F40**	★	2	84	91	121	186	40	50	1.27	**SO○X13**	TPS43	TIP15W
	3	**MVX4200X3F40**	★	2	126	133	163	228	40	50	1.27	**SO○X13**	TPS43	TIP15W
	4	**MVX4200X4F40**	★	2	168	175	205	270	40	63	1.27	**SO○X13**	TPS43	TIP15W
	4	**MVX4200X4F50**	★	2	168	175	205	280	50	63	1.27	**SO○X13**	TPS43	TIP15W
	5	**MVX4200X5F40**	★	2	210	217	247	312	40	63	1.27	**SO○X13**	TPS43	TIP15W
	5	**MVX4200X5F50**	★	2	210	217	247	322	50	63	1.27	**SO○X13**	TPS43	TIP15W
	6	**MVX4200X6F40**	★	2	252	259	289	354	40	63	1.27	**SO○X13**	TPS43	TIP15W
	6	**MVX4200X6F50**	★	2	252	259	289	364	50	63	1.26	**SO○X13**	TPS43	TIP15W

*1 Clamp Torque (lbf-in) : TPS43=31

*2 Number of Teeth

★ : **Stocked in Japan**

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	W D Wrench
43.0	2	**MVX4300X2F40**	★	2	86	93	123	188	40	50	1.18	**SO○X13**	TPS43	TIP15W
	3	**MVX4300X3F40**	★	2	129	136	166	231	40	50	1.18	**SO○X13**	TPS43	TIP15W
	4	**MVX4300X4F40**	★	2	172	179	209	274	40	63	1.18	**SO○X13**	TPS43	TIP15W
	4	**MVX4300X4F50**	★	2	172	179	209	284	50	63	1.18	**SO○X13**	TPS43	TIP15W
	5	**MVX4300X5F40**	★	2	215	222	252	317	40	63	1.18	**SO○X13**	TPS43	TIP15W
	5	**MVX4300X5F50**	★	2	215	222	252	327	50	63	1.18	**SO○X13**	TPS43	TIP15W
	6	**MVX4300X6F40**	★	2	258	265	295	360	40	63	1.17	**SO○X13**	TPS43	TIP15W
	6	**MVX4300X6F50**	★	2	258	265	295	370	50	63	1.17	**SO○X13**	TPS43	TIP15W
44.0	2	**MVX4400X2F40**	★	2	88	95	125	190	40	50	1.08	**SO○X13**	TPS43	TIP15W
	3	**MVX4400X3F40**	★	2	132	139	169	234	40	50	1.08	**SO○X13**	TPS43	TIP15W
	4	**MVX4400X4F40**	★	2	176	183	213	278	40	63	1.08	**SO○X13**	TPS43	TIP15W
	4	**MVX4400X4F50**	★	2	176	183	213	288	50	63	1.08	**SO○X13**	TPS43	TIP15W
	5	**MVX4400X5F40**	★	2	220	227	257	322	40	63	1.08	**SO○X13**	TPS43	TIP15W
	5	**MVX4400X5F50**	★	2	220	227	257	332	50	63	1.08	**SO○X13**	TPS43	TIP15W
45.0	2	**MVX4500X2F40**	★	2	90	97	127	192	40	50	0.99	**SO○X13**	TPS43	TIP15W
	3	**MVX4500X3F40**	★	2	135	142	172	237	40	50	0.99	**SO○X13**	TPS43	TIP15W
	4	**MVX4500X4F40**	★	2	180	187	217	282	40	63	0.99	**SO○X13**	TPS43	TIP15W
	4	**MVX4500X4F50**	★	2	180	187	217	292	50	63	0.99	**SO○X13**	TPS43	TIP15W
	5	**MVX4500X5F40**	★	2	225	232	262	327	40	63	0.99	**SO○X13**	TPS43	TIP15W
	5	**MVX4500X5F50**	★	2	225	232	262	337	50	63	0.99	**SO○X13**	TPS43	TIP15W
46.0	2	**MVX4600X2F40**	★	2	92	99	129	194	40	50	0.89	**SO○X13**	TPS43	TIP15W
	3	**MVX4600X3F40**	★	2	138	145	175	240	40	50	0.89	**SO○X13**	TPS43	TIP15W
	4	**MVX4600X4F40**	★	2	184	191	221	286	40	63	0.89	**SO○X13**	TPS43	TIP15W
	4	**MVX4600X4F50**	★	2	184	191	221	296	50	63	0.89	**SO○X13**	TPS43	TIP15W
	5	**MVX4600X5F40**	★	2	230	237	267	332	40	63	0.89	**SO○X13**	TPS43	TIP15W
	5	**MVX4600X5F50**	★	2	230	237	267	342	50	63	0.89	**SO○X13**	TPS43	TIP15W
47.0	2	**MVX4700X2F40**	★	2	94	101	141	206	40	63	1.9	**SO○X16**	TPS54	TIP25D
	3	**MVX4700X3F40**	★	2	141	148	188	253	40	63	1.9	**SO○X16**	TPS54	TIP25D
	4	**MVX4700X4F40**	★	2	188	195	235	300	40	63	1.9	**SO○X16**	TPS54	TIP25D
	4	**MVX4700X4F50**	★	2	188	195	235	310	50	63	1.9	**SO○X16**	TPS54	TIP25D
	5	**MVX4700X5F40**	★	2	235	242	282	347	40	63	1.9	**SO○X16**	TPS54	TIP25D
	5	**MVX4700X5F50**	★	2	235	242	282	357	50	63	1.9	**SO○X16**	TPS54	TIP25D
48.0	2	**MVX4800X2F40**	★	2	96	103	143	208	40	63	1.8	**SO○X16**	TPS54	TIP25D
	3	**MVX4800X3F40**	★	2	144	151	191	256	40	63	1.8	**SO○X16**	TPS54	TIP25D
	4	**MVX4800X4F40**	★	2	192	199	239	304	40	63	1.8	**SO○X16**	TPS54	TIP25D
	4	**MVX4800X4F50**	★	2	192	199	239	314	50	63	1.8	**SO○X16**	TPS54	TIP25D
	5	**MVX4800X5F40**	★	2	240	247	287	352	40	63	1.8	**SO○X16**	TPS54	TIP25D
	5	**MVX4800X5F50**	★	2	240	247	287	362	50	63	1.8	**SO○X16**	TPS54	TIP25D
49.0	2	**MVX4900X2F40**	★	2	98	105	145	210	40	63	1.7	**SO○X16**	TPS54	TIP25D
	3	**MVX4900X3F40**	★	2	147	154	194	259	40	63	1.7	**SO○X16**	TPS54	TIP25D
	4	**MVX4900X4F40**	★	2	196	203	243	308	40	63	1.7	**SO○X16**	TPS54	TIP25D
	4	**MVX4900X4F50**	★	2	196	203	243	318	50	63	1.7	**SO○X16**	TPS54	TIP25D
	5	**MVX4900X5F40**	★	2	245	252	292	357	40	63	1.7	**SO○X16**	TPS54	TIP25D
	5	**MVX4900X5F50**	★	2	245	252	292	367	50	63	1.7	**SO○X16**	TPS54	TIP25D

*1 Clamp Torque (lbf-in) : TPS43=31, TPS54=66

*2 Number of Teeth

ISO13399 ➤ L003
INSERTS ➤ L212
CUTTING CONDITIONS ➤ L213
USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	Wrench
50.0	2	MVX5000X2F40	★	2	100	107	147	212	40	63	1.6	SO○X16	TPS54	TIP25D
	3	MVX5000X3F40	★	2	150	157	197	262	40	63	1.6	SO○X16	TPS54	TIP25D
	4	MVX5000X4F40	★	2	200	207	247	312	40	63	1.6	SO○X16	TPS54	TIP25D
	4	MVX5000X4F50	★	2	200	207	247	322	50	63	1.6	SO○X16	TPS54	TIP25D
	5	MVX5000X5F40	★	2	250	257	297	362	40	63	1.6	SO○X16	TPS54	TIP25D
	5	MVX5000X5F50	★	2	250	257	297	372	50	63	1.6	SO○X16	TPS54	TIP25D
51.0	2	MVX5100X2F40	★	2	102	109	149	214	40	63	1.5	SO○X16	TPS54	TIP25D
	3	MVX5100X3F40	★	2	153	160	200	265	40	63	1.5	SO○X16	TPS54	TIP25D
	4	MVX5100X4F40	★	2	204	211	251	316	40	63	1.5	SO○X16	TPS54	TIP25D
	4	MVX5100X4F50	★	2	204	211	251	326	50	63	1.5	SO○X16	TPS54	TIP25D
	5	MVX5100X5F40	★	2	255	262	302	367	40	63	1.5	SO○X16	TPS54	TIP25D
	5	MVX5100X5F50	★	2	255	262	302	377	50	63	1.5	SO○X16	TPS54	TIP25D
52.0	2	MVX5200X2F40	★	2	104	111	151	216	40	63	1.39	SO○X16	TPS54	TIP25D
	3	MVX5200X3F40	★	2	156	163	203	268	40	63	1.39	SO○X16	TPS54	TIP25D
	4	MVX5200X4F40	★	2	208	215	255	320	40	63	1.39	SO○X16	TPS54	TIP25D
	4	MVX5200X4F50	★	2	208	215	255	330	50	63	1.39	SO○X16	TPS54	TIP25D
	5	MVX5200X5F40	★	2	260	267	307	372	40	63	1.39	SO○X16	TPS54	TIP25D
	5	MVX5200X5F50	★	2	260	267	307	382	50	63	1.39	SO○X16	TPS54	TIP25D
53.0	2	MVX5300X2F40	★	2	106	113	153	218	40	63	1.29	SO○X16	TPS54	TIP25D
	3	MVX5300X3F40	★	2	159	166	206	271	40	63	1.29	SO○X16	TPS54	TIP25D
	4	MVX5300X4F40	★	2	212	219	259	324	40	63	1.29	SO○X16	TPS54	TIP25D
	4	MVX5300X4F50	★	2	212	219	259	334	50	63	1.29	SO○X16	TPS54	TIP25D
	5	MVX5300X5F40	★	2	265	272	312	377	40	63	1.29	SO○X16	TPS54	TIP25D
	5	MVX5300X5F50	★	2	265	272	312	387	50	63	1.29	SO○X16	TPS54	TIP25D
54.0	2	MVX5400X2F40	★	2	108	115	155	220	40	63	1.19	SO○X16	TPS54	TIP25D
	3	MVX5400X3F40	★	2	162	169	209	274	40	63	1.19	SO○X16	TPS54	TIP25D
	4	MVX5400X4F40	★	2	216	223	263	328	40	63	1.19	SO○X16	TPS54	TIP25D
	4	MVX5400X4F50	★	2	216	223	263	338	50	63	1.19	SO○X16	TPS54	TIP25D
	5	MVX5400X5F40	★	2	270	277	317	382	40	63	1.19	SO○X16	TPS54	TIP25D
	5	MVX5400X5F50	★	2	270	277	317	392	50	63	1.19	SO○X16	TPS54	TIP25D
55.0	2	MVX5500X2F40	★	2	110	117	157	222	40	63	1.08	SO○X16	TPS54	TIP25D
	3	MVX5500X3F40	★	2	165	172	212	277	40	63	1.08	SO○X16	TPS54	TIP25D
	4	MVX5500X4F40	★	2	220	227	267	332	40	63	1.08	SO○X16	TPS54	TIP25D
	4	MVX5500X4F50	★	2	220	227	267	342	50	63	1.08	SO○X16	TPS54	TIP25D
	5	MVX5500X5F40	★	2	275	282	322	387	40	63	1.08	SO○X16	TPS54	TIP25D
	5	MVX5500X5F50	★	2	275	282	322	397	50	63	1.08	SO○X16	TPS54	TIP25D
56.0	2	MVX5600X2F40	★	2	112	119	159	224	40	63	0.98	SO○X16	TPS54	TIP25D
	3	MVX5600X3F40	★	2	168	175	215	280	40	63	0.98	SO○X16	TPS54	TIP25D
	4	MVX5600X4F40	★	2	224	231	271	336	40	63	0.98	SO○X16	TPS54	TIP25D
	4	MVX5600X4F50	★	2	224	231	271	346	50	63	0.98	SO○X16	TPS54	TIP25D
	5	MVX5600X5F40	★	2	280	287	327	392	40	63	0.98	SO○X16	TPS54	TIP25D
	5	MVX5600X5F50	★	2	280	287	327	402	50	63	0.98	SO○X16	TPS54	TIP25D

*1 Clamp Torque (lbf-in) : TPS54=66

*2 Number of Teeth

★ : Stocked in Japan

(mm)

DC	L/D	Order Number	Stock	*2 No.T	LU	LBX	LPR	OAL	DCON	DCSFMS	S10	Insert Type	*1 Clamp Screw	Wrench
57.0	2	MVX5700X2F40	★	2	114	121	161	226	40	68	1.47	SO○X18	TPS54	TIP25D
	3	MVX5700X3F40	★	2	171	178	218	283	40	68	1.47	SO○X18	TPS54	TIP25D
	4	MVX5700X4F40	★	2	228	235	275	340	40	68	1.47	SO○X18	TPS54	TIP25D
	4	MVX5700X4F50	★	2	228	235	275	350	50	68	1.47	SO○X18	TPS54	TIP25D
	5	MVX5700X5F40	★	2	285	292	332	397	40	68	1.47	SO○X18	TPS54	TIP25D
	5	MVX5700X5F50	★	2	285	292	332	407	50	68	1.47	SO○X18	TPS54	TIP25D
58.0	2	MVX5800X2F40	★	2	116	123	163	228	40	68	1.37	SO○X18	TPS54	TIP25D
	3	MVX5800X3F40	★	2	174	181	221	286	40	68	1.37	SO○X18	TPS54	TIP25D
	4	MVX5800X4F40	★	2	232	239	279	344	40	68	1.37	SO○X18	TPS54	TIP25D
	4	MVX5800X4F50	★	2	232	239	279	354	50	68	1.37	SO○X18	TPS54	TIP25D
	5	MVX5800X5F40	★	2	290	297	337	402	40	68	1.37	SO○X18	TPS54	TIP25D
	5	MVX5800X5F50	★	2	290	297	337	412	50	68	1.37	SO○X18	TPS54	TIP25D
59.0	2	MVX5900X2F40	★	2	118	125	165	230	40	68	1.26	SO○X18	TPS54	TIP25D
	3	MVX5900X3F40	★	2	177	184	224	289	40	68	1.26	SO○X18	TPS54	TIP25D
	4	MVX5900X4F40	★	2	236	243	283	348	40	68	1.26	SO○X18	TPS54	TIP25D
	4	MVX5900X4F50	★	2	236	243	283	358	50	68	1.26	SO○X18	TPS54	TIP25D
	5	MVX5900X5F40	★	2	295	302	342	407	40	68	1.26	SO○X18	TPS54	TIP25D
	5	MVX5900X5F50	★	2	295	302	342	417	50	68	1.26	SO○X18	TPS54	TIP25D
60.0	2	MVX6000X2F40	★	2	120	127	167	232	40	68	1.16	SO○X18	TPS54	TIP25D
	3	MVX6000X3F40	★	2	180	187	227	292	40	68	1.16	SO○X18	TPS54	TIP25D
	4	MVX6000X4F40	★	2	240	247	287	352	40	68	1.16	SO○X18	TPS54	TIP25D
	4	MVX6000X4F50	★	2	240	247	287	362	50	68	1.16	SO○X18	TPS54	TIP25D
	5	MVX6000X5F40	★	2	300	307	347	412	40	68	1.16	SO○X18	TPS54	TIP25D
	5	MVX6000X5F50	★	2	300	307	347	422	50	68	1.16	SO○X18	TPS54	TIP25D
61.0	2	MVX6100X2F40	★	2	122	129	169	234	40	68	1.05	SO○X18	TPS54	TIP25D
	3	MVX6100X3F40	★	2	183	190	230	295	40	68	1.05	SO○X18	TPS54	TIP25D
	4	MVX6100X4F40	★	2	244	251	291	356	40	68	1.05	SO○X18	TPS54	TIP25D
	4	MVX6100X4F50	★	2	244	251	291	366	50	68	1.05	SO○X18	TPS54	TIP25D
	5	MVX6100X5F40	★	2	305	312	352	417	40	68	1.05	SO○X18	TPS54	TIP25D
	5	MVX6100X5F50	★	2	305	312	352	427	50	68	1.05	SO○X18	TPS54	TIP25D
62.0	2	MVX6200X2F40	★	2	124	131	171	236	40	68	0.95	SO○X18	TPS54	TIP25D
	3	MVX6200X3F40	★	2	186	193	233	298	40	68	0.95	SO○X18	TPS54	TIP25D
	4	MVX6200X4F40	★	2	248	255	295	360	40	68	0.95	SO○X18	TPS54	TIP25D
	4	MVX6200X4F50	★	2	248	255	295	370	50	68	0.95	SO○X18	TPS54	TIP25D
	5	MVX6200X5F40	★	2	310	317	357	422	40	68	0.95	SO○X18	TPS54	TIP25D
	5	MVX6200X5F50	★	2	310	317	357	432	50	68	0.95	SO○X18	TPS54	TIP25D
63.0	2	MVX6300X2F40	★	2	126	133	173	238	40	68	0.85	SO○X18	TPS54	TIP25D
	3	MVX6300X3F40	★	2	189	196	236	301	40	68	0.85	SO○X18	TPS54	TIP25D
	4	MVX6300X4F40	★	2	252	259	299	364	40	68	0.85	SO○X18	TPS54	TIP25D
	4	MVX6300X4F50	★	2	252	259	299	374	50	68	0.85	SO○X18	TPS54	TIP25D
	5	MVX6300X5F40	★	2	315	322	362	427	40	68	0.85	SO○X18	TPS54	TIP25D
	5	MVX6300X5F50	★	2	315	322	362	437	50	68	0.85	SO○X18	TPS54	TIP25D

*1 Clamp Torque (lbf-in) : TPS54=66

*2 Number of Teeth

ISO13399 ➤ L003
INSERTS ➤ L212
CUTTING CONDITIONS ➤ L213
USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX

INSERTS

(mm)

Shape	Drill Dia.	Order Number	IC	S	RE	Coated					Geometry
						MC5020	MC1020	VP15TF	DP8020	TF15	
UM	ø14—ø16.5	**SOMX052704-UM**	5	2.7	0.4	●	●	●			ø.14—ø16.5
	ø17—ø19.5	**SOMX063005-UM**	6	3	0.5	●	●	●			
	ø20—ø22.5	**SOMX073505-UM**	7	3.5	0.5	●	●	●			
	ø23—ø27.5	**SOMX084005-UM**	8.3	4	0.5	●	●	●			
	ø28—ø33	**SOMX094506-UM**	9.7	4.5	0.6	●	●	●			
	ø33.5—ø39	**SOMX115506-UM**	11.6	5.5	0.6	●	●	●			ø17—ø63
	ø40—ø46	**SOMX136008-UM**	13.8	6	0.8	●	●	●			
	ø47—ø56	**SOMX166508-UM**	16.5	6.5	0.8	●	●	●			
General Purpose	ø57—ø63	**SOMX187008-UM**	18.2	7	0.8	●	●	●			
US	ø17—ø19.5	**SOMX063005-US**	6	3	0.5			●			
	ø20—ø22.5	**SOMX073505-US**	7	3.5	0.5			●			
	ø23—ø27.5	**SOMX084005-US**	8.3	4	0.5			●			
	ø28—ø33	**SOMX094506-US**	9.7	4.5	0.6			●			
	ø33.5—ø39	**SOMX115506-US**	11.6	5.5	0.6			●			
	ø40—ø46	**SOMX136008-US**	13.8	6	0.8			●			
	ø47—ø56	**SOMX166508-US**	16.5	6.5	0.8			●			
For Stainless Steel and Inner Edge	ø57—ø63	**SOMX187008-US**	18.2	7	0.8			●			
UH	ø17—ø19.5	**SOMX062905-UH**	6	2.9	0.5				●		
	ø20—ø22.5	**SOMX073405-UH**	7	3.4	0.5				●		
	ø23—ø27.5	**SOMX083905-UH**	8.3	3.9	0.5				●		
	ø28—ø33	**SOMX094406-UH**	9.7	4.4	0.6				●		
	ø33.5—ø39	**SOMX115406-UH**	11.6	5.4	0.6				●		
	ø40—ø46	**SOMX135908-UH**	13.8	5.9	0.8				●		
	ø47—ø56	**SOMX166408-UH**	16.5	6.4	0.8				●		
Strong Cutting Edge Type and Inner Edge	ø57—ø63	**SOMX186908-UH**	18.2	6.9	0.8				●		
UN	ø17—ø19.5	**SOGX063005-UN**	6	3	0.5					●	
	ø20—ø22.5	**SOGX073505-UN**	7	3.5	0.5					●	
	ø23—ø27.5	**SOGX084005-UN**	8.3	4	0.5					●	
	ø28—ø33	**SOGX094506-UN**	9.7	4.5	0.6					●	
	ø33.5—ø39	**SOGX115506-UN**	11.6	5.5	0.6					●	
	ø40—ø46	**SOGX136008-UN**	13.8	6	0.8					●	
	ø47—ø56	**SOGX166508-UN**	16.5	6.5	0.8					●	
For Aluminum Alloy	ø57—ø63	**SOGX187008-UN**	18.2	7	0.8					●	

Note 1) MC1020 and MC5020 are made exclusively for use as an outer insert.

INSERT RECOMMENDATION

		1st Recommendation		When outer insert fractures	
		Outer Insert	Inner Insert	Outer Insert	Inner Insert
P	Mild Steel, Alloy Steel	MC1020	VP15TF	VP15TF	VP15TF
		UM Breaker	**UM Breaker**	**UM Breaker**	**UM Breaker**
M	Stainless Steel	MC1020	VP15TF	VP15TF	VP15TF
		UM Breaker	**US Breaker**	**UM Breaker**	**US Breaker**
K	Cast Iron	MC5020	VP15TF	VP15TF	VP15TF
		UM Breaker	**UM Breaker**	**UM Breaker**	**UM Breaker**

		1st Recommendation		When outer insert fractures	
		Outer Insert	Inner Insert	Outer Insert	Inner Insert
H	Hardened Steel	MC1020	DP8020	VP15TF	DP8020
		UM Breaker	**UH Breaker**	**UM Breaker**	**UH Breaker**
N	Aluminum Alloy	TF15	TF15		
		UN Breaker	**UN Breaker**		

● : **USA Stock**
<10 inserts in one case>

RECOMMENDED CUTTING CONDITIONS

(inch)

	Workpiece Material	Properties	Cutting Speed **vc** (SFM)	Inner Chip Breaker	**ϕ.562"—ϕ.656" ϕ14.0—ϕ16.5mm** Feed **fr** (IPR)		
			L/D=2—6		L/D=2, 3	L/D=4	L/D=5
P	Mild Steel	≤180HB	655 (590—770)	UM	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0020 (.0016—.0024)
				UH	—	—	—
	Carbon Steel, Alloy Steel	180—280HB	460 (375—590)	UM	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0031 (.0024—.0035)
				UH	—	—	—
	Carbon Steel, Alloy Steel	280—350HB	330 (245—460)	UM	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0031 (.0024—.0035)
				UH	—	—	—
	Alloy Tool Steel	≤350HB	440 (330—560)	UM	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0031 (.0024—.0035)
				UH	—	—	—
M	Austenitic Stainless Steel	≤200HB	425 (260—590)	US	—	—	—
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)
	Austenitic Stainless Steel	>200HB	425 (260—590)	US	—	—	—
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)
	Ferritic and Martensitic Stainless Steel	≤200HB	395 (260—540)	US	—	—	—
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)
	Ferritic and Martensitic Stainless Steel	>200HB	395 (260—540)	US	—	—	—
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)
K	Gray Cast Iron	Tensile Strength ≤350MPa	525 (425—640)	UM	.0039 (.0024—.0055)	.0031 (.0024—.0039)	.0031 (.0024—.0039)
	Ductile Cast Iron	Tensile Strength ≤450MPa	330 (260—440)	UM	.0039 (.0024—.0055)	.0031 (.0024—.0039)	.0031 (.0024—.0039)
	Ductile Cast Iron	Tensile Strength ≤800MPa	330 (230—410)	UM	.0031 (.0024—.0047)	.0028 (.0024—.0031)	.0028 (.0024—.0031)
N	Aluminum Alloy	Si<5%	655 (330—1150)	UN	—	—	—
	Aluminum Alloy	5%≤Si≤10%	490 (330—655)	UN	—	—	—
	Aluminum Alloy	Si>10%	490 (330—655)	UN	—	—	—
H	Hardened Steel	38—45HRC	165 (100—260)	UH	—	—	—

Note 1) Reduce the cutting speed by around 30% when using VP15TF for outer insert.
Note 2) Recommend maximum drilling depth L/D≤3 for using outer coolant system.
Note 3) Spindle through & high pressure coolant system is recommended to make stable holes for stainless steel.

USAGE NOTE ➤ L218
SPARE PARTS ➤ M001

MVX

RECOMMENDED CUTTING CONDITIONS

	Workpiece Material	Properties	Cutting Speed **vc** (SFM)	Inner Chip Breaker	**ϕ.687"—ϕ.750" ϕ17.0—ϕ19.5mm** Feed **fr** (IPR)			
			L/D=2—6		L/D=2, 3	L/D=4	L/D=5	L/D=6
P	Mild Steel	≤180HB	655 (590—770)	UM	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0016 (.0016—.0020)
				UH				
	Carbon Steel, Alloy Steel	180—280HB	460 (375—590)	UM	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0031 (.0024—.0035)	.0020 (.0016—.0024)
				UH				
	Carbon Steel, Alloy Steel	280—350HB	330 (245—460)	UM	.0031 (.0024—.0055)	.0031 (.0024—.0035)	.0031 (.0024—.0035)	.0020 (.0016—.0024)
				UH				
	Alloy Tool Steel	≤350HB	440 (330—560)	UM	.0024 (.0024—.0055)	.0031 (.0024—.0035)	.0031 (.0024—.0035)	.0020 (.0016—.0024)
				UH				
M	Austenitic Stainless Steel	≤200HB	425 (260—590)	US	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0024 (.0016—.0031)	.0020 (.0016—.0024)
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0016 (.0016—.0020)
	Austenitic Stainless Steel	>200HB	425 (260—590)	US	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0024 (.0016—.0031)	.0020 (.0016—.0024)
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0016 (.0016—.0020)
	Ferritic and Martensitic Stainless Steel	≤200HB	395 (260—540)	US	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0024 (.0016—.0031)	.0020 (.0016—.0024)
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0016 (.0016—.0020)
	Ferritic and Martensitic Stainless Steel	>200HB	395 (260—540)	US	.0031 (.0024—.0047)	.0024 (.0016—.0031)	.0024 (.0016—.0031)	.0020 (.0016—.0024)
				UM	.0024 (.0016—.0031)	.0020 (.0016—.0024)	.0020 (.0016—.0024)	.0016 (.0016—.0020)
K	Gray Cast Iron	Tensile Strength ≤350MPa	525 (425—640)	UM	.0043 (.0031—.0055)	.0035 (.0031—.0039)	.0035 (.0031—.0039)	.0020 (.0016—.0024)
	Ductile Cast Iron	Tensile Strength ≤450MPa	330 (260—440)	UM	.0043 (.0031—.0055)	.0035 (.0031—.0039)	.0035 (.0031—.0039)	.0020 (.0016—.0024)
	Ductile Cast Iron	Tensile Strength ≤800MPa	330 (230—410)	UM	.0043 (.0031—.0055)	.0035 (.0031—.0039)	.0035 (.0031—.0039)	.0020 (.0016—.0024)
N	Aluminum Alloy	Si<5%	655 (330—1150)	UN	.0048 (.0020—.0072)	.0048 (.0020—.0072)	.0048 (.0020—.0072)	.0032 (.0020—.0048)
	Aluminum Alloy	5%≤Si≤10%	490 (330—655)	UN	.0048 (.0020—.0072)	.0048 (.0020—.0072)	.0048 (.0020—.0072)	.0032 (.0020—.0048)
	Aluminum Alloy	Si>10%	490 (330—655)	UN	.0048 (.0020—.0072)	.0048 (.0020—.0072)	.0048 (.0020—.0072)	.0032 (.0020—.0048)
H	Hardened Steel	38—45HRC	165 (100—260)	UH	.0032 (.0016—.0048)	.0024 (.0016—.0036)	—	—

Note 1) Reduce the cutting speed by around 30% when using VP15TF for outer insert.
Note 2) Recommend maximum drilling depth L/D≤3 for using outer coolant system.
Note 3) Spindle through & high pressure coolant system is recommended to make stable holes for stainless steel.

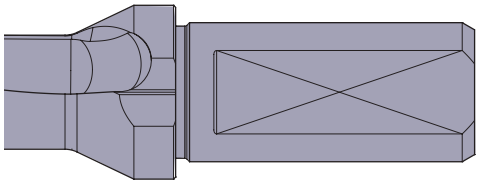
(inch)

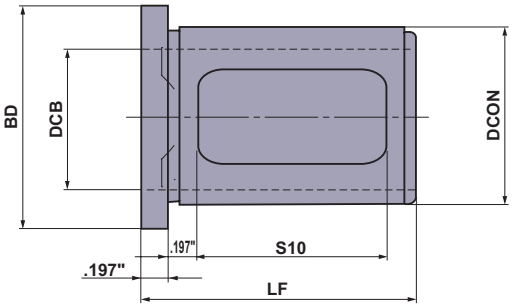
	ϕ.812"—ϕ.937" ϕ20.0—ϕ23.5mm				ϕ1.000"—ϕ1.125" ϕ24.0—ϕ29.5mm				ϕ1.187"—ϕ2.500" ϕ30.0—ϕ63mm			
	Feed **fr** (IPR)				Feed **fr** (IPR)				Feed **fr** (IPR)			
	L/D=2, 3	L/D=4	L/D=5	L/D=6	L/D=2, 3	L/D=4	L/D=5	L/D=6	L/D=2, 3	L/D=4	L/D=5	L/D=6
	.0024 (.0016–.0031)	.0024 (.0016–.0028)	.0024 (.0016–.0028)	.0016 (.0016–.0020)	.0028 (.0016–.0031)	.0024 (.0016–.0028)	.0024 (.0016–.0028)	.0020 (.0016–.0024)	.0031 (.0024–.0039)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)
	.0039 (.0024–.0071)	.0035 (.0024–.0047)	.0035 (.0024–.0047)	.0028 (.0024–.0031)	.0047 (.0031–.0071)	.0039 (.0031–.0047)	.0039 (.0031–.0047)	.0035 (.0031–.0039)	.0055 (.0031–.0094)	.0047 (.0031–.0063)	.0047 (.0031–.0063)	.0043 (.0039–.0047)
	.0039 (.0024–.0071)	.0035 (.0024–.0047)	.0035 (.0024–.0047)	.0028 (.0024–.0031)	.0047 (.0031–.0071)	.0039 (.0031–.0047)	.0039 (.0031–.0047)	.0035 (.0031–.0039)	.0055 (.0031–.0094)	.0047 (.0031–.0063)	.0047 (.0031–.0063)	.0043 (.0039–.0047)
	.0039 (.0024–.0071)	.0035 (.0024–.0047)	.0035 (.0024–.0047)	.0028 (.0024–.0031)	.0047 (.0031–.0071)	.0039 (.0031–.0047)	.0039 (.0031–.0047)	.0035 (.0031–.0039)	.0055 (.0031–.0094)	.0047 (.0031–.0063)	.0047 (.0031–.0063)	.0039 (.0031–.0047)
	.0039 (.0024–.0055)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)	.0039 (.0024–.0055)	.0031 (.0024–.0039)	.0031 (.0024–.0039)	.0028 (.0024–.0031)	.0039 (.0024–.0055)	.0035 (.0024–.0047)	.0035 (.0024–.0047)	.0028 (.0024–.0039)
	.0039 (.0024–.0047)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)	.0035 (.0024–.0047)	.0028 (.0024–.0035)	.0028 (.0024–.0035)	.0024 (.0024–.0031)	.0035 (.0024–.0047)	.0031 (.0024–.0039)	.0031 (.0024–.0039)	.0028 (.0024–.0031)
	.0039 (.0024–.0055)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)	.0039 (.0024–.0055)	.0031 (.0024–.0039)	.0031 (.0024–.0039)	.0028 (.0024–.0031)	.0039 (.0024–.0055)	.0035 (.0024–.0047)	.0035 (.0024–.0047)	.0028 (.0024–.0039)
	.0039 (.0024–.0047)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)	.0035 (.0024–.0047)	.0028 (.0024–.0035)	.0028 (.0024–.0035)	.0024 (.0024–.0031)	.0035 (.0024–.0047)	.0031 (.0024–.0039)	.0031 (.0024–.0039)	.0028 (.0024–.0031)
	.0039 (.0024–.0055)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)	.0039 (.0024–.0055)	.0031 (.0024–.0039)	.0031 (.0024–.0039)	.0028 (.0024–.0031)	.0039 (.0024–.0055)	.0035 (.0024–.0047)	.0035 (.0024–.0047)	.0028 (.0024–.0039)
	.0039 (.0024–.0047)	.0028 (.0024–.0031)	.0028 (.0024–.0031)	.0024 (.0024–.0028)	.0035 (.0024–.0047)	.0028 (.0024–.0035)	.0028 (.0024–.0035)	.0024 (.0024–.0031)	.0035 (.0024–.0047)	.0031 (.0024–.0039)	.0031 (.0024–.0039)	.0028 (.0024–.0031)
	.0055 (.0039–.0071)	.0039 (.0039–.0047)	.0039 (.0039–.0047)	.0028 (.0024–.0031)	.0059 (.0039–.0079)	.0043 (.0039–.0051)	.0043 (.0039–.0051)	.0035 (.0031–.0039)	.0059 (.0039–.0079)	.0047 (.0039–.0051)	.0047 (.0039–.0051)	.0043 (.0039–.0047)
	.0051 (.0039–.0063)	.0039 (.0039–.0043)	.0039 (.0039–.0043)	.0028 (.0024–.0031)	.0055 (.0039–.0071)	.0043 (.0039–.0047)	.0043 (.0039–.0047)	.0035 (.0031–.0039)	.0059 (.0039–.0079)	.0047 (.0039–.0051)	.0047 (.0039–.0051)	.0043 (.0039–.0047)
	.0051 (.0039–.0063)	.0039 (.0039–.0043)	.0039 (.0039–.0043)	.0028 (.0024–.0031)	.0055 (.0039–.0071)	.0043 (.0039–.0047)	.0043 (.0039–.0047)	.0035 (.0031–.0039)	.0059 (.0039–.0079)	.0047 (.0039–.0051)	.0047 (.0039–.0051)	.0043 (.0039–.0047)
	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)	.0048 (.0020–.0080)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)
	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)	.0048 (.0020–.0080)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)
	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)	.0048 (.0020–.0080)	.0048 (.0020–.0072)	.0048 (.0020–.0072)	.0032 (.0020–.0048)
	.0036 (.0024–.0056)	.0028 (.0024–.0036)	—	—	.0036 (.0024–.0056)	.0028 (.0024–.0036)	—	—	.0044 (.0024–.0064)	.0036 (.0024–.0048)	—	—

JUST FIT SLEEVE [JFS]

Inch Standard

● A sleeve for the shank of the drill to allow the cutting diameter to be increased.





(inch)

Order Number	Stock	DCB	DCON	BD	LF	S10	✱Increase (S11×2)	MVX Order Number The Last Four Letters
JFS125100-005	●	1.000	1.250	1.813	2.250	1.625	.005	C100
JFS125100-010	●	1.000	1.250	1.813	2.250	1.625	.010	C100
JFS125100-015	●	1.000	1.250	1.813	2.250	1.625	.015	C100
JFS125100-020	●	1.000	1.250	1.813	2.250	1.625	.020	C100
JFS125100-025	●	1.000	1.250	1.813	2.250	1.625	.025	C100
JFS150125-005	●	1.250	1.500	2.063	2.370	1.750	.005	C125
JFS150125-010	●	1.250	1.500	2.063	2.370	1.750	.010	C125
JFS150125-015	●	1.250	1.500	2.063	2.370	1.750	.015	C125
JFS150125-020	●	1.250	1.500	2.063	2.370	1.750	.020	C125
JFS150125-025	●	1.250	1.500	2.063	2.370	1.750	.025	C125
JFS175150-005	●	1.500	1.750	2.313	2.780	2.156	.005	C150
JFS175150-010	●	1.500	1.750	2.313	2.780	2.156	.010	C150
JFS175150-015	●	1.500	1.750	2.313	2.780	2.156	.015	C150
JFS175150-020	●	1.500	1.750	2.313	2.780	2.156	.020	C150
JFS175150-025	●	1.500	1.750	2.313	2.780	2.156	.025	C150

Not available in .750" shank diameter.

✱Increase : Size of the increase in the cutting diameter.

■ Guideline for Selecting a JUST FIT SLEEVE

Desired = (Drillø+ Increase of JFS) + .005"

(Eg.) Desired diameter is 1.015" (oversize is taken as .005").

ø1.015=(MVX1000 X ◌C125+JFS150125-010)+.005

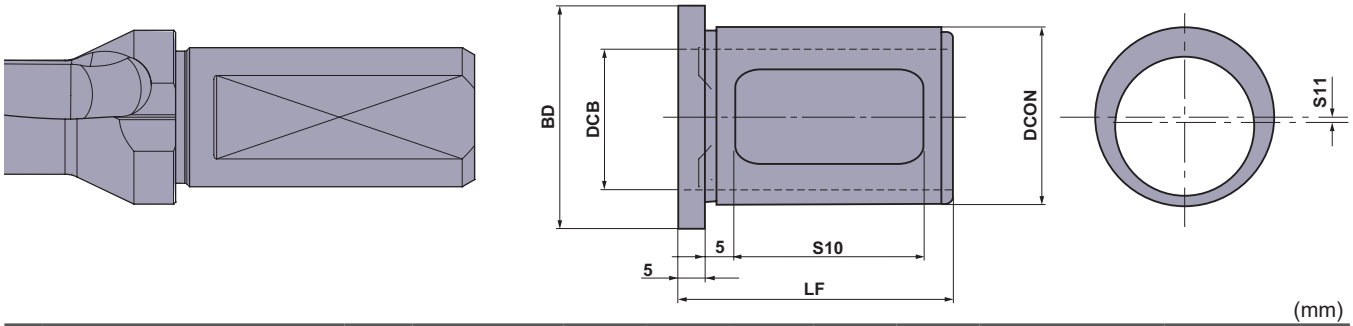
- 1.000" Drill
- Using JFS an Increase of .010".
- Oversize

<Tool Selected>
MVX : **MVX1000 X ◌C125**
JUST FIT SLEEVE [JFS]
: **JFS150125-010**

Note 1) Oversize can vary due to the cutting conditions used, please use the above as a guideline.

Metric Standard

● A sleeve for the shank of the drill to allow the cutting diameter to be increased.



(mm)

Order Number	Stock	Set Order Number	DCB	DCON	BD	LF	S10	✱Increase (S11×2)	MVX Order Number The Last Three Letters
JFS2520-10	★	**JFS-1**	20	25	33	43	30	0.1	F20
JFS2520-20	★	**JFS-1**	20	25	33	43	30	0.2	F20
JFS2520-30	★	**JFS-1**	20	25	33	43	30	0.3	F20
JFS2520-40	★	**JFS-1**	20	25	33	43	30	0.4	F20
JFS2520-50	★	**JFS-1**	20	25	33	43	30	0.5	F20
JFS3225-10	★	**JFS-2**	25	32	40	50	34	0.1	F25
JFS3225-20	★	**JFS-2**	25	32	40	50	34	0.2	F25
JFS3225-30	★	**JFS-2**	25	32	40	50	34	0.3	F25
JFS3225-40	★	**JFS-2**	25	32	40	50	34	0.4	F25
JFS3225-50	★	**JFS-2**	25	32	40	50	34	0.5	F25
JFS4032-10	★	**JFS-3**	32	40	48	55	40	0.1	F32
JFS4032-20	★	**JFS-3**	32	40	48	55	40	0.2	F32
JFS4032-30	★	**JFS-3**	32	40	48	55	40	0.3	F32
JFS4032-40	★	**JFS-3**	32	40	48	55	40	0.4	F32
JFS4032-50	★	**JFS-3**	32	40	48	55	40	0.5	F32
JFS5040-10	★	–	40	50	68	65	50	0.1	F40
JFS5040-20	★	–	40	50	68	65	50	0.2	F40
JFS5040-30	★	–	40	50	68	65	50	0.3	F40
JFS5040-40	★	–	40	50	68	65	50	0.4	F40
JFS5040-50	★	–	40	50	68	65	50	0.5	F40

Not available in 50 mm shank diameter.

✱Increase : Size of the increase in the cutting diameter.

■ Guideline for Selecting a JUST FIT SLEEVE

Desired = (Drillø+ Increase of JFS) + 0.1mm

(Eg.) Desired diameter is 20.3mm (oversize is taken as 0.1mm).

ø20.3=(MVX2000 X ◌F25+JFS3225-20)+0.1

- (MVX2000 X ◌F25): ø20mm Drill
- (JFS3225-20): Using JFS an Increase of 0.2mm.
- +0.1: Oversize

<Tool Selected>
MVX : **MVX2000 X ◌F25**
JUST FIT SLEEVE [JFS]
: **JFS3225-20**

Note 1) Oversize can vary due to the cutting conditions used, please use the above as a guideline.

■ Ordering the JUST FIT SLEEVE

● **Purchasing Method 1**

Oversize can vary due to the cutting conditions used. Therefore it is recommended to purchase as a set. (5 sleeves/set)When placing an order, please use the set order number.

● **Purchasing Method 2**

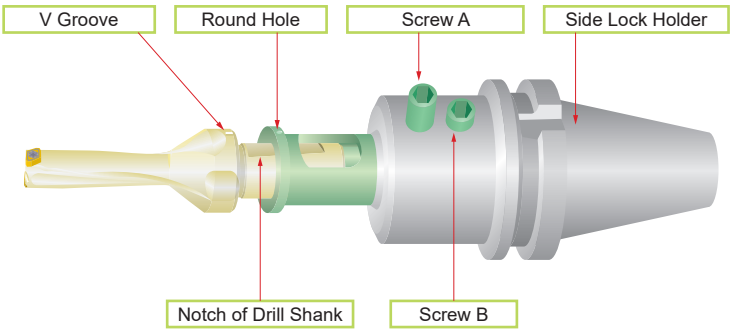
It is possible to order individually. When placing an order, please use the order number.

JUST FIT SLEEVE [JFS]

Application of JUST FIT SLEEVE

1 When inserting the drill into the side lock holder, aligin the V groove on the outer peripheral edge of the drill flange, as well as the round holes of the outer peripheral edge of the sleeve flange and the screws of the side lock holder for fixing the drill. (If the drill does not have a V groove, align the notch of the drill shank with the round holes of the sleeve.)

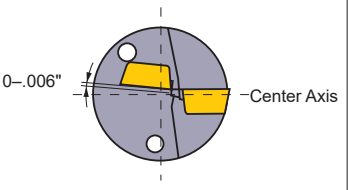
2 Insert screws A of the side lock holder directly to the open window of the sleeve and fix the drill. Tighten screw B to a degree so as not to damage the sleeve.



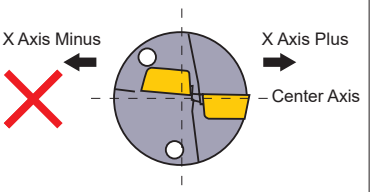
Application of MVX Type Drill

●Use on a Lathe

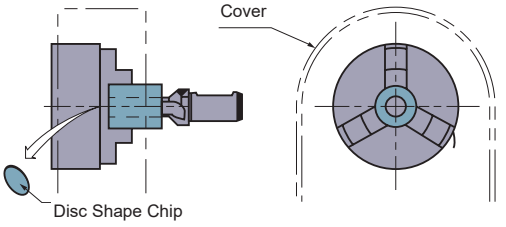
(1) The outer insert and machine X axis must be set parallel. The drill is designed that the center of the inner insert is 0-.006" lower when matching the drill center and the machine spindle center.
*The inner insert may fracture if the center height of inner insert is higher than the machine X axis.



(2) To adjust the hole diameter by off-setting the drill, please adjust to X axis plus direction (expanding direction of the hole diameter). Refer to the holder dimension list for the maximum adjustment rate of each holder.
*It is not recommended to adjust to X axis minus direction (reducing direction of the hole diameter) as the holder may interfere with the hole.



(3) When through hole drilling on a lathe the disc produced by the drill exiting the workpiece may be expelled at high velocity. To reduce the possibility of injury or damage, a cover guard is highly recommended.



STAW

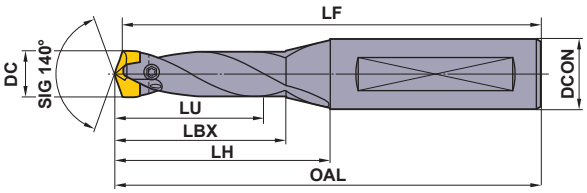
- Wavy cutting edge design for good chip control.
- Highly rigid clamping system offers stability and reliability for small hole drilling.

P | M | K | N | S | H

DC=.3906"	.3906"<DC<.7188"
0 −.00087"	0 −.00106"

INCH STANDARD

Internal Coolant



HOLDERS

DC (inch)	L/D	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	Wrench	Insert Order Number	Stock VP15TF
.3906	1.5	STAWSS0026	●	.661	.937	1.33	3.22	3.15	.625	TIP06F	* STAWN0025TH	●
	3	STAWSN0026	●	1.252	1.531	1.92	3.81	3.74	.625	TIP06F	STAWN0025TH	●
	5	STAWMN0026	●	2.039	2.311	2.71	4.60	4.53	.625	TIP06F	STAWN0025TH	●
	8	STAWLN0026	●	3.220	3.501	3.89	5.78	5.71	.625	TIP06F	STAWN0025TH	●
.4062	1.5	STAWSS0026	●	.661	.940	1.33	3.22	3.15	.625	TIP06F	* STAWN0026TH	●
	3	STAWSN0026	●	1.252	1.534	1.92	3.81	3.74	.625	TIP06F	STAWN0026TH	●
	5	STAWMN0026	●	2.039	2.314	2.71	4.60	4.53	.625	TIP06F	STAWN0026TH	●
	8	STAWLN0026	●	3.220	3.504	3.89	5.78	5.71	.625	TIP06F	STAWN0026TH	●
.4219	1.5	STAWSS0027	●	.697	.943	1.34	3.23	3.15	.625	TIP06F	* STAWN0027TH	●
	3	STAWSN0027	●	1.315	1.537	1.93	3.82	3.74	.625	TIP06F	STAWN0027TH	●
	5	STAWMN0027	●	2.142	2.317	2.72	4.61	4.53	.625	TIP06F	STAWN0027TH	●
	8	STAWLN0027	●	3.382	3.507	3.90	5.79	5.71	.625	TIP06F	STAWN0027TH	●
.4375	1.5	STAWSS0028	●	.728	1.064	1.50	3.39	3.31	.625	TIP06F	* STAWN0028TH	●
	3	STAWSN0028	●	1.378	1.690	2.13	4.02	3.94	.625	TIP06F	STAWN0028TH	●
	5	STAWMN0028	●	2.244	2.680	3.11	5.00	4.92	.625	TIP06F	STAWN0028TH	●
	8	STAWLN0028	●	3.543	3.860	4.29	6.18	6.10	.625	TIP06F	STAWN0028TH	●
.4531	1.5	STAWSS0030	●	.764	1.067	1.50	3.39	3.31	.625	TIP06F	* STAWN0029TH	●
	3	STAWSN0030	●	1.441	1.693	2.13	4.02	3.94	.625	TIP06F	STAWN0029TH	●
	5	STAWMN0030	●	2.346	2.683	3.11	5.00	4.92	.625	TIP06F	STAWN0029TH	●
	8	STAWLN0030	●	3.705	3.863	4.29	6.18	6.10	.625	TIP06F	STAWN0029TH	●
.4688	1.5	STAWSS0030	●	.764	1.069	1.51	3.40	3.31	.625	TIP06F	* STAWN0030TH	●
	3	STAWSN0030	●	1.441	1.695	2.14	4.03	3.94	.625	TIP06F	STAWN0030TH	●
	5	STAWMN0030	●	2.346	2.685	3.12	5.01	4.92	.625	TIP06F	STAWN0030TH	●
	8	STAWLN0030	●	3.705	3.865	4.30	6.19	6.10	.625	TIP06F	STAWN0030TH	●
.4844	1.5	STAWSS0031	●	.795	1.148	1.63	3.52	3.43	.625	TIP06F	* STAWN0031TH	●
	3	STAWSN0031	●	1.504	1.858	2.33	4.22	4.13	.625	TIP06F	STAWN0031TH	●
	5	STAWMN0031	●	2.449	2.848	3.32	5.21	5.12	.625	TIP06F	STAWN0031TH	●
	8	STAWLN0031	●	3.866	4.218	4.70	6.59	6.50	.625	TIP06F	STAWN0031TH	●
.5000	1.5	STAWSS0032	●	.831	1.151	1.63	3.52	3.43	.625	TIP06F	* STAWN0032TH	●
	3	STAWSN0032	●	1.567	1.861	2.33	4.22	4.13	.625	TIP06F	STAWN0032TH	●
	5	STAWMN0032	●	2.551	2.851	3.32	5.21	5.12	.625	TIP06F	STAWN0032TH	●
	8	STAWLN0032	●	4.028	4.221	4.70	6.59	6.50	.625	TIP06F	STAWN0032TH	●
.5156	1.5	STAWSS0034	●	.862	1.274	1.79	3.67	3.58	.625	TIP08W	* STAWN0033TH	●
	3	STAWSN0034	●	1.630	2.024	2.53	4.42	4.33	.625	TIP08W	STAWN0033TH	●
	5	STAWMN0034	●	2.654	3.004	3.52	5.40	5.31	.625	TIP08W	STAWN0033TH	●
	8	STAWLN0034	●	4.189	4.584	5.09	6.98	6.89	.625	TIP08W	STAWN0033TH	●
.5312	1.5	STAWSS0034	●	.862	1.277	1.80	3.68	3.58	.625	TIP08W	* STAWN0034TH	●
	3	STAWSN0034	●	1.630	2.027	2.54	4.43	4.33	.625	TIP08W	STAWN0034TH	●
	5	STAWMN0034	●	2.654	3.007	3.53	5.41	5.31	.625	TIP08W	STAWN0034TH	●
	8	STAWLN0034	●	4.189	4.587	5.10	6.99	6.89	.625	TIP08W	STAWN0034TH	●
.5469	1.5	STAWSS0035	●	.898	1.280	1.80	3.68	3.58	.625	TIP08W	* STAWN0035TH	●
	3	STAWSN0035	●	1.693	2.030	2.54	4.43	4.33	.625	TIP08W	STAWN0035TH	●
	5	STAWMN0035	●	2.756	3.010	3.53	5.41	5.31	.625	TIP08W	STAWN0035TH	●
	8	STAWLN0035	●	4.350	4.590	5.10	6.99	6.89	.625	TIP08W	STAWN0035TH	●

Note 1) The above dimensions (*) are for when installing the inserts.

Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

ISO13399 ➤ L003
INSERTS ➤ L223
CUTTING CONDITIONS ➤ L226
HOW TO USE ➤ L227

STAW

DC (inch)	L/D	Holder		Dimensions (inch)						Wrench	Insert	
		Order Number	Stock	LU	LBX	LH	OAL	LF	DCON		Order Number	Stock VP15TF
.5625	1.5	STAWSS0036	●	.925	1.322	1.87	3.76	3.66	.625	TIP08W	* STAWN0036TH	●
	3	STAWSN0036	●	1.752	2.192	2.74	4.63	4.53	.625	TIP08W	STAWN0036TH	●
	5	STAWMN0036	●	2.854	3.372	3.92	5.81	5.71	.625	TIP08W	STAWN0036TH	●
	8	STAWLN0036	●	4.508	4.902	5.49	7.38	7.28	.625	TIP08W	STAWN0036TH	●
.5781	1.5	STAWSS0037	●	.961	1.325	1.88	3.77	3.66	.625	TIP08W	* STAWN0037TH	●
	3	STAWSN0037	●	1.815	2.195	2.75	4.64	4.53	.625	TIP08W	STAWN0037TH	●
	5	STAWMN0037	●	2.957	3.375	3.93	5.82	5.71	.625	TIP08W	STAWN0037TH	●
	8	STAWLN0037	●	4.669	4.905	5.50	7.39	7.28	.625	TIP08W	STAWN0037TH	●
.5938	1.5	STAWSS0039	●	.992	1.408	2.00	3.97	3.86	.750	TIP08W	* STAWN0038TH	●
	3	STAWSN0039	●	1.878	2.468	3.06	5.03	4.92	.750	TIP08W	STAWN0038TH	●
	5	STAWMN0039	●	3.059	3.648	4.24	6.21	6.10	.750	TIP08W	STAWN0038TH	●
	8	STAWLN0039	●	4.831	5.228	5.94	7.91	7.80	.750	TIP08W	STAWN0038TH	●
.6094	1.5	STAWSS0039	●	.992	1.411	2.00	3.97	3.86	.750	TIP08W	* STAWN0039TH	●
	3	STAWSN0039	●	1.878	2.471	3.06	5.03	4.92	.750	TIP08W	STAWN0039TH	●
	5	STAWMN0039	●	3.059	3.651	4.24	6.21	6.10	.750	TIP08W	STAWN0039TH	●
	8	STAWLN0039	●	4.831	5.231	5.94	7.91	7.80	.750	TIP08W	STAWN0039TH	●
.6250	1.5	STAWSS0041	●	1.028	1.454	2.08	4.05	3.94	.750	TIP10W	* STAWN0040T	●
	3	STAWSN0041	●	1.941	2.474	3.26	5.23	5.12	.750	TIP10W	STAWN0040T	●
	5	STAWMN0041	●	3.161	3.654	4.64	6.61	6.50	.750	TIP10W	STAWN0040T	●
	8	STAWLN0041	●	4.992	5.544	6.33	8.30	8.19	.750	TIP10W	STAWN0040T	●
.6406	1.5	STAWSS0041	●	1.028	1.457	2.09	4.06	3.94	.750	TIP10W	* STAWN0041T	●
	3	STAWSN0041	●	1.941	2.477	3.27	5.24	5.12	.750	TIP10W	STAWN0041T	●
	5	STAWMN0041	●	3.161	3.657	4.65	6.62	6.50	.750	TIP10W	STAWN0041T	●
	8	STAWLN0041	●	4.992	5.547	6.34	8.31	8.19	.750	TIP10W	STAWN0041T	●
.6563	1.5	STAWSS0044	●	1.094	1.539	2.21	4.18	4.06	.750	TIP10W	* STAWN0042T	●
	3	STAWSN0044	●	2.067	2.519	3.47	5.43	5.31	.750	TIP10W	STAWN0042T	●
	5	STAWMN0044	●	3.366	3.859	4.84	6.81	6.69	.750	TIP10W	STAWN0042T	●
	8	STAWLN0044	●	5.315	5.859	6.66	8.62	8.50	.750	TIP10W	STAWN0042T	●
.6719	1.5	STAWSS0044	●	1.094	1.542	2.21	4.18	4.06	.750	TIP10W	* STAWN0043T	●
	3	STAWSN0044	●	2.067	2.522	3.47	5.43	5.31	.750	TIP10W	STAWN0043T	●
	5	STAWMN0044	●	3.366	3.862	4.84	6.81	6.69	.750	TIP10W	STAWN0043T	●
	8	STAWLN0044	●	5.315	5.862	6.66	8.62	8.50	.750	TIP10W	STAWN0043T	●
.6875	1.5	STAWSS0044	●	1.094	1.545	2.22	4.19	4.06	.750	TIP10W	* STAWN0044T	●
	3	STAWSN0044	●	2.067	2.525	3.48	5.44	5.31	.750	TIP10W	STAWN0044T	●
	5	STAWMN0044	●	3.366	3.865	4.85	6.82	6.69	.750	TIP10W	STAWN0044T	●
	8	STAWLN0044	●	5.315	5.865	6.67	8.63	8.50	.750	TIP10W	STAWN0044T	●
.7031	1.5	STAWSS0046	●	1.161	1.588	2.30	4.26	4.13	.750	TIP10W	* STAWN0045T	●
	3	STAWSN0046	●	2.193	2.648	3.67	5.64	5.51	.750	TIP10W	STAWN0045T	●
	5	STAWMN0046	●	3.571	4.068	5.05	7.02	6.89	.750	TIP10W	STAWN0045T	●
	8	STAWLN0046	●	5.638	6.188	6.98	8.95	8.82	.750	TIP10W	STAWN0045T	●
.7188	1.5	STAWSS0046	●	1.161	1.591	2.30	4.26	4.13	.750	TIP10W	* STAWN0046T	●
	3	STAWSN0046	●	2.193	2.651	3.67	5.64	5.51	.750	TIP10W	STAWN0046T	●
	5	STAWMN0046	●	3.571	4.071	5.05	7.02	6.89	.750	TIP10W	STAWN0046T	●
	8	STAWLN0046	●	5.638	6.191	6.98	8.95	8.82	.750	TIP10W	STAWN0046T	●

Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

STAW

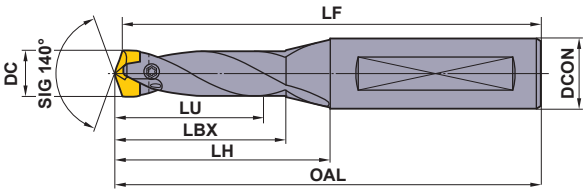
- Wavy cutting edge design for good chip control.
- Highly rigid clamping system offers stability and reliability for small hole drilling.

P | M | K | N | S | H

DC=10	10<DC<18.4
0 −0.022	0 −0.027

METRIC STANDARD

Internal Coolant



■HOLDERS

DC (mm)	L/D	Holder Order Number	Stock	Dimensions (mm) LU	LBX	LH	OAL	LF	DCON	①② Wrench	Insert DC (mm)	Order Number	Stock VP15TF
10.0 | 10.4	1.5	STAWSS1000S16	★	15	23.8	33.8	81.8	80	16	①TIP06F	10.0	* STAWN1000TH	★
	3	STAWSN1000S16	★	30	38.8	48.8	96.8	95	16	①TIP06F	10.1	STAWN1010TH	★
	5	STAWMN1000S16	★	50	58.9	68.9	116.9	115	16	①TIP06F	10.2	STAWN1020TH	★
	8	STAWLN1000S16	★	80	88.9	98.9	146.9	145	16	①TIP06F	10.3	STAWN1030TH	★
											10.4	STAWN1040TH	★
10.5 | 10.9	1.5	STAWSS1050S16	★	15.75	23.9	33.9	81.9	80	16	①TIP06F	10.5	* STAWN1050TH	★
	3	STAWSN1050S16	★	31.5	38.9	48.9	96.9	95	16	①TIP06F	10.6	STAWN1060TH	★
	5	STAWMN1050S16	★	52.5	59.0	69.0	117.0	115	16	①TIP06F	10.7	STAWN1070TH	★
	8	STAWLN1050S16	★	84	89.0	99.0	147.0	145	16	①TIP06F	10.8	STAWN1080TH	★
											10.9	STAWN1090TH	★
11.0 | 11.4	1.5	STAWSS1100S16	★	16.5	27.0	38.0	86.0	84	16	①TIP06F	11.0	* STAWN1100TH	★
	3	STAWSN1100S16	★	33	43.0	54.0	102.0	100	16	①TIP06F	11.1	STAWN1110TH	★
	5	STAWMN1100S16	★	55	68.1	79.1	127.1	125	16	①TIP06F	11.2	STAWN1120TH	★
	8	STAWLN1100S16	★	88	98.1	109.1	157.1	155	16	①TIP06F	11.3	STAWN1130TH	★
											11.4	STAWN1140TH	★
11.5 | 11.9	1.5	STAWSS1150S16	★	17.25	27.1	38.1	86.1	84	16	①TIP06F	11.5	* STAWN1150TH	★
	3	STAWSN1150S16	★	34.5	43.1	54.1	102.1	100	16	①TIP06F	11.6	STAWN1160TH	★
	5	STAWMN1150S16	★	57.5	68.1	79.1	127.1	125	16	①TIP06F	11.7	STAWN1170TH	★
	8	STAWLN1150S16	★	92	98.2	109.2	157.2	155	16	①TIP06F	11.8	STAWN1180TH	★
											11.9	STAWN1190TH	★
12.0 | 12.4	1.5	STAWSS1200S16	★	18	29.2	41.2	89.2	87	16	①TIP06F	12.0	* STAWN1200TH	★
	3	STAWSN1200S16	★	36	47.2	59.2	107.2	105	16	①TIP06F	12.1	STAWN1210TH	★
	5	STAWMN1200S16	★	60	72.2	84.2	132.2	130	16	①TIP06F	12.2	STAWN1220TH	★
	8	STAWLN1200S16	★	96	107.3	119.3	167.3	165	16	①TIP06F	12.3	STAWN1230TH	★
											12.4	STAWN1240TH	★
12.5 | 12.9	1.5	STAWSS1250S16	★	18.75	29.3	41.3	89.3	87	16	①TIP06F	12.5	* STAWN1250TH	★
	3	STAWSN1250S16	★	37.5	47.3	59.3	107.3	105	16	①TIP06F	12.6	STAWN1260TH	★
	5	STAWMN1250S16	★	62.5	72.3	84.3	132.3	130	16	①TIP06F	12.7	STAWN1270TH	★
	8	STAWLN1250S16	★	100	107.3	119.3	167.3	165	16	①TIP06F	12.8	STAWN1280TH	★
											12.9	STAWN1290TH	★
13.0 | 13.4	1.5	STAWSS1300S16	★	19.5	32.4	45.4	93.4	91	16	②TIP08W	13.0	* STAWN1300TH	★
	3	STAWSN1300S16	★	39	51.4	64.4	112.4	110	16	②TIP08W	13.1	STAWN1310TH	★
	5	STAWMN1300S16	★	65	76.4	89.4	137.4	135	16	②TIP08W	13.2	STAWN1320TH	★
	8	STAWLN1300S16	★	104	116.4	129.4	177.4	175	16	②TIP08W	13.3	STAWN1330TH	★
											13.4	STAWN1340TH	★
13.5 | 13.9	1.5	STAWSS1350S16	★	20.25	32.5	45.5	93.5	91	16	②TIP08W	13.5	* STAWN1350TH	★
	3	STAWSN1350S16	★	40.5	51.5	64.5	112.5	110	16	②TIP08W	13.6	STAWN1360TH	★
	5	STAWMN1350S16	★	67.5	76.5	89.5	137.5	135	16	②TIP08W	13.7	STAWN1370TH	★
	8	STAWLN1350S16	★	108	116.5	129.5	177.5	175	16	②TIP08W	13.8	STAWN1380TH	★
											13.9	STAWN1390TH	★
14.0 | 14.4	1.5	STAWSS1400S16	★	21	33.5	47.5	95.5	93	16	②TIP08W	14.0	* STAWN1400TH	★
	3	STAWSN1400S16	★	42	55.6	69.6	117.6	115	16	②TIP08W	14.1	STAWN1410TH	★
	5	STAWMN1400S16	★	70	85.6	99.6	147.6	145	16	②TIP08W	14.2	STAWN1420TH	★
	8	STAWLN1400S16	★	112	124.6	139.6	187.6	185	16	②TIP08W	14.3	STAWN1430TH	★
											14.4	STAWN1440TH	★

Note 1) The above dimensions (*) are for when installing the inserts.

Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

ISO13399 ➤ L003
INSERTS ➤ L223
CUTTING CONDITIONS ➤ L226
HOW TO USE ➤ L227

STAW

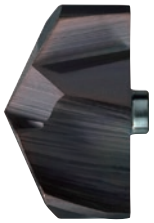
DC (mm)	L/D	Holder Order Number	Stock	Dimensions (mm) LU	LBX	LH	OAL	LF	DCON	Wrench	Insert DC (mm)	Order Number	Stock VP15TF
14.5 | 14.9	1.5	STAWSS1450S16	★	21.75	33.6	47.6	95.6	93	16	TIP08W	14.5	* STAWN1450TH	★
	3	STAWSN1450S16	★	43.5	55.7	69.7	117.7	115	16	TIP08W	14.6	STAWN1460TH	★
	5	STAWMN1450S16	★	72.5	85.7	99.7	147.7	145	16	TIP08W	14.7	STAWN1470TH	★
	8	STAWLN1450S16	★	116	124.7	139.7	187.7	185	16	TIP08W	14.8	STAWN1480TH	★
											14.9	STAWN1490TH	★
15.0 | 15.4	1.5	STAWSS1500S20	★	22.5	35.7	50.7	100.7	98	20	TIP08W	15.0	* STAWN1500TH	★
	3	STAWSN1500S20	★	45	62.7	77.7	127.7	125	20	TIP08W	15.1	STAWN1510TH	★
	5	STAWMN1500S20	★	75	92.8	107.8	157.8	155	20	TIP08W	15.2	STAWN1520TH	★
	8	STAWLN1500S20	★	120	132.8	150.8	200.8	198	20	TIP08W	15.3	STAWN1530TH	★
											15.4	STAWN1540TH	★
15.5 | 16.4	1.5	STAWSS1600S20	★	24	36.8	52.8	102.8	100	20	TIP10W	15.5	* STAWN1550T	★
											15.6	STAWN1560T	★
											15.7	STAWN1570T	★
	3	STAWSN1600S20	★	48	62.9	82.9	132.9	130	20	TIP10W	15.8	STAWN1580T	★
											15.9	STAWN1590T	★
	5	STAWMN1600S20	★	80	92.9	117.9	167.9	165	20	TIP10W	16.0	STAWN1600T	★
											16.1	STAWN1610T	★
											16.2	STAWN1620T	★
	8	STAWLN1600S20	★	128	140.9	160.9	210.9	208	20	TIP10W	16.3	STAWN1630T	★
											16.4	STAWN1640T	★
16.5 | 17.4	1.5	STAWSS1700S20	★	25.5	39.0	56.0	106.0	103	20	TIP10W	16.5	* STAWN1650T	★
											16.6	STAWN1660T	★
											16.7	STAWN1670T	★
	3	STAWSN1700S20	★	51	64.0	88.0	138.0	135	20	TIP10W	16.8	STAWN1680T	★
											16.9	STAWN1690T	★
	5	STAWMN1700S20	★	85	98.1	123.1	173.1	170	20	TIP10W	17.0	STAWN1700T	★
											17.1	STAWN1710T	★
											17.2	STAWN1720T	★
	8	STAWLN1700S20	★	136	149.1	169.1	219.1	216	20	TIP10W	17.3	STAWN1730T	★
											17.4	STAWN1740T	★
17.5 | 18.4	1.5	STAWSS1800S20	★	27	40.2	58.2	108.2	105	20	TIP10W	17.5	* STAWN1750T	★
											17.6	STAWN1760T	★
											17.7	STAWN1770T	★
	3	STAWSN1800S20	★	54	67.2	93.2	143.2	140	20	TIP10W	17.8	STAWN1780T	★
											17.9	STAWN1790T	★
	5	STAWMN1800S20	★	90	103.3	128.3	178.3	175	20	TIP10W	18.0	STAWN1800T	★
											18.1	STAWN1810T	★
											18.2	STAWN1820T	★
	8	STAWLN1800S20	★	144	157.3	177.3	227.3	224	20	TIP10W	18.3	STAWN1830T	★
											18.4	STAWN1840T	★

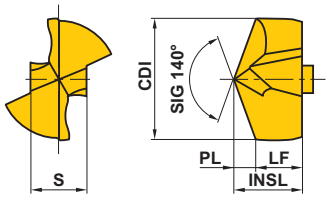
Note 1) The above dimensions (*) are for when installing the inserts.
Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

● : USA Stock ★ : Stocked in Japan
<One insert in one case>

INSERTS

INCH STANDARD





For General Use

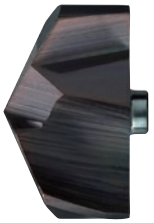
Order Number	Coated	Dimensions (inch)					Applicable Holder	
	VP15TF	CDI	INSL	LF	PL	S	inch	metric
STAWN0025TH	●	.3906	.216	.150	.066	.181	STAW○○0026	STAW○○1000S16
STAWN0026TH	●	.4062	.216	.150	.066	.181	STAW○○0026	STAW○○1000S16
STAWN0027TH	●	.4219	.226	.157	.069	.190	STAW○○0027	STAW○○1050S16
STAWN0028TH	●	.4375	.237	.165	.073	.199	STAW○○0028	STAW○○1100S16
STAWN0029TH	●	.4531	.248	.172	.076	.208	STAW○○0030	STAW○○1150S16
STAWN0030TH	●	.4688	.248	.172	.076	.208	STAW○○0030	STAW○○1150S16
STAWN0031TH	●	.4844	.259	.180	.079	.217	STAW○○0031	STAW○○1200S16
STAWN0032TH	●	.5000	.270	.187	.083	.226	STAW○○0032	STAW○○1250S16
STAWN0033TH	●	.5156	.280	.194	.086	.235	STAW○○0034	STAW○○1300S16
STAWN0034TH	●	.5312	.280	.194	.086	.235	STAW○○0034	STAW○○1300S16
STAWN0035TH	●	.5469	.291	.202	.089	.244	STAW○○0035	STAW○○1350S16
STAWN0036TH	●	.5625	.302	.209	.093	.254	STAW○○0036	STAW○○1400S16
STAWN0037TH	●	.5781	.313	.217	.096	.263	STAW○○0037	STAW○○1450S16
STAWN0038TH	●	.5938	.324	.224	.099	.272	STAW○○0039	STAW○○1500S20
STAWN0039TH	●	.6094	.324	.224	.099	.272	STAW○○0039	STAW○○1500S20
STAWN0040T	●	.6250	.334	.232	.102	.281	STAW○○0041	STAW○○1600S20
STAWN0041T	●	.6406	.334	.232	.102	.281	STAW○○0041	STAW○○1600S20
STAWN0042T	●	.6563	.356	.247	.109	.299	STAW○○0044	STAW○○1700S20
STAWN0043T	●	.6719	.356	.247	.109	.299	STAW○○0044	STAW○○1700S20
STAWN0044T	●	.6875	.356	.247	.109	.299	STAW○○0044	STAW○○1700S20
STAWN0045T	●	.7031	.378	.262	.116	.317	STAW○○0046	STAW○○1800S20
STAWN0046T	●	.7188	.378	.262	.116	.317	STAW○○0046	STAW○○1800S20

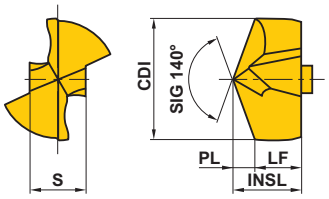
CUTTING CONDITIONS ➤ L226
HOW TO USE ➤ L227

STAW

INSERTS

METRIC STANDARD





For General Use

Order Number	Coated	Dimensions (mm)					Applicable Holder	
	VP15TF	CDI	INSL	LF	PL	S	inch	metric
STAWN1000TH	●	10.0	5.6	3.8	1.8	4.6	STAW○○0026	STAW○○1000S16
STAWN1010TH	●	10.1	5.6	3.8	1.8	4.6	STAW○○0026	STAW○○1000S16
STAWN1020TH	●	10.2	5.7	3.8	1.9	4.6	STAW○○0026	STAW○○1000S16
STAWN1030TH	●	10.3	5.7	3.8	1.9	4.6	STAW○○0026	STAW○○1000S16
STAWN1040TH	●	10.4	5.7	3.8	1.9	4.6	STAW○○0026	STAW○○1000S16
STAWN1050TH	●	10.5	5.9	4.0	1.9	4.8	STAW○○0027	STAW○○1050S16
STAWN1060TH	●	10.6	5.9	4.0	1.9	4.8	STAW○○0027	STAW○○1050S16
STAWN1070TH	●	10.7	5.9	4.0	1.9	4.8	STAW○○0027	STAW○○1050S16
STAWN1080TH	●	10.8	6.0	4.0	2.0	4.8	STAW○○0027	STAW○○1050S16
STAWN1090TH	●	10.9	6.0	4.0	2.0	4.8	STAW○○0027	STAW○○1050S16
STAWN1100TH	●	11.0	6.2	4.2	2.0	5.1	STAW○○0028	STAW○○1100S16
STAWN1110TH	●	11.1	6.2	4.2	2.0	5.1	STAW○○0028	STAW○○1100S16
STAWN1120TH	●	11.2	6.2	4.2	2.0	5.1	STAW○○0028	STAW○○1100S16
STAWN1130TH	●	11.3	6.3	4.2	2.1	5.1	STAW○○0028	STAW○○1100S16
STAWN1140TH	●	11.4	6.3	4.2	2.1	5.1	STAW○○0028	STAW○○1100S16
STAWN1150TH	●	11.5	6.5	4.4	2.1	5.3	STAW○○0030	STAW○○1150S16
STAWN1160TH	●	11.6	6.5	4.4	2.1	5.3	STAW○○0030	STAW○○1150S16
STAWN1170TH	●	11.7	6.5	4.4	2.1	5.3	STAW○○0030	STAW○○1150S16
STAWN1180TH	●	11.8	6.5	4.4	2.1	5.3	STAW○○0030	STAW○○1150S16
STAWN1190TH	●	11.9	6.6	4.4	2.2	5.3	STAW○○0030	STAW○○1150S16
STAWN1200TH	●	12.0	6.8	4.6	2.2	5.5	STAW○○0031	STAW○○1200S16
STAWN1210TH	●	12.1	6.8	4.6	2.2	5.5	STAW○○0031	STAW○○1200S16
STAWN1220TH	●	12.2	6.8	4.6	2.2	5.5	STAW○○0031	STAW○○1200S16
STAWN1230TH	●	12.3	6.8	4.6	2.2	5.5	STAW○○0031	STAW○○1200S16
STAWN1240TH	●	12.4	6.9	4.6	2.3	5.5	STAW○○0031	STAW○○1200S16
STAWN1250TH	●	12.5	7.1	4.8	2.3	5.8	STAW○○0032	STAW○○1250S16
STAWN1260TH	●	12.6	7.1	4.8	2.3	5.8	STAW○○0032	STAW○○1250S16
STAWN1270TH	●	12.7	7.1	4.8	2.3	5.8	STAW○○0032	STAW○○1250S16
STAWN1280TH	●	12.8	7.1	4.8	2.3	5.8	STAW○○0032	STAW○○1250S16
STAWN1290TH	●	12.9	7.1	4.8	2.3	5.8	STAW○○0032	STAW○○1250S16
STAWN1300TH	●	13.0	7.3	4.9	2.4	6.0	STAW○○0034	STAW○○1300S16
STAWN1310TH	●	13.1	7.3	4.9	2.4	6.0	STAW○○0034	STAW○○1300S16
STAWN1320TH	●	13.2	7.3	4.9	2.4	6.0	STAW○○0034	STAW○○1300S16
STAWN1330TH	●	13.3	7.3	4.9	2.4	6.0	STAW○○0034	STAW○○1300S16
STAWN1340TH	●	13.4	7.3	4.9	2.4	6.0	STAW○○0034	STAW○○1300S16
STAWN1350TH	●	13.5	7.6	5.1	2.5	6.2	STAW○○0035	STAW○○1350S16
STAWN1360TH	●	13.6	7.6	5.1	2.5	6.2	STAW○○0035	STAW○○1350S16
STAWN1370TH	●	13.7	7.6	5.1	2.5	6.2	STAW○○0035	STAW○○1350S16

● : USA Stock
<One insert in one case>

Order Number	Coated	Dimensions (mm)					Applicable Holder	
	VP15TF	CDI	INSL	LF	PL	S	inch	metric
STAWN1380TH	●	13.8	7.6	5.1	2.5	6.2	STAW○○0035	STAW○○1350S16
STAWN1390TH	●	13.9	7.6	5.1	2.5	6.2	STAW○○0035	STAW○○1350S16
STAWN1400TH	●	14.0	7.8	5.3	2.5	6.4	STAW○○0036	STAW○○1400S16
STAWN1410TH	●	14.1	7.9	5.3	2.6	6.4	STAW○○0036	STAW○○1400S16
STAWN1420TH	●	14.2	7.9	5.3	2.6	6.4	STAW○○0036	STAW○○1400S16
STAWN1430TH	●	14.3	7.9	5.3	2.6	6.4	STAW○○0036	STAW○○1400S16
STAWN1440TH	●	14.4	7.9	5.3	2.6	6.4	STAW○○0036	STAW○○1400S16
STAWN1450TH	●	14.5	8.1	5.5	2.6	6.7	STAW○○0037	STAW○○1450S16
STAWN1460TH	●	14.6	8.2	5.5	2.7	6.7	STAW○○0037	STAW○○1450S16
STAWN1470TH	●	14.7	8.2	5.5	2.7	6.7	STAW○○0037	STAW○○1450S16
STAWN1480TH	●	14.8	8.2	5.5	2.7	6.7	STAW○○0037	STAW○○1450S16
STAWN1490TH	●	14.9	8.2	5.5	2.7	6.7	STAW○○0037	STAW○○1450S16
STAWN1500TH	●	15.0	8.4	5.7	2.7	6.9	STAW○○0039	STAW○○1500S16
STAWN1510TH	●	15.1	8.4	5.7	2.7	6.9	STAW○○0039	STAW○○1500S16
STAWN1520TH	●	15.2	8.5	5.7	2.8	6.9	STAW○○0039	STAW○○1500S16
STAWN1530TH	●	15.3	8.5	5.7	2.8	6.9	STAW○○0039	STAW○○1500S16
STAWN1540TH	●	15.4	8.5	5.7	2.8	6.9	STAW○○0039	STAW○○1500S16
STAWN1550T	●	15.5	8.7	5.9	2.8	7.1	STAW○○0041	STAW○○1600S16
STAWN1560T	●	15.6	8.7	5.9	2.8	7.1	STAW○○0041	STAW○○1600S16
STAWN1570T	●	15.7	8.8	5.9	2.9	7.1	STAW○○0041	STAW○○1600S16
STAWN1580T	●	15.8	8.8	5.9	2.9	7.1	STAW○○0041	STAW○○1600S16
STAWN1590T	●	15.9	8.8	5.9	2.9	7.1	STAW○○0041	STAW○○1600S16
STAWN1600T	●	16.0	8.8	5.9	2.9	7.1	STAW○○0041	STAW○○1600S16
STAWN1610T	●	16.1	8.8	5.9	2.9	7.1	STAW○○0041	STAW○○1600S16
STAWN1620T	●	16.2	8.8	5.9	2.9	7.1	STAW○○0041	STAW○○1600S16
STAWN1630T	●	16.3	8.9	5.9	3.0	7.1	STAW○○0041	STAW○○1600S16
STAWN1640T	●	16.4	8.9	5.9	3.0	7.1	STAW○○0041	STAW○○1600S16
STAWN1650T	●	16.5	9.3	6.3	3.0	7.6	STAW○○0044	STAW○○1700S16
STAWN1660T	●	16.6	9.3	6.3	3.0	7.6	STAW○○0044	STAW○○1700S16
STAWN1670T	●	16.7	9.3	6.3	3.0	7.6	STAW○○0044	STAW○○1700S16
STAWN1680T	●	16.8	9.4	6.3	3.1	7.6	STAW○○0044	STAW○○1700S16
STAWN1690T	●	16.9	9.4	6.3	3.1	7.6	STAW○○0044	STAW○○1700S16
STAWN1700T	●	17.0	9.4	6.3	3.1	7.6	STAW○○0044	STAW○○1700S16
STAWN1710T	●	17.1	9.4	6.3	3.1	7.6	STAW○○0044	STAW○○1700S16
STAWN1720T	●	17.2	9.4	6.3	3.1	7.6	STAW○○0044	STAW○○1700S16
STAWN1730T	●	17.3	9.4	6.3	3.1	7.6	STAW○○0044	STAW○○1700S16
STAWN1740T	●	17.4	9.5	6.3	3.2	7.6	STAW○○0044	STAW○○1700S16
STAWN1750T	●	17.5	9.9	6.7	3.2	8.1	STAW○○0046	STAW○○1800S16
STAWN1760T	●	17.6	9.9	6.7	3.2	8.1	STAW○○0046	STAW○○1800S16
STAWN1770T	●	17.7	9.9	6.7	3.2	8.1	STAW○○0046	STAW○○1800S16
STAWN1780T	●	17.8	9.9	6.7	3.2	8.1	STAW○○0046	STAW○○1800S16
STAWN1790T	●	17.9	10.0	6.7	3.3	8.1	STAW○○0046	STAW○○1800S16
STAWN1800T	●	18.0	10.0	6.7	3.3	8.1	STAW○○0046	STAW○○1800S16
STAWN1810T	●	18.1	10.0	6.7	3.3	8.1	STAW○○0046	STAW○○1800S16
STAWN1820T	●	18.2	10.0	6.7	3.3	8.1	STAW○○0046	STAW○○1800S16
STAWN1830T	●	18.3	10.0	6.7	3.3	8.1	STAW○○0046	STAW○○1800S16
STAWN1840T	●	18.4	10.0	6.7	3.3	8.1	STAW○○0046	STAW○○1800S16

STAW

HONE WIDTH

If an insert with honing other than standard is needed, please order using the symbols below.

(Insert Order Number)

S T A W N 1 0 0 0 T ○

- S T A W: TAW Product Name
- N: N : General Use / K : Cuting tooth form for cast iron
- 1 0 0 0: Insert Diameter
- T: Honing Symbol
- ○: Honing Type

(Honing Standard)

Honing Type	Hone Width (inch)
F	0
G	.0008 — .0020
H	.0020 — .0039
-	.0039 — .0059
K	.0059 — .0079
S	.0079 — .0098
M	.0098 — .0118

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		DC Conditions / Hardness	ϕ.3906"—ϕ.5000" ϕ10.0—ϕ12.9mm		ϕ.5156"—ϕ.5469" ϕ13.0—ϕ13.9mm		ϕ.5625"—ϕ.6094" ϕ14.0—ϕ15.4mm		ϕ.62506"—ϕ.7188" ϕ15.5—ϕ18.4mm	
			Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)
P	Mild Steel	≤180HB	260 (195—330)	.008 (.006—.010)	295 (230—360)	.010 (.008—.012)	330 (260—390)	.012 (.010—.014)	330 (260—390)	.014 (.010—.016)
P	Carbon Steel Alloy Steel	180—280HB	260 (195—330)	.008 (.006—.010)	295 (230—360)	.010 (.008—.012)	330 (260—390)	.012 (.010—.014)	330 (260—390)	.014 (.010—.016)
P	Carbon Steel Alloy Steel	280—350HB	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)	295 (230—360)	.012 (.008—.014)
M	Stainless Steel	≤200HB	130 (100—165)	.005 (.004—.006)	165 (130—195)	.006 (.005—.007)	195 (165—230)	.007 (.006—.008)	195 (165—230)	.006 (.005—.008)
K	Gray Cast Iron	Tensile Strength ≤350MPa	260 (195—330)	.008 (.006—.010)	295 (230—360)	.010 (.008—.012)	330 (260—390)	.012 (.010—.014)	390 (260—460)	.018 (.014—.022)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	295 (230—360)	.012 (.010—.014)	330 (260—390)	.014 (.010—.016)

Note 1) When using a drill for DCx1.5 depth of hole, it is possible to increase the feed rate by approx. 20%.
Note 2) When using a drill for DCx8 depth of hole, please decrease the cutting speed by approx. 20%.
Note 3) When using a drill for DCx8 depth of hole, it is recommended to make a pilot hole of the same size.
Note 4) For stainless steel, please use internal coolant. (Mist & MQL are not recommended).

SPARE PARTS

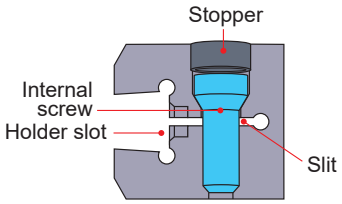
Applicable Holder	inch	mm	Pack Order Number (Internal screw & stopper)	Internal Screw	Stopper
STAWSS STAWSN STAWMN STAWLN	0026	1000S16	WS203107TPS-35LH	WS203107TPS	WS35LH
	0027	1050S16	WS203107TPS-35LH	WS203107TPS	WS35LH
	0028	1100S16	WS203108TPS-35LH	WS203108TPS	WS35LH
	0030	1150S16	WS203108TPS-35LH	WS203108TPS	WS35LH
	0031	1200S16	WS203108TPS-35LH	WS203108TPS	WS35LH
	0032	1250S16	WS203108TPS-35LH	WS203108TPS	WS35LH
	0034	1300S16	WS253909TPS-45LH	WS253909TPS	WS45LH
	0035	1350S16	WS253909TPS-45LH	WS253909TPS	WS45LH
	0036	1400S16	WS253909TPS-45LH	WS253909TPS	WS45LH
	0037	1450S16	WS253909TPS-45LH	WS253909TPS	WS45LH
	0039	1500S20	WS253909TPS-45LH	WS253909TPS	WS45LH
	0041	1600S20	WS304912TPS-55LH	WS304912TPS	WS55LH
	0044	1700S20	WS304912TPS-55LH	WS304912TPS	WS55LH
	0046	1800S20	WS304912TPS-55LH	WS304912TPS	WS55LH

* Clamp Torque (lbf-in) : WS203107TPS=8.9, WS203108TPS=8.9, WS253909TPS=17.7, WS304912TPS=22.1
Note 1) The parts included in the package are internal screw, stopper and operation manual. Please replace the parts in accordance with the operation manual.

NOTES ON USE

■INSERT INSTALLATION

1. Before inserting the insert into the holder, ensure that there are no foreign objects or dirt in the holder slot or slit. Clean using compressed air if necessary.



2. Use the wrench provided to loosen the inner screw to open the tip of the holder, then place the insert into the holder slot as shown in figure 1.
   *Ensure that the wrench is firmly in contact with the base of the inner screw head when tightening.

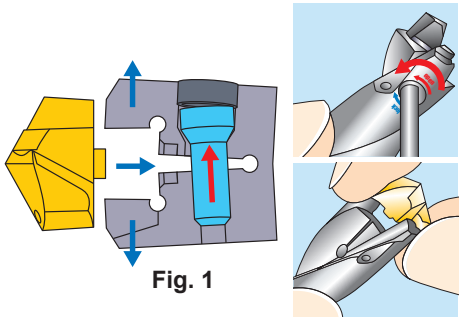


Fig. 1

3. After the insert has been set in the holder slot, tighten the inner screw while pushing the insert lightly into the pocket as shown in figure 2 to securely clamp and locate the insert.
   *Ensure that the wrench is firmly in contact with the base of the inner screw head when tightening.

Tighten clamp screws referring to the table for torque.

DC		Clamping Force	
		lbf-in	N · m
.3906"－.4844"	10mm－12.5mm	8.9	1
.5000"－.5781"	13mm－15mm	17.7	2
.5938"－.7188"	16mm－18mm	22.1	2.5

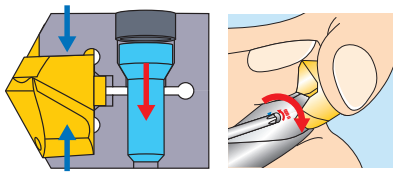
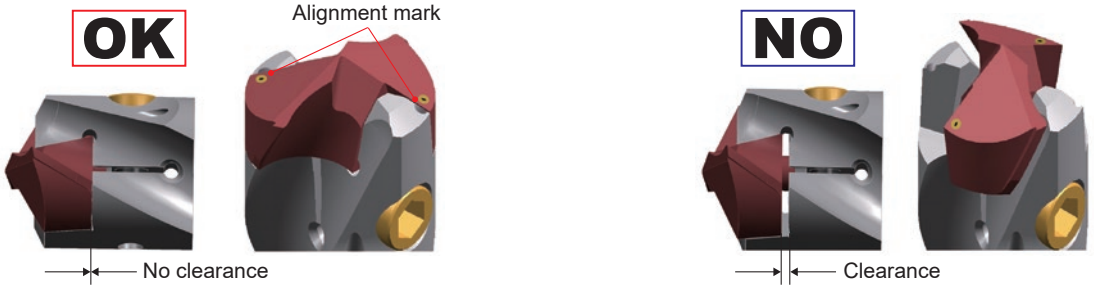


Fig. 2

4. Check there is no gap between the bottom of the insert and holder slot.



Note 1) Poor or incorrect clamping of inserts can cause poor drilling performance and/or drill breakage.
Therefore ensure that the alignment marks on both the body and insert are aligned when setting.
When machining, use safety guards and goggles.

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

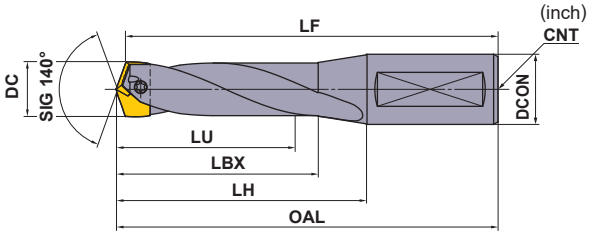
P | M | K | N | S | H

.5625≤DC≤.6875	.7031≤DC≤1.1719	DC=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

INCH STANDARD

L/D=3

Internal Coolant



Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWSN0049	●	2.319	2.811	4.032	6.282	6.148	1.000	1/8-27	WS304517T	TKY10T	WPT4405	MK1KS	.7344	*TAWNH0047T	●
													.7500	TAWNH0048T	●
													.7656	TAWNH0049T	●
TAWSN0051	●	2.441	2.977	4.040	6.290	6.148	1.000	1/8-27	WS304518T	TKY10T	WPT4405	MK1KS	.7813	*TAWNH0050T	●
													.7969	TAWNH0051T	●
TAWSN0054	●	2.567	3.101	4.046	6.296	6.148	1.000	1/8-27	WS304518T	TKY10T	WPT4405	MK1KS	.8125	*TAWNH0052T	●
													.8281	TAWNH0053T	●
													.8438	TAWNH0054T	●
TAWSN0056	●	2.693	3.266	4.250	6.500	6.344	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	*TAWNH0055T	●
													.8750	TAWNH0056T	●
TAWSN0059	●	2.819	3.390	4.256	6.506	6.344	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	*TAWNH0057T	●
													.9063	TAWNH0058T	●
													.9219	TAWNH0059T	●
TAWSN0061	●	2.945	3.557	4.502	6.877	6.706	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	*TAWNH0060T	●
													.9531	TAWNH0061T	●
TAWSN0100	●	3.071	3.641	4.507	6.882	6.706	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	*TAWNH0062T	●
													.9844	TAWNH0063T	●
													1.0000	TAWNH0100T	●
TAWSN0102	●	3.193	3.807	4.713	7.088	6.903	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	*TAWNH0101T	●
													1.0313	TAWNH0102T	●

* Clamp Torque (lbf-in) : WS304517T=31, WS304518T=31, WS355520T=49, WS355521T=49, WS406023T=75, WS406024T=75

Note 1) The above dimensions (*) are for when installing the inserts.

Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

● : USA Stock

Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWSN0105	●	3.319	3.892	4.719	7.094	6.903	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	*TAWNH0103T	●
													1.0625	**TAWNH0104T**	●
													1.0781	**TAWNH0105T**	●
TAWSN0107	●	3.445	4.018	4.923	7.298	7.099	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	*TAWNH0106T	●
													1.1094	**TAWNH0107T**	●
TAWSN0110	●	3.571	4.142	5.126	7.501	7.296	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	*TAWNH0108T	●
													1.1406	**TAWNH0109T**	●
													1.1563	**TAWNH0110T**	●
TAWSN0112	●	3.697	4.307	5.134	7.509	7.296	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1719	*TAWNH0111T	●
													1.1875	**TAWNH0112T**	●

* Clamp Torque (lbf-in) : WS406024T=75, WS508026T=110, WS508027T=110

ISO13399 ➤ L003
INSERTS ➤ L237
CUTTING CONDITIONS ➤ L236
HOW TO USE ➤ L236

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

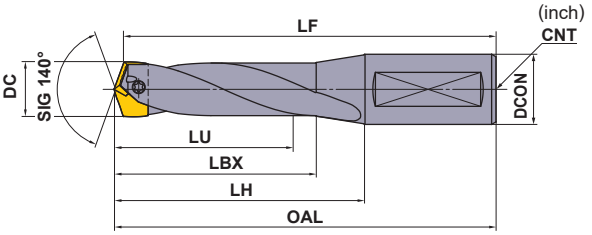
P | M | K | N | S | H

.5625≤DC≤.6875	.7031≤DC≤1.1719	DC=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

INCH STANDARD

L/D=5

Internal Coolant



Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWMN0049	●	3.776	4.347	5.410	7.660	7.526	1.000	1/8-27	WS304517T	TKY10T	WPT4405	MK1KS	.7344	*TAWNH0047T	●
													.7500	TAWNH0048T	●
													.7656	TAWNH0049T	●
TAWMN0051	●	3.976	4.591	5.614	7.864	7.722	1.000	1/8-27	WS304518T	TKY10T	WPT4405	MK1KS	.7813	*TAWNH0050T	●
													.7969	TAWNH0051T	●
TAWMN0054	●	4.181	4.794	5.620	7.870	7.722	1.000	1/8-27	WS304518T	TKY10T	WPT4405	MK1KS	.8125	*TAWNH0052T	●
													.8281	TAWNH0053T	●
													.8438	TAWNH0054T	●
TAWMN0056	●	4.386	5.038	5.825	8.075	7.919	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	*TAWNH0055T	●
													.8750	TAWNH0056T	●
TAWMN0059	●	4.591	5.241	6.225	8.475	8.313	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	*TAWNH0057T	●
													.9063	TAWNH0058T	●
													.9219	TAWNH0059T	●
TAWMN0061	●	4.795	5.486	6.470	8.845	8.674	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	*TAWNH0060T	●
													.9531	TAWNH0061T	●
TAWMN0100	●	5.000	5.688	6.672	9.047	8.871	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	*TAWNH0062T	●
													.9844	TAWNH0063T	●
													1.0000	TAWNH0100T	●
TAWMN0102	●	5.201	5.933	6.878	9.253	9.068	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	*TAWNH0101T	●
													1.0313	TAWNH0102T	●

* Clamp Torque (lbf-in) : WS304517T=31, WS304518T=31, WS355520T=49, WS355521T=49, WS406023T=75, WS406024T=75

Note 1) The above dimensions (*) are for when installing the inserts.

Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

● : USA Stock

Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWMN0105	●	5.406	6.136	7.081	9.456	9.265	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	*TAWNH0103T	●
													1.0625	**TAWNH0104T**	●
													1.0781	**TAWNH0105T**	●
TAWMN0107	●	5.610	6.380	7.286	9.661	9.462	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	*TAWNH0106T	●
													1.1094	**TAWNH0107T**	●
TAWMN0110	●	5.815	6.583	7.488	9.863	9.658	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	*TAWNH0108T	●
													1.1406	**TAWNH0109T**	●
													1.1563	**TAWNH0110T**	●
TAWMN0112	●	6.020	6.788	7.890	10.265	10.052	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1719	*TAWNH0111T	●
													1.1875	**TAWNH0112T**	●

* Clamp Torque (lbf-in) : WS406024T=75, WS508026T=110, WS508027T=110

ISO13399 ➤ L003
INSERTS ➤ L237
CUTTING CONDITIONS ➤ L236
HOW TO USE ➤ L236

TAW

- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

P | M | K | N | S | H

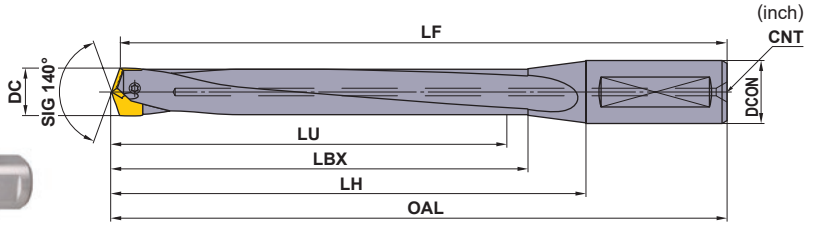
.5625≤DC≤.6875	.7031≤DC≤1.1719	DC=1.1875
−.00063 −.00134	−.00079 −.00161	−.00098 −.00197

(inch)

INCH STANDARD

L/D=8

Internal Coolant



Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWLN0049	●	5.961	6.512	7.417	9.669	9.535	1.000	1/8-27	WS304517T	TKY10T	WPT4405	MK1KS	.7344	*TAWNH0047T	●
													.7500	TAWNH0048T	●
													.7656	TAWNH0049T	●
TAWLN0051	●	6.280	6.835	7.740	9.992	9.850	1.000	1/8-27	WS304518T	TKY10T	WPT4405	MK1KS	.7813	*TAWNH0050T	●
													.7969	TAWNH0051T	●
TAWLN0054	●	6.602	7.156	8.101	10.353	10.205	1.000	1/8-27	WS304518T	TKY10T	WPT4405	MK1KS	.8125	*TAWNH0052T	●
													.8281	TAWNH0053T	●
													.8438	TAWNH0054T	●
TAWLN0056	●	6.925	7.479	8.424	10.676	10.520	1.000	1/8-27	WS355520T	TKY15T	WPT4405	MK1KS	.8594	*TAWNH0055T	●
													.8750	TAWNH0056T	●
TAWLN0059	●	7.248	7.800	8.942	11.193	11.031	1.000	1/8-27	WS355521T	TKY15T	WPT4405	MK1KS	.8906	*TAWNH0057T	●
													.9063	TAWNH0058T	●
													.9219	TAWNH0059T	●
TAWLN0061	●	7.571	8.124	9.305	11.679	11.508	1.250	1/4-18	WS355521T	TKY15T	WPT4405	MK1KS	.9375	*TAWNH0060T	●
													.9531	TAWNH0061T	●
TAWLN0100	●	7.894	8.444	9.625	11.999	11.823	1.250	1/4-18	WS406023T	TKY25T	WPT4405	MK1KS	.9688	*TAWNH0062T	●
													.9844	TAWNH0063T	●
													1.0000	TAWNH0100T	●
TAWLN0102	●	8.213	8.768	9.949	12.323	12.138	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0156	*TAWNH0101T	●
													1.0313	TAWNH0102T	●

* Clamp Torque (lbf-in) : WS304517T=31, WS304518T=31, WS355520T=49, WS355521T=49, WS406023T=75, WS406024T=75

Note 1) The above dimensions (*) are for when installing the inserts.

Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

● : USA Stock

Holder		Dimensions (inch)							*				DC (inch)	Insert	
Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	CNT	Insert Screw	Wrench	Plate	Anti-seize Lubricant		Order Number	Stock VP15TF
TAWLN0105	●	8.535	9.089	10.270	12.644	12.453	1.250	1/4-18	WS406024T	TKY25T	WPT4405	MK1KS	1.0469	*TAWNH0103T	●
													1.0625	**TAWNH0104T**	●
													1.0781	**TAWNH0105T**	●
TAWLN0107	●	8.858	9.412	10.593	12.967	12.768	1.250	1/4-18	WS508026T	TKY27T	WPT4405	MK1KS	1.0938	*TAWNH0106T	●
													1.1094	**TAWNH0107T**	●
TAWLN0110	●	9.181	9.733	10.914	13.288	13.083	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1250	*TAWNH0108T	●
													1.1406	**TAWNH0109T**	●
													1.1563	**TAWNH0110T**	●
TAWLN0112	●	9.504	10.056	11.433	13.807	13.594	1.250	1/4-18	WS508027T	TKY27T	WPT4405	MK1KS	1.1719	*TAWNH0111T	●
													1.1875	**TAWNH0112T**	●

* Clamp Torque (lbf-in) : WS406024T=75, WS508026T=110, WS508027T=110

ISO13399 ➤ L003
INSERTS ➤ L237
CUTTING CONDITIONS ➤ L236
HOW TO USE ➤ L236

TAW

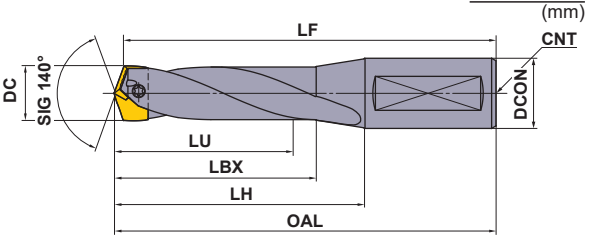
- Wavy cutting edge design for good chip control.
- Serration geometry for accurate insert location.

P | M | K | N | S | H

18<DC≤30
0
−0.021
(mm)

METRIC STANDARD

Internal Coolant



Hole Depth (L/D)	Holder Order Number	Stock	LU	LBX	LH	OAL	LF	DCON	Insert Screw *	Wrench	Plate	Anti-seize Lubricant	DC (mm)	Insert Order Number	Stock VP15TF
3	TAWSN1900S25	★	58.9	71.4	102.4	158.4	155.0	25	WS304517T	TKY10T	WPT4405	MK1KS	18.5	* TAWNH1850T	●
													18.6	TAWNH1860T	●
													18.7	TAWNH1870T	●
5	TAWMN1900S25	★	95.9	110.4	137.4	193.4	190.0	25	WS304517T	TKY10T	WPT4405	MK1KS	18.8	TAWNH1880T	●
													18.9	TAWNH1890T	●
													19.0	TAWNH1900T	●
8	TAWLN1900S25	★	151.4	165.5	188.5	244.5	241.0	25	WS304517T	TKY10T	WPT4405	MK1KS	19.1	TAWNH1910T	●
													19.2	TAWNH1920T	●
													19.3	TAWNH1930T	●
													19.4	TAWNH1940T	●
3	TAWSN2000S25	★	62.0	75.5	102.5	158.5	155.0	25	WS304518T	TKY10T	WPT4405	MK1KS	19.5	* TAWNH1950T	●
													19.6	TAWNH1960T	●
5	TAWMN2000S25	★	101.0	116.6	142.6	198.6	195.0	25	WS304518T	TKY10T	WPT4405	MK1KS	19.7	TAWNH1970T	●
													19.8	TAWNH1980T	●
8	TAWLN2000S25	★	159.5	173.7	196.7	252.7	249.0	25	WS304518T	TKY10T	WPT4405	MK1KS	19.9	TAWNH1990T	●
													20.0	TAWNH2000T	●
3	TAWSN2100S25	★	65.2	78.7	102.7	158.7	155.0	25	WS304518T	TKY10T	WPT4405	MK1KS	20.5	TAWNH2050T	●
5	TAWMN2100S25	★	106.2	121.8	142.8	198.8	195.0	25	WS304518T	TKY10T	WPT4405	MK1KS			
8	TAWLN2100S25	★	167.7	181.9	205.9	261.9	258.0	25	WS304518T	TKY10T	WPT4405	MK1KS	21.0	TAWNH2100T	●
3	TAWSN2200S25	★	68.4	83.2	108.2	164.2	160.3	25	WS355520T	TKY15T	WPT4405	MK1KS	21.5	TAWNH2150T	●
5	TAWMN2200S25	★	111.4	128.3	148.3	204.3	200.3	25	WS355520T	TKY15T	WPT4405	MK1KS			
8	TAWLN2200S25	★	175.9	190.0	214.0	270.0	266.0	25	WS355520T	TKY15T	WPT4405	MK1KS	22.0	TAWNH2200T	●

* Clamp Torque (lbf-in) : WS304517T=31, WS304518T=31, WS355520T=49

Note 1) The above dimensions (*) are for when installing the inserts.

Note 2) Please contact us for any geometry that is not in this catalog (e.g. different diameter and length).

● : USA Stock

Hole Depth (L/D)	Holder Order Number	Stock	Dimensions (mm) LU	LBX	LH	OAL	LF	DCON	* Insert Screw	Wrench	Plate	Anti-seize Lubricant	DC (mm)	Insert Order Number	Stock VP15TF
3	**TAWSN2300S25**	★	71.6	86.4	108.4	164.4	160.3	25	WS355521T	TKY15T	WPT4405	MK1KS	22.5	* **TAWNH2250T**	●
5	**TAWMN2300S25**	★	116.6	133.4	158.4	214.4	210.3	25	WS355521T	TKY15T	WPT4405	MK1KS			
8	**TAWLN2300S25**	★	184.1	198.2	227.2	283.2	279.0	25	WS355521T	TKY15T	WPT4405	MK1KS	23.0	**TAWNH2300T**	●
3	**TAWSN2400S32**	★	74.8	90.6	114.6	174.6	170.3	32	WS355521T	TKY15T	WPT4405	MK1KS	23.5	* **TAWNH2350T**	●
5	**TAWMN2400S32**	★	121.8	139.6	164.6	224.6	220.3	32	WS355521T	TKY15T	WPT4405	MK1KS			
8	**TAWLN2400S32**	★	192.3	206.4	236.4	296.4	292.0	32	WS355521T	TKY15T	WPT4405	MK1KS	24.0	**TAWNH2400T**	●
3	**TAWSN2500S32**	★	78.0	93.1	115.1	175.1	170.6	32	WS406023T	TKY25T	WPT4405	MK1KS	24.5	* **TAWNH2450T**	●
5	**TAWMN2500S32**	★	127.0	145.1	170.1	230.1	225.6	32	WS406023T	TKY25T	WPT4405	MK1KS			
8	**TAWLN2500S32**	★	200.5	214.6	244.6	304.6	300.0	32	WS406023T	TKY25T	WPT4405	MK1KS	25.0	**TAWNH2500T**	●
3	**TAWSN2600S32**	★	81.1	97.2	120.2	180.2	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS	25.5	* **TAWNH2550T**	●
5	**TAWMN2600S32**	★	132.1	151.3	175.3	235.3	230.6	32	WS406024T	TKY25T	WPT4405	MK1KS			
8	**TAWLN2600S32**	★	208.6	222.8	252.8	312.8	308.0	32	WS406024T	TKY25T	WPT4405	MK1KS	26.0	**TAWNH2600T**	●
3	**TAWSN2700S32**	★	84.3	99.4	120.4	180.4	175.6	32	WS406024T	TKY25T	WPT4405	MK1KS	26.5	* **TAWNH2650T**	●
5	**TAWMN2700S32**	★	137.3	156.5	180.5	240.5	235.6	32	WS406024T	TKY25T	WPT4405	MK1KS			
8	**TAWLN2700S32**	★	216.8	230.9	260.9	320.9	316.0	32	WS406024T	TKY25T	WPT4405	MK1KS	27.0	**TAWNH2700T**	●
3	**TAWSN2800S32**	★	87.5	102.2	125.2	185.2	180.2	32	WS508026T	TKY27T	WPT4405	MK1KS	27.5	* **TAWNH2750T**	●
5	**TAWMN2800S32**	★	142.5	162.3	185.3	245.3	240.2	32	WS508026T	TKY27T	WPT4405	MK1KS			
8	**TAWLN2800S32**	★	225.0	239.1	269.1	329.1	324.0	32	WS508026T	TKY27T	WPT4405	MK1KS	28.0	**TAWNH2800T**	●
3	**TAWSN2900S32**	★	90.7	105.4	130.4	190.4	185.2	32	WS508027T	TKY27T	WPT4405	MK1KS	28.5	* **TAWNH2850T**	●
5	**TAWMN2900S32**	★	147.7	167.4	190.4	250.4	245.2	32	WS508027T	TKY27T	WPT4405	MK1KS			
8	**TAWLN2900S32**	★	233.2	247.3	277.3	337.3	332.0	32	WS508027T	TKY27T	WPT4405	MK1KS	29.0	**TAWNH2900T**	●
3	**TAWSN3000S32**	★	93.9	109.6	130.6	190.6	185.2	32	WS508027T	TKY27T	WPT4405	MK1KS	29.5	* **TAWNH2950T**	●
5	**TAWMN3000S32**	★	152.9	172.6	200.6	260.6	255.2	32	WS508027T	TKY27T	WPT4405	MK1KS			
8	**TAWLN3000S32**	★	241.4	255.5	290.5	350.5	345.0	32	WS508027T	TKY27T	WPT4405	MK1KS	30.0	**TAWNH3000T**	●

* Clamp Torque (lbf-in) : WS355521T=49, WS406023T=75, WS406024T=75, WS508026T=110, WS508027T=110

ISO13399 ➤ L003
INSERTS ➤ L237
CUTTING CONDITIONS ➤ L236
HOW TO USE ➤ L236

TAW

RECOMMENDED CUTTING CONDITIONS

Workpiece Material		DC	ϕ.5625"—ϕ.6094" ϕ14.0—ϕ15.4mm		ϕ.6250"—ϕ.7188" ϕ15.5—ϕ18.4mm		ϕ.7344"—ϕ.8438" ϕ18.5—ϕ21.4mm	
		Conditions / Hardness	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)
P	Mild Steel	≤180HB	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)
P	Carbon Steel Alloy Steel	180—280HB	230 (195—295)	.008 (.006—.010)	260 (195—330)	.010 (.008—.012)	260 (195—330)	.010 (.008—.012)
P	Carbon Steel Alloy Steel	280—350HB	195 (165—260)	.006 (.005—.007)	230 (165—295)	.008 (.006—.010)	230 (165—295)	.008 (.006—.010)
M	Stainless Steel	≤200HB	165 (130—195)	.006 (.005—.007)	165 (130—195)	.006 (.005—.007)	195 (165—230)	.008 (.006—.009)
K	Gray Cast Iron	Tensile Strength ≤350MPa	230 (165—295)	.008 (.006—.010)	330 (195—395)	.010 (.008—.012)	390 (195—460)	.010 (.008—.012)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	230 (165—295)	.008 (.006—.010)	260 (195—295)	.010 (.008—.012)	260 (195—295)	.010 (.008—.012)

Workpiece Material		DC	ϕ.8594"—ϕ.9531" ϕ21.5—ϕ24.4mm		ϕ.9688"—ϕ1.0781" ϕ24.5—ϕ27.4mm		ϕ1.0938"—ϕ1.1875" ϕ27.5—ϕ30.4mm	
		Conditions / Hardness	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)	Cutting Speed **vc** (SFM)	Feed **fr** (IPR)
P	Mild Steel	≤180HB	330 (260—390)	.012 (.010—.014)	360 (260—390)	.012 (.010—.014)	360 (260—390)	.012 (.010—.014)
P	Carbon Steel Alloy Steel	180—280HB	295 (230—360)	.012 (.010—.014)	330 (260—390)	.012 (.010—.014)	330 (260—390)	.012 (.010—.014)
P	Carbon Steel Alloy Steel	280—350HB	260 (195—330)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)	295 (230—360)	.010 (.008—.012)
M	Stainless Steel	≤200HB	195 (165—230)	.008 (.006—.009)	230 (195—260)	.010 (.008—.011)	230 (195—260)	.010 (.008—.011)
K	Gray Cast Iron	Tensile Strength ≤350MPa	425 (260—490)	.014 (.010—.016)	460 (295—525)	.014 (.010—.016)	460 (295—525)	.016 (.012—.018)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	295 (195—330)	.012 (.010—.014)	330 (260—360)	.012 (.010—.014)	330 (260—360)	.012 (.010—.014)

NOTES ON USE

■INSERT INSTALLATION

- Loosen insert screw of holder to install insert.
- Mesh the insert serration to holder grooves.
- Fasten the insert screw using the provided wrench while holding rake face of the insert lightly with your thumb. (Figure 1)
- Check that there is no clearance between the insert bottom and holder flute end. (Figure 2)

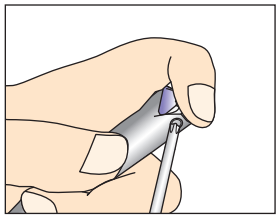


Figure 1

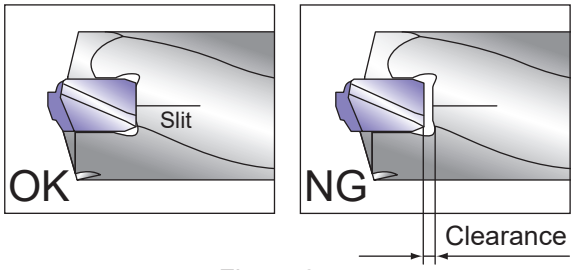


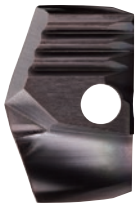
Figure 2

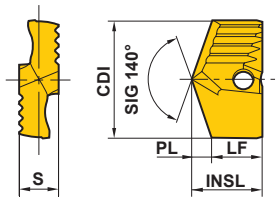
■NOTE ON INSERT REPLACEMENT

- Clean insert guide grooves by blowing air before installing a new insert.
- Clean the “slit” underneath the insert on the holder with the provided plate.
- Use the provided anti-seize lubricant for lubricating the threads of the insert screw.

INSERTS

INCH STANDARD





For General Use

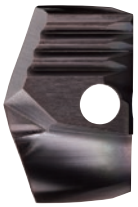
Order Number	Coated	Dimensions (inch)					Applicable Holder	
	VP15TF	CDI	INSL	LF	PL	S	Inch	Metric
TAWNH0047T	●	.7344	.484	.366	.120	.276	TAWS/M/LN0049	TAWS/M/LN1900S25
TAWNH0048T	●	.7500	.484	.362	.123	.276		
TAWNH0049T	●	.7656	.484	.362	.123	.276		
TAWNH0050T	●	.7813	.484	.358	.127	.276	TAWS/M/LN0051	TAWS/M/LN2000S25
TAWNH0051T	●	.7969	.484	.354	.131	.276		
TAWNH0052T	●	.8125	.484	.350	.134	.276	TAWS/M/LN0054	TAWS/M/LN2100S25
TAWNH0053T	●	.8281	.484	.346	.138	.276		
TAWNH0054T	●	.8438	.484	.346	.138	.276		
TAWNH0055T	●	.8594	.555	.417	.140	.315	TAWS/M/LN0056	TAWS/M/LN2200S25
TAWNH0056T	●	.8750	.555	.413	.143	.315		
TAWNH0057T	●	.8906	.555	.409	.147	.315	TAWS/M/LN0059	TAWS/M/LN2300S25
TAWNH0058T	●	.9063	.555	.406	.150	.315		
TAWNH0059T	●	.9219	.555	.406	.150	.315		
TAWNH0060T	●	.9375	.555	.402	.154	.315	TAWS/M/LN0061	TAWS/M/LN2400S32
TAWNH0061T	●	.9531	.555	.398	.157	.315		
TAWNH0062T	●	.9688	.618	.461	.159	.354	TAWS/M/LN0100	TAWS/M/LN2500S32
TAWNH0063T	●	.9844	.618	.457	.163	.354		
TAWNH0100T	●	1.0000	.618	.457	.163	.354		
TAWNH0101T	●	1.0156	.618	.453	.166	.354	TAWS/M/LN0102	TAWS/M/LN2600S32
TAWNH0102T	●	1.0313	.618	.449	.170	.354		
TAWNH0103T	●	1.0469	.618	.445	.174	.354	TAWS/M/LN0105	TAWS/M/LN2700S32
TAWNH0104T	●	1.0625	.618	.445	.174	.354		
TAWNH0105T	●	1.0781	.618	.441	.177	.354		
TAWNH0106T	●	1.0938	.661	.484	.179	.394	TAWS/M/LN0107	TAWS/M/LN2800S32
TAWNH0107T	●	1.1094	.661	.480	.183	.394		
TAWNH0108T	●	1.1250	.661	.476	.186	.394	TAWS/M/LN0110	TAWS/M/LN2900S32
TAWNH0109T	●	1.1406	.661	.476	.186	.394		
TAWNH0110T	●	1.1563	.661	.472	.190	.394		
TAWNH0111T	●	1.1719	.661	.469	.193	.394	TAWS/M/LN0112	TAWS/M/LN3000S32
TAWNH0112T	●	1.1875	.661	.465	.197	.394		

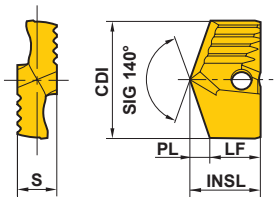
● : USA Stock
<One insert in one case>

TAW

INSERTS

METRIC STANDARD





For General Use

Order Number	Coated	Dimensions (mm)					Applicable Holder	
	VP15TF	CDI	INSL	LF	PL	S	Inch	Metric
TAWNH1850T	●	18.5	12.7	9.3	3.4	7.0		
TAWNH1860T	●	18.6	12.7	9.3	3.4	7.0		
TAWNH1870T	●	18.7	12.7	9.3	3.4	7.0		
TAWNH1880T	●	18.8	12.7	9.3	3.4	7.0	TAWSN0049	TAWSN1900S25
TAWNH1890T	●	18.9	12.7	9.3	3.4	7.0	TAWMN0049	TAWMN1900S25
TAWNH1900T	●	19.0	12.7	9.2	3.5	7.0	TAWLN0049	TAWLN1900S25
TAWNH1910T	●	19.1	12.7	9.2	3.5	7.0		
TAWNH1920T	●	19.2	12.7	9.2	3.5	7.0		
TAWNH1930T	●	19.3	12.7	9.2	3.5	7.0		
TAWNH1940T	●	19.4	12.7	9.2	3.5	7.0		
TAWNH1950T	●	19.5	12.6	9.1	3.5	7.0		
TAWNH1960T	●	19.6	12.7	9.1	3.6	7.0		
TAWNH1970T	●	19.7	12.7	9.1	3.6	7.0	TAWSN0051	TAWSN2000S25
TAWNH1980T	●	19.8	12.7	9.1	3.6	7.0	TAWMN0051	TAWMN2000S25
TAWNH1990T	●	19.9	12.7	9.1	3.6	7.0	TAWLN0051	TAWLN2000S25
TAWNH2000T	●	20.0	12.6	9.0	3.6	7.0		
TAWNH2050T	●	20.5	12.6	8.9	3.7	7.0	TAWSN0054	TAWSN2100S25
TAWNH2100T	●	21.0	12.6	8.8	3.8	7.0	TAWMN0054	TAWMN2100S25
							TAWLN0054	TAWLN2100S25
TAWNH2150T	●	21.5	14.5	10.6	3.9	8.0	TAWSN0056	TAWSN2200S25
TAWNH2200T	●	22.0	14.5	10.5	4.0	8.0	TAWMN0056	TAWMN2200S25
							TAWLN0056	TAWLN2200S25
TAWNH2250T	●	22.5	14.5	10.4	4.1	8.0	TAWSN0059	TAWSN2300S25
TAWNH2300T	●	23.0	14.5	10.3	4.2	8.0	TAWMN0059	TAWMN2300S25
							TAWLN0059	TAWLN2300S25
TAWNH2350T	●	23.5	14.5	10.2	4.3	8.0	TAWSN0061	TAWSN2400S32
TAWNH2400T	●	24.0	14.5	10.1	4.4	9.0	TAWMN0061	TAWMN2400S32
							TAWLN0061	TAWLN2400S32
TAWNH2450T	●	24.5	16.2	11.7	4.5	9.0	TAWSN0100	TAWSN2500S32
TAWNH2500T	●	25.0	16.1	11.6	4.5	9.0	TAWMN0100	TAWMN2500S32
							TAWLN0100	TAWLN2500S32
TAWNH2550T	●	25.5	16.1	11.5	4.6	9.0	TAWSN0102	TAWSN2600S32
TAWNH2600T	●	26.0	16.1	11.4	4.7	9.0	TAWMN0102	TAWMN2600S32
							TAWLN0102	TAWLN2600S32
TAWNH2650T	●	26.5	16.1	11.3	4.8	9.0	TAWSN0105	TAWSN2700S32
TAWNH2700T	●	27.0	16.1	11.2	4.9	9.0	TAWMN0105	TAWMN2700S32
							TAWLN0105	TAWLN2700S32
TAWNH2750T	●	27.5	17.3	12.3	5.0	10.0	TAWSN0107	TAWSN2800S32
TAWNH2800T	●	28.0	17.3	12.2	5.1	10.0	TAWMN0107	TAWMN2800S32
							TAWLN0107	TAWLN2800S32
TAWNH2850T	●	28.5	17.3	12.1	5.2	10.0	TAWSN0110	TAWSN2900S32
TAWNH2900T	●	29.0	17.3	12.0	5.3	10.0	TAWMN0110	TAWMN2900S32
							TAWLN0110	TAWLN2900S32
TAWNH2950T	●	29.5	17.3	11.9	5.4	10.0	TAWSN0112	TAWSN3000S32
TAWNH3000T	●	30.0	17.3	11.8	5.5	10.0	TAWMN0112	TAWMN3000S32
							TAWLN0112	TAWLN3000S32

● : USA Stock
<One insert in one case>

SPARE PARTS

IDENTIFICATION M002
SPARE PARTS
- CLAMP SCREW M004
- SET BOLT M009
- STANDARD FOR ADJUSTABLE SCREWS AND NUTS M011
- SHIM M012
- SHIM SCREW M015
- PIN / RING / CLAMP LEVER M016
- CLAMP BRIDGE M017
- CHIP BREAKER M017
- COOLANT NOZZLE M018
- STOPPER M018
- ANTI SEIZE LUBRICANT M018

STANDARD FOR NON-STOCK PARTS
- CLAMP SCREW M019
- PLUG M019
- STOP PLUG FOR NOZZLE M019

IDENTIFICATION

■ IDENTIFICATION OF CLAMP SCREW (Metric coarse right hand screw thread)

H SC 060 05

Length

Example	
Symbol	L
05	.197
10	.394
20	.787
30	1.181

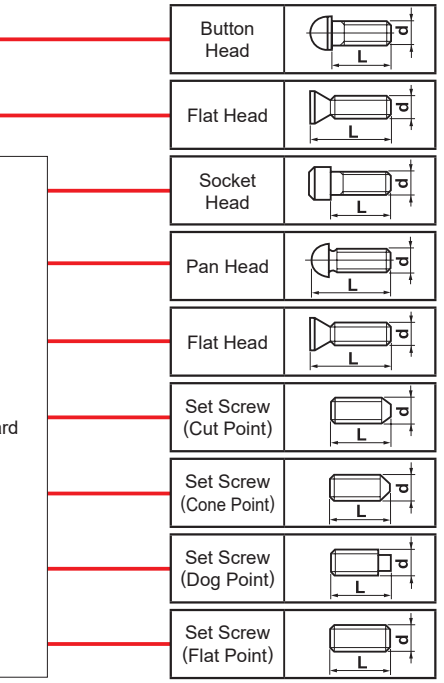
Screw Diameter

Example	
Symbol	d
050	M5
060	M6

Screw Head

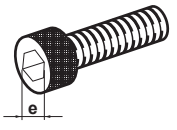
Symbol	Geometry
H	Hexagonal Hole Dimensions
S	With Slot
C	With Cross Hole

Symbol	JIS Standard
BH / BHA	Button Head
FC	Flat Head
SC	Socket Head
PM	Pan Head
FM	Flat Head
SD	Set Screw (Cut Point)
SP	Set Screw (Cone Point)
SR	Set Screw (Dog Point)
SS	Set Screw (Flat Point)



● Hexagonal Hole Dimensions

Diameter (Metric)	Pitch (mm)	e Dimensions			
		HBH	HFC	HSC	HS○
M2	.4	—	—	.059	.035
M2.5	.45	—	—	.079	.051
M3	.5	.079	.079	.098	.059
M4	.7	.098	.098	.118	.079
M5	.8	.118	.118	.157	.098
M6	1.0	.157	.157	.197	.118
M8	1.25	.197	.197	.236	.157
M10	1.5	.236	.236	.315	.197



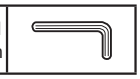
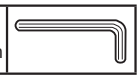
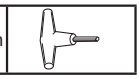
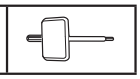
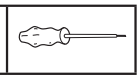
■ IDENTIFICATION OF WRENCH

HKY **15** **R**

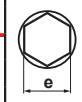
Wrench Sizes

Wrench Shapes

Symbol	Wrench
HKY	Hexagonal Wrench
TKY	Torx Wrench
NKY	Torx Wrench
TIP	Torx plus® Wrench

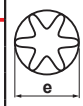
Symbol	Wrench	
R	Standard L Wrench	
L	Long L Wrench	
T	T Wrench	
F FS	Flag Wrench	
W	Flag Wrench	
D DS	Driver	

Hexagonal Wrench



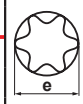
Symbol	e
15	.059
20	.079
25	.098
30	.118
35	.138
40	.157
50	.197
60	.236

Torx Wrench



Symbol	e	Drive Size
06	.071	T6
08	.094	T8
10	.110	T10
15	.130	T15
20	.154	T20
25	.177	T25
27	.201	T27
30	.217	T30

Torx plus® Wrench



Symbol	e	Drive Size
06	.071	6IP
07	.083	7IP
08	.094	8IP
10	.110	10IP
15	.130	15IP
25	.154	251P

IMX **10** - **WR**

Symbol	Wrench
IMX	IMX Series

Wrench Sizes

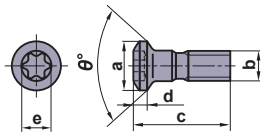
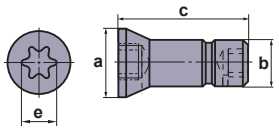
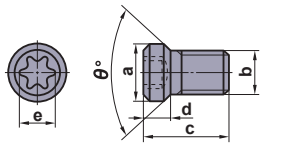
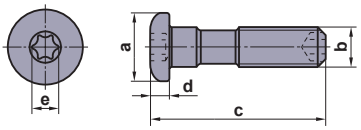
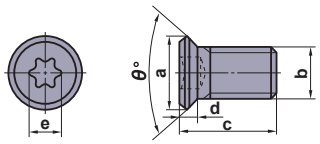
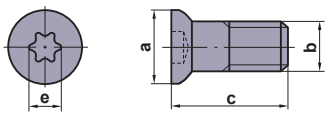
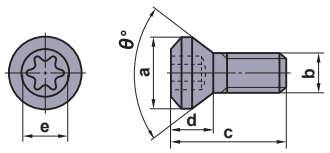
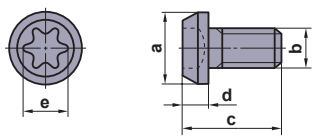
mm

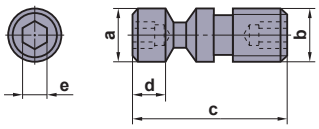
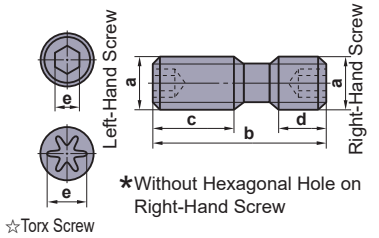
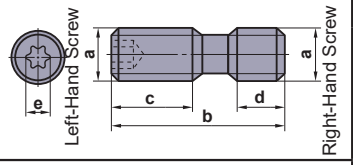
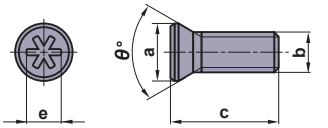
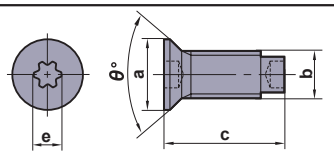
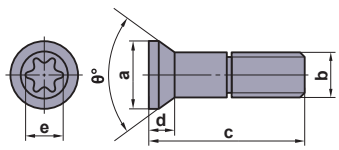
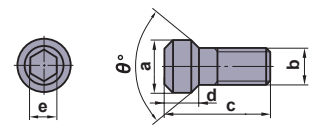
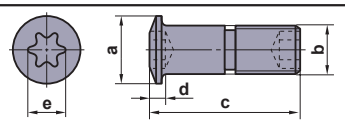
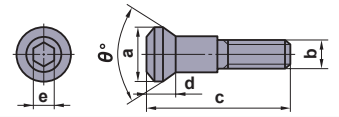
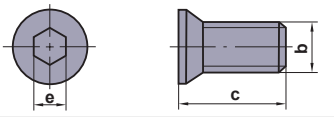
Symbol	B
10	10
12	12
16	16
20	20
25	25

Wrench Shapes ; WR

SPARE PARTS

CLAMP SCREW

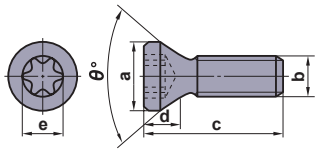
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-in)	Tool Holder
	**AJS3010T10**	.197	M3×0.5	.394	.059	T10	120	22	**AJX** (➲K286) **PMC** (➲K376)
	AJS4012T15	.276	M4×0.7	.472	.087	T15	120	31	**AJX** (➲K286) **PMC** (➲K376)
	AJS5014T25	.315	M5×0.8	.551	.106	T25	120	66	
	**BLS02**	.165	M3	.270	—	T08	—	18	
	BLS03	.235	M4	.335	—	T15	—	27	
	BLS04	.268	M5	.356	—	T20	—	35	
	BLS05	.294	M5	.504	—	T20	—	44	
	BLS06	.317	M5	.610	—	T20	—	53	
	BLS08	.375	M6	.803	—	T30	—	58	
	BLS12	.474	M8	.969	—	T30	—	58	
	**CS250T**	.146	M2.5×0.45	.236	.071	T8	90	8.9	**MILLING TOOLS** (➲K001)
	∗**CS250560T**	.154	M2.5×0.45	.205	.098	T8	60	8.9	**BRP** (➲K344)
	CS300890T	.161	M3×0.5	.315	.081	T8	90	8.9	
	∗**CS350760T**	.217	M3.5×0.6	.276	.157	T15	60	31	
	∗**CS350860T**	.217	M3.5×0.6	.331	.157	T15	60	31	**MMTI** (➲G026) **BRP** (➲K344)
	CS350990T	.189	M3.5×0.6	.354	.093	T10	90	22	
	CS401160T	.224	M4×0.7	.433	.177	T15	60	31	
	CS451190T	.248	M4.5×0.75	.433	.114	T20	90	44	**AL** Type Holder (➲C041)
	CS501290T	.276	M5×0.8	.433	.138	T25	90	66	
	∗ **CS5015060T**	.283	M5×0.8	.591	.093	T20	60	44	**AHX640S** (➲K074)
	**DC0520T**	.335	M5×0.8	.886	.098	T15	—	31	**DOUBLE CLAMP** Type Holder (➲C006)
	DC0621T	.413	M6×1.0	.984	.157	T20	—	44	**DOUBLE CLAMP DIMPLE BAR** (➲E021) **HSK-T** Tool Holder (➲H006)
	**FC400890T**	.220	M4×0.7	.295	.051	T10	90	22	**AL** Type Holder (➲C042) **AL** Type Boring Bar (➲E028)
	**GTS1**	.220	6-40UNF	.500	—	T10	—	14	
	GTS2	.310	10-32UNF	.750	—	T20	—	45	
	GTS3	.350	10-32UNF	.750	—	T20	—	45	
	**GY05016S**	.343	M5×0.8	.630	.138	T20	90	44	**GY** Series (➲F152)
	**GY06013M**	.472	M6×1.0	.709	.197	T30	—	53	**GY** Series (➲F152)

Geometry	Order Number	Dimensions (inch)						Torque (lbf-in)	Tool Holder
		a	b	c	d	e	θ°		
	**LLCS105**	M5×0.8	M5×0.8	.394	.059	.787	—	13	**HSK-T** Tool Holder (➲H012)
	LLCS106	.236	M6×1	.650	.138	.098	—	19	
	LLCS108	.315	M8×1.25	.827	.256	.118	—	29	
 ☆Torx Screw	☆ **LS10T**	M7×0.75	.551	.236	.197	T25	—	71	**AOX445** (➲K095)
	☆ **LS15T**	M7×0.75	.709	.276	.276	T25	—	71	
	**LS0622T**	M6×0.75	.866	.315	.315	T15	—	53	**AHX640W** (➲K086)
	**NS251**	.142	M2.5×0.45	.276	—	.087	60	6.2	**SMALL TOOLS** (➲D001)
	NS401	.228	M4×0.7	.236	—	.142	60	31	
	**NS402W**	.230	M4×0.7	.394	—	.087	60	6.2	**SMALL TOOLS** (➲D001)
	NS403W	.230	M4×0.7	.472	—	.087	60	6.2	
	NS404W	.228	M4×0.7	.394	—	.087	90	6.2	
	**RS3008TS**	.169	M3×0.35	.331	.079	T8	61	13	**SRF/SUF** Series (➲K350)
	RS3008T	.169	M3×0.35	.339	.079	T8	61	13	
	RS3510T	.197	M3.5×0.35	.394	.091	T10	61	22	
	RS4015T	.236	M4×0.5	.551	.106	T15	61	29	
	RS5020T	.319	M5×0.5	.646	.142	T20	61	44	
	RS6025T	.374	M6×0.75	.846	.165	T25	61	66	
	RS8030T	.472	M8×0.75	.984	.197	T30	61	88	
	**S2**	.157	M2.5×0.45	.256	.091	.079	92	14	
	S3	.177	M3×0.5	.303	.094	.079	92	13	
	**SETS51**	.268	M5×0.8	.583	.059	T15	—	31	**HSK-T** Tool Holder (➲H016)
	SETS61	.315	M6×1	.787	.071	T20	—	44	**MMTE** (➲G021) **MMTI** (➲G026)
	**SLCS105**	.394	M5×0.8	.984	.248	.157	90	62	
	**S34**	—	10-32UNF	.313	—	.078	—		
	S46	—	1/4-28UNF	.500	—	.094	—		

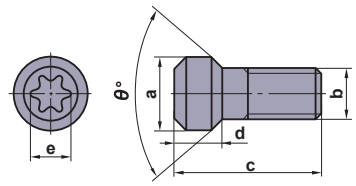
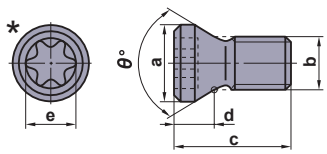
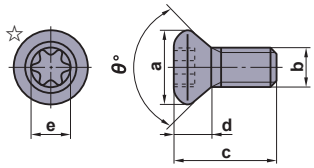
*Without Hexagonal Hole on Right-Hand Screw

SPARE PARTS

CLAMP SCREW

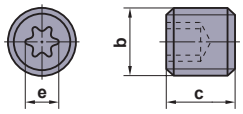
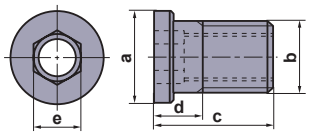
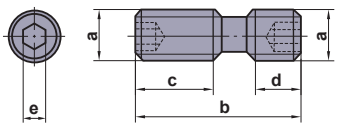
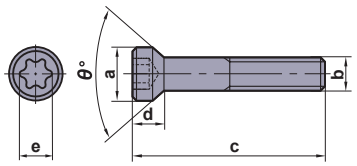
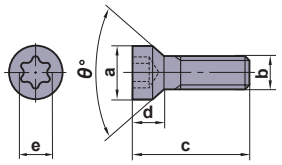
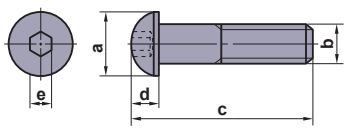


Geometry	Order Number	Dimensions (inch)						Torque (lbf-in)	Tool Holder
		a	b	c	d	e	θ°		
	TPS20	.106	M2×0.4	.138	.051	6IP	60	4.5	**ARP** (➲K328)
	TPS20-1	.104	M2×0.4	.185	.094	6IP	60	5.3	**MVX** (➲L199)
	TPS22	.118	M2.2×0.45	.185	.063	7IP	60	4.5	**ARP** (➲K328)
	TPS22S	.118	M2.2×0.45	.165	.063	7IP	60	4.5	**ARP** (➲K328)
	TPS25	.130	M2.5×0.45	.217	.067	7IP	60	8.9	**APX3000** (➲K154)
	TPS25-1	.130	M2.5×0.45	.256	.067	7IP	60	8.9	**APX3000** (➲K154)
	TPS27F1	.146	M2.7×0.35	.256	.071	7IP	60	8.9	**VPX200** (➲K182)
	TPS27F2	.146	M2.7×0.35	.315	.071	7IP	60	8.9	**VPX200** (➲K182)
	TPS3	.154	M3×0.5	.264	.055	10IP	60	18	**MVX** (➲L200)
	TPS3R	.181	M3×0.5	.335	.075	10IP	60	18	**WJX09** (➲K308)
	TPS3SB	.173	M3×0.5	.315	.079	10IP	80	27	**AXD4000A** (➲K240)
	TPS35	.209	M3.5×0.6	.453	.110	15IP	60	31	**ASX445** (➲K056) **ASX400** (➲K138) **PMR** (➲K379)
	TPS351	.189	M3.5×0.6	.281	.055	10IP	60	22	**MVX** (➲L200)
	TPS351B	.201	M3.5×0.6	.283	.092	10IP	60	22	**ARP** (➲K328)
	TPS4	.209	M4×0.7	.315	.102	15IP	60	31	**APX4000** (➲K168) **ARP** (➲K328) **MVX** (➲L201)
	TPS40F1	.209	M4×0.5	.413	.110	15IP	60	27	**VPX300** (➲K193)
	TPS4R	.252	M4×0.7	.417	.087	15IP	R4	31	**WSX445** (➲K042)
	TPS4S	.209	M4×0.7	.276	.102	15IP	60	31	
	TPS43	.209	M4×0.7	.394	.102	15IP	60	31	**APX4000** (➲K168) **MVX** (➲L201)
	TPS54	.268	M5×0.8	.472	.126	25IP	60	66	**MVX** (➲L202)

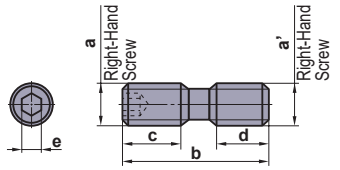
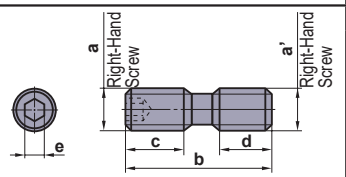
Geometry	Order Number	Dimensions (inch)						Torque (lbf-in)	Tool Holder
		a	b	c	d	e	θ°		
	*TS16	.098	M1.6×0.35	.126	.063	T6	60	5.3	**MICRO-DEX** (➲E029)
	TS2	.106	M2×0.4	.181	.055	T6	60	5.3	
	*TS2A	.106	M2×0.4	.177	.047	T6	60	5.3	**AQX** (➲K276)
	TS2C	.106	M2×0.4	.150	.055	T6	60	5.3	
	☆TS2D	.150	M2×0.4	.209	.076	T6	82	5.3	**DIMPLE BAR** (➲E007)
	TS21	.106	M2×0.4	.134	.055	T6	60	5.3	**S Type** Boring Bar (➲E012)
	*TS22	.118	M2.2×0.45	.197	.047	T6	60	5.3	
	*TS25	.130	M2.5×0.45	.217	.067	T8	60	8.9	**AQX** (➲K276) **AJX** (➲K286)
	☆TS25D	.172	M2.5×0.45	.244	.087	T8	82	8.9	**DIMPLE BAR** (➲E007)
	*TS25H	.142	M2.5×0.45	.217	.079	T8	60	15	**SRM2** (➲K362)
	TS202	.106	M2×0.4	.217	.071	T6	60	5.3	
	TS253	.130	M2.5×0.45	.177	.067	T8	60	8.9	**MILLING TOOLS** (➲K001)
	TS254	.130	M2.5×0.45	.276	.067	T8	60	8.9	**SMALL TOOLS** (➲D001) **PMF** (➲K378)
	*TS255	.138	M2.5×0.45	.295	.063	T8	60	8.9	
	TS3	.154	M3×0.5	.236	.079	T8	60	8.9	
	TS304	.154	M3×0.5	.413	.079	T8	60	13	
	TS3D	.197	M3×0.5	.236	.091	T10	82	22	**DIMPLE BAR** (➲E006)
	TS3SB	.173	M3×0.5	.315	.079	T8	80	13	**AXD4000** (➲K226)
	TS3SBS	.173	M3×0.5	.256	.080	T8	80	13	**AXD4000** (➲K226)
	TS31D	.189	M3×0.5	.283	.087	T10	82	22	**DIMPLE BAR** (➲E007)
	*TS32	.154	M3×0.5	.295	.079	T8	60	18	**SRM2** (➲K362)
	*TS33	.154	M3×0.5	.264	.079	T8	60	13	**AQX** (➲K276) **AJX** (➲K286) **PMC** (➲K376)
	TS35	.189	M3.5×0.6	.256	.094	T10	60	22	
	*TS35D	.209	M3.5×0.6	.472	.110	T15	60	31	**HSK** Tool Holder (➲H013)
	TS35R	.224	M3.5×0.6	.394	.083	T15	—	31	**AHX440S** (➲K064) **AHX475S** (➲K070)
	TS351	.189	M3.5×0.6	.283	.094	T10	60	22	**AJX** (➲K286) **SRM2** (➲K362) **PMC** (➲K376)
	TS352	.189	M3.5×0.6	.394	.118	T10	60	22	
	TS4	.213	M4×0.7	.315	.102	T15	60	31	**CFSP** (➲K348)
	TS4D	.220	M4×0.7	.303	.098	T15	82	31	**DIMPLE BAR** (➲E006)
	TS4S	.213	M4×0.7	.276	.093	T15	80	31	
	*TS4SL	.213	M4×0.7	.315	.096	T15	80	35	**BXD4000** (➲K258)
	TS4SB	.228	M4×0.7	.354	.105	T15	80	31	**AXD7000** (➲K246)
	*TS4SBL	.228	M4×0.7	.413	.105	T15	80	31	**GY** Series (➲F016) **AXD7000** (➲K246)
	*TS4SBLL	.228	M4×0.7	.571	.105	T15	80	31	
	TS43	.213	M4×0.7	.394	.102	T15	60	31	**AJX** (➲K286) **BRP** (➲K344) **PMC** (➲K376) **SRM2** (➲K362)
	TS44	.213	M4×0.7	.472	.102	T15	60	31	
	TS405	.213	M4×0.7	.551	.102	T15	60	31	**VAS400** (➲K144)
	TS406	.213	M4×0.7	.610	.102	T15	60	31	
	TS407	.213	M4×0.7	.354	.102	T15	60	31	**AQX** (➲K276) **AJX** (➲K286)
	TS450	.232	M4.5×0.75	.512	.142	T20	60	44	
	TS5	.268	M5×0.8	.354	.126	T25	60	66	**CFSP** (➲K348)
	TS5R	.272	M5×0.8	.472	.138	T20	60	44	**WJX** (➲K318)
	TS52	.268	M5×0.8	.315	.126	T25	60	66	**CFSP** (➲K348)
	TS53	.268	M5×0.8	.630	.126	T25	60	66	
	TS54	.268	M5×0.8	.472	.126	T25	60	66	**AJX** (➲K286)
	TS55	.268	M5×0.8	.413	.126	T25	60	66	**GY** Series (➲F016) **AQX** (➲K276) **SPX** (➲K268) **SRM2** (➲K362)
	*TS6S	.335	M6×1.0	.512	.173	T30	60	89	**AQX** (➲K276) **SRM2** (➲K362)
	*TS6	.335	M6×1.0	.630	.173	T30	60	89	**SRM2** (➲K362)

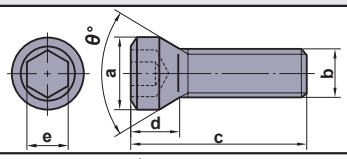
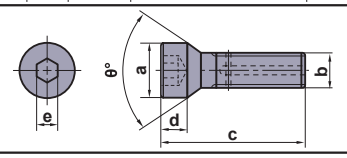
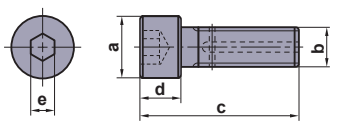
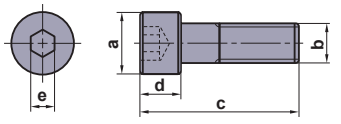
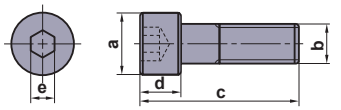
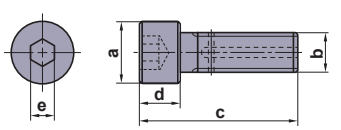
SPARE PARTS

CLAMP SCREW

Geometry	Order Number	Dimensions (inch)						Torque (lbf-in)	Tool Holder
		a	b	c	d	e	θ°		
	**TSS04005**	—	M4×0.7	.197	—	T8	—	—	**PMF** (➲K378)
	TSS04505S	—	M4.5×0.5	.197	—	T10	—	—	**FMAX** (➲K096)
	**WCS503507H**	.248	M5×0.5	.276	.130	.138	—	44	**ASX445** (➲K056) **ASX400** (➲K138) **PMR** (➲K379)
	**XNS35**	10-32UNF	.625	.220	.220	.094	—	30	**M** Type Tool Holder (➲C007) **M** Type Boring Bar (➲E024)
	XNS36	10-32UNF	.750	.250	.250	.094	—	30	
	XNS46	1/4-28UNF	.750	.310	.310	.125	—	45	
	XNS47	1/4-28UNF	.875	.280	.280	.125	—	45	
	XNS48	1/4-28UNF	1.000	.370	.370	.125	—	45	
	XNS58	5/16-24UNF	1.000	.500	.280	.156	—	70	
	XNS59	5/16-24UNF	1.120	.470	.410	.156	—	70	
	XNS510	5/16-24UNF	1.125	.500	.500	.156	—	70	
	XNS610	3/8-24UNF	1.250	.500	.500	.188	—	135	
	**WS304517T**	.177	M3×0.5	.650	.134	T10	60	31	
	WS304518T	.177	M3×0.5	.689	.134	T10	60	31	
	WS355520T	.217	M3.5×0.6	.768	.154	T15	60	49	
	WS355521T	.217	M3.5×0.6	.807	.154	T15	60	49	
	WS406023T	.236	M4×0.7	.866	.173	T25	60	75	
	WS406024T	.236	M4×0.7	.906	.173	T25	60	75	
	WS508026T	.315	M5×0.8	.984	.205	T27	60	106	
	WS508027T	.315	M5×0.8	1.024	.205	T27	60	106	
	**WS203107TPS**	.120	M2×0.25	.287	.067	6IP	60	8.9	
	WS203108TPS	.120	M2×0.25	.327	.075	6IP	60	8.9	
	WS253909TPS	.152	M2.5×0.35	.374	.094	8IP	60	18	
	WS304912TPS	.191	M3×0.35	.472	.128	10IP	60	22	
	**HBH06012**	.413	M6×1	.630	.157	.157	—	4	**PMF** (➲K378)
	HBH06020	.413	M6×1	.945	.157	.157	—	4	**HSK-T** Tool Holder (➲H001)
	HBH08040	.551	M8×1.25	1.772	.197	.197	—	6.8	

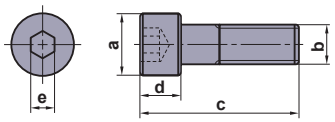
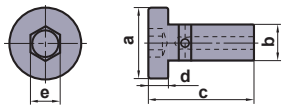
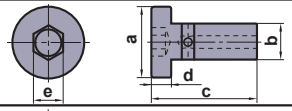
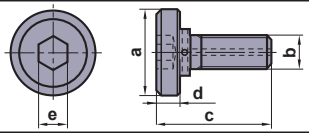
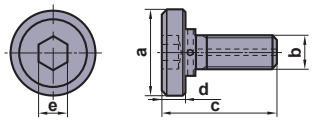
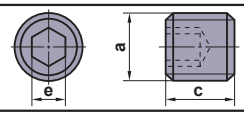
SET BOLT

Geometry	Order Number	Dimensions (inch)						Torque (lbf-ft)	Tool Holder
		a	a'	b	c	d	e		
	**HDS10031**	M10x1.0	M10x1.5	1.220	.551	.472	.197	80	**PMF** (➲K378)
	**HDSU37513**	5/16-32UNEF	3/8-24UNF	1.260	.472	.433	.156	54	**BRP** (➲K344)

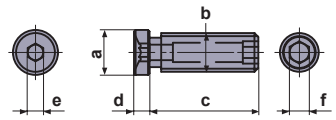
Geometry	Order Number	Dimensions (inch)						Torque (lbf-ft)	Tool Holder
		a	b	c	d	e	θ°		
	**BOE4S06U**	.562	3/8-24UNF	1.358	.374	.313	60	29	
	**HFF08043H**	.433	M8×1.25	1.693	.197	.197	90	73	**AXD4000** (➲K226) **BXD4000** (➲K258)
	**HSCU25011H**	.370	1/4-28UNF	1.347	.250	.156	—	120	**WSX445** (➲K042) **AJX** (➲K286) **APX3000** (➲K154) **APX4000** (➲K168) **AXD7000** (➲K246)
	HSCU25014H	.370	1/4-28UNF	1.647	.250	.156	—	120	
	HSCU37513H	.562	3/8-24UNF	1.625	.375	.250	—	348	
	HSCU50014H	.750	1/2-20UNF	1.875	.500	.375	—	708	
	HSCU62516H	.938	5/8-18UNF	2.250	.625	.500	—	960	
	HSCU75016H	1.125	3/4-16UNF	2.375	.750	.625	—	1320	**BXD4000** (➲K258)
	**HSCUF25013**	.375	1/4-28UNF	1.500	.250	.188	—	120	**APX4000** (➲K168) **SPX** (➲K268)
	HSCUF37513	.562	3/8-24UNF	1.625	.375	.313	—	348	
	HSCUF37520	.562	3/8-24UNF	2.375	.375	.313	—	348	
	HSCUF50014	.750	1/2-20UNF	1.875	.500	.375	—	708	
	HSCUF50018	.750	1/2-20UNF	2.250	.500	.375	—	708	
	HSCUF50023	.750	1/2-20UNF	2.725	.500	.375	—	708	
	HSCUF50028	.750	1/2-20UNF	3.248	.500	.375	—	708	
	HSCUF62518	.938	5/8-18UNF	2.375	.625	.500	—	960	
	HSCUF62535	.938	5/8-18UNF	4.125	.625	.500	—	960	
	HSCUF62528	.938	5/8-18UNF	3.373	.625	.500	—	960	
	HSCUF75018	1.125	3/4-16UNF	2.500	.750	.625	—	1320	
	HSCUF75040	1.125	3/4-16UNF	4.750	.750	.625	—	1320	
	**HSCUC62523**	.938	5/8-11UNS	2.875	.625	.500	—	960	
	HSCUC75025	1.125	3/4-10UNS	3.250	.750	.625	—	1320	
	**HSC08025H**	.512	M8×1.25	1.299	.315	.197	—	212	**WSX445** (➲K042) **APX3000** (➲K154) **APX4000** (➲K168) **AXD4000** (➲K226) **AXD7000** (➲K246) **AJX** (➲K286) **BXD4000** (➲K258)
	HSC08030H	.512	M8×1.25	1.496	.315	.197	—	212	
	HSC10030H	.630	M10×1.5	1.575	.394	.236	—	354	
	HSC12035H	.709	M12×1.75	1.850	.472	.394	—	708	
	HSC16040H	.945	M16×2	2.205	.630	.551	—	1328	

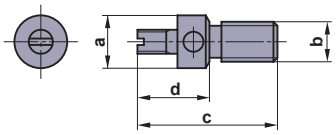
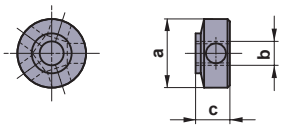
SPARE PARTS

SET BOLT

Geometry	Order Number	Dimensions (inch) a	b	c	d	e	θ°	Torque (lbf-ft)	Tool Holder
	**HSC05030**	.335	M5×0.8	1.181	.197	.157	—	48	**APX4000** (➲K168) **PMF** (➲K378) **PMR** (➲K379) **SPX** (➲K268) **GY** Series (➲F016) **VPX200** (➲K182) **VPX300** (➲K193) **ASPX** (➲K262)
	HSC08040	.512	M8×1.25	1.890	.315	.236	—	212	
	HSC08045	.512	M8×1.25	2.087	.315	.236	—	212	
	HSC08050	.512	M8×1.25	2.283	.315	.236	—	212	
	HSC10035	.630	M10×1.5	1.772	.394	.236	—	390	
	HSC10040	.630	M10×1.5	1.969	.394	.315	—	389	
	HSC10045	.630	M10×1.5	2.165	.394	.315	—	390	
	HSC10050	.630	M10×1.5	2.362	.394	.315	—	390	
	HSC10055	.630	M10×1.5	2.559	.394	.315	—	390	
	HSC10060	.630	M10×1.5	2.756	.394	.315	—	389	
	HSC10070	.630	M10×1.5	3.150	.394	.315	—	389	
	HSC12035	.709	M12×1.75	1.850	.472	.394	—	708	
	HSC12040	.709	M12×1.75	2.047	.472	.394	—	672	
	HSC12045	.709	M12×1.75	2.244	.472	.394	—	708	
	HSC12050	.709	M12×1.75	2.441	.472	.394	—	708	
	HSC12060	.709	M12×1.75	2.835	.472	.394	—	708	
	HSC12070	.709	M12×1.75	3.228	.472	.394	—	708	
	HSC16035	.945	M16×2.0	2.008	.630	.551	—	1328	
	HSC16040	.945	M16×2.0	2.205	.630	.551	—	1328	
	HSC16055	.945	M16×2.0	2.795	.630	.551	—	1328	
	HSC16065	.945	M16×2.0	3.189	.630	.551	—	1680	
	HSC16080	.945	M16×2.0	3.780	.630	.551	—	1328	
	HSC20040	1.181	M20×2.5	2.362	.787	.669	—	2832	
	HSC20090	1.181	M20×2.5	4.331	.787	.669	—	2832	
	**HSCX12030H**	.945	M12×1.75	1.457	.275	.315	—	354	**FMAX** (➲K096)
	HSCX16035H	1.181	M16×1	1.732	.354	.472	—	885	
	HSCX16045H	1.181	M16×2.0	2.126	.354	.472	—	885	
	HSCX20035H	1.417	M20×2.5	1.818	.433	.551	—	1593	
	**HSCXU50012H**	.945	1/2-20UNF	1.496	.315	.375	—	708	**FMAX** (➲K096)
	HSCXU62514H	1.181	5/8-18UNF	1.732	.354	.500	—	960	
	HSCXU75017H	1.417	3/4-16UNF	2.126	.433	.625	—	1320	
	**MBAU75016H**	2.000	3/4-16UNF	2.188	.563	.625	—	2832	**AJX** (➲K286) **AXD7000** (➲K246)
	MBAU100016H	2.593	1-14UNS	2.188	.563	.625	—	4608	
	**MBA16033H**	1.575	M16×2	1.693	.394	.551	—	1328	**AJX** (➲K286) **APX4000** (➲K168) **AXD4000** (➲K226) **AXD7000** (➲K246) **BXD4000** (➲K258)
	MBA20040H	1.969	M20×2.5	2.126	.551	.669	—	2832	
	MBA24045H	2.559	M24×3.0	2.323	.551	.669	—	4603	
	**HGM-PT1/8**	—	1/8-28	.276	—	.197	—	33	**HSK-T** Tool Holder (➲H001)

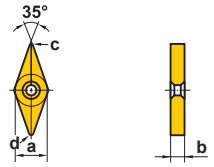
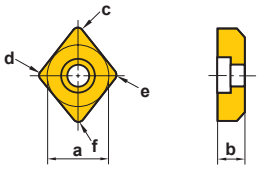
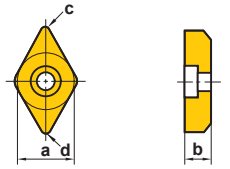
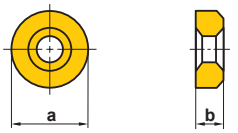
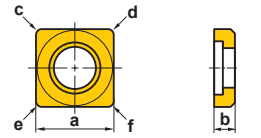
STANDARD FOR ADJUSTABLE SCREWS AND NUTS

Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**HVS060519**	.228	M5×0.8	.551	.079	.079	.098	

Geometry	Order Number	Dimensions (inch)				Tool Holder
		a	b	c	d	
	**KSS2**	.260	M5×0.8	.689	.354	**FMAX**(➲K096)
	**KSN3**	.339	M3×0.35	.169	—	**FMAX**(➲K096)

SPARE PARTS

SHIM

Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**DCSVN32**	.375	.125	.031	.047	—	—	**DOUBLE CLAMP** Holder (➲C024) **DOUBLE CLAMP DIMPLE BAR** (➲E023)
	**ICSN322**	.375	.125	.031	.031	.031	.031	**M** Type Tool Holder (➲C007) **M** Type Boring Bar (➲E024)
	ICSN432	.500	.188	.031	.031	.031	.031	
	ICSN433	.500	.188	.047	.047	.047	.047	
	ICSN533	.625	.188	.047	.047	.047	.047	
	ICSN633	.750	.188	.047	.047	.047	.047	
	**IDSN322**	.375	.125	.031	.031	—	—	**M** Type Tool Holder (➲C010) **M** Type Boring Bar (➲E024)
	IDSN433	.500	.188	.047	.047	—	—	
	IDSN533	.625	.188	.047	.047	—	—	
	IDSN543	.625	.250	.047	.047	—	—	
	**IRSN32**	.375	.125	—	—	—	—	**M** Type Tool Holder (➲C013)
	IRSN43	.500	.188	—	—	—	—	
	IRSN44	.500	.250	—	—	—	—	
	IRSN63	.750	.188	—	—	—	—	
	**ISSN322**	.375	.125	.031	.031	.031	.031	**M** Type Tool Holder (➲C014) **M** Type Boring Bar (➲E025)
	ISSN323	.375	.125	.047	.047	.047	.047	
	ISSN433	.500	.188	.047	.047	.047	.047	
	ISSN434	.500	.188	.063	.063	.063	.063	
	ISSN443	.500	.250	.047	.047	.047	.047	
	ISSN533	.625	.188	.047	.047	.047	.047	
	ISSN633	.750	.188	.047	.047	.047	.047	
	ISSN634	.750	.188	.063	.063	.063	.063	
	ISSN643	.750	.250	.047	.047	.047	.047	
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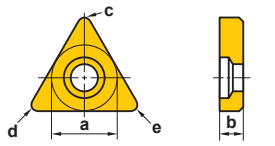
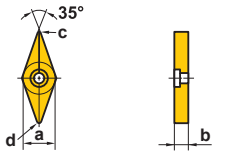
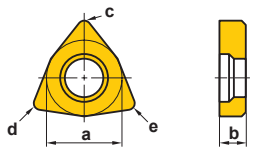
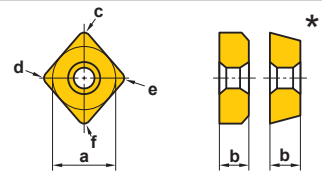
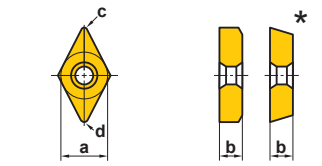
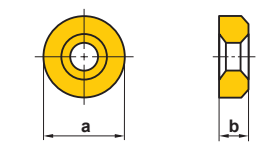
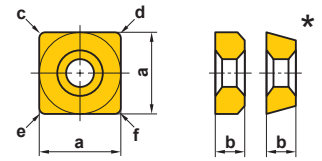
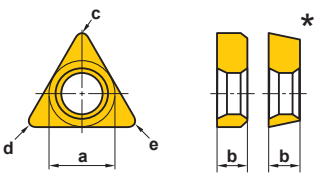
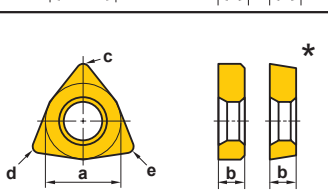
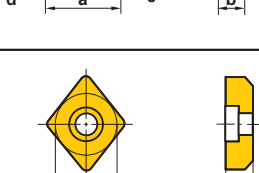
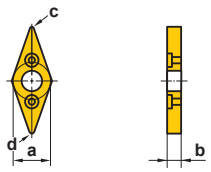
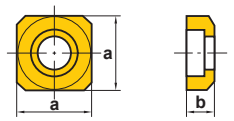
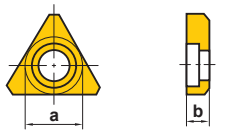
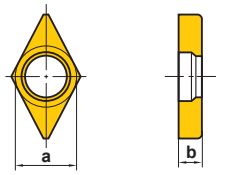
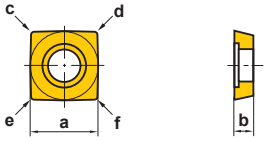
	ISSN846	1.000	.250	.094	.094	.094	.094	
	**ITSN322**	.375	.125	.031	.031	.031	—	**M** Type Tool Holder (➲C018) **M** Type Boring Bar (➲E025)
	ITSN323	.375	.125	.047	.047	.047	—	
	ITSN324	.375	.125	.063	.063	.063	—	
	ITSN332	.375	.188	.031	.031	.031	—	
	ITSN333	.375	.188	.047	.047	.047	—	
	ITSN334	.375	.188	.063	.063	.063	—	
	ITSN432	.500	.188	.031	.031	.031	—	
	ITSN434	.500	.188	.063	.063	.063	—	
	ITSN438	.500	.188	.125	.125	.125	—	
	ITSN533	.625	.188	.047	.047	.047	—	
	ITSN534	.625	.188	.063	.063	.063	—	
	ITSN633	.750	.188	.047	.047	.047	—	
	ITSN636	.750	.188	.094	.094	.094	—	
	**IVSN322**	.375	.125	.031	.031	—	—	**M** Type Tool Holder (➲C024) **M** Type Boring Bar (➲E026)
	IVSN432	.500	.188	.031	.031	—	—	
	IVSN433	.500	.188	.047	.047	—	—	

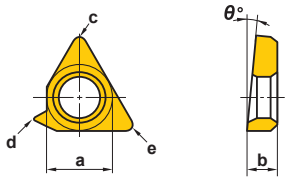
Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**IWSN322**	.375	.125	.031	.031	.031	—	**M** Type Tool Holder (➲C027) **M** Type Boring Bar (➲E026)
	IWSN432	.500	.188	.031	.031	.031	—	
	IWSN533	.625	.188	.047	.047	.047	—	
	**LLSCN32**	.375	.125	.016	.016	.031	.031	**DOUBLE CLAMP** Type Holder (➲C006) **DOUBLE CLAMP DIMPLE BAR** (➲E021) **HSK-T** Tool Holder (➲H001)
	LLSCN33	.375	.188	.016	.016	.031	.031	
	LLSCN42	.500	.125	.031	.031	.047	.047	
	✻ **LLSCP32**	.375	.125	.016	.016	.031	.031	
	✻ **LLSCP42**	.500	.125	.031	.031	.047	.047	
	**LLSDN32**	.375	.125	.031	.047	—	—	**DOUBLE CLAMP** Type Holder (➲C010) **DOUBLE CLAMP DIMPLE BAR** (➲E021) **HSK-T** Tool Holder (➲H001)
	LLSDN42	.500	.125	.031	.047	—	—	
	LLSDN43	.500	.188	.031	.047	—	—	
	✻ **LLSDP42**	.500	.125	.031	.047	—	—	
	**LLSRN123**	.386	.125	—	—	—	—	**DOUBLE CLAMP** Type Holder (➲C013) **HSK-T** Tool Holder (➲H001)
	**LLSSN42**	.500	.125	.031	.031	.047	.047	**DOUBLE CLAMP** Type Holder (➲C014) **DOUBLE CLAMP DIMPLE BAR** (➲E022)
	✻ **LLSSP42**	.500	.125	.031	.031	.047	.047	
	**LLSTN32**	.375	.125	.016	.031	.047	—	**DOUBLE CLAMP** Type Holder (➲C018) **DOUBLE CLAMP DIMPLE BAR** (➲E022)
	LLSTN33	.375	.188	.016	.031	.047	—	
	✻ **LLSTP32**	.375	.125	.016	.031	.047	—	
	**LLSWN32**	.375	.125	.016	.031	.047	—	**DOUBLE CLAMP** Type Holder (➲C027) **DOUBLE CLAMP DIMPLE BAR** (➲E023)
	LLSWN33	.375	.188	.016	.031	.047	—	
	LLSWN42	.500	.125	.016	.031	.047	—	
	✻ **LLSWP42**	.500	.125	.016	.031	.047	—	
	**SPSCN42**	.500	.125	—	—	—	—	**SP** Type Tool Holder (➲C030)

SPARE PARTS

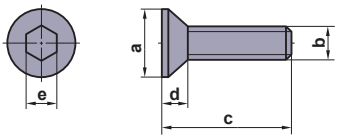
SHIM

Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**SPSVN32**	.317	.125	.012	.012	—	—	**SP** Type Tool Holder (➲C036) **HSK-T** Tool Holder (➲H001)
	**SPSSN42**	.468	.125	—	—	—	—	**SP** Type Tool Holder (➲C034)
	**SPSTN32**	.352	.125	—	—	—	—	**SP** Type Tool Holder (➲C035)
	**SPSDN32**	.342	.125	—	—	—	—	**SP** Type Tool Holder (➲C031)

Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	f	
	**STASX400N**	.433	.118	.015	.015	.015	.015	**ASX400** (➲K138)
	STASX445N	.424	.118	—	—	—	—	**ASX445** (➲K056)

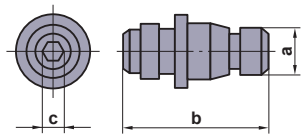
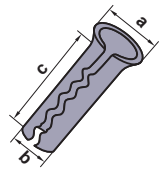
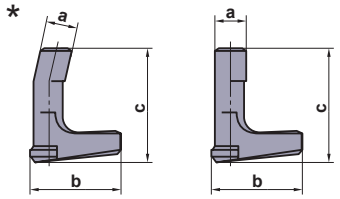
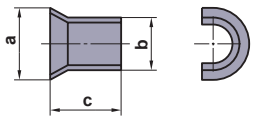
Geometry	Order Number	Dimensions (inch)						Tool Holder
		a	b	c	d	e	θ°	
	**CTE32TN15**	.375	.128	.031	.016	.031	2.955	**MMTE** (➲G021) **MMTI** (➲G026) **HSK-T** Tool Holder (➲H001)
	CTE32TN05	.375	.128	.031	.016	.031	1.970	
	CTE32TP05	.375	.126	.031	.016	.031	.985	
	CTE32TP15	.375	.125	.031	.016	.031	0	
	CTE32TP25	.375	.133	.031	.016	.031	-.985	
	CTE32TP35	.375	.141	.031	.016	.031	-1.970	
	CTE32TP45	.375	.149	.031	.016	.031	-2.995	
	CTI32TN15	.375	.128	.031	.016	.031	2.898	
	CTI32TN05	.375	.128	.031	.016	.031	1.932	
	CTI32TP05	.375	.126	.031	.016	.031	.966	
	CTI32TP15	.375	.125	.031	.016	.031	0	
	CTI32TP25	.375	.133	.031	.016	.031	-.966	
	CTI32TP35	.375	.141	.031	.016	.031	-1.932	
	CTI32TP45	.375	.146	.031	.016	.031	-2.898	
	CTE43TN15	.500	.192	.039	.024	.039	2.955	
	CTE43TN05	.500	.191	.039	.024	.039	1.970	
	CTE43TP05	.500	.189	.039	.024	.039	.985	
	CTE43TP15	.500	.187	.039	.024	.039	0	
	CTE43TP25	.500	.198	.039	.024	.039	-.985	
	CTE43TP35	.500	.209	.039	.024	.039	-1.970	
	CTE43TP45	.500	.219	.039	.024	.039	-2.995	
	CTI43TN15	.500	.192	.039	.024	.039	2.898	
	CTI43TN05	.500	.191	.039	.024	.039	1.932	
	CTI43TP05	.500	.189	.039	.024	.039	.966	
	CTI43TP15	.500	.187	.039	.024	.039	0	
	CTI43TP25	.500	.198	.039	.024	.039	-.966	
	CTI43TP35	.500	.208	.039	.024	.039	-1.932	
	CTI43TP45	.500	.219	.039	.024	.039	-2.898	

SHIM SCREW

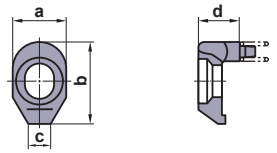
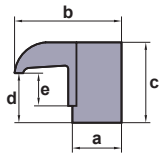
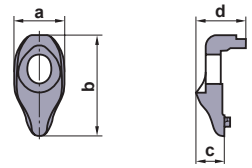
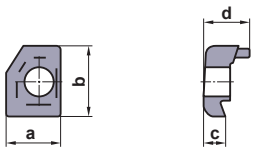
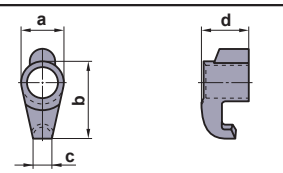
Geometry	Order Number	Dimensions (inch)					Torque (lbf-ft)	Tool Holder
		a	b	c	d	e		
	**HFC03006**	.118	M3×0.5	.236	.067	.079	6	**MMTE** (➲G021) **MMTI** (➲G026) **HSK-T** Tool Holder (➲H001)
	HFC03008	.118	M3×0.5	.315	.067	.079	6	
	HFC04008	.157	M4×0.7	.315	.091	.098	10	
	HFC04010	.157	M4×0.7	.394	.091	.098	10	

SPARE PARTS

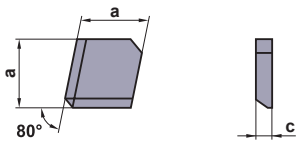
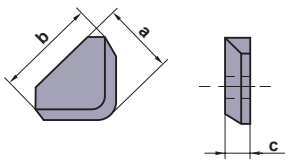
PIN / RING / CLAMP LEVER

Geometry	Order Number	Dimensions (inch) a	b	c	Tool Holder
	**NL23**	.313—1.260	.313	.063	**M** Type Tool Holder (➲C007) **M** Type Boring Bar (➲E024)
	NL33	.313—1.260	.347	.078	
	NL33L	.394—1.260	.406	.078	
	NL34	.394—1.260	.453	.078	
	NL34L	.394—1.260	.500	.078	
	NL43	.394—1.260	.422	.078	
	NL44	.250—1.102	.516	.094	
	NL46	.250—1.102	.688	.094	
	NL56	.313—.945	.703	.125	
	NL58	.313—.945	.844	.125	
	NL68	.375—.945	.875	.141	
	NL68L	.375—.945	.938	.141	
	NL810	.438—.787	.813	.156	
	**BCP141**	.118	.055	.220	**SP** Type Holder (➲C036) **HSK-T** Tool Holder (➲H001)
	**LLCL14**	.185	.528	.520	**HSK-T** Tool Holder (➲H001)
	LLCL24	.185	.638	.583	
	✱ **LLCL112**	.138	.512	.531	
	**LLP13**	.219	.191	.209	**DOUBLE CLAMP** Type Holder (➲C006) **DOUBLE CLAMP DIMPLE BAR** (➲E021) **HSK-T** Tool Holder (➲H001)
	LLP14	.285	.258	.228	
	LLP23	.219	.191	.268	
	LLP24	.285	.258	.358	

CLAMP BRIDGE

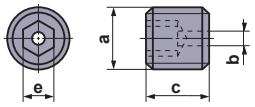
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	Tool Holder
	**AMS3**	.276	.472	.118	.130	—	**AJX** (➲K286) **PMC** (➲K376)
	AMS4	.354	.531	.118	.150	—	
	AMS5	.394	.590	.136	.197	—	
	**CL6**	.310	.580	.440	.062	.094	**M** Type Tool Holder (➲C007) **M** Type Boring Bar (➲E024)
	CL7	.310	.640	.310	.062	—	
	CL9	.430	.750	.660	.344	.125	
	CL12	.430	.880	.660	.344	.125	
	CL19	.310	.550	.310	.187	—	
	CL20	.375	.730	.380	.125	—	
	CL24	.491	1.000	.785	.453	.136	
	CL30	.430	1.000	.660	.344	.125	
	**DCK2211**	.433	.866	.259	.357	—	**DOUBLE CLAMP** Holder (➲C006) **DOUBLE CLAMP DIMPLE BAR** (➲E021) **HSK-T** Tool Holder (➲H001)
	DCK2613	.512	1.043	.289	.407	—	
	DCK3113	.512	1.220	.354	.472	—	
	**MTK1R/L**	.512	.689	.197	.472	—	**HSK-T** Tool Holder (➲H001)
	**SETK51**	.268	.571	.114	.315	—	**MMTE** (➲G021) **MMTI** (➲G026) **HSK-T** Tool Holder (➲H001)
	SETK61	.350	.713	.161	.339	—	

CHIP BREAKER

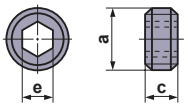
Geometry	Order Number	Dimensions (inch) a	b	c	d	e	Tool Holder
	**CBC4**	.440	—	.062	.500	—	**M** Type Tool Holder **M** Type Boring Bar
	**CBR4**	.421	.560	.120	.500	—	**M** Type Tool Holder

SPARE PARTS

COOLANT NOZZLE

Geometry	Order Number	Dimensions (inch)				Tool Holder
		a	b	c	e	
	**HSD04004H06**	M4x0.7	.024	.157	.079	**ARP**(➲K329), **ASPX**(➲K262)
	HSD04004H08	M4x0.7	.031	.157	.079	**ARP**(➲K329), **ASPX**(➲K262)
	HSD04004H12	M4x0.7	.047	.157	.079	**ARP**(➲K329), **ASPX**(➲K262)
	HSD04004H16	M4x0.7	.063	.157	.079	**ARP**(➲K329), **ASPX**(➲K262)

STOPPER

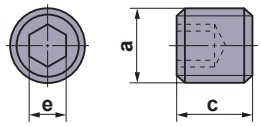
Geometry	Order Number	Dimensions (inch)			Tool Holder
		a	c	e	
	**WS35LH**	.137	.067	.079	**STAW**(➲L226)
	WS45LH	.137	.067	.079	**STAW**(➲L226)
	WS55LH	.137	.067	.079	**STAW**(➲L226)

ANTI SEIZE LUBRICANT

Shape	Order Number	Stock	Volume (oz)
	MK1KS	●	0.1

STANDARD FOR NON-STOCK PARTS

Compatible parts are available commercially (JIS Standard).
Please refer to the dimensions below and purchase required parts.



CLAMP SCREW

Holder Order Number	Page	Parts Order Number	Reference Dimensions (inch)			Torque (lbf-ft)
			a	c	e	
H63TH-EV2525R/L-112	H019	HSS12025	M12×1.75	.984	.236	416
H100TH-EV3232R/L-180	H019	HSS14035	M14×2.0	1.378	.236	469
H63TH-EN2525R/L-115	H020	HSS12030	M12×1.75	1.181	.236	416
H100TH-EN3232R/L-130	H020	HSS14030	M14×2.0	1.181	.236	469
H63TH-EV2020R/L-105-3	H021	HSS12030	M12×1.75	1.181	.236	416
H63TH-B08-65	H021	HSS08010	M8×1.25	.394	.157	124
H63TH-B10-70	H021	HSS08012	M8×1.25	.472	.157	124
H63TH-B12-70	H021	HSS08012	M8×1.25	.472	.157	124
H63TH-B16-75	H021	HSS10016	M10×1.5	.630	.197	239
H63TH-B20-75	H021	HSS10016	M10×1.5	.630	.197	239
H63TH-B25-83	H021	HSS12016	M12×1.75	.630	.236	416
H63TH-B32-87	H021	HSS12016	M12×1.75	.630	.236	416
H63TH-B40-97	H021	HSS16012	M16×2.0	.472	.315	1044
H100TH-B25-120	H022	HSS12016	M12×1.75	.630	.236	416
H100TH-B32-135	H022	HSS12018	M12×1.75	.709	.236	416
H100TH-B40-150	H022	HSS16020	M16×2.0	.787	.315	1044
H100TH-B50-180	H022	HSS16020	M16×2.0	.787	.315	1044
SL3208-90	H022	HSS06008	M6×1.0	.315	.118	52
SL3210-90	H022	HSS08008	M8x1.25	.315	.157	124
SL3212-90	H022	HSS08008	M8x1.25	.315	.157	124
SL3216-90	H022	HSS08006	M8x1.25	.236	.157	124
SL3220-90	H022	HSS08005	M8x1.25	.197	.157	124

PLUG

Holder Order Number	Page	Parts Order Number	Reference Dimensions (inch)			Torque (lbf-ft)
			a	c	e	
H63TH-EV2525R/L-112	H019	HGM-PT1/8	1/8-28	.276	.197	—
H100TH-EV3232R/L-180	H019	HSS06006	M6×1.0	.236	.118	—
H63TH-EN2525R/L-115	H020	HSS06006	M6×1.0	.236	.118	—
H100TH-EN3232R/L-130	H020	HSS06006	M6×1.0	.236	.118	—
H63TH-EV2020R/L-105-3	H021	HSS06006	M6×1.0	.236	.118	—

STOP PLUG FOR NOZZLE

Holder Order Number	Page	Parts Order Number	Reference Dimensions (inch)			Torque (lbf-ft)
			a	c	e	
H63TH-EV2020R/L-105-3	H021	HSS05012	M5×0.8	.472	.098	—

● : USA Stock

Memo

TECHNICAL DATA

ISO13399 COMPLIANCE N002
TROUBLE SHOOTING FOR TURNING N006
CHIP CONTROL FOR TURNING N008
EFFECTS OF CUTTING CONDITIONS FOR TURNING N009
FUNCTION OF TOOL FEATURES FOR TURNING N011
FORMULAS FOR TURNING N015
TROUBLE SHOOTING FOR THREADING N016
THREADING METHODS N017
TROUBLE SHOOTING FOR FACE MILLING N020
FUNCTION OF TOOL FEATURES FOR FACE MILLING N021
FORMULAS FOR FACE MILLING N024
TROUBLE SHOOTING FOR END MILLING N025
END MILL FEATURES AND SPECIFICATION N026
END MILL TYPE AND GEOMETRY N027
PITCH SELECTION OF PICK FEED N028
TROUBLE SHOOTING FOR DRILLING N029
DRILL WEAR CONDITION AND CUTTING EDGE DAMAGE N030
DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS N031
FORMULAS FOR DRILLING N034
TOOL WEAR AND DAMAGE N035
MATERIAL CROSS REFERENCE LIST N036
SURFACE ROUGHNESS N040
HARDNESS COMPARISON TABLE N041
CUTTING TOOL MATERIALS N042
GRADE CHAIN N043
GRADE COMPARISON TABLE N044
INSERT CHIP BREAKER COMPARISON TABLE N050

LIST OF PROPERTY SYMBOLS COMPLYING WITH ISO13399

Alphabetical

Source: ISO13399 standard
URL : https://www.iso.org/search/x/query/13399

ISO13399 Property Symbols	Content
ADJLX	Adjustment limit maximum
ADJRG	Adjustment range
ALF	Clearance angle radial
ALP	Clearance angle axial
AN	Clearance angle major
ANN	Clearance angle minor
APMX	Depth of cut maximum
AS	Clearance angle wiper edge
ASP	Adjusting screw protrusion
AZ	Plunge depth maximum
B	Shank width
BBD	Balanced by design
BCH	Corner chamfer length
BD	Body diameter
BDX	Body diameter maximum
BHCC	Bolt hole circle count
BHTA	Body half taper angle
BMC	Body material code
BS	Wiper edge length
BSR	Wiper edge radius
CASC	Cartridge size code
CB	Chip breaker face count
CBDP	Connection bore depth
CBMD	Chip breaker manufacturers designation
CBP	Chip breaker property
CCMS	Connection code machine side
CCWS	Connection code workpiece side
CCP	Chamfer corner property
CDI	Insert cutting diameter
CDX	Cutting depth maximum
CEATC	Tool cutting edge angle type code
CECC	Cutting edge condition code
CEDC	Cutting edge count
CF	Spot chamfer
CHW	Corner chamfer width
CICT	Cutting item count
CNC	Corner count
CND	Coolant entry diameter
CNSC	Coolant entry style code
CNT	Coolant entry thread size
CP	Coolant pressure
CRE	Spot radius
CRKS	Connection retention knob thread size
CSP	Coolant supply property
CTP	Coating property
CTX	Cutting point translation X-direction
CTY	Cutting point translation Y-direction
CUTDIA	Work piece parting diameter maximum
CUB	Connection unit basis
CW	Cutting width

ISO13399 Property Symbols	Content
CWX	Cutting width maximum
CXD	Coolant exit diameter
CXSC	Coolant exit style code
CZC	Connection size code
D1	Fixing hole diameter
DAH	Diameter access hole
DAXN	Axial groove outside diameter minimum
DAXX	Axial groove outside diameter maximum
DBC	Diameter bolt circle
DC	Cutting diameter
DCB	Connection bore diameter
DCBN	Connection bore diameter minimum
DCBX	Connection bore diameter maximum
DCC	Design configuration style code
DCCB	Counterbore diameter connection bore
DCIN	Cutting diameter internal
DCINN	Cutting diameter internal minimum
DCINX	Cutting diameter internal maximum
DCN	Cutting diameter minimum
DCON	Connection diameter
DCONMS	Connection diameter machine side
DCONWS	Connection diameter workpiece side
DCSC	Cutting diameter size code
DCSFMS	Contact surface diameter machine side
DCX	Cutting diameter maximum
DF	Flange diameter
DHUB	Hub diameter
DMIN	Minimum bore diameter
DMM	Shank diameter
DN	Neck diameter
DRVA	Drive angle
EPSR	Insert included angle
FHA	Flute helix angle
FHCSA	Fixing hole countersunk angle
FHCSD	Fixing hole countersunk diameter
FLGT	Flange thickness
FMT	Form type
FXHLP	Fixing hole property
GAMF	Rake angle radial
GAMN	Rake angle normal
GAMO	Rake angle orthogonal
GAMP	Rake angle axial
GAN	Insert rake angle
H	Shank height
HA	Thread height theoretical
HAND	Hand
HBH	Head bottom offset height
HBKL	Head back offset length
HBKW	Head back offset width
HBL	Head bottom offset length
HC	Thread height actual
HF	Functional height
HHUB	Hub height
HTB	Body height
IC	Inscribed circle diameter
IFS	Insert mounting style code

LIST OF PROPERTY SYMBOLS COMPLYING WITH ISO13399

ISO13399 Property Symbols	Content
IIC	Insert interface code
INSL	Insert length
KAPR	Tool cutting edge angle
KCH	Corner chamfer angle
KRINS	Cutting edge angle major
KWL	Keyway length
KWW	Keyway width
KYP	Keyway property
L	Cutting edge length
LAMS	Inclination angle
LB	Body length
LBB	Chip breaker width
LBX	Body length maximum
LCCB	Counterbore depth connection bore
LCF	Length chip flute
LDRED	Reduced body diameter length
LE	Cutting edge effective length
LF	Functional length
LFA	A dimension on lf
LH	Head length
LPR	Protruding length
LS	Shank length
LSC	Clamping length
LSCN	Clamping length minimum
LSCX	Clamping length maximum
LTA	LTA length (length from MCS to CRP)
LU	Usable length
LUX	Usable length maximum
M	M-dimension
M2	Distance between the nominal inscribed circle and the corner of an insert that has the secondary included angle
MHA	Mounting hole angle
MHD	Mounting hole distance
MHH	Mounting hole height
MIID	Master insert identification
MTP	Clamping type code
NCE	Cutting end count
NOF	Flute count
NOI	Insert index count
NT	Tooth count
OAH	Overall height
OAL	Overall length
OAW	Overall width
PDPT	Profile depth insert
PDX	Profile distance ex
PDY	Profile distance ey
PFS	Profile style code
PL	Point length
PNA	Profile included angle
PSIR	Tool lead angle
PSIRL	Cutting edge angle major left hand
PSIRR	Cutting edge angle major right hand
RAL	Relief angle left hand
RAR	Relief angle right hand
RCP	Rounded corner property
RE	Corner radius
REL	Corner radius left hand

ISO13399 Property Symbols	Content
RER	Corner radius right hand
RMPX	Ramping angle maximum
RPMX	Rotational speed maximum
S	Insert thickness
S1	Insert thickness total
SC	Insert shape code
SDL	Step diameter length
SIG	Point angle
SSC	Insert seat size code
SX	Shank cross section shape code
TC	Tolerance class insert
TCE	Tipped cutting edge code
TCTR	Thread tolerance class
TD	Thread diameter
THFT	Thread form type
THL	Threading length
THLGTH	Thread length
THSC	Tool holder shape code
THUB	Hub thickness
TP	Thread pitch
TPI	Threads per inch
TPIN	Threads per inch minimum
TPIX	Threads per inch maximum
TPN	Thread pitch minimum
TPT	Thread profile type
TPX	Thread pitch maximum
TQ	Torque
TSYC	Tool style code
TTP	Thread type
ULDR	Usable length diameter ratio
UST	Unit system
W1	Insert width
WEP	Wiper edge property
WF	Functional width
WF2	Distance between the cutting reference point and the front seating surface of a turning tool
WFS	Functional width secondary
WT	Weight of item
ZEFF	Face effective cutting edge count
ZEFP	Peripheral effective cutting edge count
ZNC	Cutting edge center count
ZNF	Face mounted insert count
ZNP	Peripheral mounted insert count

LIST OF REFERENCE SYMBOLS COMPLYING WITH ISO13399

ISO13399 Reference Symbols	Content
CIP	Coordinate system in process
CRP	Cutting reference point
CSW	Coordinate system workpiece side
MCS	Mounting coordinate system
PCS	Primary coordinate system

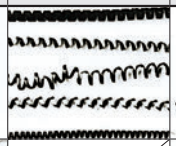
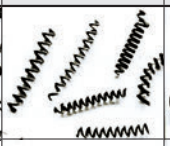
TROUBLE SHOOTING FOR TURNING

Trouble		Factors	Insert Grade Selection: Select a Harder Grade	Insert Grade Selection: Select a Tougher Grade	Insert Grade Selection: Select a Grade with Better Thermal Shock Resistance	Insert Grade Selection: Select a Grade with Better Adhesion Resistance	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Depth of Cut (Up ↗ / Down ↘)	Cutting Conditions: Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Conditions: Cutting Fluids: Determine Dry or Wet Cutting	Style and Design of the Tool: Select Chip Breaker	Style and Design of the Tool: Rake Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Corner Radius (Up ↗ / Down ↘)	Style and Design of the Tool: Lead Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing Strengthens the Cutting Edge (Up ↗ / Down ↘)	Style and Design of the Tool: Class of Insert (Unground-Ground)	Style and Design of the Tool: Improve Tool Holder Rigidity	Machine and Installation of Tool: Installation of the Tool and Workpiece	Machine and Installation of Tool: Toolholder Overhang	Machine and Installation of Tool: Machine with Inadequate Horsepower and Rigidity
Short Tool Life	Rapid insert wear	Improper tool grade	●																		
		Improper cutting edge geometry										●	↗●	↗●	↗●	●↘					
		Improper cutting conditions					●↘	↗●			Wet										
	Chipping and fracturing of cutting edge	Improper tool grade		●																	
		Improper cutting conditions						●↘	●↘												
		Lack of cutting edge strength										●		↗●		↗●					
		Thermal cracking			●		●↘	●↘	●↘	●	Dry										
		Built-up edge				●	↗●	↗●		●	Wet										
		Lack of rigidity																●	●	●	●
Worsening Dimensional Accuracy	Dimensional unevenness during machining	Improper insert tolerance															●				
		Large cutting resistance and cutting edge flank										●	●	●↘	●↘	●↘		●	●	●	●
	Machining accuracy not maintained adjustment is necessary each time	Improper tool grade	●																		
		Improper cutting conditions					●↘	↗●													
Poor Surface Finish	Worsening surface roughness	Welding occurs					↗●			●	Wet										
		Improper cutting edge geometry										●		↗●							
		Vibration occurs					●↘	●↘	●↘									●	●	●	●
Heat Generation	Cutting heat creates deterioration in machining accuracy and tool life	Improper cutting conditions					●↘	●↘	●↘												
		Improper cutting edge geometry										●	↗●			●↘					

Trouble		Factors / Solutions	Insert Grade Selection: Select a Harder Grade	Insert Grade Selection: Select a Tougher Grade	Insert Grade Selection: Select a Grade with Better Thermal Shock Resistance	Insert Grade Selection: Select a Grade with Better Adhesion Resistance	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Depth of Cut (Up ↗ / Down ↘)	Cutting Conditions: Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Conditions: Cutting Fluids: Determine Dry or Wet Cutting	Style and Design of the Tool: Select Chip Breaker	Style and Design of the Tool: Rake Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Corner Radius (Up ↗ / Down ↘)	Style and Design of the Tool: Lead Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing Strengthens the Cutting Edge (Up ↗ / Down ↘)	Style and Design of the Tool: Class of Insert (Unground-Ground)	Style and Design of the Tool: Improve Tool Holder Rigidity	Machine and Installation of Tool: Installation of the Tool and Workpiece	Machine and Installation of Tool: Toolholder Overhang	Machine and Installation of Tool: Machine with Inadequate Horsepower and Rigidity
Burr / Chipping / Roughness	Burr (Steel, Aluminum alloy)	Notch wear occurs	●																		
		Improper cutting conditions					● ↘	↗ ●			● Wet										
		Improper cutting edge geometry										●	↗ ●	● ↘	● ↘	● ↘					
	Chipping (Cast iron)	Improper cutting conditions						● ↘	● ↘												
		Improper cutting edge geometry										●	↗ ●	↗ ●	↗ ●	● ↘					
		Vibration occurs																●	●	●	●
	Roughness (Mild steel)	Improper tool grade				●															
		Improper cutting conditions					↗ ●			●	● Wet										
		Improper cutting edge geometry										●	↗ ●			● ↘					
		Vibration occurs																●	●	●	●
Chip Control	Uncontrolled, continuous / tangled	Improper cutting conditions					● ↘	↗ ●	↗ ●		● Wet										
		Wide chip control range										●									
		Improper cutting edge geometry												● ↘	● ↘						
	Broken into short lengths and scatter	Improper cutting conditions						● ↘	● ↘		● Dry										
		Small chip control range										●									
		Improper cutting edge geometry												↗ ●	↗ ●						

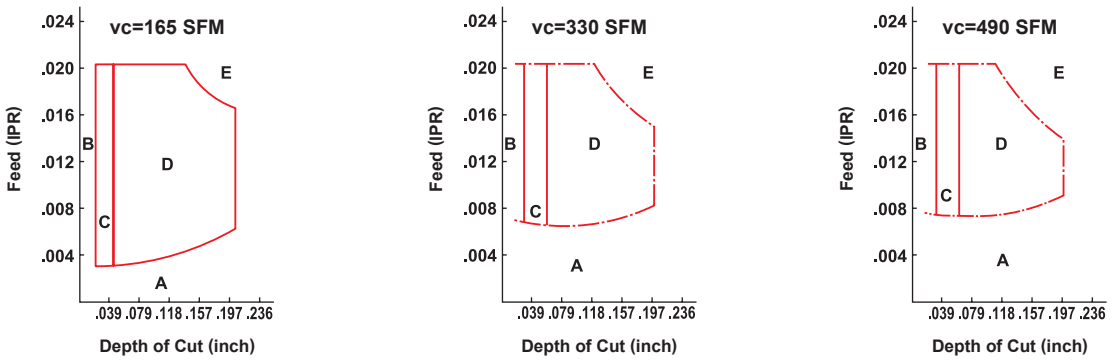
CHIP CONTROL FOR TURNING

■CHIP BREAKING CONDITIONS IN STEEL TURNING

Type	A Type	B Type	C Type	D Type	E Type
Small Depth of Cut d <.276"					
Large Depth of Cut d=.276"–.591"					
Curl Length l	No Curl	l≥2 inch	l≤2 inch 1–5 Curl	≒ 1 Curl	1 curl–half curl
Note	●Irregular continuous shape ●Tangle about tool and workpiece	●Regular continuous shape ●Long chips	Good	Good	●Chip scattering ●Chattering ●Poor finished surface ●Maximum

●Cutting Speed and Chip Control Range of Chip Breaker

In general, when cutting speed increases, the chip control range tends to become narrower.

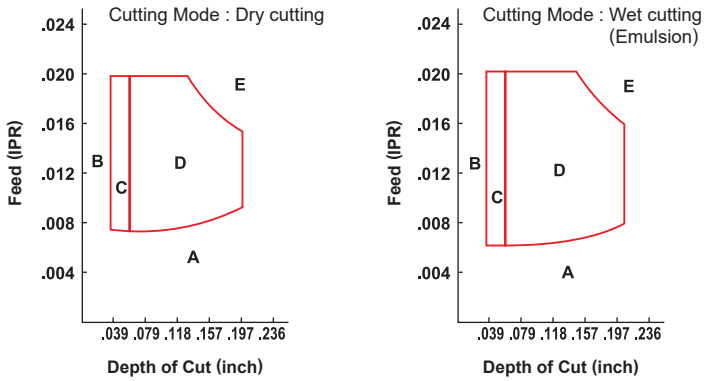


Workpiece : **AISI 1045 (180HB)**
Insert : **TNMG332**
Grade : **P10** Grade

Tool : **MTJNR2525M16N**
Dry Cutting

●Effects of Coolant on the Chip Control Range of a Chip Breaker

If the cutting speed is the same, the range of chip control differs according to whether coolant is used or not.



Workpiece : **AISI 1045**
Cutting Condition : **vc=330 SFM**

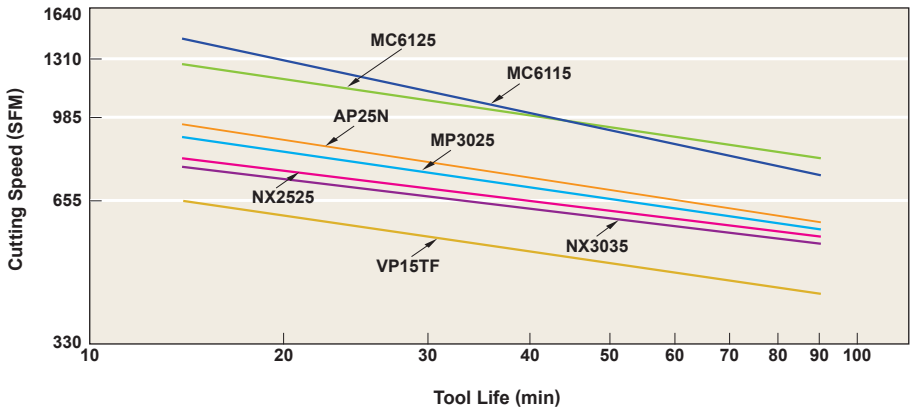
EFFECTS OF CUTTING CONDITIONS FOR TURNING

■EFFECTS OF CUTTING CONDITIONS

Ideal conditions for cutting are short cutting time, long tool life, and high cutting accuracy. In order to obtain these conditions, selection of efficient cutting conditions and tool, based on workpiece, hardness, shape and machine capability is necessary.

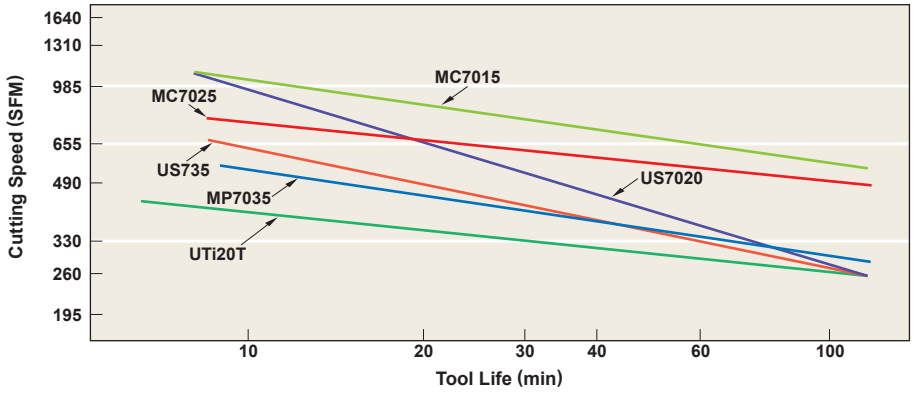
■CUTTING SPEED

Cutting speed effects tool life greatly. Increasing cutting speed increases cutting temperature and results in shortening tool life. Cutting speed varies depending on the type and hardness of the workpiece. Selecting a tool grade suitable for the cutting speed is necessary.



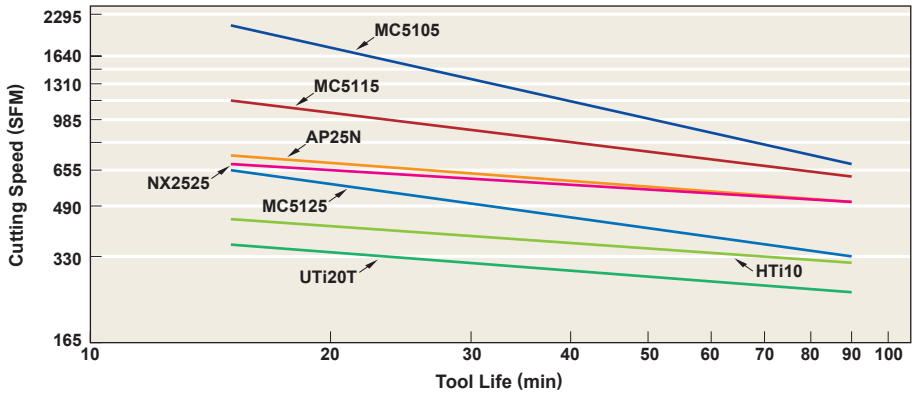
P Class Grade Tool Life

Workpiece : **AISI 1045**
Tool Life Standard : **VB = .012 inch**
Depth of Cut : **.059 inch**
Feed : **.012 IPR**
Holder : **MCLNR-164C**
Insert : **CNMG432**
Dry Cutting



M Class Grade Tool Life

Workpiece : **AISI 304**
Tool Life Standard : **.012 inch**
Depth of Cut : **.059 inch**
Feed : **.012 IPR**
Holder : **MCLNR-164C**
Insert : **CNMG432MA**
Dry Cutting



K Class Grade Tool Life

Workpiece : **AISI No.45B Cast Iron**
Tool Life Standard : **.012 inch**
Depth of Cut : **.059 inch**
Feed : **.012 IPR**
Holder : **MCLNR-164C**
Insert : **CNMG432**
Dry Cutting

●Effects of Cutting Speed

1. Increasing cutting speed by 20% decreases tool life to 1/2. Increasing cutting speed by 50% decreases tool life to 1/5.
2. Cutting at low cutting speed (65—130 SFM) tends to cause chattering. Thus, tool life is shortened.

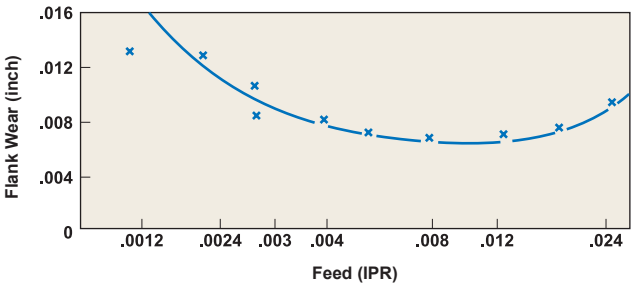
EFFECTS OF CUTTING CONDITIONS FOR TURNING

■FEED

When cutting with a general type holder, feed is the distance a holder moves per workpiece revolution. When milling, feed is the distance a machine table moves per cutter revolution divided by the number of inserts. Thus, it is indicated as feed per tooth. Feed rate relates to finished surface roughness.

●Effects of Feed

1. Decreasing feed rate results in flank wear and shortens tool life.
2. Increasing feed rate increases cutting temperature and flank wear. However, effects on the tool life is minimal compared to cutting speed.
3. Increasing feed rate improves machining efficiency.



Cutting Conditions Workpiece : AISI 4340 Grade : P10
Insert : 0-0-5-5-35-35-0.3 mm
Depth of Cut ap=.040 inch Cutting Speed vc=660 SFM
Cutting Time Tc=10 min

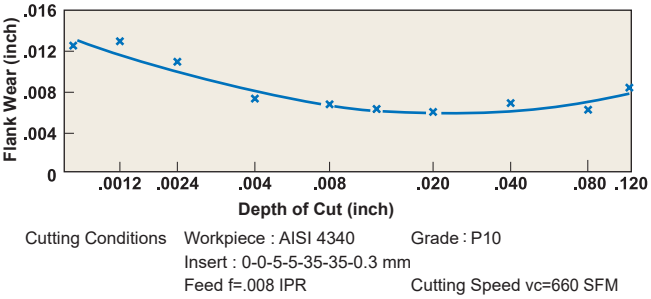
Feed and Flank Wear Relationship in Steel Turning

■DEPTH OF CUT

Depth of cut is determined according to the required stock removal, shape of workpiece, power and rigidity of the machine and tool rigidity.

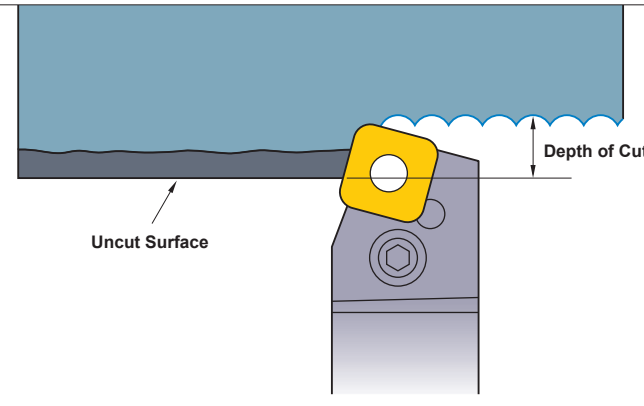
●Effects of Depth of Cut

1. Changing depth of cut doesn't effect tool life greatly.
2. Small depths of cut result in friction when cutting the hardened layer of a workpiece. Thus tool life is shortened.
3. When cutting uncut surfaces or cast iron surfaces, the depth of cut needs to be increased as much as the machine power allows in order to avoid cutting impure hard layers with the tip of cutting edge to prevent chipping and abnormal wear.



Cutting Conditions Workpiece : AISI 4340 Grade : P10
Insert : 0-0-5-5-35-35-0.3 mm
Feed f=.008 IPR Cutting Speed vc=660 SFM
Cutting Time Tc=10 min

Depth of Cut and Flank Wear Relationship in Steel Turning

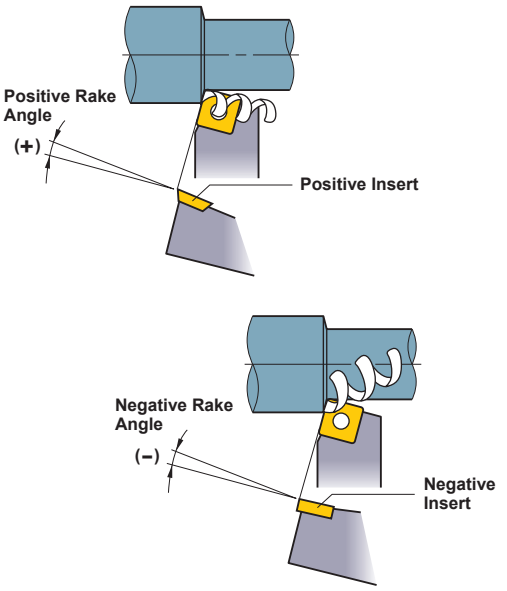


Roughing of Surface Layer that Includes Uncut Surface

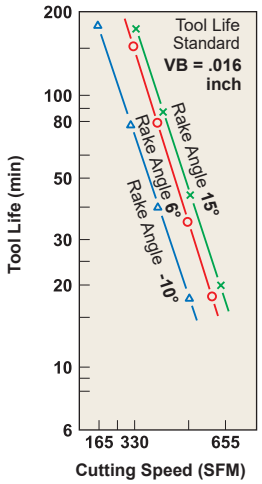
FUNCTION OF TOOL FEATURES FOR TURNING

■RAKE ANGLE

Rake angle is a cutting edge angle that has large effects on cutting resistance, chip disposal, cutting temperature and tool life.

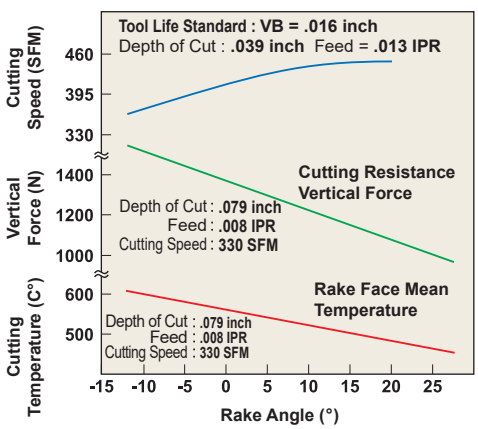


Chip Disposal and Rake Angle



Cutting Conditions
Grade : **P10**
Depth of Cut : **.039 inch**
Feed : **.013 IPR**
Workpiece : **Alloy steel**

Rake Angle and Tool Life



Cutting Conditions
Workpiece : **Alloy steel** Grade : **P10**
Insert : **0-Var-5-5-20-20-0.5 mm**
Dry Cutting

Effects of Rake Angle on Cutting Speed, Vertical Force, and Cutting Temperature

●Effects of Rake Angle

1. Increasing rake angle in the positive (+) direction improves sharpness.
2. Increasing rake angle by 1° in the positive (+) direction decreases cutting power by about 1%.
3. Increasing rake angle in the positive (+) direction lowers cutting edge strength and in the negative (-) direction increases cutting resistance.

When to Increase Rake Angle in the Negative (-) Direction

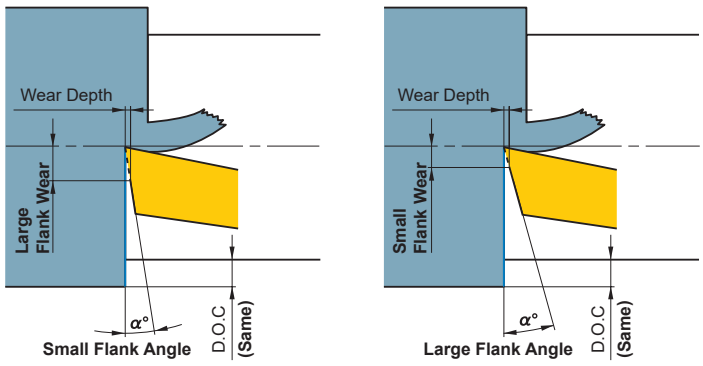
- ○ **Hard workpiece.**
- ○ **When cutting edge strength is required such as in interrupted cutting and uncut surface cutting.**

When to Increase Rake Angle in the Positive (+) Direction

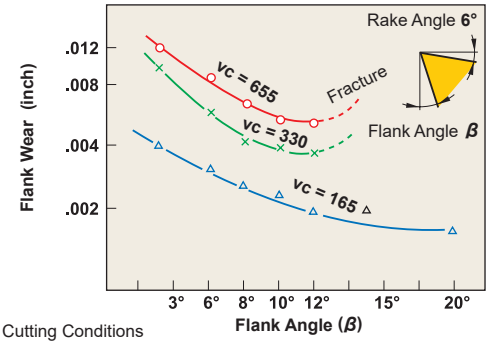
- ○ **Soft workpieces.**
- ○ **Workpiece is easily machined.**
- ○ **When the workpiece or the machine have poor rigidity.**

■FLANK ANGLE

Flank angle prevents friction between flank face and workpiece resulting in smooth feed.



Flank angle creates a space between tool and workpiece. Flank angle relates to flank wear.



Cutting Conditions
Workpiece : **Alloy steel (200HB)** Insert : **0-6-β-β-20-20-0.5 mm**
Grade : **P20** Feed : **.013 IPR**
Depth of Cut : **.039 inch** Cutting Time : **20 min**

Flank Angle and Flank Wear Relationship

●Effects of Flank Angle

1. Increasing flank angle decreases flank wear occurrence.
2. Increasing flank angle lowers cutting edge strength.

When to Decrease Flank Angle

- ○ **Hard workpiece.**
- ○ **When cutting edge strength is required.**

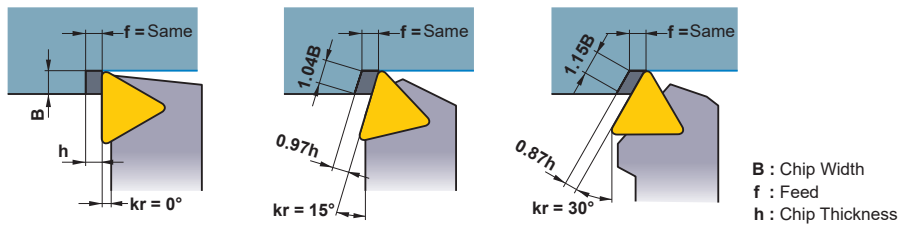
When to Increase Flank Angle

- ○ **Soft workpiece.**
- ○ **Workpiece suffer from work hardening easily.**

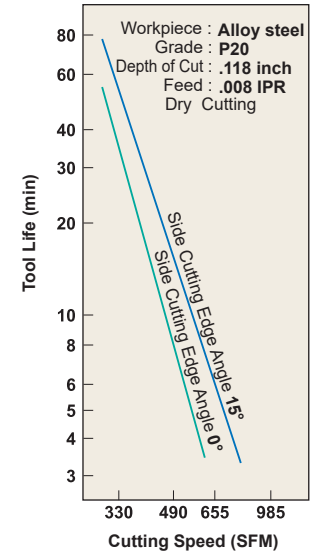
FUNCTION OF TOOL FEATURES FOR TURNING

■SIDE CUTTING EDGE ANGLE (LEAD ANGLE)

Side cutting edge angle lower impact load and effect feed force, back force, and chip thickness.



Side Cutting Edge Angle and Chip Thickness

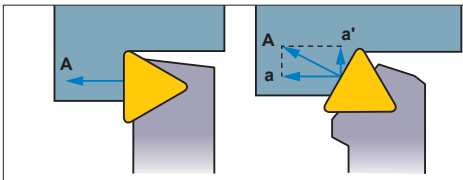


Side Cutting Edge and Tool Life

●Effects of Side Cutting Edge Angle (Lead Angle)

1. At the same feed rate, increasing the side cutting edge angle increases the chip contact length and decreases chip thickness. As a result, the cutting force is dispersed on a longer cutting edge and tool life is prolonged. (Refer to the chart.)
2. Increasing the side cutting edge angle increases force a'. Thus, thin, long workpiece suffer from bending in some cases.
3. Increasing the side cutting edge angle decreases chip control.
4. Increasing the side cutting edge angle decreases the chip thickness and increases chip width. Thus, breaking chips is difficult.

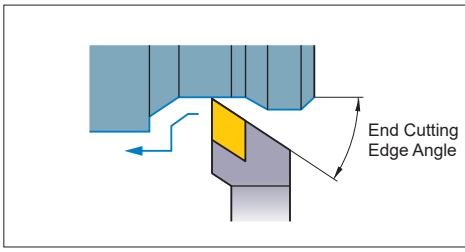
When to Decrease Lead Angle	When to Increase Lead Angle
○Finishing with small depth of cut. ○Thin, long workpiece. ○When the machine has poor rigidity.	○Hard workpiece which produce high cutting temperature. ○When roughing a large diameter workpiece. ○When the machine has high rigidity.



Receive force A. Force A is divided into a and a'.

■END CUTTING EDGE ANGLE

The end cutting edge angle avoids interference between the machined surface and the tool (end cutting edge). Usually 5°–15°.

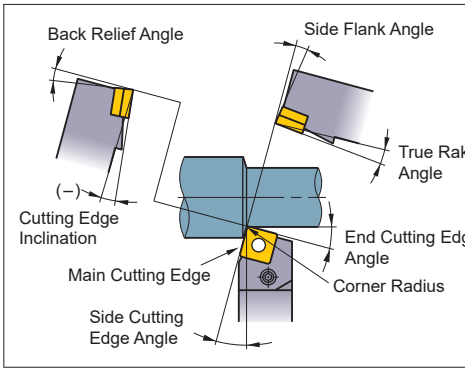


●Effects of End Cutting Edge Angle

1. Decreasing the end cutting edge angle increases cutting edge strength, but it also increases cutting edge temperature.
2. Decreasing the end cutting edge angle increases the back force and can result in chattering and vibration while machining.
3. Small end cutting edge angle in roughing and large angle in finishing are recommended.

■CUTTING EDGE INCLINATION

Cutting edge inclination indicates inclination of the rake face. In heavy cutting, the cutting edge receives extremely large shock at the beginning of cutting. Cutting edge inclination keeps the cutting edge from receiving this shock and prevents fracturing. 3°– 5° in turning and 10°– 15° in milling are recommended.

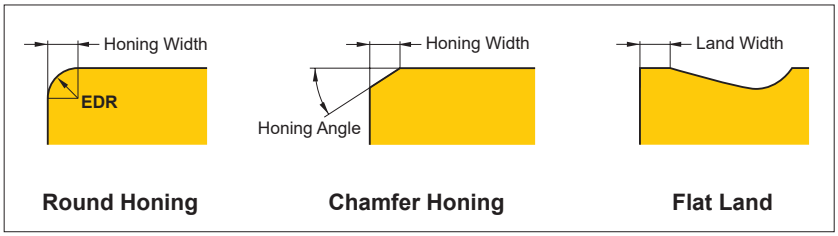


●Effects of Cutting Edge Inclination

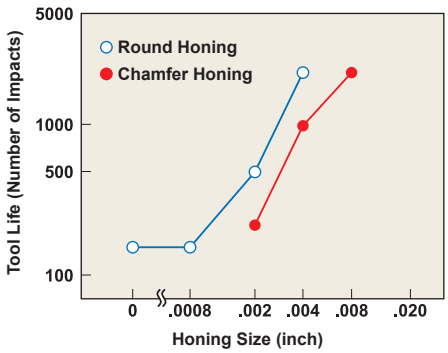
1. Negative (-) cutting edge inclination disposes chips in the workpiece direction, and positive (+) disposes chips in the opposite direction.
2. Negative (-) cutting edge inclination increases cutting edge strength, but it also increases back force of cutting resistance. Thus, chattering easily occurs.

■HONING AND LAND

Honing and land are cutting edge shapes that maintain cutting edge strength.
Honing can be round or chamfer type. The optimal honing or / and land width is approximately 1/2 of the feed.
Land is the narrow flat area on the rake or flank face.

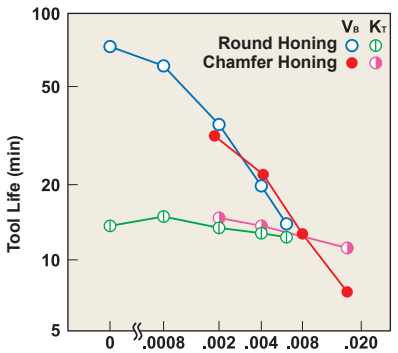


Round Honing　Chamfer Honing　Flat Land



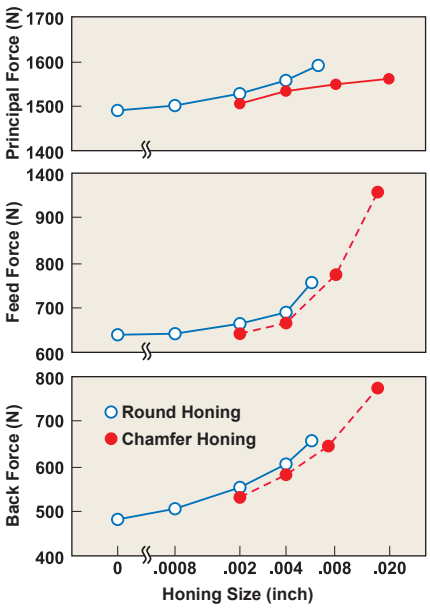
Workpiece : **Alloy steel (280HB)**
Grade : **P10**
Cutting Conditions : **vc=655 SFM ap=.059 inch f=.013 IPR**

Honing Size and Tool Life Due to Fracturing



Workpiece : **Alloy steel (220HB)**
Grade : **P10**
Cutting Conditions : **vc=525 SFM ap=.059 inch f=.018 IPR**

Honing Size and Tool Life Due to Wear



Workpiece : **Alloy steel (220HB)**
Grade : **P10**
Cutting Conditions : **vc=333 SFM ap=.059 inch f=.017 IPR**

Honing Size and Cutting Resistance

●Effects of Honing

1.Enlarging the honing increases cutting edge strength, and reduces fracturing.
2.Enlarging the honing increases flank wear occurrence. Honing size doesn't affect rake wear.
3.Enlarging the honing increases cutting resistance and chattering.

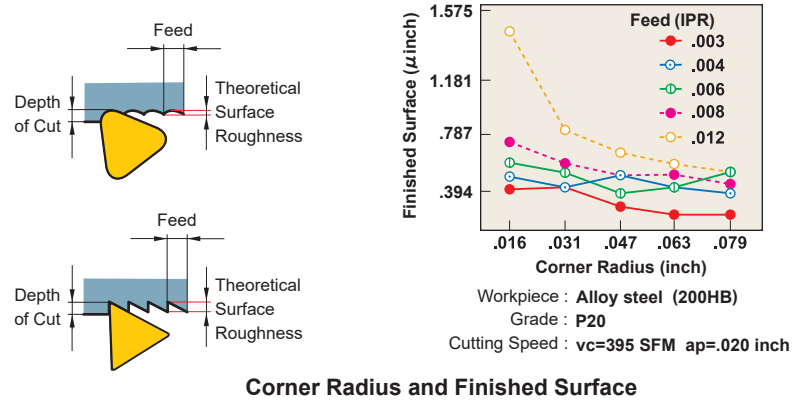
When to Decrease Honing Size	When to Increase Honing Size
○ When finishing with small depth of cut and small feed. ○ Soft workpiece. ○ When the workpiece and the machine have poor rigidity.	○ Hard workpiece. ○ When the cutting edge strength is required such as for uncut surface cutting and interrupted cutting. ○ When the machine has high rigidity.

*Cemented carbide, coated diamond, and indexable cermet inserts have round honing as standard.

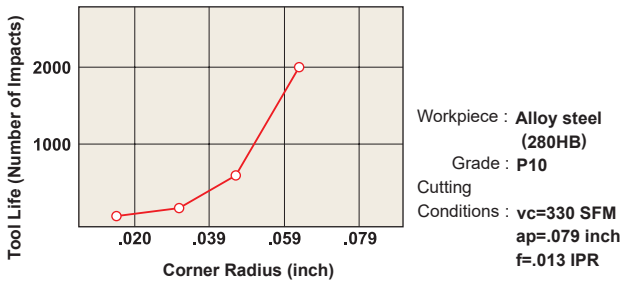
FUNCTION OF TOOL FEATURES FOR TURNING

■CORNER RADIUS

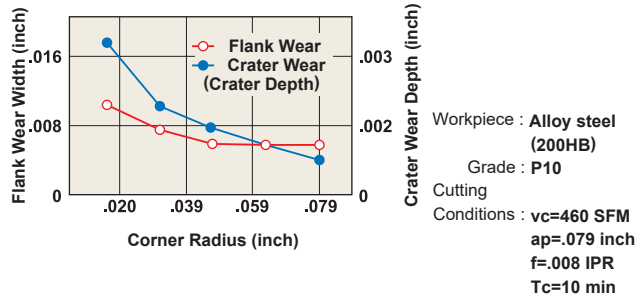
Corner radius effects the cutting edge strength and finished surface. In general, a corner radius 2 – 3 times the feed is recommended.



Corner Radius and Finished Surface



Corner Radius Size and Tool Life Due to Fracturing



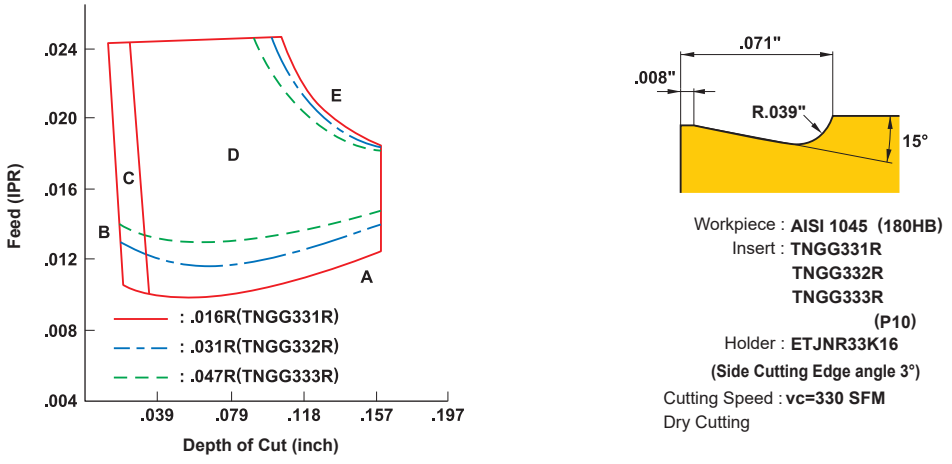
Corner Radius Size and Tool Wear

●Effects of Corner Radius

1. Increasing the corner radius improves the surface finish.
2. Increasing the corner radius improves cutting edge strength.
3. Increasing the corner radius too much increases the cutting resistance and causes chattering.
4. Increasing the corner radius decreases flank and rake wear.
5. Increasing the corner radius too much results in poor chip control.

When to Decrease Corner Radius	When to Increase Corner Radius
○Finishing with small depth of cut. ○Thin, long workpiece. ○When the machine has poor rigidity.	○When the cutting edge strength is required such as in interrupted cutting and uncut surface cutting. ○When roughing a workpiece with large diameter. ○When the machine has high rigidity.

●Corner Radius and Chip Control Range



Note 1) Please refer to page N008 for chip shapes (A, B, C, D, E).

FORMULAS FOR TURNING

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot Dm \cdot n}{12} (SFM)$$

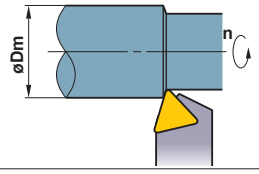
vc (SFM) : Cutting Speed
Dm (inch) : Workpiece Diameter
π (3.14) : Pi
n (min^{-1}) : Main Axis Spindle Speed

(Problem) What is the cutting speed when the main axis spindle speed is 700 min^{-1} and external diameter is ϕ2" ?

(Answer) Substitute π=3.14, Dm=2, n=700 into the formula.

$$vc = \frac{\pi \cdot Dm \cdot n}{12} = \frac{3.14 \times 2 \times 700}{12} = 365 \text{ SFM}$$

The answer is 365 SFM.



■FEED (f)

$$f = \frac{I}{n} (IPR)$$

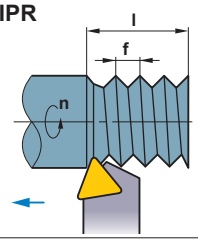
f (IPR) : Feed per Revolution
I (IPM) : Cutting Length per Min.
n (min^{-1}) : Main Axis Spindle Speed

(Problem) What is the feed per revolution when the main axis spindle speed is 500 min^{-1} and cutting length per minute is 4.72 IPM ?

(Answer) Substitute n=500, I=4.72 into the formula.

$$f = \frac{I}{n} = \frac{4.72}{500} = .009 \text{ IPR}$$

The answer is .009 IPR.



■CUTTING TIME (Tc)

$$Tc = \frac{lm}{I} (min)$$

Tc (min) : Cutting Time
lm (inch) : Workpiece Length
I (IPM) : Cutting Length per Min.

(Problem) What is the cutting time when 4 inch workpiece is machined at 1000 min^{-1} with feed= .008 IPR ?

(Answer) First, calculate the cutting length per min. from the feed and spindle speed.

$$I = f \times n = .008 \times 1000 = 8 \text{ IPM}$$

Substitute the answer above into the formula.

$$Tc = \frac{lm}{I} = \frac{4}{8} = 0.5 \text{ min}$$

0.5×60=30 (sec.)
The answer is 30 sec.

■THEORETICAL FINISHED SURFACE ROUGHNESS (h)

$$h = \frac{f^2}{8RE} \times 1000 (\mu inch)$$

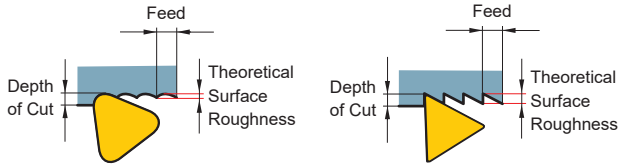
h (μinch) : Finished Surface Roughness
f (IPR) : Feed per Revolution
RE (inch) : Insert Corner Radius

(Problem) What is the theoretical finished surface roughness when the insert corner radius is .031 inch and feed is .008 IPR ?

(Answer) Substitute f= .008 IPR, RE= .031 into the formula.

$$h = \frac{(.008)^2}{8 \times .031} \times 1000 = .258 \ \mu inch$$

The answer is .258 μinch.

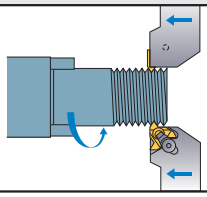
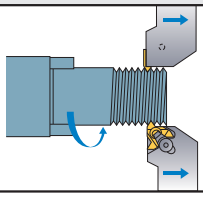
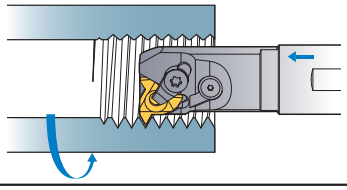
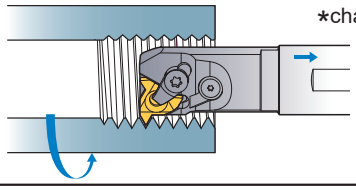


TROUBLE SHOOTING FOR THREADING

Problems	Observation	Causes	Solutions
Low thread precision.	Threads do not mesh with each other.	Incorrect tool installation.	Set the insert center height at 0".
			Check holder inclination (Lateral).
	Shallow thread.	Incorrect depth of cut.	Modify the depth of cut.
		Lack of insert wear or plastic deformation resistance.	Refer to "Quickly generated flank wear." and "Large plastic deformation." below.
Poor surface finish.	Surface damage.	Chips wrap around or clog the workpiece.	Change to flank infeed and control the chip discharge direction.
			Change to an M-class insert with a 3-D chip breaker.
		The side of the insert cutting edge interferes with the workpiece.	Check the lead angle and select an appropriate shim.
	Surface tears.	Built-up edge (Welding).	Increase cutting speed.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Decrease depth of cut per pass.
	Surface vibrations.	Cutting speed too high.	Decrease the cutting speed.
		Insufficient workpiece or tool clamping.	Re-check workpiece and tool clamping. (Chuck pressure, clamping allowance)
		Incorrect tool installation.	Set the insert center height at 0".
Short tool life.	Flank wear quickly generated.	Cutting speed too high.	Decrease the cutting speed.
		Too many passes causes abrasive wear.	Reduce the number of passes.
		Small depth of cut for the finishing pass.	Do not re-cut at 0" depth of cut. Depth of cut larger than .002" is recommended.
	Non-uniform wear of the right and left sides of the cutting edge.	The workpiece lead angle and the tool lead angle do not match.	Check the workpiece lead angle and select an appropriate shim.
	Chipping and fracture.	Cutting speed too low.	Increase cutting speed.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.
		Unstable clamping.	Check workpiece deflection.
			Shorten tool overhang.
			Recheck workpiece and tool clamping. (Chuck pressure, clamping allowance)
		Chip packing.	Increase coolant pressure to blow away chips.
			Change the tool pass to control chips. (Lengthen each pass to allow the coolant to clear the chips.
			Change from standard internal cutting to back turning to prevent chip jamming.
		Non-chamfered workpiece causes high resistance at the start of each pass.	Chamfer the workpiece entry and exit faces .
	Large plastic deformation.	High cutting speed and large heat generation.	Decrease the cutting speed.
		Lack of coolant supply.	Check coolant supply is sufficient.
			Increase coolant pressure and volume.
		Cutting resistance too high.	Increase the number of passes and decrease the cutting resistance per pass.

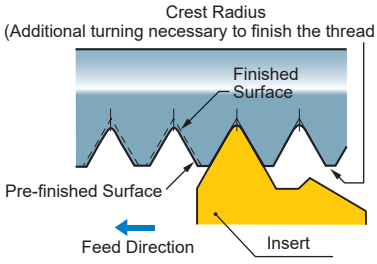
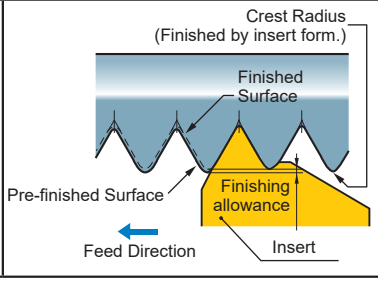
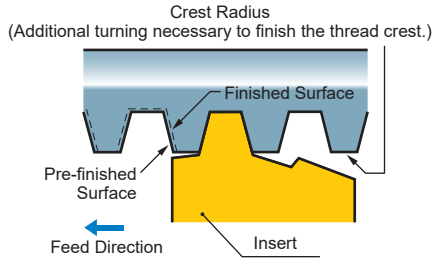
THREADING METHODS

THREADING METHODS

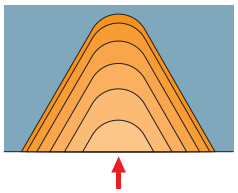
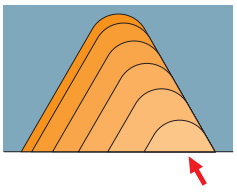
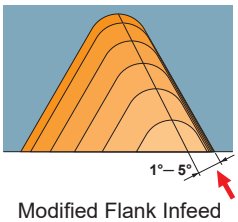
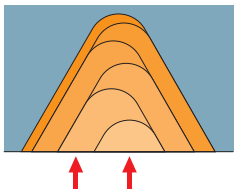
	Right Hand Thread	Left Hand Thread
EXTERNAL		 *change the shim
INTERNAL		 *change the shim

· Usually, threads are cut feeding the insert towards the chuck.
· When machining left hand threads, note that clamping rigidity is lowered due the application of back turning.
· When machining left hand threads, the lead angle is negative. Ensure an appropriate lead angle by changing the shim.

INSERT TYPES

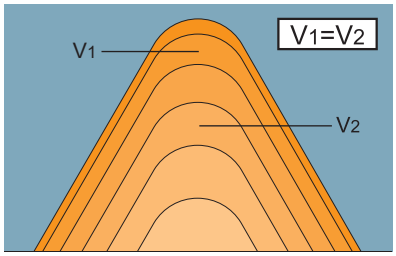
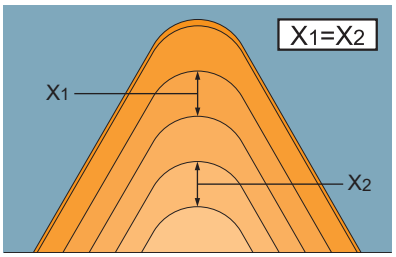
Partial Form	Full Form	Semi Full Form (Trapezoidal threads only)
● The same insert can be used for a range of pitches. ● Shorter tool life because the nose radius of the insert is smaller than that of a full form insert. ● Finishing with another operation may be necessary.	● No deburring needed after threading. ● Requires specific insert for each thread form and pitch.	● No de-burring needed after threading. ● Requires specific insert for each thread form and pitch. ● Finishing with another operation may be necessary.
		

INFEED METHODS

Features		Radial Infeed	Flank Infeed	Modified Flank Infeed	Incremental Infeed
					
	Advantages	● Easiest to use. (Standard program for threading) ● Wide application. (Cutting conditions easy to change.) ● Uniform wear of the right and left sides of the cutting edge.	● Relatively easy to use. (Semi-standard program for threading.) ● Reduced cutting force. ● Suitable for large pitch threads or materials that peel easily. ● Good chip discharge.	● Preventing flank wear on the right side of the cutting edge. ● Reduced cutting force. ● Good for large pitch or materials that peel easily. ● Good chip discharge.	● Uniform wear of the right and left sides of the cutting edge. ● Reduced cutting force. ● Good for large pitch or materials that peel easily.
	Disadvantages	● Difficult chip control. ● Subject to vibration in the later passes due to long cutting edge in contact with workpiece. ● Ineffective for large pitch threading. ● Heavy load on the nose radius.	● Large flank wear of the right side of a cutting edge. ● Relatively difficult to change cutting depth. (Re-programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (NC programming necessary)	● Complex machining programming. ● Difficult to change cutting depth. (Re-programming necessary) ● Chip control is difficult.

THREADING METHODS

THREADING DEPTH

	Features	
	Advantages	Disadvantages
 Fixed cut area	· Easy to use. (Standard program for threading.) · Superior resistance to vibration. (Constant cutting force.)	· Long chips generated during the final pass. · Complex calculation of cutting depth when changing the number of passes.
 Fixed cutting depth	· Reduced load on nose radius during the first half of the passes. · Easy chip control. (Optional setting of chip thickness) · Easy to calculate cutting depth when changing the number of passes. · Good chip control.	· Subject to vibration in the later stages of cutting. (Increased cutting force) · In some cases, changing the NC program is necessary.

* It is recommended to set the depth of cut of the final pass to .002-.001 inch
Large cutting depths can cause vibration, leading to a poor surface finish.

■ Formulas

●Formulas to calculate infeed for each pass in a reduced series.

$$\triangle ap_n = \frac{ap}{\sqrt{n_{ap}-1}} \times \sqrt{b}$$

$\triangle ap_n$: Depth of cut
n : Actual pass
ap : Total depth of cut
n_{ap} : Number of passes
b : 1st pass 0.3
2nd pass 2–1=1
3rd pass 3–1=2
·
·
nth pass

Example) External threading (ISO metric)
Pitch : 1.0 mm
ap : 0.6 mm
n_{ap} : 5

1st pass $\triangle ap_1 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{0.3} = 0.16 \rightarrow$ **0.16** ($\triangle ap_1$)
2nd pass $\triangle ap_2 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{2-1} = 0.3 \rightarrow$ **0.14** ($\triangle ap_2 - \triangle ap_1$)
3rd pass $\triangle ap_3 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{3-1} = 0.42 \rightarrow$ **0.12** ($\triangle ap_3 - \triangle ap_2$)
4th pass $\triangle ap_4 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{4-1} = 0.52 \rightarrow$ **0.1** ($\triangle ap_4 - \triangle ap_3$)
5th pass $\triangle ap_5 = \frac{0.60}{\sqrt{5-1}} \times \sqrt{5-1} = 0.6 \rightarrow$ **0.08** ($\triangle ap_5 - \triangle ap_4$)

■ NC Program for Modified Flank Infeed

●Example:- M12×1.0 5 passes modified 1°-3° (mm)

External Threading	Internal Treading
G00 Z = 5.0 X = 14.0 G92 U–4.34 Z–13.0 F1.0 G00 W–0.07 G92 U–4.64 Z–13.0 F1.0 G00 W–0.06 G92 U–4.88 Z–13.0 F1.0 G00 W–0.05 G92 U–5.08 Z–13.0 F1.0 G00 W–0.03 G92 U–5.20 Z–13.0 F1.0 G00	G00 Z = 5.0 X = 10.0 G92 U4.34 Z–13.0 F1.0 G00 W–0.07 G92 U4.64 Z–13.0 F1.0 G00 W–0.05 G92 U4.84 Z–13.0 F1.0 G00 W–0.04 G92 U5.02 Z–13.0 F1.0 G00 W–0.03 G92 U5.14 Z–13.0 F1.0 G00

Selecting Cutting Conditions

		Priority					
		Tool life	Cutting force	Surface finish	Precision of thread	Chips discharge	Efficiency (Reduced passes)
Threading methods	Radial	○		○	○		○
	Flank	(△ : Modified)	○	(△ : Modified)		○	
Cutting depth	Fixed cutting depth					○	
	Fixed cut area	○	○	○	○		○

Note) ・Tool life and surface finish accuracy can be increased by changing the threading method from flank infeed to modified flank infeed.
・Chip control can be improved by increasing the cutting depth in the later half of passes.

Cutting depth and the number of passes

●Selection of the appropriate cutting depth and the right number of passes is vital for threading.

・For most threading, use a "threading cycle program," which has originally been installed on machines, and specify "total cutting depth" and "cutting depth in the first or final pass."

・Cutting depth and the number of passes are easy to change for the radial infeed method, thus making it easy to determine the appropriate cutting conditions.

Feature and benefits of Mitsubishi products

・Insert grades, specially produced for threading tools, ensure highly efficient cutting by enabling high-speed machining and a reduced number of passes.

Machining Cost Reduction

Advice on improved threading

●Increasing tool life

・To prevent damage to the nose radius -
Recommended method - Modified flank infeed.

・To have uniform flank wear on both sides of a cutting edge -
Recommended method - Radial infeed

・To prevent crater wear -
Recommended method - Flank infeed

●Preventing chip problems

・Change to flank or modified infeed.

・During radial infeed cutting, use an inverted holder and change the coolant supply to a downward direction.

・When using the radial infeed method, set the minimum cutting depth at around .008 inch to make the chips thicker.

・Tangled chips during internal threading can damage the insert. In these cases, pause slightly away from the start point and clear the chips with coolant before every pass.

・Change to M-class inserts with a 3-D chip breaker.

●To achieve highly efficient machining

・Increase cutting speed. (Dependant on the maximum revolution and rigidity of the machine.)

・Reduce the number of passes. (Reduce by 30-40%.)

・A reduced number of passes can improve chip discharge because of the thicker chips generated.

●Preventing vibration

・Change to flank or modified infeed.

・When using radial infeed, reduce cutting depth in the later half of passes and lower the cutting speed.

●Increased surface finish accuracy

・A final pass should be performed at the same depth of cut as the last regular pass.

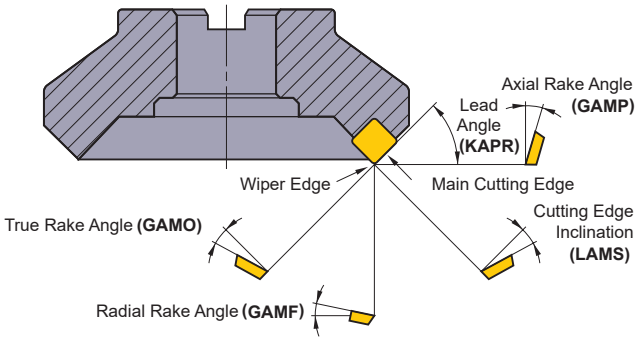
・When using the flank infeed method, change to radial infeed only during the final pass.

TROUBLE SHOOTING FOR FACE MILLING

Trouble		Solutions / Factors	Insert Grade Selection: Select a Harder Grade	Insert Grade Selection: Select a Tougher Grade	Insert Grade Selection: Select a Grade with Better Thermal Shock Resistance	Insert Grade Selection: Select a Grade with Better Adhesion Resistance	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Depth of Cut (Up ↗ / Down ↘)	Cutting Conditions: Engage Angle (↗ Up)	Cutting Conditions: Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Conditions: Cutting Fluids: Determine Dry or Wet Cutting	Style and Design of the Tool: Rake Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Corner Angle (Up ↗ / Down ↘)	Style and Design of the Tool: Honing Strengthens the Cutting Edge (Up ↗ / Down ↘)	Style and Design of the Tool: Cutter Diameter (Up ↗ / Down ↘)	Style and Design of the Tool: Decrease the Number of Teeth	Style and Design of the Tool: Wider Chip Pocket	Style and Design of the Tool: Use of a Wiper Insert	Style and Design of the Tool: Run-out Accuracy	Style and Design of the Tool: Improve Cutter Rigidity	Machine and Installation of Tool: Installation of the Tool and Workpiece	Machine and Installation of Tool: Shorten Tool Overhang	Machine and Installation of Tool: Machine with Inadequate Horsepower and Rigidity
Short Tool LIfe	Rapid insert wear	Improper tool grade	●																					
		Improper cutting edge geometry											↗●	↗●	●↘					●				
		Improper cutting conditions					●↘					Wet												
	Chipping and fracturing of cutting edge	Improper tool grade		●																				
		Improper cutting conditions						●↘	●↘															
		Lack of cutting edge strength													↗●									
		Thermal cracking occurs			●		●↘	●↘	●↘		●	Dry												
		Built-up edge occurs				●	↗●	↗●			●	Wet												
		Lack of rigidity																			●	●	●	●
Poor Surface Finish	Worsening surface roughness	Improper cutting conditions	●				●↘	●↘	●↘															
		Welding occurs				●	↗●				●	Wet	↗●		●↘									
		Poor run-out accuracy																	●	●				
		Vibration occurs					●↘	●↘	●↘	↗●			↗●		●↘		●				●	●	●	●
	Not parallel or irregular surface	Workpiece bending						●↘	●↘				↗●	●↘	●↘		●					●		
		Tool clearance																			●	●	●	●
		Large back force											↗●	●↘	●↘		●							
Burr / Chipping	Burr	Chip thickness is too large					↗●	●↘	●↘															
		Cutter diameter is too large								↗●						●↘								
		Poor sharpness											↗●		●↘									
		A large corner angle												●↘										
	Chipping	Improper cutting conditions						●↘	●↘															
		Poor sharpness											↗●		●↘									
		Corner angle is too small												↗●										
		Vibration occurs					●↘	●↘	●↘	↗●			↗●		●↘		●				●	●	●	●
Chip Control	Poor chip disposal, chip jamming and chip packing	Welding occurs					↗●																	
		Chip thickness is too thin					↗●	↗●																
		Cutter diameter is too small														●↘								
		Poor chip disposal									●	Wet					●	●						

FUNCTION OF TOOL FEATURES FOR FACE MILLING

■FUNCTION OF EACH CUTTING EDGE ANGLE IN FACE MILLING

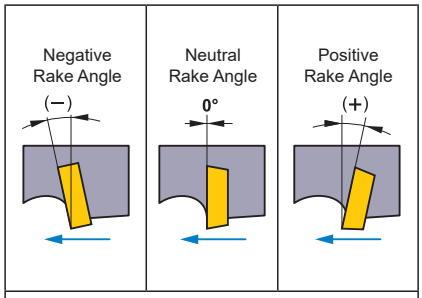


Each Cutting Edge Angle in Face Milling

Type of Angle	Symbol	Function	Effect
Axial Rake Angle	GAMP	Determines chip disposal direction.	**Positive** : Excellent machinability.
Radial Rake Angle	GAMF	Determines sharpness.	**Negative** : Excellent chip disposal.
Lead Angle	KAPR	Determines chip thickness.	**Small** : Thin chips and small cutting impact. Large back force.
True Rake Angle	GAMO	Determines actual sharpness.	**Positive(large)** : Excellent machinability. Minimal welding. **Negative(large)** : Poor machinability. Strong cutting edge.
Cutting Edge Inclination	LAMS	Determines chip disposal direction.	**Positive (large)** : Excellent chip disposal. Low cutting edge strength.

■STANDARD INSERTS

●Positive and Negative Rake Angle

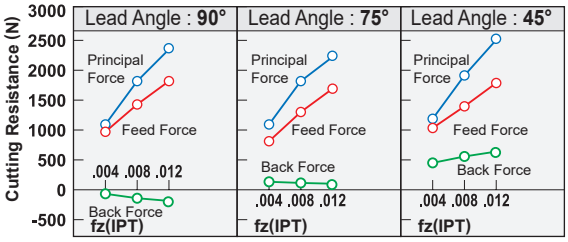


- Insert shape whose cutting edge precedes is a positive rake angle.
- Insert shape whose cutting edge follows is a negative rake angle.

●Standard Cutting Edge Shape

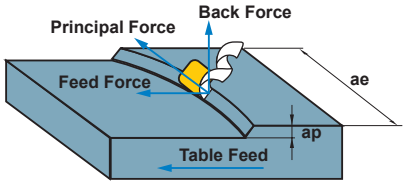
Standard Cutting Edge Combinations		(+) Axial Rake Angle / Radial Rake Angle (+) Double Positive (DP Edge Type)	(−) Axial Rake Angle / Radial Rake Angle (−) Double Negative (DN Edge Type)	(+) Axial Rake Angle / Radial Rake Angle (−) Negative/Positive (NP Edge Type)
Axial Rake Angle (GAMP)		Positive (+)	Negative (−)	Positive (+)
Radial Rake Angel (GAMF)		Positive (+)	Negative (−)	Negative (−)
Insert Used		Positive Insert (One Sided Use)	Negative Insert (Double Sided Use)	Positive Insert (One Sided Use)
Workpiece	Steel	●	–	●
	Cast Iron	–	●	●
	Aluminum Alloy	●	–	–
	Difficult-to-Cut Material	●	–	●

■LEAD ANGLE (KAPR) AND CUTTING RESISTANCE



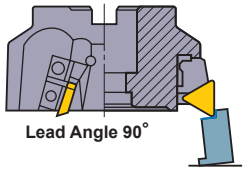
Workpiece : **Alloy Steel (281HB)**
Tool : **ø4" Single Insert**
Cutting Conditions : **vc=410 SFM ap=.157 inch ae=4.33 inch**

Cutting Resistance Comparison between Different Lead Angles

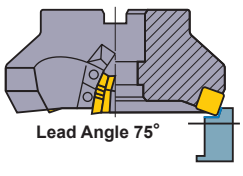


Three Cutting Resistance Forces in Milling

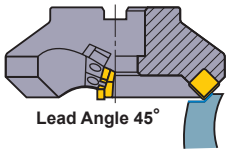
Lead Angle 90° — Back force is in the minus direction. Lifts the workpiece when workpiece clamp rigidity is low.



Lead Angle 75° — Lead Angle 75° is recommended for face milling of workpiece with low rigidity such as thin workpiece.



Lead Angle 45° — The largest back force. Bends thin workpiece and lowers cutting accuracy.
✱ Prevents workpiece edge chipping in cast iron cutting.



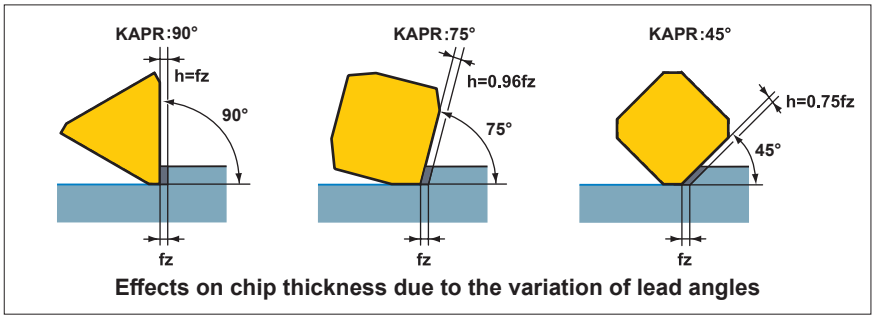
✱ Principal force: Force is in the opposite direction of face milling rotation.
✱ Back force: Force that pushes in the axial direction.
✱ Feed Force: Force is in the feed direction and is caused by table feed.

FUNCTION OF TOOL FEATURES FOR FACE MILLING

■LEAD ANGLE AND TOOL LIFE

●Lead Angle and Chip Thickness

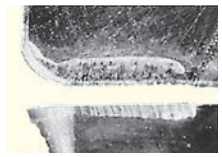
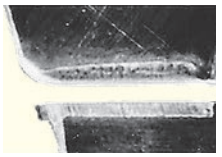
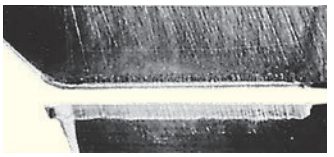
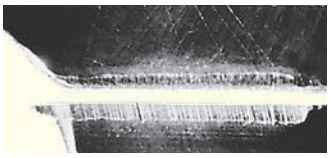
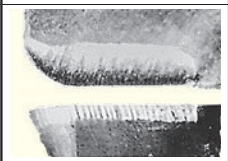
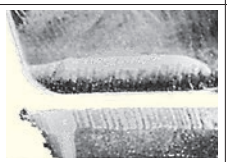
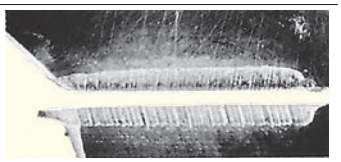
When the depth of cut and feed per tooth, fz, are fixed, the larger lead angle (KAPR) is, then the thinner chip thickness (h) becomes (for a 45° KAPR, it is approx. 75% that of a 0° KAPR). This can be seen in below. Therefore as the KAPR increases, the cutting resistance decreases resulting in longer tool life. Note however, if the chip thickness is too large then the cutting resistance can increase leading to vibrations and shortened tool life.



Effects on chip thickness due to the variation of lead angles

●Corner Angle and Crater Wear

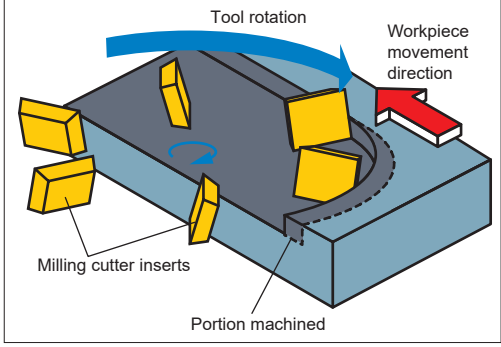
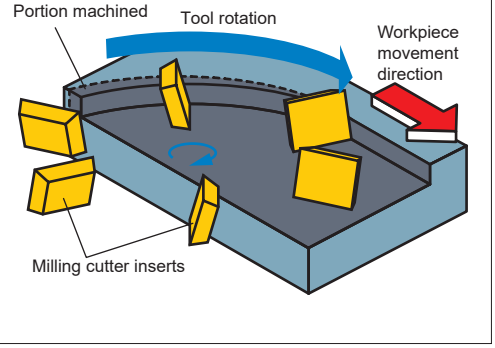
Below shows wear patterns for different lead angles. When comparing crater wear for 90° and 45° lead angles, it can be clearly seen that the crater wear for 90° lead angle is larger. This is because if the chip thickness is relatively large, the cutting resistance increases and so promotes crater wear. As the crater wear develops then cutting edge strength will reduce and lead to fracturing.

	90° Lead Angle	**75°** Lead Angle	**45°** Lead Angle
vc=330 SFM Tc=69 min			
vc=410 SFM Tc=55 min			
vc=525 SFM Tc=31 min			

Workpiece : **AISI 4340 (287HB)**
Tool : **DC=4.92 inch**
Insert : **M20**
Cutting Conditions : **ap=.118 inch**
ae=4.33 inch
fz=.008 IPT
Cutting Mode : Dry Cutting

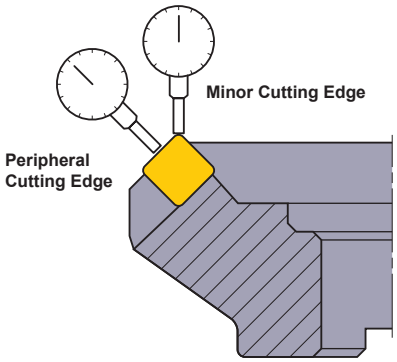
■UP CUT AND DOWN CUT MILLING

Which method to be used will depend on the machine and the face mill cutter that has been selected. Generally down cut machining offers longer tool life than up cut milling.

Up Cut Milling	**Down Cut Milling**
	

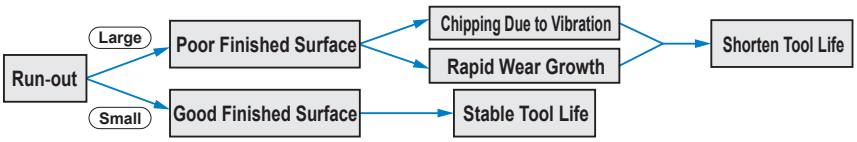
■FINISHED SURFACE

●Cutting Edge Run-out Accuracy

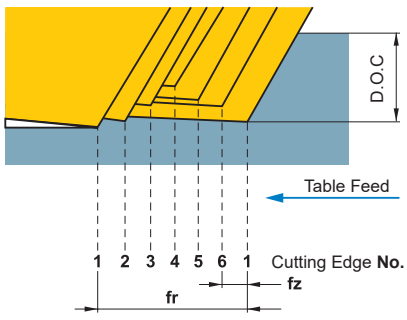


Cutting Edge Run-out and Accuracy in Face Milling

Cutting edge run-out accuracy of indexable inserts on the cutter body greatly affects the surface finish and tool life.



●Improve Finished Surface Roughness

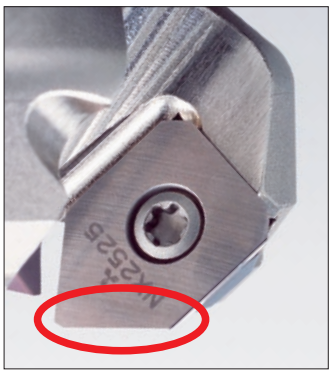


fz : Feed per Tooth
fr : Feed per Revolution

Sub Cutting Edge Run-out and Finished Surface

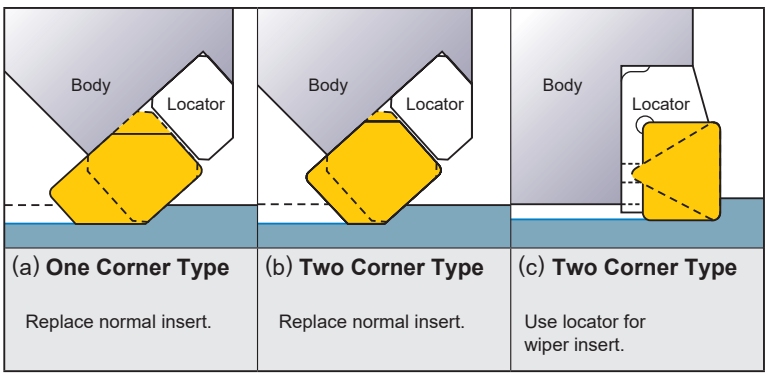
Usually the minor cutting edges are set parallel to the face of a milling cutter and theoretically the finished surface accuracy should be maintained, even if run-out accuracy is poor.

Actual Problems	Countermeasure
· Cutting edge run-out. · Minor cutting edge inclination. · Cutter body accuracy. · Spare parts accuracy. · Welding, vibration, chattering.	**Wiper Insert** *Machine a surface that has already been machined by normal insert in order to produce smooth finished surface.



· Replace one normal insert with wiper insert.
· Wiper inserts are set to protrude by .0012 — .004 inch from the standard inserts.
Value depends on the cutting edge and insert combination.

●How to Set a Wiper Insert



(a) **One Corner Type**	(b) **Two Corner Type**	(c) **Two Corner Type**
Replace normal insert.	Replace normal insert.	Use locator for wiper insert.

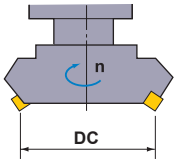
· Wiper edge length has to be longer than the feed per revolution.
*Too long wiper edge causes chattering.
· When the cutter diameter is large and feed per revolution is longer than the wiper edge, use two or three wiper inserts.
· When using two wiper inserts or more, eliminate run-out of wiper inserts.
· Use a high hardness grade (high wear resistance) for wiper inserts.

FORMULAS FOR FACE MILLING

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{12} \text{ (SFM)}$$

vc (SFM) : Cutting Speed
DC (inch) : Cutter Diameter
π (3.14) : Pi
n (min^{-1}) : Main Axis Spindle Speed



(Problem) What is the cutting speed when main axis spindle speed is 350 min^{-1} and cutter diameter is ϕ5" ?

(Answer) Substitute π 3.14, DC=5", n=350 into the formula.

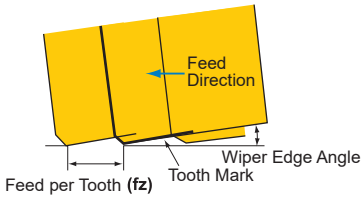
$$vc = \frac{\pi \cdot DC \cdot n}{12} = \frac{3.14 \times 5" \times 350}{12} = 457.9 \text{ SFM}$$

The answer is 457.9 SFM.

■FEED PER TOOTH (fz)

$$fz = \frac{vf}{z \cdot n} \text{ (IPT)}$$

fz (IPT) : Feed per Tooth **z** : Insert Number
vf (IPM) : Table Feed per Min.
n (min^{-1}) : Main Axis Spindle Speed (Feed per Revolution fr=z×fz)



(Problem) What is the feed per tooth when the main axis spindle speed is 500 min^{-1}, insert number is 10, and table feed is 20 IPM ?

(Answer) Substitute the above figures into the formula.

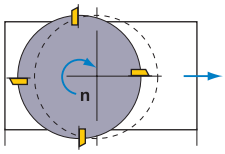
$$fz = \frac{Vf}{z \times n} = \frac{20}{10 \times 500} = .004 \text{ IPT}$$

The answer is .004 IPT.

■TABLE FEED (vf)

$$vf = fz \cdot z \cdot n \text{ (IPM)}$$

vf (IPM) : Table Feed per Min.
fz (IPT) : Feed per Tooth **z** : Insert Number
n (min^{-1}) : Main Axis Spindle Speed



(Problem) What is the table feed when feed per tooth is .004 IPT, with 10 inserts and main axis spindle speed is 500 min^{-1}?

(Answer) Substitute the above figures into the formula.

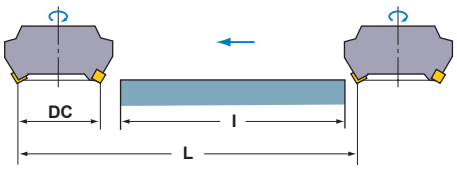
vf = fz×z×n = .004 IPT×10×500 = 20 IPM

The answer is 20 IPM.

■CUTTING TIME (Tc)

$$Tc = \frac{L}{vf} \text{ (min)}$$

Tc (min) : Cutting Time
vf (IPM) : Table Feed per Min.
L (inch) : Total Table Feed Length (Workpiece Length(l)+Cutter Diameter(DC))



(Problem) What is the cutting time required for finishing 4" width and 12" length surface of a cast iron (AISI No 30 B) block when cutter diameter is ϕ8", the number of inserts is 16, the cutting speed is 410 SFM, and feed per tooth is .01". (spindle speed is 200 min^{-1})

(Answer) Calculate table feed per min vf=.01×16×200=32 IPM
Calculate total table feed length. L=12+8=20 inch
Substitute the above answers into the formula.

$$Tc = \frac{20}{32} = 0.625 \text{ (min)}$$

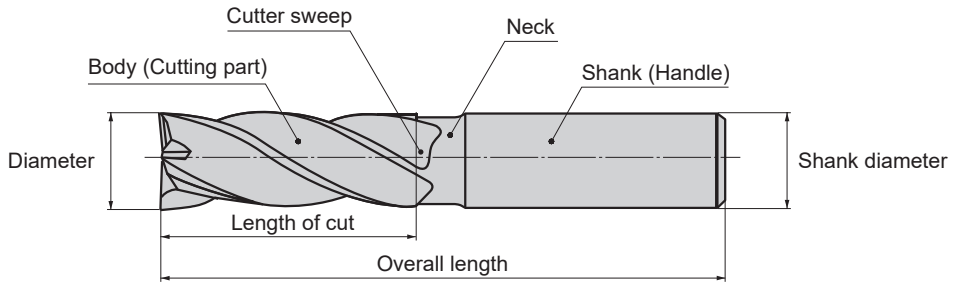
0.625 × 60 = 37.5 (sec.) The answer is 37.5 sec.

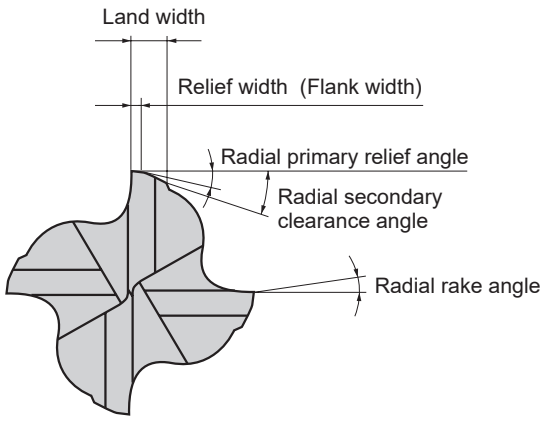
TROUBLE SHOOTING FOR END MILLING

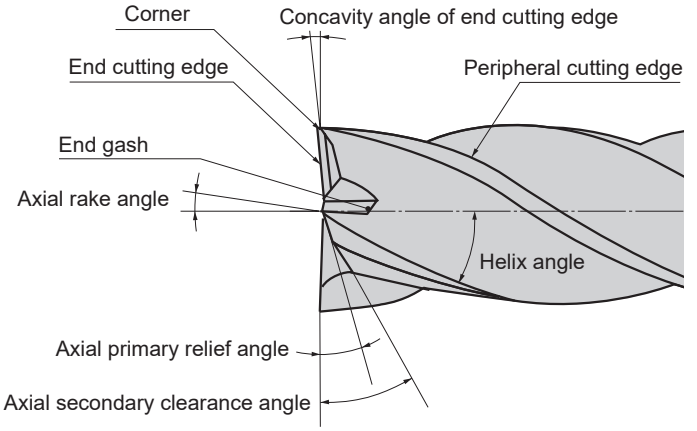
Trouble		Factors / Solutions	Insert Grade Selection	Cutting Conditions									Style and Design of the Tool						Machine and Installation of Tool					
			Coated Tool	Cutting Speed (Up ↗ / Down ↘)	Feed Rate (Up ↗ / Down ↘)	Depth of Cut (Up ↗ / Down ↘)	Decrease Pick Feed Rate	Down Cut	Air Blow	Cutting Fluids: Increase Coolant Quantity	Cutting Fluids: Do Not Use Water-soluble Cutting Fluid	Cutting Fluids: Determine Dry or Wet Cutting	Helix Angle (Up ↗ / Down ↘)	Number of Flutes (Up ↗ / Down ↘)	Concavity Angle of End Cutting Edge (Up ↗ / Down ↘)	Tool Diameter (Up ↗ / Down ↘)	Improve End Mill Rigidity	Wider Chip Pocket	Shorten Tool Overhang	Tool Installation Accuracy	Spindle Collet Run-out Accuracy	Collet Inspection and Exchange	Increase Chuck Clamping Power	Machine Stability, Rigidity
Short Tool Life	Large wear at the peripheral cutting edge	Non-coated insert is used	●																					
		Not enough flutes												↗●										
		Improper cutting conditions		●↘							●													
		Up cut milling						Down Cut																
	Chipping	Improper cutting conditions																						
		Fragile cutting edge															●							
		Insufficient clamping force																				●	●	
		Poor clamping rigidity																	●	●	●	●	●	●
	Breakage during cutting	Improper cutting conditions				●↘																		
		Poor end mill rigidity														↗●	●							
		Overhang longer than necessary				●↘													●					
		Chip packing								●								●						
Poor Surface Finish	Vibration during cutting	Improper cutting conditions		●↘	●↘																			
		Poor end mill rigidity											↗●	↗●		↗●	●							
		Poor clamping rigidity																	●	●	●	●	●	●
	Poor wall surface roughness	Large cutting edge wear	●																					
		Improper cutting conditions		●↘		●↘																		
		Chip jamming							●	●		Wet												
	Poor bottom surface roughness	The end cutting edge does not have a concave angle			●↘	●↘									↗●									
		Large pick feed					●																	
	Out of vertical	Large cutting edge wear	●																					
		Improper cutting conditions			●↘	●↘																		
		Poor end mill rigidity											↗●	↗●		↗●	●							
	Poor surface finish accuracy	Improper cutting conditions		●↘	●↘	●↘																		
		Poor clamping rigidity																	●	●	●	●	●	●
Burr / Chipping / Burrs	Burr, workpiece chipping	Improper cutting conditions			●↘	●↘																		
		Large helix angle											↗●											
	Quick burr formation	Notch wear occurs	●																					
		Improper cutting conditions		●↘	↗●																			
Chip Control	Chip packing	Metal removal too large			●↘	●↘																		
		Lack of flute chip space												●↘				●						

END MILL FEATURES AND SPECIFICATION

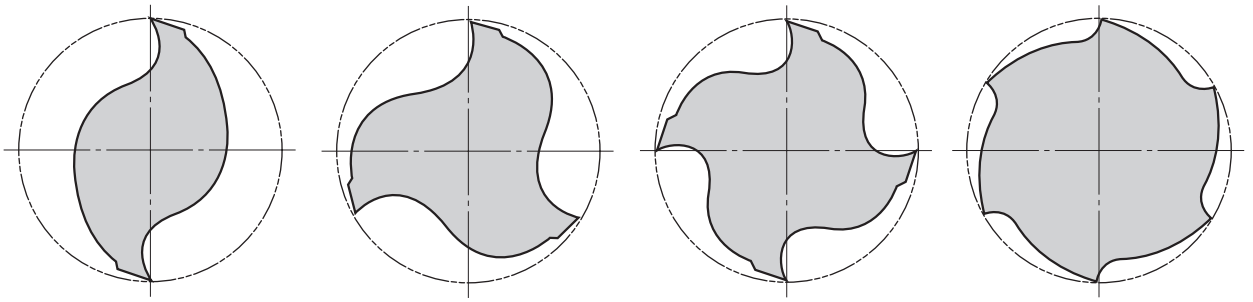
NOMENCLATURE







COMPARISON OF SECTIONAL AREA OF CHIP POCKET



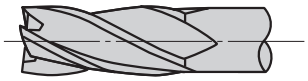
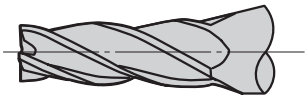
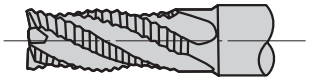
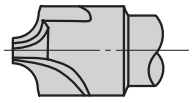
2-flutes 50% | 3-flutes 45% | 4-flutes 40% | 6-flutes 20%

CHARACTERISTICS AND APPLICATIONS OF DIFFERENT-NUMBER-OF-FLUTE END MILLS

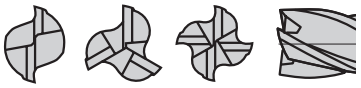
		2-flutes	3-flutes	4-flutes	6-flutes
Feature	Advantage	Effective chip disposal. Horizontal feed milling possible.	Effective chip disposal. Horizontal feed milling possible.	High rigidity.	High rigidity. Superior cutting edge durability.
	Fault	Low rigidity.	Diameter is not measured easily.	Chip disposal is poor.	Chip disposal is poor.
Usage		Various cutting modes including slotting, shoulder milling and drilling.	Slotting, shoulder milling Heavy cutting, finishing	Shallow slotting, shoulder milling Finishing	Machining hardened steels. Shallow slotting, shoulder milling.

END MILL TYPE AND GEOMETRY

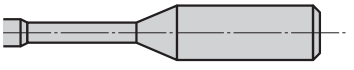
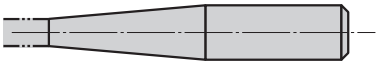
■PERIPHERAL CUTTING EDGE

Type	Shape	Feature
Ordinary Flute		Regular flute geometry as shown is most commonly used for roughing and finishing of side milling, slotting and shoulder milling.
Tapered Flute		A tapered flute geometry is used for special applications such as mold drafts and for applying taper angles after conventional straight edged milling.
Roughing Flute		Roughing type geometry has a wave like edge form and breaks the material into small chips. Additionally the cutting resistance is low enabling high feed rates when roughing. The inside face of the flute is suitable for regrinding.
Formed Flute		Special form geometry as shown is used for producing corner radii on components. There are an infinite number of different geometry's that can be manufactured using such style of cutters.

■END CUTTING EDGE

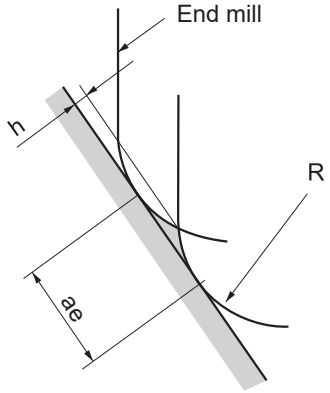
Type	Shape	Feature
Square End (With Center Hole)		Generally used for side milling, slotting and shoulder milling. Plunge cutting is not possible due to the center hole that is used to ensure accurate grinding and regrinding of the tool.
Square End (Center Cut)		Generally used for side milling, slotting and shoulder milling. Plunge cutting is possible and greater plunge cutting efficiency is obtained when using fewer flutes. Regrinding on the flank face can be done.
Ball End		Geometry completely suited for curved surface milling. At the extreme end point the chip pocket is very small leading to inefficient chip evacuation.
Corner Radius End		Used for radius profiling and corner radius milling. When pick feed milling an end mill with a large diameter and small corner radius can be efficiently used.

■SHANK AND NECK PARTS

Type	Shape	Feature
Standard (Straight Shank)		Most widely used type.
Long Shank		Long shank type for deep pocket and shoulder applications.
Long Neck		Long neck geometry can be used for deep slotting and is also suitable for boring.
Taper Neck		Long taper neck features are best utilized on deep slotting and mold draft applications.

PITCH SELECTION OF PICK FEED

■PICK FEED MILLING (CONTOURING) WITH BALL NOSE END MILLS, END MILLS WITH CORNER RADIUS



$$h=R \cdot \left[1-\cos\left\{\sin^{-1}\left(\frac{ae}{2R}\right)\right\}\right]$$

R : Radius of Ball Nose(RE), Corner Radius(RE)

ae : Pick Feed

h : Cusp Height

■CORNER R OF END MILLS AND CUSP HEIGHT BY PICK FEED

Unit : inch

ae / R	Pick Feed									
	.004	.008	.012	.016	.020	.024	.028	.031	.035	.039
0.5	.0001	.0004	.0009	.0017	.0026	.0039	—	—	—	—
1	.00004	.0002	.0004	.0008	.0016	.0018	.0025	.0033	.0042	—
1.5	.00004	.0001	.0003	.0005	.0008	.0012	.0016	.0021	.0027	.0034
2	.00004	.0001	.0002	.0004	.0006	.0009	.0012	.0016	.0020	.0025
2.5	.00004	.00007	.0002	.0003	.0005	.0007	.0010	.0013	.0016	.0020
3		.00007	.0002	.0003	.0004	.0006	.0008	.0011	.0013	.0017
4		.00004	.0001	.0002	.0003	.0004	.0006	.0008	.0010	.0012
5		.00004	.00007	.0002	.0002	.0004	.0005	.0006	.0008	.0010
6		.00004	.00007	.0001	.0002	.0003	.0004	.0005	.0007	.0008
8			.00004	.0001	.0002	.0002	.0003	.0004	.0005	.0006
10			.00004	.00007	.0001	.0002	.0002	.0003	.0004	.0005
12.5			.00004	.00007	.0001	.0002	.0002	.0002	.0003	.0004

ae / R	Pick Feed									
	.043	.047	.051	.055	.059	.063	.067	.071	.075	.079
0.5	—	—	—	—	—	—	—	—	—	—
1	—	—	—	—	—	—	—	—	—	—
1.5	.0041	—	—	—	—	—	—	—	—	—
2	.0030	.0036	.0043	—	—	—	—	—	—	—
2.5	.0024	.0029	.0034	.0039	—	—	—	—	—	—
3	.0020	.0024	.0028	.0033	.0037	.0043	—	—	—	—
4	.0015	.0018	.0021	.0024	.0028	.0032	.0036	.0041	—	—
5	.0012	.0014	.0017	.0019	.0022	.0025	.0029	.0032	.0036	.0040
6	.0010	.0012	.0014	.0016	.0019	.0021	.0024	.0027	.0030	.0033
8	.0007	.0009	.0010	.0012	.0014	.0016	.0018	.0020	.0022	.0025
10	.0006	.0007	.0008	.0010	.0011	.0013	.0014	.0016	.0018	.0020
12.5	.0005	.0006	.0007	.0008	.0009	.0010	.0011	.0013	.0014	.0016

TROUBLE SHOOTING FOR DRILLING

Trouble		Factors	Cutting Conditions: Cutting Speed (Up ↗ / Down ↘)	Cutting Conditions: Feed Rate (Up ↗ / Down ↘)	Cutting Conditions: Lower the Feed at Initial Entry	Cutting Conditions: Lower the Feed when Exiting	Cutting Conditions: Step Feed	Cutting Conditions: Increase the Accuracy and the Depth of the Pre-hole	Cutting Conditions: Cutting Fluids: Increase Oil Ratio	Cutting Conditions: Cutting Fluids: Increase Volume	Cutting Conditions: Cutting Fluids: Increase Coolant Pressure	Style and Design of the Tool: Chisel Width (Large ↗ / Small ↘)	Style and Design of the Tool: Honing Width (Large ↗ / Small ↘)	Style and Design of the Tool: Core Thickness (Large ↗ / Small ↘)	Style and Design of the Tool: Shorten the Flute Length	Style and Design of the Tool: Decrease the Lip Height	Style and Design of the Tool: Use a Drill with Coolant Holes	Style and Design of the Tool: Change to a Drill with X Type Thinning	Machine and Installation of Tool: Tool Installation Accuracy	Machine and Installation of Tool: Shorten Tool Overhang	Machine and Installation of Tool: Flatten the Workpiece Face	Machine and Installation of Tool: Workpiece Installation Accuracy	Machine and Installation of Tool: Machine Stability, Rigidity
Short Tool Life	Drill breakage	Lack of drill rigidity												●	●								
		Improper cutting conditions		● ↘																			
		Large deflection of the tool holder																	●				●
		Workpiece face is inclined																			●		
	Large wear at the peripheral cutting edge	Improper cutting conditions	● ↘																				
		Increase in temp. at cutting point							●	●							●						
		Poor run-out accuracy																	●				
	Chipping of the peripheral cutting edge	Improper cutting conditions		● ↘			●																
		Large deflection of the tool holder																	●				●
		Chattering, vibration											● ↘							●		●	●
	Chisel edge chipping	The chisel edge width is too large										● ↘											
		Poor entry			●																		
		Chattering, vibration											● ↘							●		●	●
Poor Hole Accuracy	Hole diameter increases	Lack of drill rigidity												↗ ●	●								
		Improper drill geometry														●							
	Hole diameter becomes smaller	Increase in temp. at cutting point							●	●							●						
		Improper cutting conditions	● ↘																				
		Improper drill geometry														●							
	Poor straightness	Lack of drill rigidity												↗ ●	●								
		Large deflection of the tool holder																	●				●
		Poor guiding properties						●															
	Poor hole positioning accuracy, roundness and surface finish	Lack of drill rigidity												↗ ●	●								
		Poor entry																●					
		Improper cutting conditions			●																		
		Large deflection of the tool holder																	●				●
Burr	Burrs at the hole exit	Improper drill geometry											● ↘										
		Improper cutting conditions				●																	
Chip Control	Long chips	Improper cutting conditions		↗ ●				●															
		Poor chip disposal								●	●			● ↘			●						
	Chip packing	Improper cutting conditions	● ↘	● ↘				●															
		Poor chip disposal								●	●			● ↘			●						

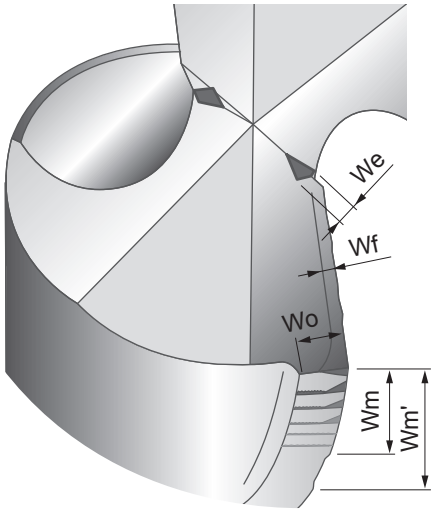
TECHNICAL DATA

N

DRILL WEAR CONDITION AND CUTTING EDGE DAMAGE

■DRILL WEAR CONDITION

The diagram below shows a simple drawing depicting the wear of a drill's cutting edge. The generation and the amount of wear differ according to the workpiece and cutting conditions used. But generally, the peripheral wear is largest and determines a drill tool life. When regrinding, the flank wear at the point needs to be ground away completely. Therefore, if there is large wear, more material needs to be ground away to renew the cutting edge.



We : Chisel edge wear width

Wf : Flank wear width (The middle of the cutting edge)

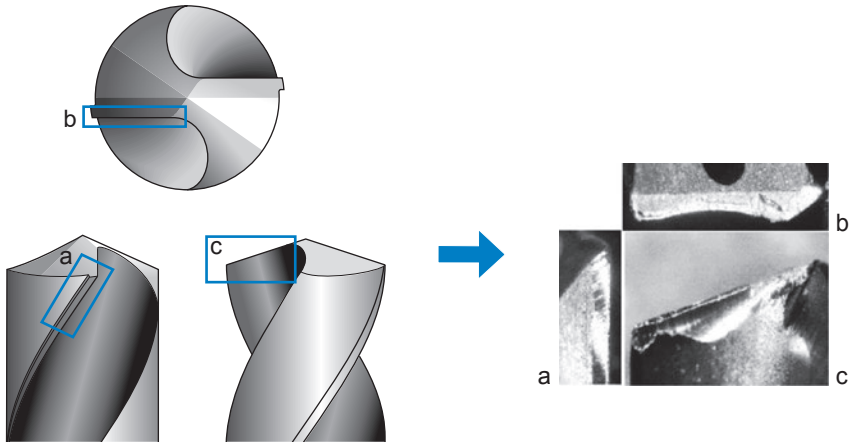
Wo : Outer corner wear width

Wm : Margin wear width

Wm' : Margin wear width (Leading edge)

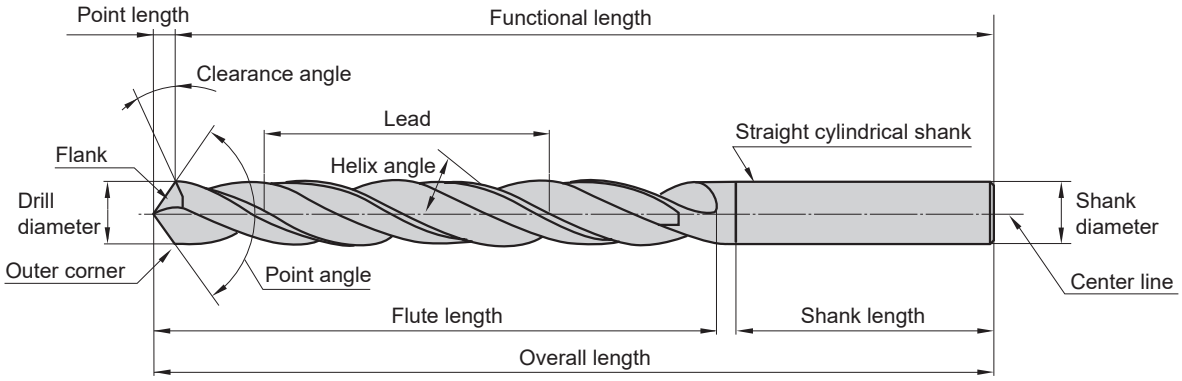
■CUTTING EDGE DAMAGE

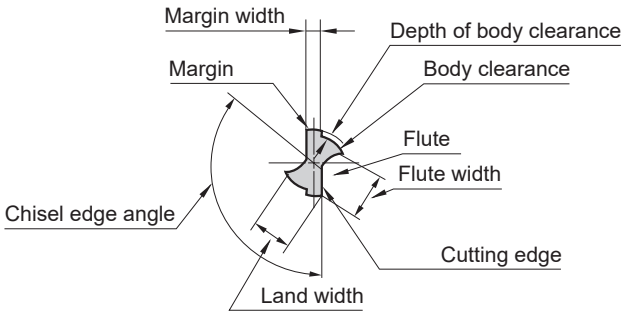
When drilling, the cutting edge of the drill can suffer from chipping, fracture and abnormal damage. In such cases it is important to take a closer look at the damage, investigate the cause and take countermeasures.



DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

■NAMES OF EACH PART OF A DRILL





■SHAPE SPECIFICATION AND CUTTING CHARACTERISTICS

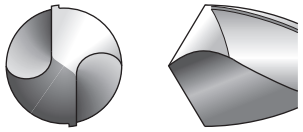
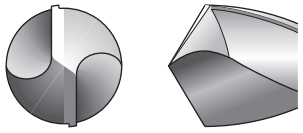
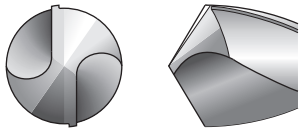
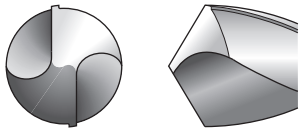
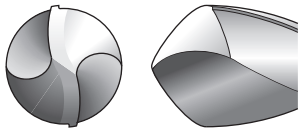
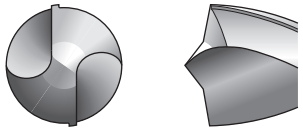
Helix Angle	Is the inclination of the flute with respect to the axial direction of a drill, which corresponds to the rake angle. The rake angle of a drill differs according to the position along the cutting edge. The rake angle is largest at the periphery and smallest towards the center of the cutting edge. The chisel edge has a negative rake angle, crushing the work. **High-hardness material** **Small ◀·· Rake Angle ··▶ Large** **Soft material** (Aluminum, etc.)
Flute Length	It is determined by depth of hole, guide bush length, and regrinding allowance. Since the influence on the tool life is great, it is necessary to minimize it as much as possible.
Point Angle	In general, the angle is 118° for high speed steel drills and 130—140° for carbide drills. **Soft material with good machinability** **Small ◀·· Point angle ··▶ Large** **For hard material and high-efficiency machining**
Web Thickness	It is an important element that determines the rigidity and chip disposal performance of a drill. The web thickness is set according to applications. Low cutting resistance Low rigidity Good chip disposal performance Machinable material **Thin ◀·· Web thickness ··▶ Thick** Large cutting resistance High rigidity Poor chip disposal High-hardness material, cross hole drilling, etc.
Margin	The margin determines the drill diameter and functions as a drill guide during drilling. The margin width is decided taking into consideration the friction within the hole to be drilled. **Poor guiding performance** **Small ◀·· Margin width ··▶ Large** **Good guiding performance**
Diameter Back Taper	To reduce friction with the inside of the drilled hole, the portion from the point to the shank is tapered slightly. The degree is usually represented by the quantity of reduction in the diameter with respect to the flute length, which is approx. .0016"—.016"/4".

DRILL TERMINOLOGY AND CUTTING CHARACTERISTICS

CUTTING EDGE GEOMETRY AND ITS INFLUENCE

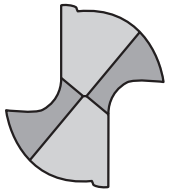
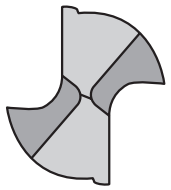
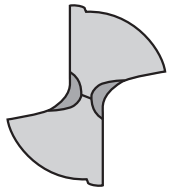
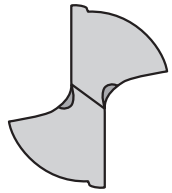
As shown in table below, it is possible to select the most suitable cutting edge geometry for different applications. If the most suitable cutting edge geometry is selected then higher machining efficiency and higher hole accuracy can be obtained.

Typical Cutting Edge Geometries

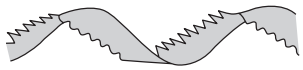
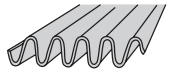
Grinding Name	Geometry	Features and Effect	Use
Conical		• The flank is conical and the clearance angle increases toward the center of the drill.	• For general use.
Flat		• The flank is flat and facilitates cutting.	• Mainly for small diameter drills.
Three Rake Angles		• As there is no chisel edge, the results are high centripetal force and small hole oversize. • Requires a special grinding machine. • Requires grinding of three sides.	• For drilling operations that require high hole accuracy and positioning accuracy.
Spiral Point		• To increase the clearance angle near the center of the drill, conical grinding combined with irregular helix. • S type chisel edge with high centripetal force and machining accuracy.	• For drilling that requires high accuracy.
Radial Lip		• The cutting edge is ground radial with the aim of dispersing load. • High machining accuracy and finished surface roughness. • For through holes, small burrs on the base. • Requires a special grinding machine.	• For cast iron and light alloy. • For cast iron plates. • Steel
Center Point Drill		• This geometry has two-stage point angle for better concentricity and a reduction in shock when exiting the workpiece.	• For thin sheet drilling.

WEB THINNING

The rake angle of the cutting edge of a drill reduces toward the center, and it changes into a negative angle at the chisel edge. During drilling, the center of a drill crushes the work, generating 50—70% of the cutting resistance. Web thinning is very effective for reduction in the cutting resistance of a drill, early removal of cut chips at the chisel edge, and better initial bite.

Geometry				
	X type	**XR type**	**S type**	**N type**
Features	The thrust load substantially reduces, and the bite performance improves. This is effective when the web is thick.	The initial performance is slightly inferior to that of the X type, but the cutting edge is tough and the applicable range of workpieces is wide.	Popular design, easy cutting type.	Effective when the web is comparatively thick.
Major Applications	General drilling and deep hole drilling.	General drilling and stainless steel drilling.	General drilling for steel, cast iron, and non-ferrous metal.	Deep hole drilling.

DRILLING CHIPS

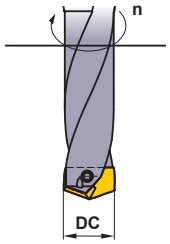
Types of Chips	Geometry	Features and Ease of Raking
Conical Spiral		Fan-shaped chips cut by the cutting edge are curved by the flute. Chips of this type are produced when the feeding rate of ductile material is small. If the chip breaks after several turns, the chip raking performance is satisfactory.
Long Pitch		Long pitch chips exit without coiling and will coil around the drill.
Fan		This is a chip broken by the restraint caused by the drill flute and the wall of a drilled hole. It is generated when the feed rate is high.
Segment		A conical spiral chip that is broken before the chip grows into the long-pitch shape by the restraint caused by the wall of the drilled hole due to the insufficiency of ductility. Excellent chip disposal and chip discharge.
Zigzag		A chip that is buckled and folded because of the shape of flute and the characteristics of the material. It easily causes chip packing in the flute.
Needle		Chips broken by vibration or broken when brittle material is curled with a small radius. The raking performance is satisfactory, but these chips can become closely packed jams.

FORMULAS FOR DRILLING

■CUTTING SPEED (vc)

$$vc = \frac{\pi \cdot DC \cdot n}{12} \text{ (SFM)}$$

vc (SFM) : Cutting Speed **DC(inch)** : Drill Diameter
π (3.14) : Circular Constant **n (min^{-1})** : Rotational Speed of the Main Spindle



(Problem) What is the cutting speed when main axis spindle speed is 1350 min^{-1} and drill diameter is .500 inch ?

(Answer) Substitute π=3.14, DC=.500 inch, n=1350 into the formula

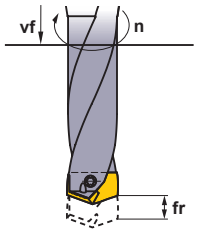
$$vc = \frac{\pi \cdot DC \cdot n}{12} = \frac{3.14 \times .500 \times 1350}{12} = 176.6 \text{ SFM}$$

The answer is 176.6 SFM

■FEED OF THE MAIN SPINDLE (vf)

$$vf = fr \cdot n \text{ (IPM)}$$

vf (IPM) : Feed Speed of the Main Spindle (Z axis)
fr (IPR) : Feed per Revolution
n (min^{-1}) : Rotational Speed of the Main Spindle



(Problem) What is the spindle feed (vf) when feed per revolution is .008 IPR and main axis spindle speed is 1350 min^{-1}?

(Answer) Substitute fr=.008, n=1350 into the formula

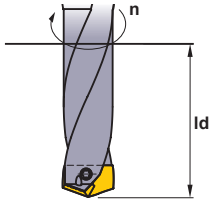
vf = fr×n = .008×1350 = 10.8 IPM

The answer is 10.8 IPM.

■DRILLING TIME (Tc)

$$Tc = \frac{ld \cdot i}{n \cdot fr}$$

Tc (min) : Drilling Time
n (min^{-1}) : Spindle Speed
ld (inch) : Hole Depth
fr (IPR) : Feed per Revolution
i : Number of Holes



(Problem) What is the drilling time required for drilling a 1.2 inch length hole in alloy steel at a cutting speed of 165 SFM and feed .006 IPR ?

(Answer) Spindle Speed $n = \frac{165 \times 12}{.59 \times 3.14} = 1068.8 \text{ min}^{-1}$

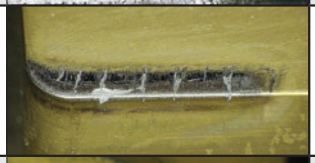
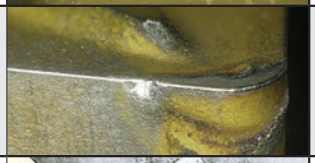
$$Tc = \frac{1.2 \times 1}{1068.8 \times .006} = .187$$

$$= .187 \times 60 \fallingdotseq 11.2 \text{ sec}$$

The answer is 11.2 sec.

TOOL WEAR AND DAMAGE

CAUSES AND COUNTERMEASURES

Tool Damage Form		Cause	Countermeasure
Flank Wear		· Tool grade is too soft. · Cutting speed is too high. · Flank angle is too small. · Feed rate is extremely low.	· Tool grade with high wear resistance. · Lower cutting speed. · Increase flank angle. · Increase feed rate.
Crater Wear		· Tool grade is too soft. · Cutting speed is too high. · Feed rate is too high.	· Tool grade with high wear resistance. · Lower cutting speed. · Lower feed rate.
Chipping		· Tool grade is too hard. · Feed rate is too high. · Lack of cutting edge strength. · Lack of shank or holder rigidity.	· Tool grade with high toughness. · Lower feed rate. · Increase honing. (Round honing is to be changed to chamfer honing.) · Use large shank size.
Fracture		· Tool grade is too hard. · Feed rate is too high. · Lack of cutting edge strength. · Lack of shank or holder rigidity.	· Tool grade with high toughness. · Lower feed rate. · Increase honing. (Round honing is to be changed to chamfer honing.) · Use large shank size.
Plastic Deformation		· Tool grade is too soft. · Cutting speed is too high. · Depth of cut and feed rate are too large. · Cutting temperature is high.	· Tool grade with high wear resistance. · Lower cutting speed. · Decrease depth of cut and feed rate. · Tool grade with high thermal conductivity.
Welding		· Cutting speed is low. · Poor sharpness. · Unsuitable grade.	· Increase cutting speed. (For ANSI 1045, cutting speed 260 SFM.) · Increase rake angle. · Tool grade with low affinity. (Coated grade, cermet grade)
Thermal Cracks		· Expansion or shrinkage due to cutting heat. · Tool grade is too hard. *Especially in milling.	· Dry cutting. (For wet cutting, flood workpiece with cutting fluid) · Tool grade with high toughness.
Notching		· Hard surfaces such as uncut surface, chilled parts and machining hardened layer. · Friction caused by jagged shaped chips. (Caused by small vibration)	· Tool grade with high wear resistance. · Increase rake angle to improve sharpness.
Flaking		· Cutting edge welding and adhesion. · Poor chip disposal.	· Increase rake angle to improve sharpness. · Enlarge chip pocket.

MATERIAL CROSS REFERENCE LIST

CARBON STEEL

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
A570.36	STKM 12A STKM 12C	1.0038	RSt.37-2	4360 40 C	–	E 24-2 Ne	–	–	1311	15
1015	–	1.0401	C15	080M15	–	CC12	C15, C16	F.111	1350	15
1020	–	1.0402	C22	050A20	2C	CC20	C20, C21	F.112	1450	20
1213	SUM22	1.0715	9SMn28	230M07	1A	S250	CF9SMn28	F.2111 11SMn28	1912	Y15
12L13	SUM22L	1.0718	9SMnPb28	–	–	S250Pb	CF9SMnPb28	11SMnPb28	1914	–
–	–	1.0722	10SPb20	–	–	10PbF2	CF10Pb20	10SPb20	–	–
1215	–	1.0736	9SMn36	240M07	1B	S300	CF9SMn36	12SMn35	–	Y13
12L14	–	1.0737	9SMnPb36	–	–	S300Pb	CF9SMnPb36	12SMnP35	1926	–
1015	S15C	1.1141	Ck15	080M15	32C	XC12	C16	C15K	1370	15
1025	S25C	1.1158	Ck25	–	–	–	–	–	–	25
A572-60	–	1.8900	StE380	4360 55 E	–	–	FeE390KG	–	2145	–
1035	–	1.0501	C35	060A35	–	CC35	C35	F.113	1550	35
1045	–	1.0503	C45	080M46	–	CC45	C45	F.114	1650	45
1140	–	1.0726	35S20	212M36	8M	35MF4	–	F210G	1957	–
1039	–	1.1157	40Mn4	150M36	15	35M5	–	–	–	40Mn
1335	SMn438(H)	1.1167	36Mn5	–	–	40M5	–	36Mn5	2120	35Mn2
1330	SCMn1	1.1170	28Mn6	150M28	14A	20M5	C28Mn	–	–	30Mn
1035	S35C	1.1183	Cf35	060A35	–	XC38TS	C36	–	1572	35Mn
1045	S45C	1.1191	Ck45	080M46	–	XC42	C45	C45K	1672	Ck45
1050	S50C	1.1213	Cf53	060A52	–	XC48TS	C53	–	1674	50
1055	–	1.0535	C55	070M55	9	–	C55	–	1655	55
1060	–	1.0601	C60	080A62	43D	CC55	C60	–	–	60
1055	S55C	1.1203	Ck55	070M55	–	XC55	C50	C55K	–	55
1060	S58C	1.1221	Ck60	080A62	43D	XC60	C60	–	1678	60Mn
1095	–	1.1274	Ck101	060A96	–	XC100	–	F.5117	1870	–
W1	SK3	1.1545	C105W1	BW1A	–	Y105	C36KU	F.5118	1880	–
W210	SUP4	1.1545	C105W1	BW2	–	Y120	C120KU	F.515	2900	–

ALLOY STEEL

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
A573-81	SM400A, SM400B SM400C	1.0144	St.44.2	4360 43 C	–	E28-3	–	–	1412	–
–	SM490A, SM490B SM490C	1.0570	St52-3	4360 50 B	–	E36-3	Fe52BFN Fe52CFN	–	2132	–
5120	–	1.0841	St52-3	150M19	–	20MC5	Fe52	F.431	2172	–
9255	–	1.0904	55Si7	250A53	45	55S7	55Si8	56Si7	2085	55Si2Mn
9262	–	1.0961	60SiCr7	–	–	60SC7	60SiCr8	60SiCr8	–	–
ASTM 52100	SUJ2	1.3505	100Cr6	534A99	31	100C6	100Cr6	F.131	2258	GCr15
ASTM A204Gr.A	–	1.5415	15Mo3	1501-240	–	15D3	16Mo3KW	16Mo3	2912	–
4520	–	1.5423	16Mo5	1503-245-420	–	–	16Mo5	16Mo5	–	–
ASTM A350LF5	–	1.5622	14Ni6	–	–	16N6	14Ni6	15Ni6	–	–
ASTM A353	–	1.5662	X8Ni9	1501-509-510	–	–	X10Ni9	XBNi09	–	–
3135	SNC236	1.5710	36NiCr6	640A35	111A	35NC6	–	–	–	–
3415	SNC415(H)	1.5732	14NiCr10	–	–	14NC11	16NiCr11	15NiCr11	–	–
3415, 3310	SNC815(H)	1.5752	14NiCr14	655M13	36A	12NC15	–	–	–	–
8620	SNCM220(H)	1.6523	21NiCrMo2	805M20	362	20NCD2	20NiCrMo2	20NiCrMo2	2506	–
8740	SNCM240	1.6546	40NiCrMo22	311-Type 7	–	–	40NiCrMo2(KB)	40NiCrMo2	–	–
–	–	1.6587	17CrNiMo6	820A16	–	18NCD6	–	14NiCrMo13	–	–
5015	SCr415(H)	1.7015	15Cr3	523M15	–	12C3	–	–	–	15Cr

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
5140	SCr440	1.7045	42Cr4	–	–	–	–	42Cr4	2245	40Cr
5155	SUP9(A)	1.7176	55Cr3	527A60	48	55C3	–	–	–	20CrMn
–	SCM415(H)	1.7262	15CrMo5	–	–	12CD4	–	12CrMo4	2216	–
ASTM A182 F11, F12	–	1.7335	13CrMo4 4	1501-620Gr27	–	15CD3.5 15CD4.5	14CrMo45	14CrMo45	–	–
ASTM A182 F.22	–	1.7380	10CrMo910	1501-622 Gr31, 45	–	12CD9 12CD10	12CrMo9 12CrMo10	TU.H	2218	–
–	–	1.7715	14MoV63	1503-660-440	–	–	–	13MoCrV6	–	–
–	–	1.8523	39CrMoV13 9	897M39	40C	–	36CrMoV12	–	–	–
9840	–	1.6511	36CrNiMo4	816M40	110	40NCD3	38NiCrMo4(KB)	35NiCrMo4	–	–
4340	–	1.6582	34CrNiMo6	817M40	24	35NCD6	35NiCrMo6(KB)	–	2541	40CrNiMoA
5132	SCr430(H)	1.7033	34Cr4	530A32	18B	32C4	34Cr4(KB)	35Cr4	–	35Cr
5140	SCr440(H)	1.7035	41Cr4	530M40	18	42C4	41Cr4	42Cr4	–	40Cr
5115	–	1.7131	16MnCr5	(527M20)	–	16MC5	16MnCr5	16MnCr5	2511	18CrMn
4130	SCM420 SCM430	1.7218	25CrMo4	1717CDS110 708M20	–	25CD4	25CrMo4(KB)	55Cr3	2225	30CrMn
4137 4135	SCM432 SCCRM3	1.7220	34CrMo4	708A37	19B	35CD4	35CrMo4	34CrMo4	2234	35CrMo
4140 4142	SCM 440	1.7223	41CrMo4	708M40	19A	42CD4TS	41CrMo4	42CrMo4	2244	40CrMoA
4140	SCM440(H)	1.7225	42CrMo4	708M40	19A	42CD4	42CrMo4	42CrMo4	2244	42CrMo 42CrMnMo
–	–	1.7361	32CrMo12	722M24	40B	30CD12	32CrMo12	F.124.A	2240	–
6150	SUP10	1.8159	50CrV4	735A50	47	50CV4	50CrV4	51CrV4	2230	50CrVA
–	–	1.8509	41CrAlMo7	905M39	41B	40CAD6 40CAD2	41CrAlMo7	41CrAlMo7	2940	–
L3	–	1.2067	100Cr6	BL3	–	Y100C6	–	100Cr6	–	CrV, 9SiCr
–	SKS31 SKS2, SKS3	1.2419	105WCr6	–	–	105WC13	100WCr6 107WCr5KU	105WCr5	2140	CrWMo
L6	SKT4	1.2713	55NiCrMoV6	BH224/5	–	55NCDV7	–	F.520.S	–	5CrNiMo
ASTM A353	–	1.5662	X8Ni9	1501-509	–	–	X10Ni9	XBNi09	–	–
2515	–	1.5680	12Ni19	–	–	Z18N5	–	–	–	–
–	–	1.6657	14NiCrMo134	832M13	36C	–	15NiCrMo13	14NiCrMo131	–	–
D3 ASTM D3	SKD1	1.2080	X210Cr12	BD3	–	Z200C12	X210Cr13KU X250Cr12KU	X210Cr12	–	Cr12
D2	SKD11	1.2601	X153CrMoV12	BD2	–	–	X160CrMoV12	–	–	Cr12MoV
A2	SKD12	1.2363	X100CrMoV5	BA2	–	Z100CDV5	X100CrMoV5	F.5227	2260	Cr5Mo1V
H13 ASTM H13	SKD61	1.2344	X40CrMoV51 X40CrMoV51	BH13	–	Z40CDV5	X35CrMoV05KU X40CrMoV51KU	X40CrMoV5	2242	40CrMoV5
–	SKD2	1.2436	X210CrW12	–	–	–	X215CrW121KU	X210CrW12	2312	–
S1	–	1.2542	45WCrV7	BS1	–	–	45WCrV8KU	45WCrSi8	2710	–
H21	SKD5	1.2581	X30WCrV93	BH21	–	Z30WCV9	X28W09KU	X30WCrV9	–	30WCrV9
–	–	1.2601	X165CrMoV12	–	–	–	X165CrMoW12KU	X160CrMoV12	2310	–
W210	SKS43	1.2833	100V1	BW2	–	Y1105V	–	–	–	V
T4	SKH3	1.3255	S 18-1-2-5	BT4	–	Z80WKCV	X78WCo1805KU	HS18-1-1-5	–	W18Cr4VCo5
T1	SKH2	1.3355	S 18-0-1	BT1	–	Z80WCV	X75W18KU	HS18-0-1	–	–
–	SCMnH/1	1.3401	G-X120Mn12	Z120M12	–	Z120M12	XG120Mn12	X120MN12	–	–
HW3	SUH1	1.4718	X45CrSi93	401S45	52	Z45CS9	X45CrSi8	F.322	–	X45CrSi93
D3	SUH3	1.3343	S6-5-2	4959BA2	–	Z40CSD10	15NiCrMo13	–	2715	–
M2	SKH9, SKH51	1.3343	S6/5/2	BM2	–	Z85WDCV	HS6-5-2-2	F.5603	2722	–
M7	–	1.3348	S 2-9-2	–	–	–	HS2-9-2	HS2-9-2	2782	–
M35	SKH55	1.3243	S6/5/2/5	BM35	–	6-5-2-5	HS6-5-2-5	F.5613	2723	–

MATERIAL CROSS REFERENCE LIST

STAINLESS STEEL (FERRITIC, MARTENSITIC)

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
403	SUS403	1.4000	X7Cr13	403S17	–	Z6C13	X6Cr13	F.3110	2301	OCr13 1Cr12
–	–	1.4001	X7Cr14	–	–	–	–	F.8401	–	–
416	SUS416	1.4005	X12CrS13	416S21	–	Z11CF13	X12CrS13	F.3411	2380	–
410	SUS410	1.4006	X10Cr13	410S21	56A	Z10C14	X12Cr13	F.3401	2302	1Cr13
430	SUS430	1.4016	X8Cr17	430S15	60	Z8C17	X8Cr17	F.3113	2320	1Cr17
–	SCS2	1.4027	G-X20Cr14	420C29	56B	Z20C13M	–	–	–	–
–	SUS420J2	1.4034	X46Cr13	420S45	56D	Z40CM Z38C13M	X40Cr14	F.3405	2304	4Cr13
405	–	1.4003	–	405S17	–	Z8CA12	X6CrAl13	–	–	–
420	–	1.4021	–	420S37	–	Z8CA12	X20Cr13	–	2303	–
431	SUS431	1.4057	X22CrNi17	431S29	57	Z15CNi6.02	X16CrNi16	F.3427	2321	1Cr17Ni2
430F	SUS430F	1.4104	X12CrMoS17	–	–	Z10CF17	X10CrS17	F.3117	2383	Y1Cr17
434	SUS434	1.4113	X6CrMo17	434S17	–	Z8CD17.01	X8CrMo17	–	2325	1Cr17Mo
CA6-NM	SCS5	1.4313	X5CrNi134	425C11	–	Z4CND13.4M	(G)X6CrNi304	–	2385	–
405	SUS405	1.4724	X10CrA113	403S17	–	Z10C13	X10CrA112	F.311	–	OCr13Al
430	SUS430	1.4742	X10CrA118	430S15	60	Z10CAS18	X8Cr17	F.3113	–	Cr17
HNV6	SUH4	1.4747	X80CrNiSi20	443S65	59	Z80CSN20.02	X80CrSiNi20	F.320B	–	–
446	SUH446	1.4762	X10CrA124	–	–	Z10CAS24	X16Cr26	–	2322	2Cr25N
EV8	SUH35	1.4871	X53CrMnNiN219	349S54	–	Z52CMN21.09	X53CrMnNiN219	–	–	5Cr2Mn9Ni4N
S44400	–	1.4521	X1CrMoTi182	–	–	–	–	–	2326	–
–	–	1.4922	X20CrMoV12-1	–	–	–	X20CrMoNi1201	–	2317	–
630	–	1.4542	–	–	–	Z7CNU17-04	–	–	–	–

STAINLESS STEEL (AUSTENITIC)

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
304L	SUS304L	1.4306	X2CrNi1911	304S11	–	Z2CN18.10	X2CrNi18.11	–	2352	OCr19Ni10
304	SUS304	1.4350	X5CrNi189	304S11	58E	Z6CN18.09	X5CrNi1810	F.3551 F.3541 F.3504	2332	OCr18Ni9
303	SUS303	1.4305	X12CrNiS188	303S21	58M	Z10CNF18.09	X10CrNiS18.09	F.3508	2346	1Cr18Ni9MoZr
–	SUS304L	–	–	304C12	–	Z3CN19.10	–	–	2333	–
304L	SCS19	1.4306	X2CrNi189	304S12	–	Z2CrNi1810	X2CrNi18.11	F.3503	2352	–
301	SUS301	1.4310	X12CrNi177	–	–	Z12CN17.07	X12CrNi1707	F.3517	2331	Cr17Ni7
304LN	SUS304LN	1.4311	X2CrNiN1810	304S62	–	Z2CN18.10	–	–	2371	–
316	SUS316	1.4401	X5CrNiMo1810	316S16	58J	Z6CND17.11	X5CrNiMo1712	F.3543	2347	0Cr17Ni11Mo2
–	SCS13	1.4308	G-X6CrNi189	304C15	–	Z6CN18.10M	–	–	–	–
–	SCS14	1.4408	G-X6CrNiMo1810	316C16	–	–	–	F.8414	–	–
–	SCS22	1.4581	G-X5CrNiMoNb1810	318C17	–	Z4CNDNb1812M	XG8CrNiMo1811	–	–	–
316LN	SUS316LN	1.4429	X2CrNiMoN1813	–	–	Z2CND17.13	–	–	2375	OCr17Ni13Mo
316L	–	1.4404	–	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2348	–
316L	SCS16 SUS316L	1.4435	X2CrNiMo1812	316S13	–	Z2CND17.12	X2CrNiMo1712	–	2353	OCr27Ni12Mo3
316	–	1.4436	–	316S13	–	Z6CND18-12-03	X8CrNiMo1713	–	2343, 2347	–
317L	SUS317L	1.4438	X2CrNiMo1816	317S12	–	Z2CND19.15	X2CrNiMo1816	–	2367	OOCr19Ni13Mo
UNS V 0890A	–	1.4539	X1NiCrMo	–	–	Z6CNT18.10	–	–	2562	–
321	SUS321	1.4541	X10CrNiTi189	321S12	58B	Z6CNT18.10	X6CrNiTi1811	F.3553 F.3523	2337	1Cr18NI9Ti
347	SUS347	1.4550	X10CrNiNb189	347S17	58F	Z6CNNb18.10	X6CrNiNb1811	F.3552 F.3524	2338	1Cr18Ni11Nb
316Ti	–	1.4571	X10CrNiMoTi1810	320S17	58J	Z6CNDT17.12	X6CrNiMoTi1712	F.3535	2350	Cr18Ni12Mo2T
318	–	1.4583	X10CrNiMoNb1812	–	–	Z6CNDNb1713B	X6CrNiMoNb1713	–	–	Cr17Ni12Mo3Mb

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
309	SUH309	1.4828	X15CrNiSi2012	309S24	–	Z15CNS20.12	X6CrNi2520	–	–	1Cr23Ni13
310S	SUH310	1.4845	X12CrNi2521	310S24	–	Z12CN2520	X6CrNi2520	F.331	2361	OCr25Ni20
308	SCS17	1.4406	X10CrNi18.08	–	58C	Z1NCDU25.20	–	F.8414	2370	–
–	–	1.4418	X4CrNiMo165	–	–	Z6CND16-04-01	–	–	–	–
17-7PH	–	1.4568	–	316S111	–	Z8CNA17-07	X2CrNiMo1712	–	–	–
		1.4504								
NO8028	–	1.4563	–	–	–	Z1NCDU31-27-03	–	–	2584	–
S31254						Z1CNDU20-18-06AZ			2378	
321	SUS321	1.4878	X12CrNiTi189	321S32	58B, 58C	Z6CNT18.12B	X6CrNiTi18 11	F.3523	–	1Cr18Ni9Ti

HEAT RESISTANT STEEL

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
330	SUH330	1.4864	X12NiCrSi3616	–	–	Z12NCS35.16	–	–	–	–
HT, HT 50	SCH15	1.4865	G-X40NiCrSi3818	330C11	–	–	XG50NiCr3919	–	–	–

GRAY CAST IRON

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
–	–	–	–	–	–	–	–	–	0100	–
No 20 B	FC100	–	GG 10	–	–	Ft 10 D	–	–	0110	–
No 25 B	FC150	0.6015	GG 15	Grade 150	–	Ft 15 D	G15	FG15	0115	HT150
No 30 B	FC200	0.6020	GG 20	Grade 220	–	Ft 20 D	G20	–	0120	HT200
No 35 B	FC250	0.6025	GG 25	Grade 260	–	Ft 25 D	G25	FG25	0125	HT250
No 40 B	–	–	–	–	–	–	–	–	–	–
No 45 B	FC300	0.6030	GG 30	Grade 300	–	Ft 30 D	G30	FG30	0130	HT300
No 50 B	FC350	0.6035	GG 35	Grade 350	–	Ft 35 D	G35	FG35	0135	HT350
No 55 B	–	0.6040	GG 40	Grade 400	–	Ft 40 D	–	–	0140	HT400
A436 Type 2	–	0.6660	GGL NiCr202	L-NiCuCr202	–	L-NC 202	–	–	0523	–

DUCTILE CAST IRON

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
60-40-18	FCD400	0.7040	GGG 40	SNG 420/12	–	FCS 400-12	GS 370-17	FGE 38-17	07 17-02	QT400-18
–	–	–	GGG 40.3	SNG 370/17	–	FGS 370-17	–	–	07 17-12	–
–	–	0.7033	GGG 35.3	–	–	–	–	–	07 17-15	–
80-55-06	FCD500	0.7050	GGG 50	SNG 500/7	–	FGS 500-7	GS 500	FGE 50-7	07 27-02	QT500-7
A43D2	–	0.7660	GGG NiCr202	Grade S6	–	S-NC202	–	–	07 76	–
–	–	–	GGG NiMn137	L-NiMn 137	–	L-MN 137	–	–	07 72	–
–	FCD600	–	GGG 60	SNG 600/3	–	FGS 600-3	–	–	07 32-03	QT600-3
100-70-03	FCD700	0.7070	GGG 70	SNG 700/2	–	FGS 700-2	GS 700-2	FGS 70-2	07 37-01	QT700-18

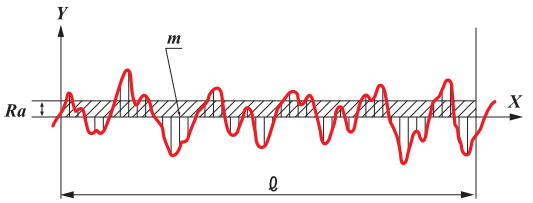
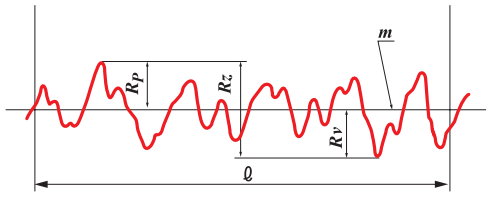
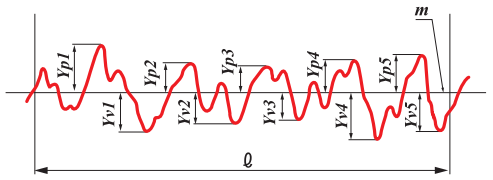
MALLEABLE CAST IRON

USA	Japan	Germany		U. K.		France	Italy	Spain	Sweden	China
AISI/SAE	JIS	W-nr.	DIN	BS	EN	AFNOR	UNI	UNE	SS	GB
–	FCMB310	–	–	8 290/6	–	MN 32-8	–	–	08 14	–
32510	FCMW330	–	GTS-35	B 340/12	–	MN 35-10	–	–	08 15	–
40010	FCMW370	0.8145	GTS-45	P 440/7	–	Mn 450	GMN45	–	08 52	–
50005	FCMP490	0.8155	GTS-55	P 510/4	–	MP 50-5	GMN55	–	08 54	–
70003	FCMP540	–	GTS-65	P 570/3	–	MP 60-3	–	–	08 58	–
A220-70003	FCMP590	0.8165	GTS-65-02	P 570/3	–	Mn 650-3	GMN 65	–	08 56	–
A 220-80002	FCMP690	–	GTS-70-02	P 690/2	–	Mn 700-2	GMN 70	–	08 62	–

SURFACE ROUGHNESS

SURFACE ROUGHNESS

(From JIS B 0601-1994)

Type	Code	Determination	Determination Example (Figure)
Arithmetical Mean Roughness	Ra	Ra means the value obtained by the following formula and expressed in micrometer (μm) when sampling only the reference length from the roughness curve in the direction of the mean line, taking X-axis in the direction of mean line and Y-axis in the direction of longitudinal magnification of this sampled part and the roughness curve is expressed by y=f(x): $Ra=\frac{1}{\ell}\int_0^{\ell}\lvert f(x)\rvert dx$ (μm)	
Maximum Height	Rz	Rz shall be that only when the reference length is sampled from the roughness curve in the direction of the mean line, the distance between the top profile peak line and the bottom profile valley line on this sampled portion is measured in the longitudinal magnification direction of roughness curve and the obtained value is expressed in micrometer (μm). Note) When finding Rz, a portion without an exceptionally high peak or low valley, which may be regarded as a flaw, is selected as the sampling length. $Rz=R_P+Rv$ (μm)	
Ten-Point Mean Roughness	RzJIS	RzJIS shall be that only when the reference length is sampled from the roughness curve in the direction of its mean line, the sum of the average value of absolute values of the heights of five highest profile peaks (Yp) and the depths of five deepest profile valleys (Yv) measured in the vertical magnification direction from the mean line of this sampled portion and this sum is expressed in micrometer (μm). $Rz_{JIS}=\frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$ (μm)	 $Yp1, Yp2, Yp3, Yp4, Yp5$:altitudes of the five highest profile peaks of the sampled portion corresponding to the reference length l. $Yv1, Yv2, Yv3, Yv4, Yv5$:altitudes of the five deepest profile valleys of the sampled portion corresponding to the reference length l.

RELATIONSHIP BETWEEN ARITHMETICAL MEAN (Ra) AND CONVENTIONAL DESIGNATION (REFERENCE DATA)

Arithmetical Mean Roughness Ra		Max. Height Rz	Ten-Point Mean Roughness RzJIS	Sampling Length for Rz • RzJIS l (mm)	Conventional Finish Mark
Standard Series	Cutoff Value λc (mm)	Standard Series			
0.012 a	0.08	0.05s	0.05z	0.08	▽▽▽▽
0.025 a	0.25	0.1 s	0.1 z		
0.05 a		0.2 s	0.2 z	0.25	
0.1 a	0.8	0.4 s	0.4 z		
0.2 a		0.8 s	0.8 z	0.8	
0.4 a		1.6 s	1.6 z		▽▽▽
0.8 a		3.2 s	3.2 z		
1.6 a		6.3 s	6.3 z		
3.2 a	2.5	12.5 s	12.5 z	2.5	▽▽
6.3 a		25 s	25 z		
12.5 a	8	50 s	50 z		▽
25 a		100 s	100 z	8	
50 a		200 s	200 z		—
100 a	—	400 s	400 z	—	

*The correlation among the three is shown for convenience and is not exact.
*Ra : The evaluation length of Rz and RzJIS is the cutoff value and sampling length multiplied by 5, respectively.

HARDNESS COMPARISON TABLE

HARDNESS CONVERSION NUMBERS OF STEEL

Brinell Hardness (**HB**), 10 mm Ball, Load: 3,000 kgf		Vickers Hardness (**HV**)	Rockwell Hardness (3)				Shore Hardness (**HS**)	Tensile Strength (Approx.)
Standard Ball	Tungsten Carbide Ball		A Scale, Load: 60 kgf, Diamond Point (**HRA**)	B Scale, Load: 100 kgf, 1/16" Ball (**HRB**)	C Scale, Load: 150 kgf, Diamond Point (**HRC**)	D Scale, Load: 100 kgf, Diamond Point (**HRD**)		MPa (2)
—	—	940	85.6	—	68.0	76.9	97	—
—	—	920	85.3	—	67.5	76.5	96	—
—	—	900	85.0	—	67.0	76.1	95	—
—	(767)	880	84.7	—	66.4	75.7	93	—
—	(757)	860	84.4	—	65.9	75.3	92	—
—	(745)	840	84.1	—	65.3	74.8	91	—
—	(733)	820	83.8	—	64.7	74.3	90	—
—	(722)	800	83.4	—	64.0	73.8	88	—
—	(712)	—	—	—	—	—	—	—
—	(710)	780	83.0	—	63.3	73.3	87	—
—	(698)	760	82.6	—	62.5	72.6	86	—
—	(684)	740	82.2	—	61.8	72.1	—	—
—	(682)	737	82.2	—	61.7	72.0	84	—
—	(670)	720	81.8	—	61.0	71.5	83	—
—	(656)	700	81.3	—	60.1	70.8	—	—
—	(653)	697	81.2	—	60.0	70.7	81	—
—	(647)	690	81.1	—	59.7	70.5	—	—
—	(638)	680	80.8	—	59.2	70.1	80	—
—	630	670	80.6	—	58.8	69.8	—	—
—	627	667	80.5	—	58.7	69.7	79	—
—	—	677	80.7	—	59.1	70.0	—	—
—	601	640	79.8	—	57.3	68.7	77	—
—	—	640	79.8	—	57.3	68.7	—	—
—	578	615	79.1	—	56.0	67.7	75	—
—	—	607	78.8	—	55.6	67.4	—	—
—	555	591	78.4	—	54.7	66.7	73	2055
—	—	579	78.0	—	54.0	66.1	—	2015
—	534	569	77.8	—	53.5	65.8	71	1985
—	—	533	77.1	—	52.5	65.0	—	1915
—	514	547	76.9	—	52.1	64.7	70	1890
(495)	—	539	76.7	—	51.6	64.3	—	1855
—	—	530	76.4	—	51.1	63.9	—	1825
	495	528	76.3	—	51.0	63.8	68	1820
(477)	—	516	75.9	—	50.3	63.2	—	1780
—	—	508	75.6	—	49.6	62.7	—	1740
	477	508	75.6	—	49.6	62.7	66	1740
(461)	—	495	75.1	—	48.8	61.9	—	1680
—	—	491	74.9	—	48.5	61.7	—	1670
	461	491	74.9	—	48.5	61.7	65	1670
444	—	474	74.3	—	47.2	61.0	—	1595
—	—	472	74.2	—	47.1	60.8	—	1585
—	444	472	74.2	—	47.1	60.8	63	1585

Brinell Hardness (**HB**), 10 mm Ball, Load: 3,000 kgf		Vickers Hardness (**HV**)	Rockwell Hardness (3)				Shore Hardness (**HS**)	Tensile Strength (Approx.)
Standard Ball	Tungsten Carbide Ball		A Scale, Load: 60 kgf, Diamond Point (**HRA**)	B Scale, Load: 100 kgf, 1/16" Ball (**HRB**)	C Scale, Load: 150 kgf, Diamond Point (**HRC**)	D Scale, Load: 100 kgf, Diamond Point (**HRD**)		MPa (2)
429	429	455	73.4	—	45.7	59.7	61	1510
415	415	440	72.8	—	44.5	58.8	59	1460
401	401	425	72.0	—	43.1	57.8	58	1390
388	388	410	71.4	—	41.8	56.8	56	1330
375	375	396	70.6	—	40.4	55.7	54	1270
363	363	383	70.0	—	39.1	54.6	52	1220
352	352	372	69.3	(110.0)	37.9	53.8	51	1180
341	341	360	68.7	(109.0)	36.6	52.8	50	1130
331	331	350	68.1	(108.5)	35.5	51.9	48	1095
321	321	339	67.5	(108.0)	34.3	51.0	47	1060
311	311	328	66.9	(107.5)	33.1	50.0	46	1025
302	302	319	66.3	(107.0)	32.1	49.3	45	1005
293	293	309	65.7	(106.0)	30.9	48.3	43	970
285	285	301	65.3	(105.5)	29.9	47.6	—	950
277	277	292	64.6	(104.5)	28.8	46.7	41	925
269	269	284	64.1	(104.0)	27.6	45.9	40	895
262	262	276	63.6	(103.0)	26.6	45.0	39	875
255	255	269	63.0	(102.0)	25.4	44.2	38	850
248	248	261	62.5	(101.0)	24.2	43.2	37	825
241	241	253	61.8	100	22.8	42.0	36	800
235	235	247	61.4	99.0	21.7	41.4	35	785
229	229	241	60.8	98.2	20.5	40.5	34	765
223	223	234	—	97.3	(18.8)	—	—	—
217	217	228	—	96.4	(17.5)	—	33	725
212	212	222	—	95.5	(16.0)	—	—	705
207	207	218	—	94.6	(15.2)	—	32	690
201	201	212	—	93.8	(13.8)	—	31	675
197	197	207	—	92.8	(12.7)	—	30	655
192	192	202	—	91.9	(11.5)	—	29	640
187	187	196	—	90.7	(10.0)	—	—	620
183	183	192	—	90.0	(9.0)	—	28	615
179	179	188	—	89.0	(8.0)	—	27	600
174	174	182	—	87.8	(6.4)	—	—	585
170	170	178	—	86.8	(5.4)	—	26	570
167	167	175	—	86.0	(4.4)	—	—	560
163	163	171	—	85.0	(3.3)	—	25	545
156	156	163	—	82.9	(0.9)	—	—	525
149	149	156	—	80.8	—	—	23	505
143	143	150	—	78.7	—	—	22	490
137	137	143	—	76.4	—	—	21	460
131	131	137	—	74.0	—	—	—	450
126	126	132	—	72.0	—	—	20	435
121	121	127	—	69.8	—	—	19	415
116	116	122	—	67.6	—	—	18	400
111	111	117	—	65.7	—	—	15	385

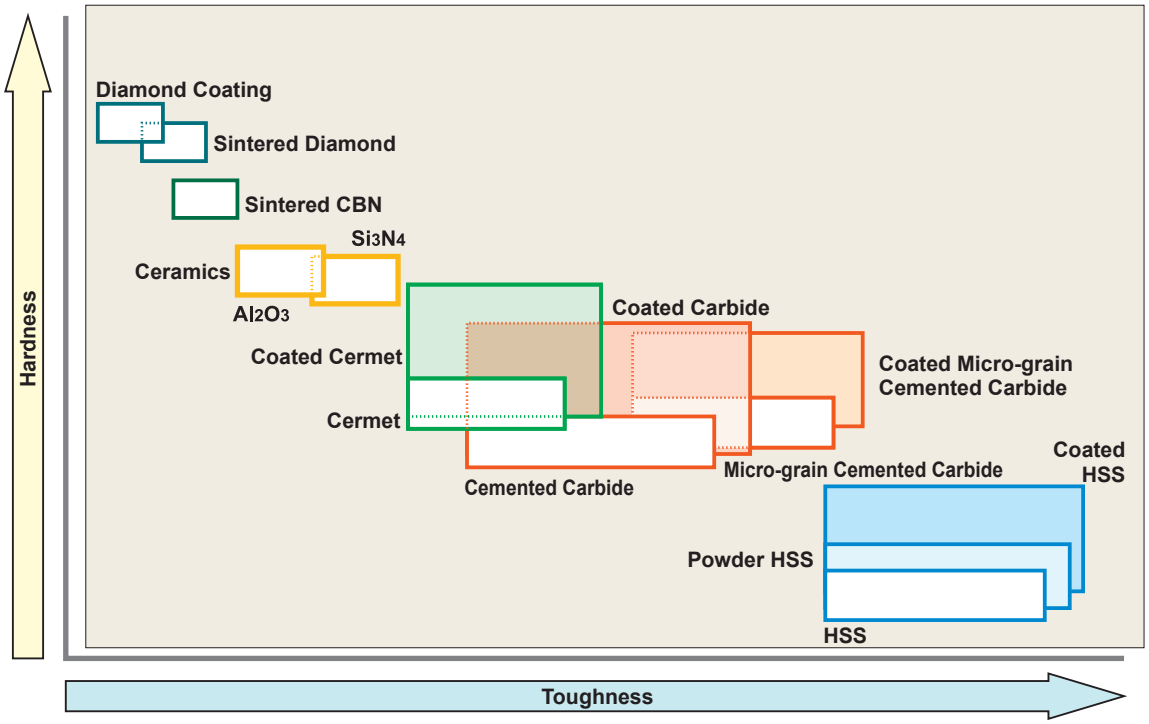
Note 1) The above list is the same as that of AMS Metals Hand book with tensile strength in approximate metric value and Brinell hardness over a recommended range.

Note 2) 1MPa=1N/mm^2

Note 3) Figures in ( ) are rarely used and are included for reference. This list has been taken from JIS Handbook Steel I.

CUTTING TOOL MATERIALS

The chart below shows the relationship between various tool materials, in relation with hardness on a vertical axis and toughness on a horizontal axis.
Today, cemented carbide, coated carbide and TiC-TiN-based cermet are key tool materials in the market, as they offer a good balance of hardness and toughness.

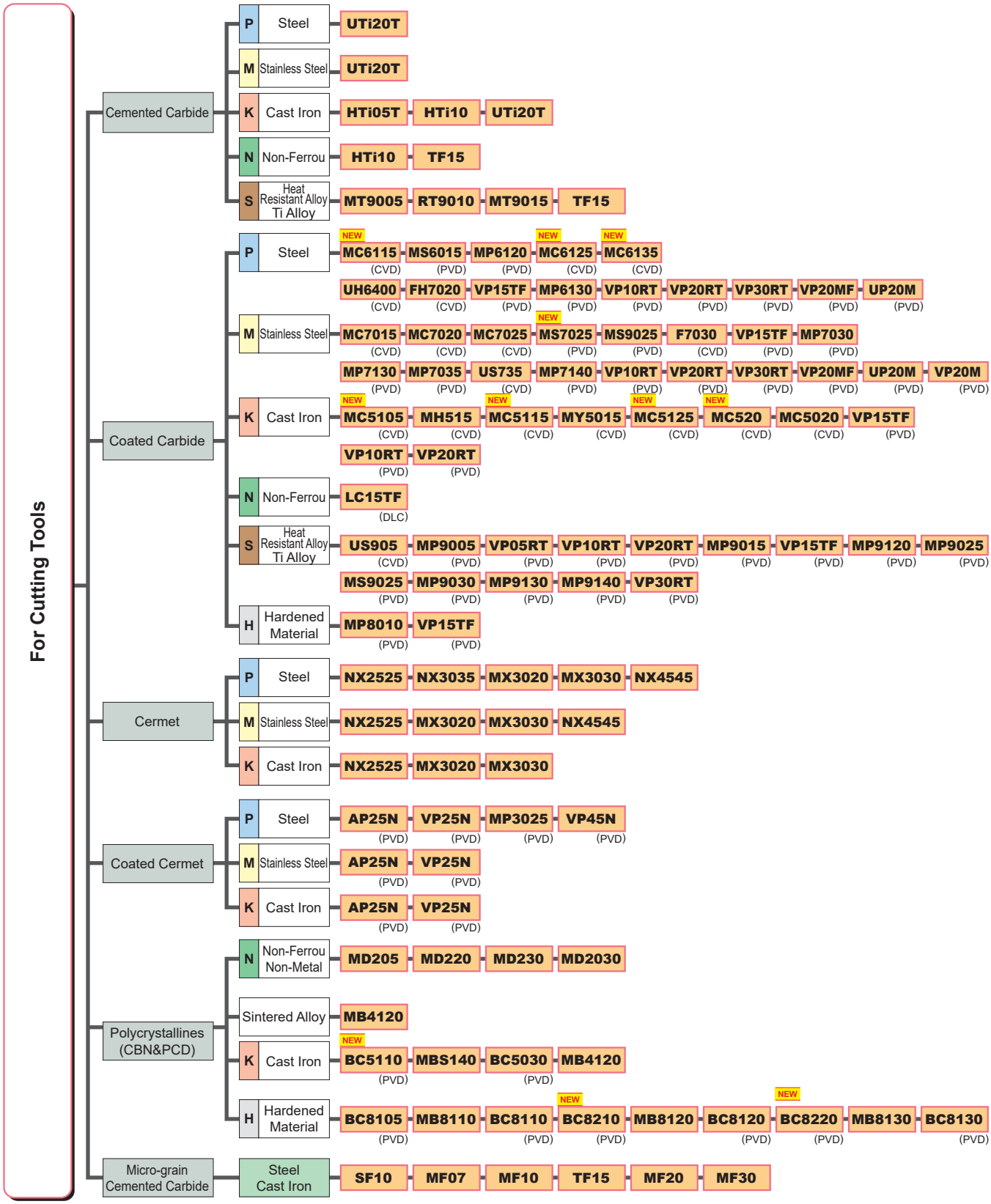


GRADE CHARACTERISTICS

Hard Materials	Hardness (HV)	Energy Formation (kcal/g · atom)	Solubility in Iron (%.1250℃)	Thermal * Conductivity (W/m·k)	Thermal Expansion (x 10^{-6}/k)	Tool Material
Diamond	>9000	–	Highly Soluble	2100	3.1	Sintered Diamond
CBN	>4500	–	–	1300	4.7	Sintered CBN
Si_3N_4	1600	–	–	100	3.4	Ceramics
Al_2O_3	2100	-100	≒0	29	7.8	Ceramics Cemented Carbide
TiC	3200	-35	< 0.5	21	7.4	Cermet Coated Carbide
TiN	2500	-50	–	29	9.4	Cermet Coated Carbide
TaC	1800	-40	0.5	21	6.3	Cemented Carbide
WC	2100	-10	7	121	5.2	Cemented Carbide

* 1W/m • K=2.39×10^{-3}cal/cm • sec • ℃

GRADE CHAIN


For Cutting Tools
Cemented Carbide
P Steel
UTi20T
M Stainless Steel
UTi20T
K Cast Iron
HTi05T
HTi10
UTi20T
N Non-Ferrou
HTi10
TF15
S Heat Resistant Alloy Ti Alloy
MT9005
RT9010
MT9015
TF15
Coated Carbide
P Steel
NEW MC6115 (CVD)
MS6015 (PVD)
MP6120 (PVD)
NEW MC6125 (CVD)
NEW MC6135 (CVD)
UH6400 (CVD)
FH7020 (CVD)
VP15TF (PVD)
MP6130 (PVD)
VP10RT (PVD)
VP20RT (PVD)
VP30RT (PVD)
VP20MF (PVD)
UP20M (PVD)
M Stainless Steel
MC7015 (CVD)
MC7020 (CVD)
MC7025 (CVD)
NEW MS7025 (PVD)
MS9025 (PVD)
F7030 (CVD)
VP15TF (PVD)
MP7030 (PVD)
MP7130 (PVD)
MP7035 (PVD)
US735 (CVD)
MP7140 (PVD)
VP10RT (PVD)
VP20RT (PVD)
VP30RT (PVD)
VP20MF (PVD)
UP20M (PVD)
VP20M (PVD)
K Cast Iron
NEW MC5105 (CVD)
MH515 (CVD)
NEW MC5115 (CVD)
MY5015 (CVD)
NEW MC5125 (CVD)
NEW MC520 (CVD)
MC5020 (CVD)
VP15TF (PVD)
VP10RT (PVD)
VP20RT (PVD)
N Non-Ferrou
LC15TF (DLC)
S Heat Resistant Alloy Ti Alloy
US905 (CVD)
MP9005 (PVD)
VP05RT (PVD)
VP10RT (PVD)
VP20RT (PVD)
MP9015 (PVD)
VP15TF (PVD)
MP9120 (PVD)
MP9025 (PVD)
MS9025 (PVD)
MP9030 (PVD)
MP9130 (PVD)
MP9140 (PVD)
VP30RT (PVD)
H Hardened Material
MP8010 (PVD)
VP15TF (PVD)
Cermet
P Steel
NX2525
NX3035
MX3020
MX3030
NX4545
M Stainless Steel
NX2525
MX3020
MX3030
NX4545
K Cast Iron
NX2525
MX3020
MX3030
Coated Cermet
P Steel
AP25N (PVD)
VP25N (PVD)
MP3025 (PVD)
VP45N (PVD)
M Stainless Steel
AP25N (PVD)
VP25N (PVD)
K Cast Iron
AP25N (PVD)
VP25N (PVD)
Polycrystallines (CBN&PCD)
N Non-Ferrou Non-Metal
MD205
MD220
MD230
MD2030
Sintered Alloy
MB4120
K Cast Iron
NEW BC5110 (PVD)
MBS140
BC5030 (PVD)
MB4120
H Hardened Material
BC8105 (PVD)
MB8110
BC8110 (PVD)
NEW BC8210 (PVD)
MB8120
BC8120 (PVD)
NEW BC8220 (PVD)
MB8130
BC8130 (PVD)
Micro-grain Cemented Carbide
Steel Cast Iron
SF10
MF07
MF10
TF15
MF20
MF30

GRADE COMPARISON TABLE

CEMENTED CARBIDE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01										
		P10					IC70	ST10P	TH10			
		P20	UTi20T				IC70 IC50M	ST20E	KS20			P20
		P30	UTi20T				IC50M IC54	A30 A30N	UX30 KS15F			
		P40					IC54	ST40E	TX40			
	M	M10		KU10 K313 K68		890	IC07	EH510	TH10			
		M20	UTi20T	KU10 K313 K68		HX 883	IC07 IC08 IC20	EH520	KS20			
		M30	UTi20T				IC08 IC20 IC28	A30 A30N	UX30			
		M40					IC28		TU40			
	K	K01	HTi05T	KU10 K313 K68				H1 H2	KS05F			
		K10	HTi10	KU10 K313 K68		890	IC20	EH510	TH10	KW10 GW15		K10
		K20	UTi20T	KU10 K313 K68	H13A	HX	IC20	G10E H10E EH520	KS15F KS20	GW25		
		K30	UTi20T			883		G10E H10E				
	N	N01			H10			H1 H2	KS05F	GW05 KW10		
		N10	HTi10	KU10 K313 K68	H10 HBA	890	IC08 IC20	EH510	TH10	KW10 GW15	WK1	K10
		N20		KU10 K313 K68	H10 HBA	HX KX	IC08 IC20	G10E EH520	KS15F			K10
		N30				883						
	S	S01	MT9005							SW05		
		S10	MT9005 RT9010 MT9015	KU10 K313 K68	H10A H10F H13A	HX 883	IC07 IC08	EH510	KS05F TH10	SW10	WS10 WK1	K10
		S20	RT9010 TF15	KU10 K313 K68		883	IC07 IC08	EH520	KS15F KS20	SW25		
		S30	TF15									
Milling	P	P10										
		P20	UTi20T	K125M			IC50M IC28	A30N				
		P30	UTi20T	GX	SM30		IC50M IC28	A30N	UX30			
		P40					IC28					
	M	M10										
		M20	UTi20T				IC08 IC20	A30N				
		M30	UTi20T		SM30		IC08 IC28	A30N				
		M40					IC28					
	K	K01	HTi05T	K115M,K313								
		K10	HTi10	K115M K313			IC20	G10E	TH10	KW10 GW25	WK10	IN05S
		K20	UTi20T		H13A	HX	IC20	G10E		GW25		IN05S IN10K IN15K
		K30	UTi20T									IN10K IN15K

Note 1) The above table is selected from a publication. We have not obtained approval from each company.

MICRO GRAIN

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Cutting Tools	Z	Z01	**SF10 MF07 MF10**		PN90 6UF,H3F 8UF,H6F		F0	F MD05F MD1508			IN05S
		Z10	**HTi10 MF20**		H10F	890	XF1 F1 AFU	MD10 MD0508 MD07F	FW30		IN05S
		Z20	**TF15 MF30**		H15F	890 883	AF0 SF2 AF1	EM10 MD20 G1F			IN05S
		Z30				883	A1 CC				

CERMET

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01	**AP25N* VP25N***				IC20N IC520N*	T1000A	NS520 GT720*	CCX* TN610 PV710* PV30*		CT3000 PV3010* PV3030*
		P10	**NX2525 AP25N* VP25N***	KT315 KT125	CT5015 GC1525*	TP1020 TP1030* CM CMP*	IC20N IC520N* IC530N*	T1500A T1500Z*	NS520 NS9530 GT9530* AT9530*	CCX* TN60 TN610 PV710* TN620 PV720*	WEP10C*	CT3000 PV3010* PV3030*
		P20	**NX2525 AP25N* VP25N* NX3035 MP3025***	KT325 KT1120 KT5020*	GC1525*	TP1020 TP1030*	IC20N IC520N* IC30N IC530N* IC75T	T1500A T1500Z* T2500A T2500Z* T3000Z*	NS9530 GT9530* AT9530*	TN60 TN620 PV720* TN6020	WEP10C*	
		P30	**MP3025* VP45N***				IC75T	T3000Z*		PV730* PV90*		
	M	M10	**NX2525 AP25N* VP25N***	KT125	GC1525*	TP1020 TP1030* CM CMP*		T1000A T1500Z*		TN60 TN620 PV720* TN6020		CT3000 PV3010* PV3030*
		M20	**NX2525 AP25N* VP25N***					T1500A T1500Z*		TN90 TN6020 TN620 PV720* PV90*		CT3000 PV3010* PV3030*
		M30								PV730*		
	K	K01	**NX2525 AP25N***					T1000A	NS520 GT720*	CCX* PV7005*		PV3030*
		K10	**NX2525 AP25N***	KT325 KT125	CT5015				NS520 NS9530 GT9530*	CCX* PV7005* TN60		CT3000 PV3010* PV3030*
		K20	**NX2525 AP25N***									CT3000 PV3010*
Milling	P	P10	**NX2525**			C15M	IC30N			TN620M TN60		
		P20	**MX3020 NX2525**	KT530M HT7 KT605M	CT530	C15M MP1020	IC30N	T250A T2500A		TN100M TN620M TN60		IN60C
		P30	**MX3030 NX4545**				IC30N	T4500A	NS740			
	M	M10	**NX2525**				IC30N			TN60		
		M20	**MX3020 NX2525**	KT530M HT7 KT605M	CT530	C15M	IC30N	T250A T2500A		TN100M		
		M30	**MX3030 NX4545**					T4500A				
	K	K01										
		K10	**NX2525**							TN60		
		K20	**NX2525**	KT530M HT7								

*Coated Cermet

Note 1) The above table is selected from a publication. We have not obtained approval from each company.

GRADES COMPARISON TABLE

CVD COATED GRADE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01	MC6115	KCP05B KCP05	GC4305 GC4415	TP0501 TP1501	IC9150 IC8150 IC428	AC810P AC8015P	T9105 T9205	CA510 CA5505	WPP01	TT8105B
		P10	MC6115 MY5015 MC6125	KCP10B KCP10 KCP25	GC4315 GC4325 GC4415	TP1501 TP2501	IC9150 IC8150 IC8250	AC810P AC8020P	T9205 T9105 T9115 T9215	CA510 CA5505 CA515 CA5515	WPP01 WPP05 WPP10G	TT8115B TT8125B
		P20	MC6115 MC6125 MC6135 MY5015	KCP25B KCP30B KCP25 KCP25C	GC4315 GC4325 GC4425	TP2501	IC8250 IC9250 IC8350	AC8020P AC820P AC2000 AC8025P	T9115 T9125 T9215 T9225	CA025P CA515 CA5515 CA525 CA5525 CR9025	WPP10S WPP20S WPP20G	TT8125B TT5100
		P30	MC6125 MC6135 UH6400	KCP30B KCP30	GC4325 GC4335 GC4425	TP3501	IC8350 IC9250 IC9350	AC6030M AC8035P AC830P AC630M	T9125 T9135 T9225 T9235	CA025P CA525 CA5525 CA530 CA5535 CR9025	WPP30S WPP30G	TT5100 TT8135B
		P40	MC6035 UH6400	KCP40 KCP40B	GC4335	TP3501 TP40	IC9350	AC6030M AC8035P AC630M AC830P	T9135 T9235	CA530 CA5535		TT7100
	M	M10	MC7015 US7020	KCM15B KCM15	GC2015 GC2220	TM1501 TM2000	IC6015 IC8250	AC610M AC6020M	T6120 T6215	CA6515	WAM20	TT9215
		M20	MC7015 US7020 MC7025	KCM15 KCM25B KCP40B	GC2015 GC2220	TM2000 TM2501	IC8150 IC6015	AC6020M AC610M AC6030M AC630M	T6120 T6215	CA6515 CA6525		TT5100 TT9215
		M30	MC7025 US735	KCM35B KCP40	GC2025	TM4000 TM3501	IC8250 IC6025	AC6030M AC630M	T6130	CA6525		TT9225 TT9235
		M40	US735	KCM35B	GC2025	TM4000 TM3501	IC6025	AC6030M AC630M				TT9235
	K	K01	MC5105	KCK05B KCK05	GC3205 GC3210	TK0501 TH1500	IC5005	AC405K AC4010K	T505 T5105	CA4505 CA310	WKK10S	TT7005
		K10	MC5115 MH515 MY5015	KCK15B KCK15 KCK20 KCK20B	GC3205 GC3210	TK0501 TK1501	IC5005 IC5010 IC428	AC405K AC4010K AC4015K AC415K	T515 T5115	CA315 CA4515	WKK20S	TT7015
		K20	MC5125 MH515 MY5015	KCK20B KCK20	GC3225	TK1501	IC5010 IC8150	AC4015K AC415K AC420K	T5115 T5125	CA320 CA4515	WKP30S	
		K30	MC6115		GC3225			AC8025P	T5125			
	S	S01	US905		S05F S205					CA6515 CA6525		TT3005 TT9215
Milling	P	P10				MP1501	IC5400 IC5600	ACP2000 XCU2500 ACP100			WKP25S	IN6515
		P20	MC7020 F7030	KCPM20	GC4220	MP1501 MP2501 T25M	IC5400 IC5500	ACP2000 XCU2500 ACP100	T3130 T3225		WKP35S WKP35 WKP35G	IN6537
		P30	MC7020 F7030	KCPK30	GC4330 GC4230	MP1501 MP2501 TM25 T350M	IC5500	XCU2500 ACP100	T3130 T3225			IN6537
		P40			GC4340 GC4240	MM4500 T350M						
	M	M10						XCU2500 XCS2000				
		M20	MC7020 F7030	KC925M		MP2501 MS2500 T25M T350M		ACP100 ACM200 XCU2500 XCS2000	T3130 T3225	CA6535		IN6530
		M30	MC7020 F7030	KC930M	GC2040	MP2501 T25M T350M	IC5820	ACP100 XCU2500 ACM200 XCS2000	T3130 T3225	CA6535		IN7035
		M40		KC930M KC935M		MM4500 T350M						
	K	K01										
		K10	MC520 MC5020					XCK2000 ACK200	T1215 T1115	CA420M	WAK15	
		K20	MC520 MC5020	KC915M	GC3220 GC3330 K20W	MP1501	IC5100	ACK200 XCK2500 XCK2000 ACK200	T1115		WKP25	IN6515
		K30		KC920M KC925M KCPK30 KC930M KC935M	GC3330 GC3040	MP1501	IC5100 DT7150				WKP35G	IN6530
	S	S01										
		S10				MP2501	IC5820	ACM200 XCS2000		CA6535	WSM45X	
		S20			GC2040	MP2501 MS2500 T350M T25M	IC5820	ACM200 XCS2000		CA6535		
		S30			S40T	MS2500 T350M T25M				CA6535		IN6535 IN7035

Note 1) The above table is selected from a publication. We have not obtained approval from each company.

PVD COATED GRADE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Turning	P	P01										
		P10	VP10MF MS6015	KCU10 KC5010 KC5510	GC1125	CP200 TS2000	IC250 IC807 IC907 IC908		AH710	PR1705 PR930 PR1025 PR1115 PR1225 PR1725		TT4410
		P20	VP10RT VP20RT VP15TF VP20MF MS6015	KCS10 KCU10 KC5025 KC5525	GC1525 GC1125	TS2500	IC1007 IC250 IC308 IC807 IC808 IC907 IC908 IC1008 IC1028 IC3028		AH725 AH120 J740 SH730 SH725	PR930 PR1025 PR1725 PR1115 PR1225 PR1425 PR1535		TT9080 TT4430
		P30	VP10RT VP20RT VP15TF VP20MF MS7025	KCU25 KC5525	GC1125	CP500	IC228 IC250 IC328 IC330 IC354 IC528 IC1008 IC1028	AC1030U AC530U	AH725 AH120 SH730 GH730 GH130 AH740 J740 SH725 AH7025	PR1025 PR1725 PR1225 PR1425 PR1535 PR1625		TT7220
		P40				CP500 CP600	IC228 IC328 IC528 IC928 IC1008 IC1028		AH740	PR1535		TT8020
	M	M01				CP200 TS2000				PR1725		
		M10	VP10MF	KCS10 KCU10 KC5010	GC1525 GC1115 GC1125 GC1105	CP200 TS2000 TS2500	IC354 IC807 IC907 IC1007		AH8005 AH630 AH6225	PR1025 PR1225 PR930 PR1725	WSM20 WSM20S	TT4410 TT5080
		M20	VP10RT VP20RT VP15TF VP20MF MS7025 MS9025	KCU25 KC5025 KCU10 KC5010 KCS10	GC1525 GC1115 GC1125	TS2500 CP500 CP600	IC354 IC808 IC908 IC1008 IC1028	AC1030U AC530U AC6040M	AH725 AH120 SH730 AH630 SH725 AH8015 AH7025 AH6225	PR1025 PR1225 PR930 PR1535 PR1725	WSM30 WSM30S	TT4430 TT9080
		M30	VP10RT VP20RT VP15TF VP20M VP20MF MS7025 MP7035	KC5025 KCU25	GC1125 GC2035	CP500 CP600	IC228 IC250 IC328 IC1008 IC1028	AC530U AC1030U AC6040M	AH725 AH120 SH730 J740 AH645 SH725 AH6235	PR1025 PR1725 PR1535 PR1225		TT8020 TT8080
		M40	MP7035		GC2035	CP600	IC328 IC928 IC1008 IC1028	AC530U AC6040M AC1030U	AH645 AH6235	PR1535 PR1225		
	K	K01										
		K10		KCU10 KCS10 KC5010 KC5510		CP200 TS2000	IC350 IC1008		GH110 AH110			TT6080
		K20	VP10RT VP20RT VP15TF	KCU15 KCU25		CP200 TS2000 TS2500	IC228 IC808 IC830 IC908 IC1007 IC1008	AC1030U AC530U	AH7025 AH120			
		K30	VP10RT VP20RT VP15TF	KCU25 KC5525		CP500	IC228 IC350 IC808 IC830 IC908 IC928 IC1007 IC1008		AH120 GH130			
	S	S01	MP9005 VP05RT			TH1000	IC804 IC807 IC907	AC510U AC5005S AC5015S	AH8005	PR005S PR015S	WSM10 WSM10S	
		S10	MP9005 MP9015 VP10RT	KCU10 KC5010 KCS10 KCS10B	GC1105	CP200 TS2000 TS2050 TS2500 TH1000	IC806 IC807	AC5005S AC510U AC520U AC5015S AC5025S	AH8005 AH8015	PR005S PR015S	WSM20 WSM20S	TT5080 TT3010
		S20	MP9015 MT9015	KCU10 KCU25 KC5025 KCS10 KC5010 KCS10B	GC1105 GC1115 GC1125	TS2000 TS2500 CP200	IC228 IC328 IC808 IC908 IC928 IC806	AC520U AC5015S AC5025S	AH7025 AH8015	PR015S PR1535	WSM30 WSM30S	TT4430 TT3020 TT9080
		S30	MS9025 MP9025 VP15TF VP20RT	KCU25 KC5025	GC1125	CP600	IC928 IC830	AC1030U	AH630 AH7025	PR015S PR1535		TT8020
Milling	P	P01							AH710 AH110			
		P10		KC505M KC715M KC510M KC515M	GC1010 GC1130		IC250 IC350 IC808 IC810 IC910 IC950	ACU2500 ACP200	AH120 AH725	PR830 PR1225		IN4015 IN2004
		P20	MP6120 VP15TF	KC522M KC525M KC527M KC610M KC620M KC635M KC715M KC730M KTPK20	GC1010 GC1030 GC1130 GC2030	F25M MP3000	IC250 IC328 IC330 IC350 IC808 IC810 IC830 IC910 IC928 IC950	ACU2500 ACP200	AH3135 AH3225 AH725 AH120 AH9130 AH6030 AH9030	PR830 PR1225 PR1230 PR1525		IN2004 IN2205

Note 1) The above table is selected from a publication. We have not obtained approval from each company.

GRADES COMPARISON TABLE

PVD COATED GRADE

	ISO Classification	ISO Symbol	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Iscar	Sumitomo Electric	Tungaloy	Kyocera	Walter	Ingersoll
Milling	P	P30	**MP6120 VP15TF MP6130 VP30RT**	KC735M KC725M KC530M KCPM40	GC1010 GC1030 GC2030 GC1130	F25M MP3000 F30M MP2050	IC250 IC328 IC330 IC350 IC830 IC845 IC928 IC950	ACU2500 ACP200 ACP300	AH725 AH130 AH140 AH3035 AH6030 AH3225 AH9130	PR1230 PR1525	WSP45S WSP45G	IN1040 IN1540 IN2040 IN2205
		P40	**VP30RT**	KC735M KCPM40	GC2030 GC1030 GC1130	F40M T60M	IC328 IC330 IC830 IC928	ACP300	AH140 AH3035	PR1525		
	M	M01					IC907					
		M10		KC715M KC515M	GC1025 GC1030 GC1010 GC1130			ACM100 ACU2500	AH725	PR1225		
		M20	**VP15TF MP7130 MP7030 VP20RT**	KC610M KC635M KC730M KC522M KC525M KCPM40 KTPK20	GC1025 GC1030 GC1040 GC2030 S30T	F25M MP3000	IC250 IC808 IC830 IC928	ACU2500 ACP200	AH725 AH6030 AH130 AH330 AH9130	PR1025 PR1225	WSM35S WSM35G	IN2205
		M30	**VP15TF MP7130 MP7030 VP20RT MP7140 VP30RT**	KC725M KC735M KCPM40 KC530M	S30T GC1040 GC2030	F30M F40M MP3000 MP2050	IC250 IC328 IC330 IC380 IC830 IC882 IC928	ACP200 ACP300 ACM300	AH130 AH140 AH730 AH3135 AH4035 AH9130	PR830 PR1225 PR1525 PR1535	WSP45S WSP45G	IN1515 IN1530 IN2005 IN2505 IN2205
		M40	**MP7140 VP30RT**			F40M MP2050	IC250 IC328 IC330 IC882	ACP300 ACM300	AH140 AH3135 AH4035	PR1525 PR1535		
	K	K01	**MP8010**						AH110 AH330			
		K10	**MP8010**	KCKP10 KC514M KC515M KC527M KC635M KCK20B	GC1010	MK2050	IC350 IC810 IC830 IC900 IC910 IC928 IC950 IC380	ACU2500 ACK3000	AH110 AH725 AH120 AH330	PR1210 PR1510	WKK25S WKK25G	IN2510 IN2004
		K20	**VP15TF VP20RT**	KTPK20 KC514M KC610M KC520M KC620M KC524M KCK20B	GC1010 GC1020	MK2000 MK2050	IC350 IC808 IC810 IC830 IC910 IC928 IC950	ACU2500 ACK3000 ACK300	AH120 AH9130 AH9030	PR1210 PR1510		IN1030 IN2010 IN2015 IN2205
		K30	**VP15TF VP20RT**	KC522M KC725M KC524M KC735M	GC1020	MK2050	IC350 IC808 IC830 IC928 IC950	ACK300 ACK3000	AH120			IN1510 IN2030 IN2205
	S	S01					IC907 IC808		AH110 AH710	PR1210		
		S10	**MP9120 VP15TF**	KC510M	GC1130 GC1010 GC1030 GC2030	MS2050	IC907 IC840 IC910 IC808	EH520Z EH20Z ACM100	AH120 AH725	PR1210		
		S20	**MP9120 VP15TF MP9130 MP9030**	KC522M KC525M KCSM30 KCPM40	S30T GC2030 GC1030 GC1130	MS2050 MP2050	IC808 IC830 IC928 IC328 IC330 IC840 IC882 IC380	EH520Z EH20Z ACK300 ACP300	AH725 AH6030 AH130	PR1535	WSM35S WSM35G	IN2205
		S30	**MP9140**	KC725M KCPM40	GC2030 GC1040	MS2050 F40M KCSM40	IC830 IC882 IC928	ACP300 ACM300	AH130 AH3135	PR1535	WSP45G	IN2205
	H	H01	**MP8010 VP05HT**						AH110 AH710		WHH15 WHH15X	
		H10	**VP15TF VP10H**	KC505M KC510M	GC1130 GC1010 GC1030	MH1000 F15M	IC808 IC907		AH110 AH120 AH710			
		H20	**VP15TF**		GC1030 GC1130	F15M	IC808 IC380		AH120 AH3135 AH725 AH9030			
		H30				MP3000 F30M	IC380		AH3135			

Note 1) The above table is selected from a publication. We have not obtained approval from each company.

CBN

	ISO Classification	ISO Symbol	Mitsubishi Materials	Sandvik	Sumitomo Electric	Tungaloy	Kyocera
Turning	H	H01	**BC8105 BC8210 BC8110 MB8110**	CB7105 CB7015	BNC2010 BN1000	BXA10 BXM10 BX310	KBN05M KBN510
		H10	**BC8210 BC8110 BC8220 BC8120 MB8110 MB8120**	CB7115 CB7125 CB7025	BNC2010 BNC2115 BN2000	BXA10 BXA20 BXM20 BX330	KBN020 KBN05M KBN25M KBN525
		H20	**BC8220 BC8120 MB8120**	CB7125 CB7025	BNC2020 BNC2125 BN2000	BXA20 BXM20 BX360	KBN020 KBN25M
		H30	**BC8130 MB8130**	CB7525 CB7135	BNC300 BN350	BXC50 BX380	KBN35M
	S	S01	**MB730**		BN700 BN7000	BX950	
	K	K01	**BC5110 MB5015**		BNC8115 BNS8125	BX910	
		K10	**MB4120**	CB7525	BNC8115 BNS8125	BX480	KBN475 KBN60M
		K20	**MB4120**		BNC8115 BNS8125	BX480	KBN475 KBN60M
		K30	**BC5030 MBS140**	CB7925	BNC8115 BNS8125	BX480	
	Sintered Alloy		**MB4120**		BN7115 BN7000	BX480 BX470	KBN70M KBN570

PCD

	ISO Classification	ISO Symbol	Mitsubishi Materials	Sandvik	Sumitomo Electric	Tungaloy	Kyocera
Turning	N	N01	**MD205**	CD05	DA90	DX180 DX160	KPD230
		N10	**MD220**	CD10	DA150	DX140	KPD010
		N20	**MD220**		DA2200	DX120	
		N30	**MD230 MD2030**		DA1000	DX110	KPD001

Note 1) The above table is selected from a publication. We have not obtained approval from each company.

INSERT CHIP BREAKER COMPARISON TABLE

NEGATIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Walter	TaeguTec	Sumitomo Electric	Tungaloy	Kyocera
P	Finish	FH, FP FY, FS	FF	 LC	FF1, FF2	FP5	FLP FA FX	 FA, FB FL	01* TF, 11 ZF	 GP, PP, VF XP, XP-T, XF
	Light	LP SA, SH	 K LF, FN	XF PF MF	 MF2	MP3, FV5	FM MLP FG	SU LU, FE SX, SE	PS NS, 27 TSF, AS, TQ	PQ HQ, CQ
	Light (Mild Steel)	SY					FC		17	XQ, XS
	Light (With Wiper)	SW	FW	WL, WF	W-FF2 W-MF2	FW5, NF	WS	LUW, SEW	FW, SW AFW, ASW	WF WP, WQ
	Medium	MP MA MH	 MP, P MN	PM QM, XM XMR	MF3 MF5, M3 M5	MP5, MV5 MU5	PC, MP, FT MT MGP	GU UG GE, UX	PM, NM, ZM TA, TM, AM, 28 DM, 33, 37, 38	PG, CJ, GS PS, HS PT
	Medium (With Wiper)	MW	MW, RW	WMX, WM WR	W-M6, W-M3 W-MF5	MW5, NM	WT	GUW		WE
	Rough	RP GH Std.	RN, RP	PR, HM Std.	M6, MR6, MR7	RP5, RP7 RV5	RGP RT Std.	MU, MX, ME UZ	TH, THS Std.	PH GT Std.
	Heavy	HZ HL, HM, HX HV	MR, RP RM RH	QR, PR HR, MR	R4, R5 R57, RR6, R7 R68, RR9	HU3, NRF HU5 HU7, NRR	RX, RH HD, HY, HT HZ, EH	MP HG, HP HU, HW, HF	TRS, 57 TU TUS, 65	PX
M	Finish Light	SH, LM	FF, FP LF*	XF, MF	FF1, FF2 MF1	FM5	SF	SU, EF	SS	MQ, SK*
	Medium	MS, GM MM, MA ES	MS, MP UP	MM QM, XM K	MF3 MF4 MF5, M3	MM5, RM5 MU5	ML EM, MM VF	EX, EG, UP GU HM	SA, SF SM S	MS, MU TK ST
	Heavy	GH, RM HL, HZ	MR, RP	MR MR	M5, M6, R6 R56, RR6, R7 R8,PR9	HU5		EM, MU MP	TH, SH	
K	Finish Light	LK, MA	FN	KF	MF2 M3, M4	MK5	FG		CF	KQ
	Medium	MK, GK Std.	RP,UN	KM	M5	RK5, MV7	MC	UZ, GZ, UX	CM Std.	KG, Std., C
	Rough	RK		KR, KRR	MR7	RK7 RV7	KT			KH. GC, PH
	Heavy	Flat Top	Flat Top		MR9 Flat Top	Flat Top		Flat Top	CH, Flat Top	ZS, Flat Top
S	Finish	FS*, FJ*	FS*, FF	SF	MF1	FM5	FA	EF		MQ, SK*
	Light	LS,MJ,MJ*	LF *, MS, FN	SGF*	MF3	NFT MS3	EA, SF	SU*	HRF	
	Medium	MS MA	UP, P, NGP*	NGP*, SM QM	M1 M3	NMS, NMT MU5		EG, EX, UP	SDM, HRM, 28 SA, HMM	SQ MS, MU, TK
	Heavy	RS, GJ	RP	SR, SMR	MR3 MR4	NRS, NRT HU5	ET	MU		SG, SX

*Peripheral ground type insert.

Note 1) Above charts are based on published data and not authorized by each manufacturer.

7°POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Walter	TaeguTec	Sumitomo Electric	Tungaloy	Kyocera
P	Finish	SMG*	LF*	UM*		FP2*	SL* SA*	FF* FC*, SC*	JP* JS*, 01*	CF*,CK* GQ*,GF* SKS*, SK*
	Finish Light	FP, FV LS-P* LP, SV	UF, 11 LF, FP	PF, UF	FF1 F1, MF2	PF4, FP4	FA, FX SM*, FG	FB, FP, LU LB, SU	PF, PSF PS, PSS, TSF	GP, PP, VF XP
	Light (With Wiper)	SW	FW	WF	W-F1	FW4, PF		LUW, SDW		WP
	Medium	MV MP, Std.	MF, MP	PM, UM PR, UR	M3 F2, M5	FP6, MP4 MP6, RP4	PC SH*, MT	GU MU	TM, 23 PM, 24	HQ, MF* XQ, GK
	Medium (With Wiper)	MW	MW	WM	W-MF2 W-M3	MW4, PM	WT		SW	
M	Finish Light	FS-P* FM LS-P* LM	LF, UF FP	MF, UF	F1, F2 MF2	FM2* FM4	FA FG	FF* FC*, SI* LU LB, SU	JP* PF, PSF PS, PSS	CF*,CK* GQ*,GF* MQ*,SK*
	Medium	MM Std.	MP	MM, UM MR, UR	M3 M5	FM6 MM4, RM4	PC MT	GU, MU	PM	HQ, GK
K	Medium	MK, Std. Flat Top	Flat Top	KF, KM, UM, KR	F1, M3, M5	FK6, MK4 RK4, RK6	MT	MU, Flat Top*	Flat Top, CM	Flat Top*
N	Medium	AZ*	HP*	AL*	AL*	FN2*, PM2* MN2*	FL*	AG* AW*	AL*	AP* AH*
S	Finish Light	FS*, LS* FS-P*, LS-P* FJ* LS, MS	LF* HP*	UM* UF, MF UM, MM		FM2* FM4, FM6 MM4, RM4	SA*, FA, FG SL*, SM* SH*, PC, MT	FF* SI* GU	Std.	CF*, CK* GQ*, GF* SK*, MQ

*Peripheral ground type insert.

Note 1) Above charts are based on published data and not authorized by each manufacturer.

11°POSITIVE INSERT TYPE

ISO Classification	Cutting Mode	Mitsubishi Materials	Kennametal	Sandvik	Seco Tools	Walter	TaeguTec	Sumitomo Electric	Tungaloy	Kyocera
P	Finish Light	FV, SMG* SV	UF, FP FW, LF	PF		FP4	FG PC	SI, FK. FB LU, LUW, LB SU,SF	01* PF, PSF PS, PSS, TSF	PP, GP, GF* SKS*, CF*, CK* PF*, XP
	Medium	MV	MF MP, MW	PM, UM		MP4		GU, MU, US	PM TM, 23 24	HQ XQ
M	Finish Light	SMG* SV	HP* LF	MF		FM4	PC	SU	SS* PF, PS	GF*, CK* PF*, GP, CF* SKS*
	Medium	MV		MM		MM4		GU, MU, US	PM, Std.	HQ

*Peripheral ground type insert.

Note 1) Above charts are based on published data and not authorized by each manufacturer.

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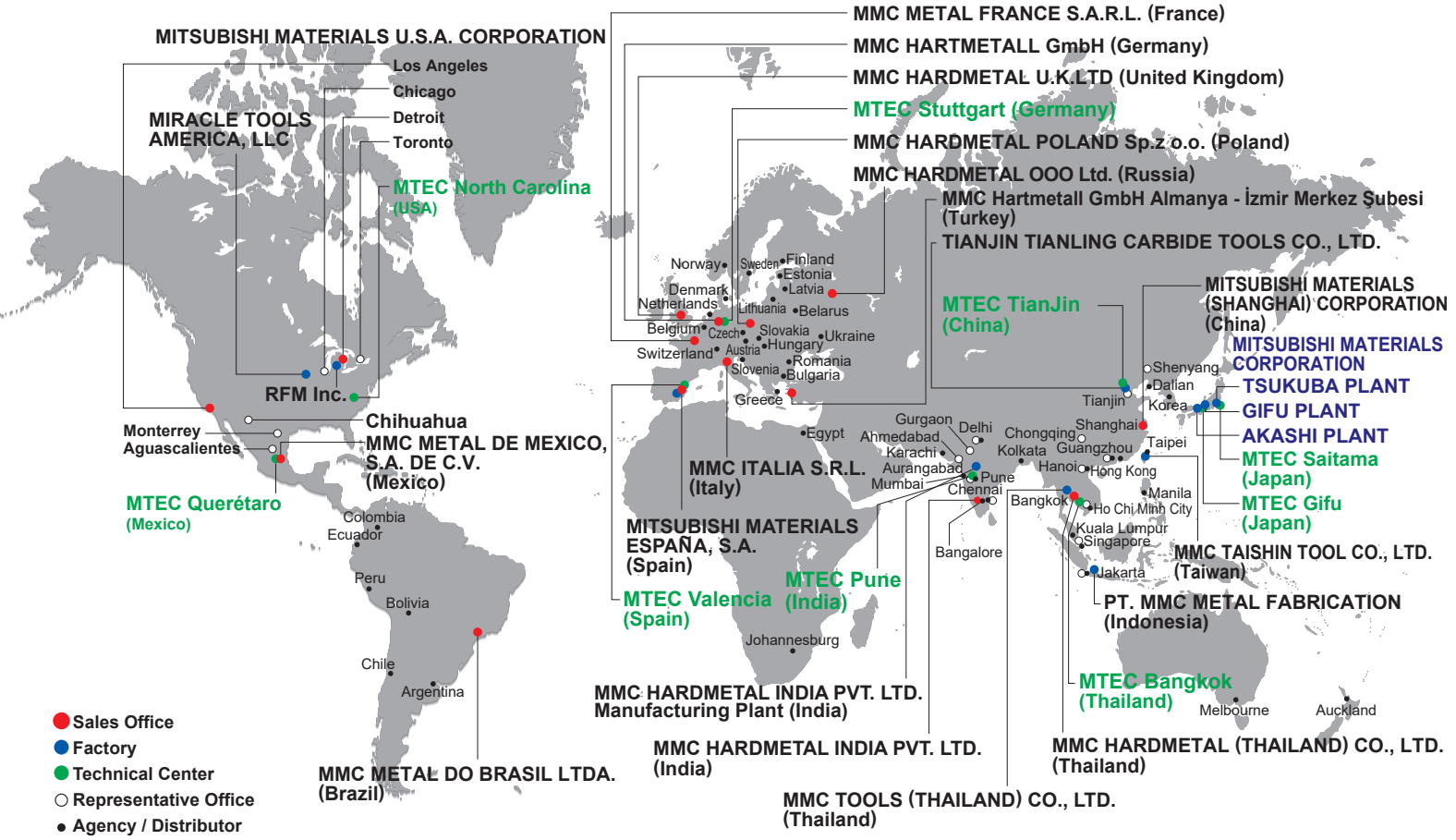

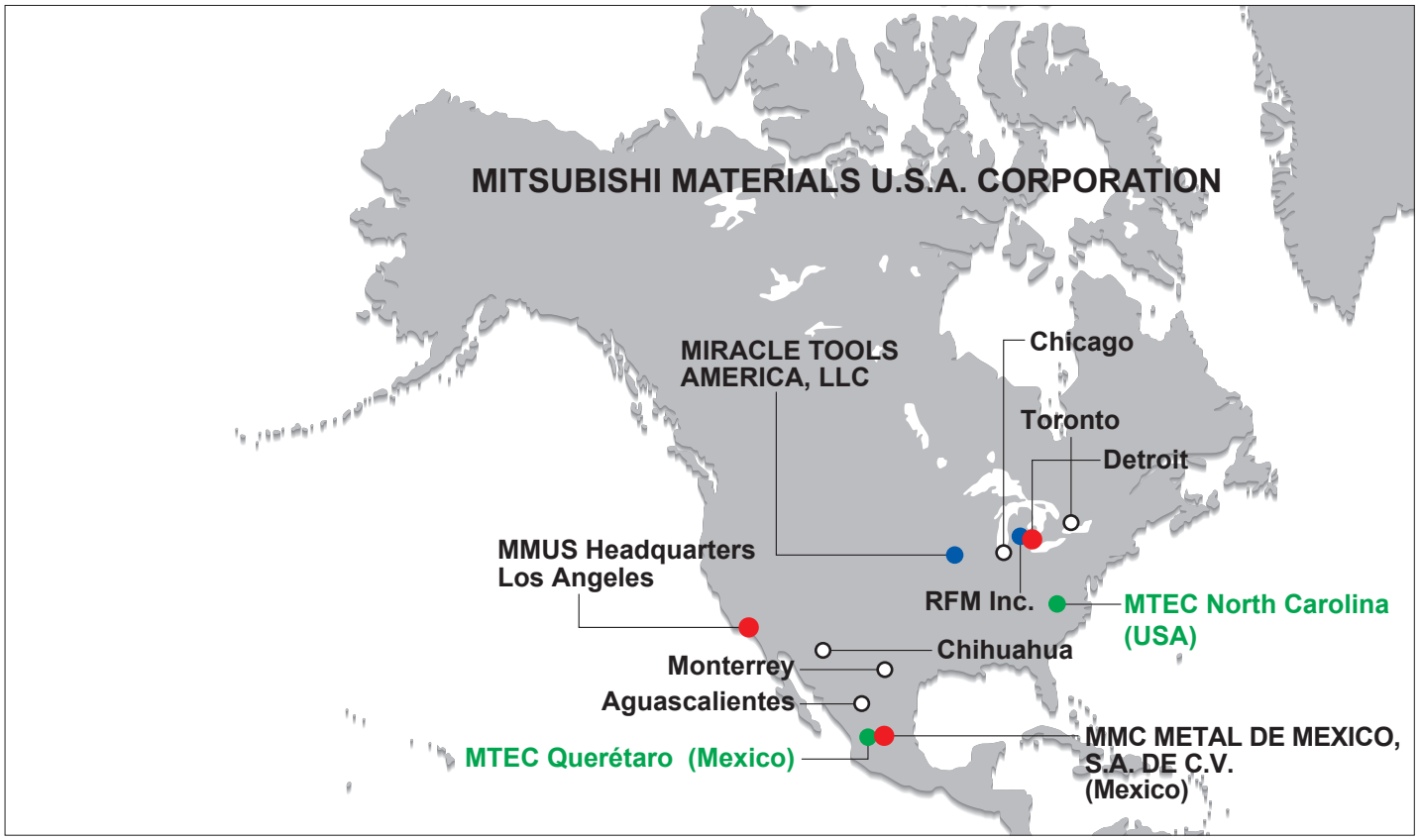

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