PROVEN SOLUTIONS I ALWAYS AVAILABLE

ALL-STAR

AMERICAS | VOL 1

INDEXABLE MILLING

ALL-STAR WIDIA™

AHB TOOLING & MACHINERY

COMPLETE METALWORKING SOLUTIONS

(800) 991-4225
www.ahbinc.com
ISO Certified
customerservice@ahbinc.com

WIDIA™

The All-Star Program reinforces the core qualities of the WIDIA™ diamond — providing proven solutions that are easy to find and always available.

With All-Star, customers can benefit from product reliability and quick delivery to increase machine utilization.

ALL-STAR

ALL-STAR

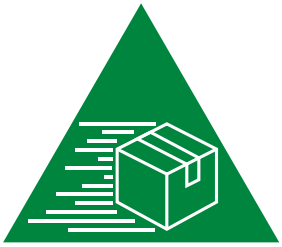
PROVEN SOLUTIONS

Products included in the All-Star program were chosen based on their proven performance and popularity. These industry-leading solutions combine versatility and productivity to deliver savings.

EASY TO FIND

It is easy to recommend All-Star on-the-go or in the shop while using tools like the NOVO™ tool advisor or the Machining Central app. To view All-Star products on widia.com, use the All-Star filter.

Available to download in the app store!



ALWAYS AVAILABLE

All-Star products are held to the highest availability standards. This means products that are flagged as All-Star feature same-day shipping for all orders received before 6pm EST.

TO SEE ALL PRODUCTS LINES, VISIT OUR DIGITAL RESOURCES

WIDIA NOVO™ Application
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INDEXABLE MILLING

SHOULDER MILLING

Pages A4–A37

VSM890™
VSM490-15™
VSM490-10™
VSM17™
VSM11™
M690

90° HIGH-SPEED CUTTING

Pages A38–A43

VHSC

ALL-STAR

FACE MILLING

Pages A44–A55

M1200 Mini
M1200

COPY MILLING

Pages A56–A78

VXF™
M370™
M200™
M100™

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0º/90º SHOULDER MILLS

VSM890

Pages A6–A8

8-Edged, Double-Sided 0° Victory™
Shoulder-Face Mill

VSM490-15 & VSM490-10

Pages A10–A14, A16–A20

4-Edged, Double-Sided 0° Victory Shoulder-Face Mill

ALL-STAR

VSM17 & VSM11

Pages A22–A31

2-Edged, 0° Victory™ Shoulder Mill (VSM)

M690

Pages A32–A37

4-Edged 90° Shoulder Mill

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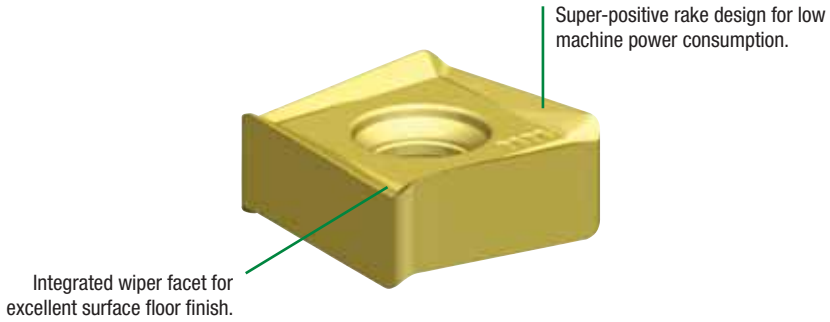
VSM890™

8-Edged, Double-Sided True 0° Victory™ Shoulder-Face Mill (VSM)

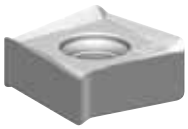
- Superior Metal Removal Rates (MRR) delivered through high-performance grades and chipbreakers.
- Coarse, medium, and fine pitch cutter density to perfectly translate machining capability into higher productivity.
- New pocket seat design for improved insert seating and great stability at roughing applications.
- Comprehensive standard offering for cutter bodies and inserts to address light machining to heavy roughing jobs.
- Available in the new WU10PM™ and WS40PM™ grades.

- **Weldon® End Mills:** 1.25" and 1.5"
- **Shell Mills:** 2–10"



Unique insert rake design to reduce and perfectly balance axial and radial cutting forces. Engineered for light machining to heavy roughing in all material groups.

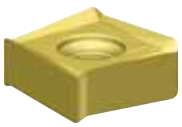
★ -ALP



N

First choice for Non-Ferrous materials.

★ -ML



P M S

First choice for Stainless Steel, light machining, and finishing jobs.

★ -MM

P M K S H

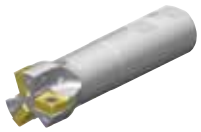
First choice for general purpose in all workpiece materials. Engineered for high-feed rates.

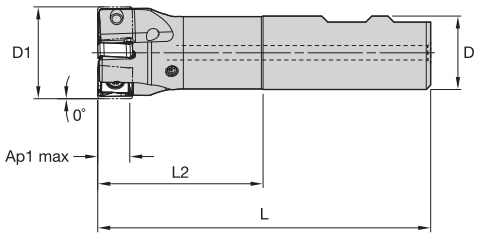
Finishing Capabilities/Lower Cutting Forces

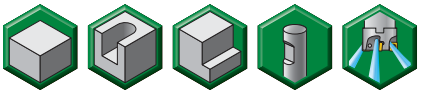
Geometry Strengthening/Stronger Cutting Edge Protection

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Weldon® End Mills • Inch

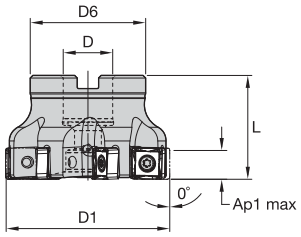


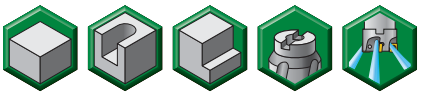




order number	catalog number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
6596129	VSM890D125Z03W100SN12	1.250	1.000	4.530	2.250	.387	3	33400	Yes	.89
6596130	VSM890D150Z04W100SN12	1.500	1.000	4.530	2.250	.387	4	29100	Yes	1.18

Shell Mills • Inch





order number	catalog number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
6596131	VSM890D200Z04S075SN12	2.000	.750	1.750	1.575	.387	4	23800	Yes	.73
6596132	VSM890D200Z05S075SN12	2.000	.750	1.750	1.575	.387	5	23800	Yes	.70
6596133	VSM890D250Z05S075SN12	2.500	.750	1.750	1.575	.387	5	20700	Yes	1.06
6596134	VSM890D250Z07S075SN12	2.500	.750	1.750	1.575	.387	7	20700	Yes	.99
6596135	VSM890D300Z05S100SN12	3.000	1.000	2.190	1.750	.387	5	18500	Yes	1.63
6596136	VSM890D300Z07S100SN12	3.000	1.000	2.190	1.750	.387	7	18500	Yes	1.73
6596137	VSM890D300Z09S100SN12	3.000	1.000	2.190	1.750	.387	9	18500	Yes	1.69

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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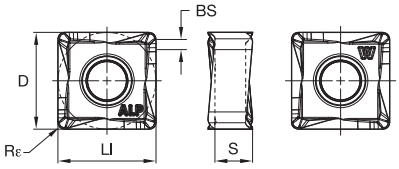
Inserts • SNHX-ALP • For Aluminum and Other Non-Ferrous Alloys

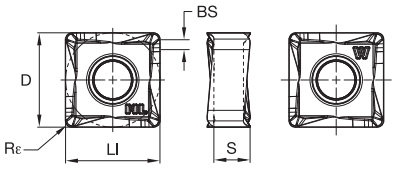


● first choice
○ alternate choice

P	
M	
K	
N	●
S	
H	

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	D mm	D in	BS mm	BS in	Rε mm	Rε in	WN25PM
SNHX120408PNERALP	SNHX1202PNERALP	8	12,00	.472	4,61	.181	12,00	.472	1,34	.053	0,80	.032	6596397

Inserts • SNHX-ML • Precision Finishing and Light Machining



● first choice
○ alternate choice

P	●	○
M	●	●
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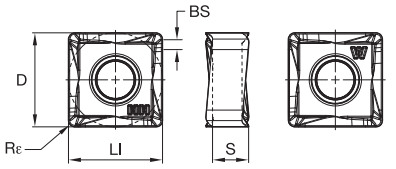
H		

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	D mm	D in	BS mm	BS in	Rε mm	Rε in	WP25PM	WS40PM
SNHX120408PNERML	SNHX1202PNERML	8	12,00	.472	4,61	.181	12,00	.472	1,34	.053	0,80	.032	6596398	6596399

Inserts • SNHX-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

P	●	●	○	
M	●	●	●	
K	○			●
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S	●	○	●	
H				●

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	D mm	D in	BS mm	BS in	Rε mm	Rε in	WP25PM	WP40PM	WS40PM	WU10PM
SNHX120408PNSRMM	SNHX1202PNSRMM	8	12,00	.472	4,61	.181	12,00	.472	1,34	.053	0,80	.032	6596431	6596432	6596433	6596400

WIDIA™ Victory™

WS40PM

Breakthrough in the latest substrate and coating technology to boost productivity in **stainless steels and high-temp alloys**

Advanced Milling Grade for Titanium

Multilayer PVD AlTiN-TiN Coating

- Improved chemical and abrasive wear resistance.
- Consistent tool life performance.
- Primarily for wet machining. Also great results in dry machining.

New Medium-Grained Substrate

- Minimizes tendency for thermal cracking.
- Excellent fatigue resistance and edge strength.
- Rich in cobalt content for improved toughness.

widia.com

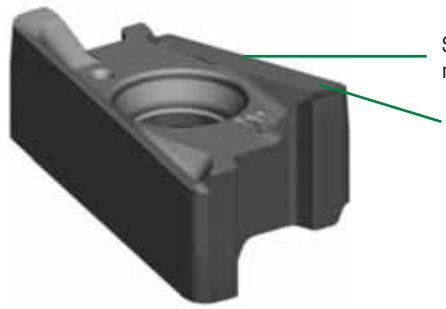
WIDIA™

VSM490™-15

4-Edged, Double-Sided 0° Victory™ Shoulder Mill (VSM)

- True 0° roughing tool with embedded finishing capabilities all in one tool.
- Best-in-class wall finish in axial stepping-down jobs.
- Lower cutting forces and real soft cutting action.
- Perfect fit for taper 50 spindles.
- Coarse, medium, and fine pitch shell mills available.

- **Ap Capabilities:** Up to .591"
- **Weldon® End Mills:** 1–1.5"
- **Cylindrical End Mills:** .625–1.5"
- **Shell Mills:** 1.5–6.0"
- **M4000 Cartridge Milling System:** 6–12"



Four insert geometries for all material groups in shoulder milling applications.

★ -ALP

N

For non-ferrous materials.

★ -ML

P M S

First choice for stainless steel. Lower cutting forces.

★ -MM

P M K S

First choice, especially when machining steels.

★ -MH

P K

First choice for cast iron, and also recommended for heavy applications.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

Wall Quality

Competitor Tool

Traditional tools are designed to achieve a 0° wall, but exhibit poor performance when machining walls in multiple passes.

VSM490-15

VSM490-15 eliminates the mismatch and minimizes the marks left behind in step-down milling operations. By increasing wall quality and avoiding a second tool, productivity increases significantly.

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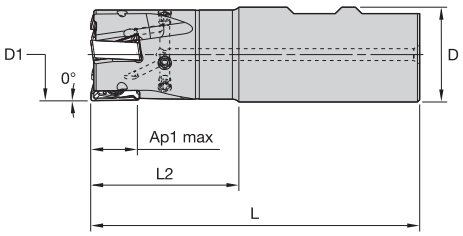
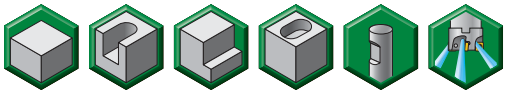
Weldon® End Mills • Inch

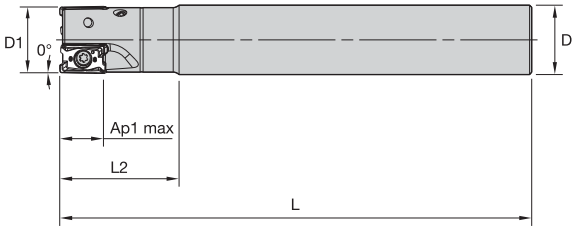


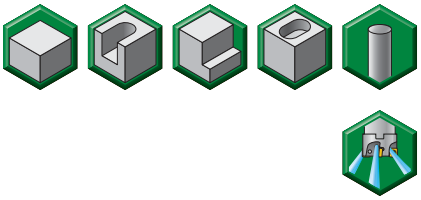


order number	catalog number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
5710590	VSM490D100Z02W100XN15	1.000	1.000	4.030	1.750	.591	2	26300	Yes	.73
5710591	VSM490D125Z03W100XN15	1.250	1.000	4.530	2.250	.591	3	22100	Yes	.90
5710592	VSM490D150Z04W125XN15	1.500	1.250	4.530	2.250	.591	4	19500	Yes	1.42

NOTE: Weldon type not recommended for finishing operations.

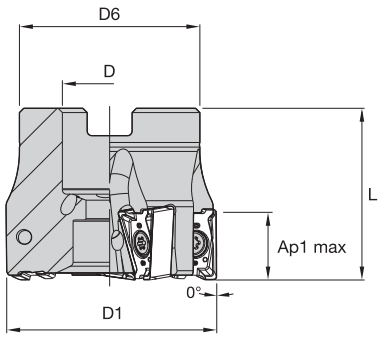
Cylindrical End Mills • Inch

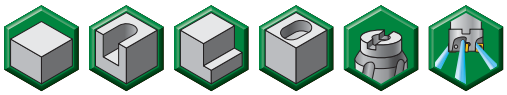




order number	catalog number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
5873101	VSM490D100Z02C100XN15L800	1.000	1.000	8.000	1.750	.591	2	26300	Yes	1.60
5873102	VSM490D125Z03C125XN15L800	1.250	1.250	8.000	2.250	.591	3	22100	Yes	2.50
5873103	VSM490D150Z04C125XN15L800	1.500	1.250	8.000	2.250	.591	4	19500	Yes	2.61

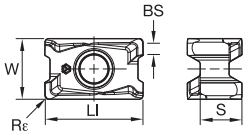
Shell Mills • Inch





order number	catalog number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
5710593	VSM490D150Z05S050XN15	1.500	.500	1.420	1.575	.591	5	19500	Yes	.43
5710594	VSM490D200Z05S075XN15	2.000	.750	1.750	1.575	.591	5	16100	Yes	.78
5710595	VSM490D200Z06S075XN15	2.000	.750	1.750	1.575	.591	6	16100	Yes	.77
5710598	VSM490D300Z07S100XN15	3.000	1.000	2.190	1.750	.591	7	12700	Yes	1.83
5873106	VSM490D400Z08S150XN15	4.000	1.500	3.380	2.000	.591	8	10800	Yes	3.31
5873109	VSM490D600Z10S200XN15	6.000	2.000	4.880	2.380	.591	10	8600	Yes	10.42

Inserts • XNGU-ALP • For Aluminum and Other Non-Ferrous Alloys



● first choice
○ alternate choice

P		
M		
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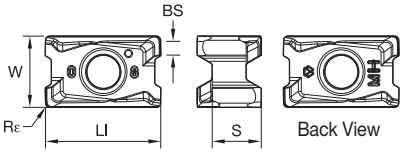
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WN25PM
XNGU15T604ERALP	XNGU1501ERALP	4	16,20	.638	6,88	.271	10,00	.394	2,20	.088	0,40	.016	0,03	.001	6082644
XNGU15T608ERALP	XNGU1502ERALP	4	16,20	.638	6,88	.271	10,00	.394	1,80	.072	0,80	.032	0,03	.001	6082645

Inserts • XNGU-MH • Heavy Roughing



● first choice
○ alternate choice

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M			●	●
K		●	○	
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S			●	○
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ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WK15CM	WP25PM	WP40PM
XNGU15T608SRMH	XNGU1502SRMH	4	16,20	.638	6,88	.271	10,00	.394	1,80	.069	0,80	.032	0,10	.004	6003725	6003570	6003721

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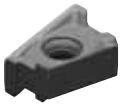
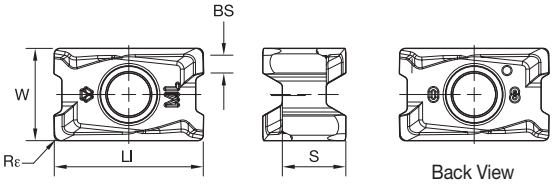
Inserts • XNGU-ML • Precision Finishing and Light Machining





● first choice
○ alternate choice

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S														●	●		
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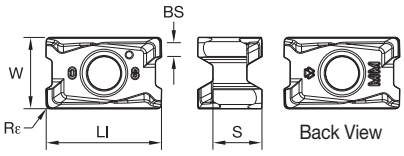
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WS40PM	WU35PM
XNGU15T604ERML	XNGU1501ERML	4	16,20	.638	6,88	.271	10,00	.394	2,20	.088	0,40	.016	0,08	.003	'	5890823
XNGU15T608ERML	XNGU1502ERML	4	16,20	.638	6,88	.271	10,00	.394	1,80	.072	0,80	.032	0,08	.003	6180324	5873483

Inserts • XNGU-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

P														○	●	●	
M														●	●	●	
K														○			
N																	
S														●	○	●	
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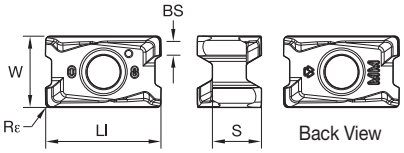
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WP25PM	WP40PM	WU35PM
XNGU15T608SRMM	XNGU1502SRMM	4	16,20	.638	6,88	.271	10,00	.394	1,90	.073	0,80	.031	0,10	.004	5710527	5710528	5710529

Inserts • XNPU-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

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S				●		○	●	●										
H																		

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WK15CM	WK15PM	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XNPU15T608SRMM	XNPU1502SRMM	4	16,10	.634	6,88	.271	10,00	.394	1,90	.076	0,80	.032	0,10	.004	5873420	5873419	5873415	5873418	5873416	6180320	5873417
XNPU15T612SRMM	XNPU1503SRMM	4	16,10	.634	6,88	.271	10,00	.394	1,50	.059	1,20	.047	0,10	.004	5890763	-	5890728	5890761	-	-	-
XNPU15T616SRMM	XNPU1504SRMM	4	16,10	.634	6,88	.271	10,00	.394	1,10	.045	1,60	.063	0,10	.004	-	-	-	5883450	5883448	6180322	-

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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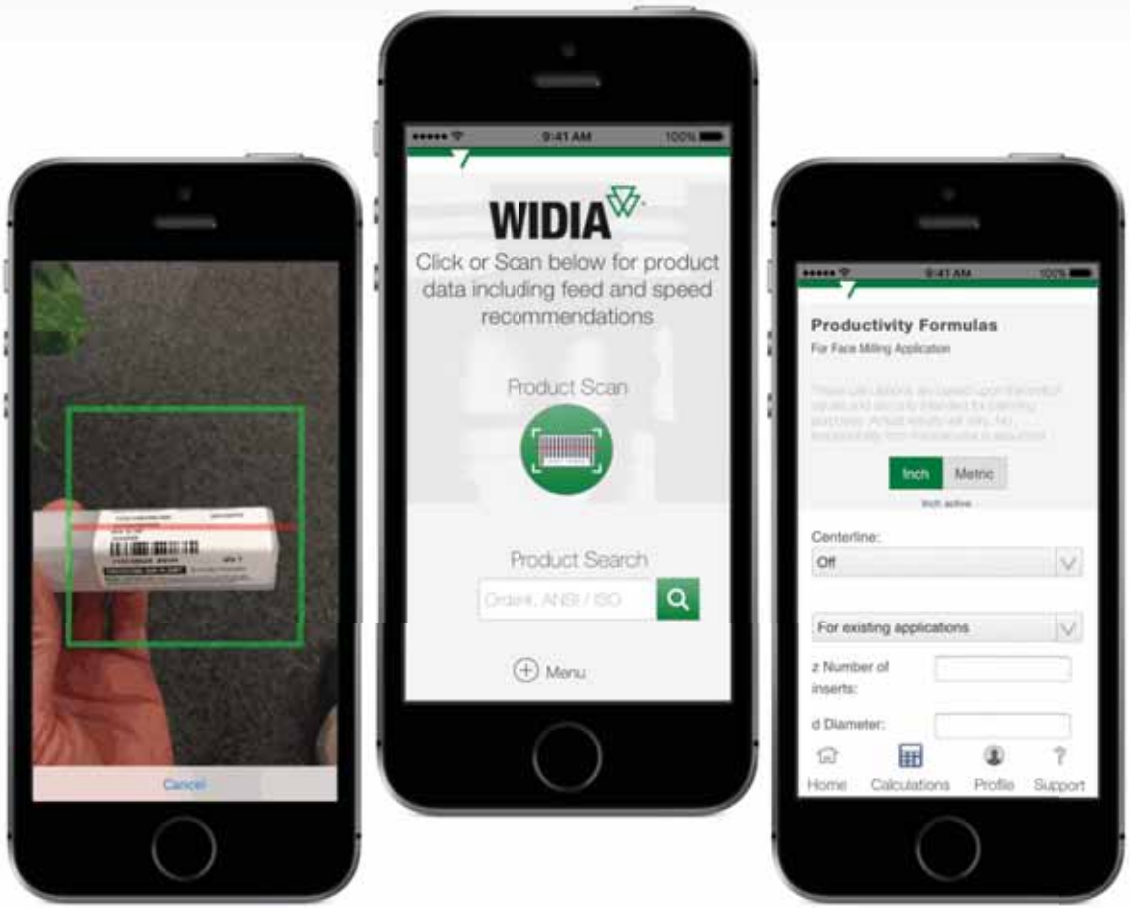
Machining Central App from WIDIA™

The fastest, easiest way to get feeds and speeds.



SCAN

With the new WIDIA app, product data is just a quick scan away. Now, when you're on the floor and need to quickly access the speeds and feeds of your favorite WIDIA tool, the WIDIA app gives you reliable information in just a few seconds.

SEARCH

Don't have a barcode? The new WIDIA app includes another simple search technique — just type the tool's corresponding order number or the ANSI or ISO catalog number into the search bar. You'll get the same reliable data as if you'd scanned the tool's barcode. It's simple and quick — no interruption in production!

CALCULATE

Have a specific machining need that our recommended speeds and feeds don't quite address? Try out our three NOVO™ based calculators. Both end milling and face milling calculators are available. Simply fill in the blank fields, and our calculators will quickly provide the data you need.

DOWNLOAD THE **WIDIA MACHINING CENTRAL** MOBILE APP

widia.com

Download on the App Store

GET IT ON Google Play

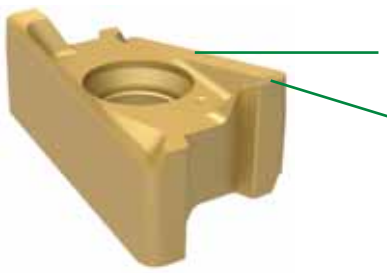
WIDIA™

VSM490™-10

4-Edged, Double-Sided 0° Victory™ Shoulder Mill (VSM)

- True 0° roughing tool with embedded finishing capabilities all in one tool.
- Best-in-class wall finish in axial stepping-down jobs.
- Lower cutting forces and real soft cutting action.
- Perfect fit for taper 40 spindles and driven units.

- **Ap Capabilities:** Up to .394"
- **Weldon® End Mills:** .625–1.5"
- **Cylindrical End Mills:** .625–1.5"
- **Shell Mills:** 1.5–5.0"
- **M4000 Cartridge Milling System:** 6–12"



Four insert geometries for all material groups in shoulder milling applications.

★ -ALP

N

For non-ferrous materials.

★ -ML

P M K S H

First choice for stainless steel, light machining, and finishing jobs.

★ -MM

P M K S H

First choice for general purpose in all material groups.

★ -MH

P K

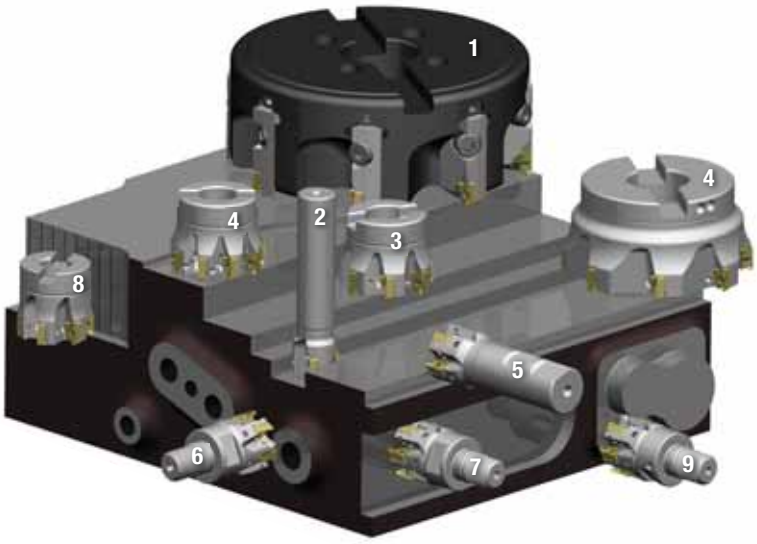
First choice for HPC roughing cast iron. Strongest edge protection with additional margins.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

Applications

1. Face milling with modular M4000 cartridge milling system.
2. Full slotting with 100% radial engagement.
3. Shoulder milling with step-down capabilities and great wall finish.
4. Shoulder milling with low axial and high radial engagement.
5. Shoulder milling with low radial and high axial engagement.
6. HPC face milling. Excellent choice to clean up castings.
7. Trochoidal slot milling.
8. Z-axis plunge milling.
9. Contour milling.



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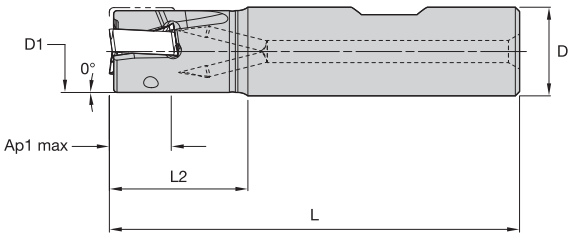
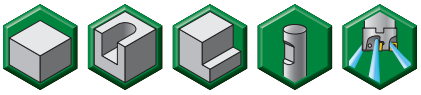
Weldon® End Mills • Inch

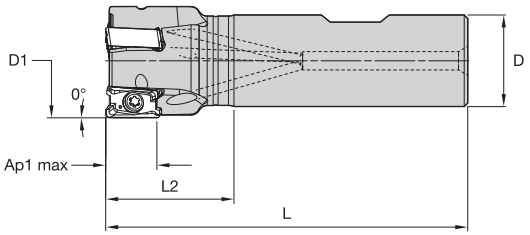
Regular Shank



Regular Shank



Reduced Shank

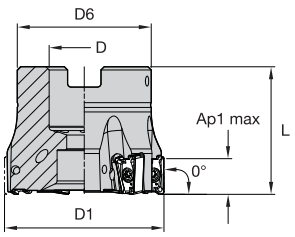


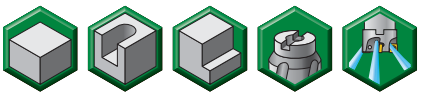
Reduced Shank

order number	catalog number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
6425472	VSM490D100Z03W075XN10	1.000	.750	3.250	1.220	.394	3	33900	Yes	.39
6425474	VSM490D100Z04W100XN10	1.000	1.000	3.750	1.470	.394	4	33900	Yes	.71

NOTE: Weldon type not recommended for finishing operations.

Shell Mills • Inch





order number	catalog number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
6425386	VSM490D200Z05S075XN10	2.000	.750	1.750	1.577	.394	5	22100	Yes	.81
6425387	VSM490D200Z07S075XN10	2.000	.750	1.750	1.577	.394	7	22100	Yes	.81
6425404	VSM490D300Z10S100XN10	3.000	1.000	2.190	1.750	.394	10	17600	Yes	2.05

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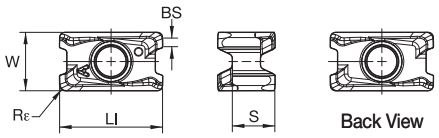
Inserts • XNGU-ALP • For Aluminum and Other Non-Ferrous Alloys



● first choice
○ alternate choice

P		
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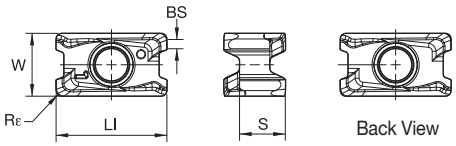
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WN25PM
XNGU100404ERALP	XNGU1001ERALP	4	11,66	.459	4,83	.190	6,60	.260	1,37	.054	0,40	.016	0,02	.001	6425382

Inserts • XNGU-ML • Precision Finishing and Light Machining



● first choice
○ alternate choice

P		○
M		●
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H		

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WS40PM
XNGU100408ERML	XNGU1002ERML	4	11,66	.459	4,83	.190	6,60	.260	1,00	.039	0,80	.031	0,02	.001	6425370

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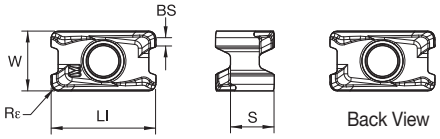
Inserts • XNGU-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

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M		●														
K																
N																
S		●														
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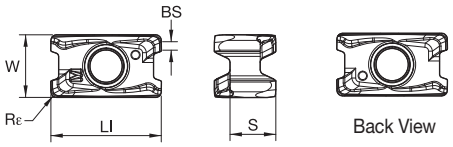
ISO catalog number	ANSI catalog number	cutting edges	LI		S		W		BS		Rε		hm		WS40PM
			mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
XNGU100404SRMM	XNGU1001SRMM	4	11,66	.459	4,83	.190	6,60	.260	1,37	.054	0,40	.016	0,08	.003	6425417
XNGU100408SRMM	XNGU1002SRMM	4	11,66	.459	4,83	.190	6,60	.260	1,00	.039	0,80	.031	0,08	.003	6425423

Inserts • XNGU-MH • Heavy Roughing



● first choice
○ alternate choice

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M		●														
K																
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S		○														
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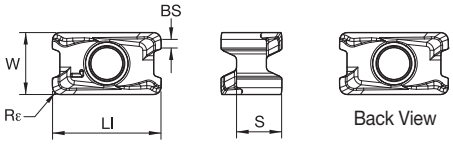
ISO catalog number	ANSI catalog number	cutting edges	LI		S		W		BS		Rε		hm		WP40PM
			mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	
XNGU100408SRMH	XNGU1002SRMH	4	11,66	.459	4,83	.190	6,60	.260	0,90	.036	0,80	.032	0,08	.003	6425357

Inserts • XNPU-ML • Light Machining



● first choice
○ alternate choice

P	
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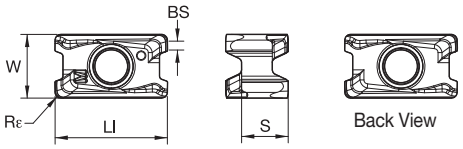
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WK15PM
XNPU100408ERML	XNPU1002ERML	4	11,60	.457	4,83	.190	6,60	.260	0,90	.036	0,80	.031	0,02	.001	6425366

Inserts • XNPU-MM • Universal Geometry for Medium Machining



● first choice
○ alternate choice

P	○	●	○
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K	○		
N			
S	●	○	●
H			

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WP25PM	WP40PM	WS40PM
XNPU100408SRMM	XNPU1002SRMM	4	11,60	.457	4,83	.190	6,60	.260	0,90	.036	0,80	.031	0,08	.003	6425361	6425363	6425362

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VARIable by WIDIA™

VARIable by WIDIA is a new tooling program that offers customers more ways to save while reducing tooling costs. This program will help you save on steel costs based on the number of inserts you buy — the more inserts you buy, the more you save.

Contact your local WIDIA sales representative for more information.

*Available Product Families:

- M1200
- VSM890™
- VSM490-10™
- VSM490-15™
- VSM11™
- VSM17™
- WGC

*VHM17 cutters are not included in this program.

Program Guidelines For VARIable by WIDIA

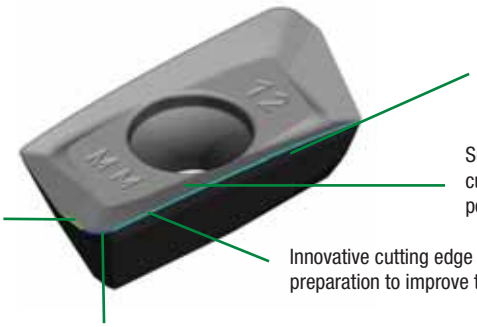
- Applicable for U.S. only.
- Free tooling limited to steel with no additional discounts on carbide.
- Please reference the appropriate ordering code on your P.O. when order is placed.
- Offer applies to qualified, standard catalog products only (Ferts), and is not valid in combination with any other offer or on exchange of current WIDIA products.
- Purchased and free items must be on the same order number.
- Program to be used for new business opportunities and not for existing repeat business.
- All orders must be for immediate shipment. Previous purchases, scheduled agreements, contract releases, blanked orders, and price concession orders are not covered by this program.
- All transactions are final. No returns are permitted other than defective products.
- Program is void where prohibited by law. All local, state, and federal laws apply.
- Ongoing program until further notice.

VSM17™

2-Edged, 0° Victory™ Shoulder Mill (VSM)

- True 0° shoulder milling platform.
- Aggressive ramping capability up to 8.5° with end mills with a diameter of 1".
- Optimized chip gash for improved cutter stability and chip flow.
- Well-guided internal coolant supply to the cutting edge.
- Best-in-class milling grade WS40PM boosts productivity when machining stainless steel and high-temp alloys.

- **Ap Capabilities:** Up to .638"
- **Screw-On End Mills:** 1–1.5"
- **Weldon® End Mills:** 1–1.5"
- **Cylindrical End Mills:** 1–1.5"
- **Shell Mills:** 1.5–6"
- **M4000 Cartridge Milling System:** 6–12"



Geometries for all material groups in shoulder milling applications.

★ - ALP

N

Roughing and finishing of aluminum alloys. High precision. Periphery ground.

★ -ML

P M S H

Light machining and finishing. First choice for stainless steel and titanium. Periphery ground.

★ -MM

P M K S H

Medium machining. First choice for general purpose. Precision pressed to size.

★ -MH

P M K S

First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

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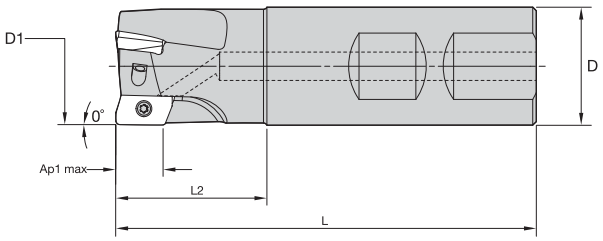
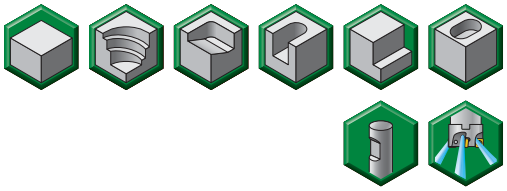
Weldon® End Mills • Inch

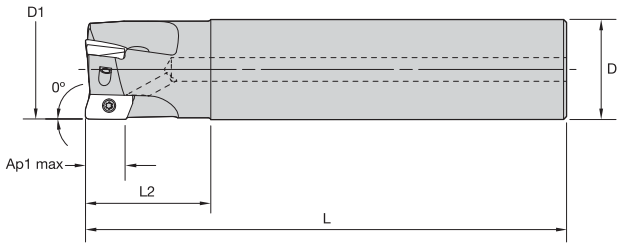


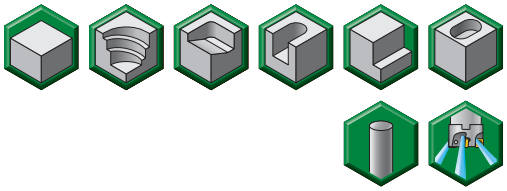


order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5988028	VSM17D100Z02W100XD17	1.000	1.000	3.500	1.220	.642	2	8.5°	41300	Yes	.59
5988029	VSM17D125Z03W125XD17	1.250	1.250	4.000	1.720	.641	3	5.8°	34700	Yes	1.05

NOTE: Weldon type not recommended for finishing operations.

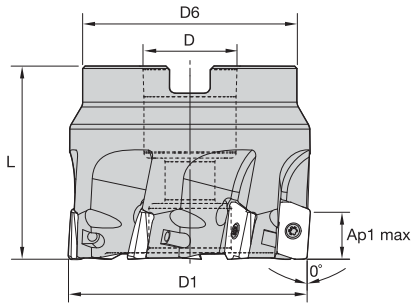
Cylindrical End Mills (Regular and Long Version) • Inch

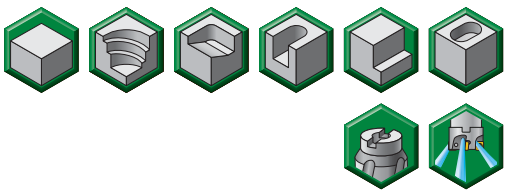




order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5988011	VSM17D100Z02C100XD17L450	1.000	1.000	4.500	1.750	.642	2	8.5°	41300	Yes	.78
5988012	VSM17D100Z02C100XD17L670	1.000	1.000	6.700	1.750	.642	2	8.5°	41300	Yes	1.23
5988014	VSM17D125Z03C125XD17L800	1.250	1.250	8.000	2.000	.641	3	5.8°	34700	Yes	2.36

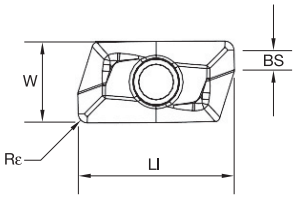
Shell Mills • Inch

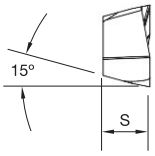




order number	catalog number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5988021	VSM17D200Z04S075XD17	2.000	.750	1.750	1.575	.635	4	3.0°	25600	Yes	.68
5988022	VSM17D200Z05S075XD17	2.000	.750	1.750	1.575	.635	5	3.0°	25600	Yes	.71
5988024	VSM17D300Z06S100XD17	3.000	1.000	2.188	1.750	.626	6	1.7°	20100	Yes	1.73

Inserts • XDCT-ML



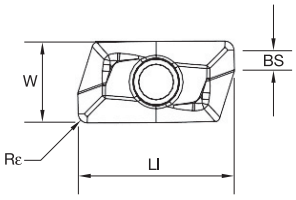


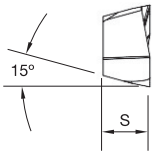
● first choice
○ alternate choice

P	○
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WP25PM
XDCT170408PEERML	XDCT1702ERML	2	19,15	.754	2,22	.088	4,90	.193	9,60	.378	0,80	.031	0,04	.002	5988983

Inserts • XDCT-ALP





● first choice
○ alternate choice

P		
M		
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N	●	●
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H		

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WN10HM	WN25PM
XDCT170408PEFRALP	XDCT1702RALP	2	19,15	.754	2,22	.088	4,90	.193	9,60	.378	0,80	.031	0,02	.001	6007345	6007344

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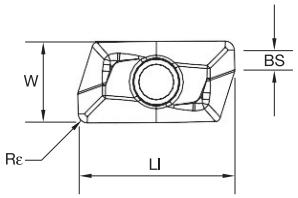
Inserts • XDPT-MM



● first choice
○ alternate choice

P		○	●	●	○														
M		●	○	●	●														
K		○	○																
N																			
S		●		○	●														
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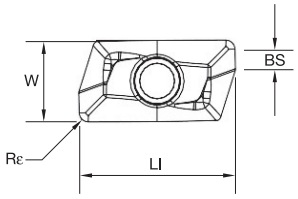
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WP25PM	WP35CM	WP40PM	WS40PM
XDPT170432PESRMM	XDPT1708SRMM	2	18,85	.742	—	—	4,89	.192	9,59	.378	3,20	.125	0,10	.004	5988206	-	5988205	-
XDPT170408PESRMM	XDPT1702SRMM	2	19,15	.754	2,15	.085	4,90	.193	9,60	.378	0,80	.031	0,10	.004	5987949	-	5987946	6180212
XDPT170412PESRMM	XDPT1703SRMM	2	19,16	.754	1,77	.070	4,90	.193	9,60	.378	1,20	.047	0,10	.004	-	-	-	6180213
XDPT170416PESRMM	XDPT1704SRMM	2	19,17	.755	1,38	.054	4,90	.193	9,60	.378	1,60	.063	0,10	.004	5988155	5988156	-	6180214

Inserts • XDPT-MH



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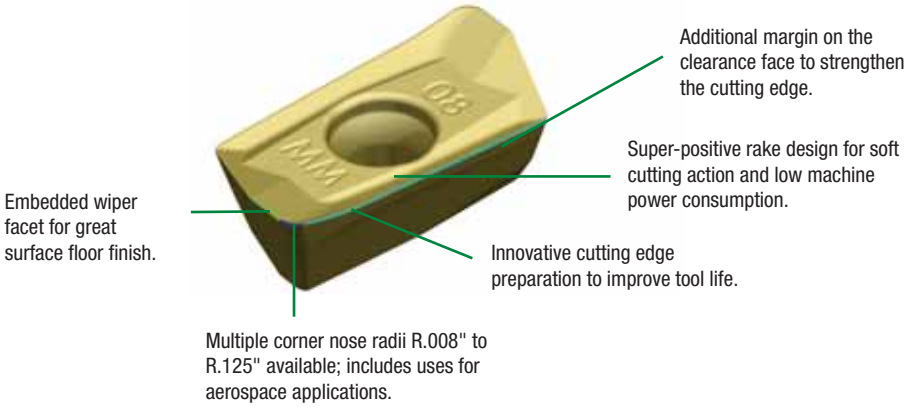
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WP35CM	WP40PM	WS40PM
XDPT170408PESRMH	XDPT1702SRMH	2	19,15	.754	2,10	.083	4,91	.193	9,60	.378	0,80	.031	0,13	.005	-	5989052	6425148
XDPT170412PESRMH	XDPT1703SRMH	2	19,16	.754	1,73	.068	4,91	.193	9,60	.378	1,20	.047	0,13	.005	5991816	-	-

VSM11™

2-Edged, 0° Victory™ Shoulder Mill (VSM)

- True 0° shoulder milling platform.
- Aggressive ramping capability up to 12.5° with end mills with a diameter of .625".
- Optimized chip gash for improved cutter stability and chip flow.
- Well-guided internal coolant supply to the cutting edge.
- Best-in-class milling grade WS40PM boosts productivity when machining stainless steel and high-temp alloys.

- **Ap Capabilities:** Up to .453"
- **Screw-On End Mills:** .75–1.5"
- **Weldon® End Mills:** .625–1.25"
- **Cylindrical End Mills:** .5–1.25"
- **Shell Mills:** 1.5–4"
- **Helical Cutters:** 1–2"
- **M4000 Cartridge Milling System:** 6–12"



Geometries for all material groups in shoulder milling applications.

★ -ALP

N

Roughing and finishing of aluminum alloys. High precision. Periphery ground.

★ -PCD

N

Roughing and finishing of aluminum alloys. Abrasive non-ferrous materials. High precision. Periphery ground.

★ -ML

P M S H

Light machining and finishing. First choice for stainless steel and titanium. Periphery ground.

★ -MM

P M K S H

Medium machining. First choice for general purpose. Precision pressed to size.

★ -MH

P M K S

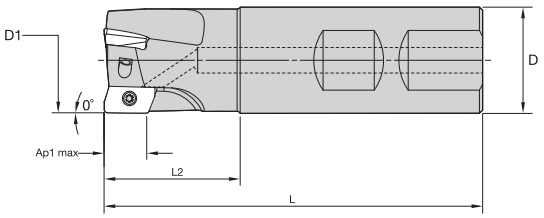
First choice for heavy-duty machining. Steel and cast iron materials. Precision pressed to size.

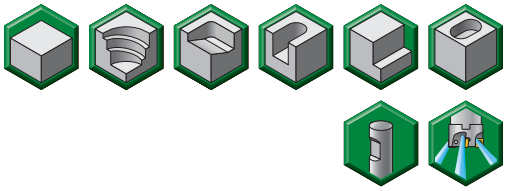
Finishing Capabilities/Lower Cutting Forces

Geometry Strengthening

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Weldon® End Mills • Inch

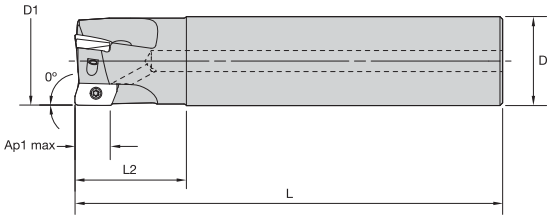


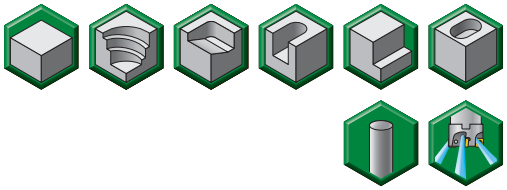


order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5416416	VSM11D062Z02W062XD11	.625	.625	2.750	.844	.454	2	12.5°	41700	Yes	.18
5416418	VSM11D075Z03W075XD11	.750	.750	3.200	1.170	.455	3	8.6°	36300	Yes	.31
6025663	VSM11D100Z03W075XD11	1.000	.750	3.250	1.220	.453	3	5.1°	29900	Yes	.37
5416419	VSM11D100Z03W100XD11	1.000	1.000	3.500	1.220	.453	3	5.1°	29900	Yes	.62
5416450	VSM11D100Z04W100XD11	1.000	1.000	3.500	1.220	.453	4	5.1°	29900	Yes	.64

NOTE: Weldon type not recommended for finishing operations.

Cylindrical End Mills (Regular and Long Version) • Inch





order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5416485	VSM11D050Z01C062XD11L400	.500	.625	4.000	.800	.461	1	4.2°	50400	Yes	.29
5416486	VSM11D062Z02C062XD11L400	.625	.625	4.000	1.000	.454	2	12.5°	41700	Yes	.28
5416487	VSM11D075Z02C075XD11L450	.750	.750	4.500	1.100	.455	2	8.6°	36300	Yes	.46
5416726	VSM11D075Z02C075XD11L670	.750	.750	6.700	1.610	.455	2	8.6°	36300	Yes	.69
5416488	VSM11D075Z03C075XD11L450	.750	.750	4.500	1.100	.455	3	8.6°	36300	Yes	.47
5416727	VSM11D075Z03C075XD11L670	.750	.750	6.700	1.610	.455	3	8.6°	36300	Yes	.70
5416489	VSM11D100Z03C100XD11L480	1.000	1.000	4.800	1.250	.453	3	5.1°	29900	Yes	.90
5416728	VSM11D100Z03C100XD11L800	1.000	1.000	8.000	2.100	.453	3	5.1°	29900	Yes	1.54
5416520	VSM11D100Z04C100XD11L480	1.000	1.000	4.800	1.250	.453	4	5.1°	29900	Yes	.92
5416729	VSM11D100Z04C100XD11L800	1.000	1.000	8.000	2.100	.453	4	5.1°	29900	Yes	1.56

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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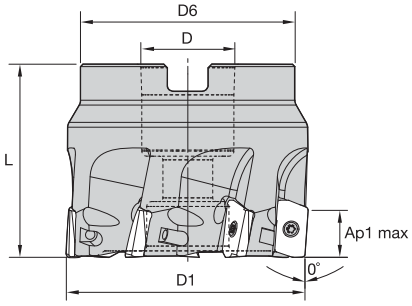
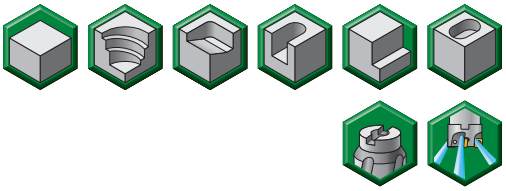
Shell Mills • Inch





order number	catalog number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5416391	**VSM11D150Z04S075XD11**	1.500	.750	1.420	1.575	.449	4	2.8°	23300	Yes	.41
5416393	**VSM11D200Z05S075XD11**	2.000	.750	1.750	1.575	.446	5	1.9°	19700	Yes	.79
5416394	**VSM11D200Z08S075XD11**	2.000	.750	1.750	1.575	.446	8	1.9°	19700	Yes	.80
5416397	**VSM11D300Z08S100XD11**	3.000	1.000	2.190	1.750	.446	8	1.2°	15700	Yes	1.96

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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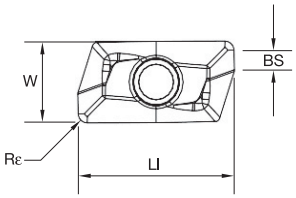
Inserts • XDCT-ALP



● first choice
○ alternate choice

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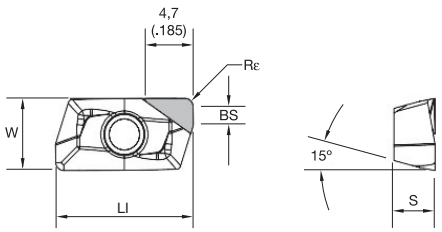
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WN10HM	WN25PM
XDCT110404PDFRALP	XDCT1101RALP	2	13,43	.529	2,09	.082	4,00	.157	6,90	.272	0,40	.016	0,02	.001	-	5417054
XDCT110408PDFRALP	XDCT1102RALP	2	13,44	.529	1,69	.067	4,00	.157	6,90	.272	0,80	.031	0,02	.001	5936171	5417053

Inserts • XDCW-PCD



● first choice
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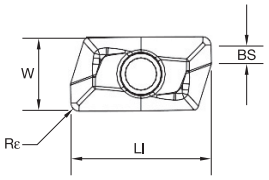
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WDN10U
XDCW110404PDFRPCD	XDCW1101RPCD	1	13,41	.528	2,22	.088	4,00	.157	6,90	.272	0,40	.016	0,02	.001	5415420

Inserts • XDCT-ML



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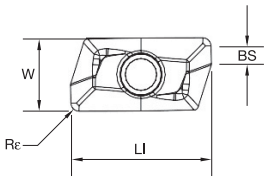
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WP25PM	WP35CM	WP40PM	WS40PM	WU35PM
XDCT110404PDERML	XDCT1101ERML	2	13,43	.529	2,09	.082	4,00	.157	6,90	.272	0,40	.016	0,04	.002	-	5536670	-	6180174	-
XDCT110408PDERML	XDCT1102ERML	2	13,44	.529	1,69	.067	4,00	.157	6,90	.272	0,80	.031	0,04	.002	5415548	-	5545065	6180173	5415546

Inserts • XDPT-MM



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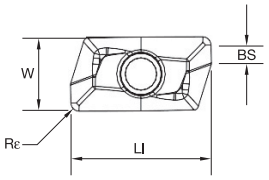
ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WP25PM	WP35CM	WP40PM	WS40PM
XDPT110404PDSRMM	XDPT1101SRMM	2	13,49	.531	2,06	.081	4,13	.163	6,94	.273	0,39	.015	0,06	.003	-	-	5642231	6180149
XDPT110408PDSRMM	XDPT1102SRMM	2	13,50	.531	1,66	.065	4,13	.163	6,94	.273	0,78	.031	0,06	.003	5415319	5415318	5545063	6180148
XDPT110412PDSRMM	XDPT1103SRMM	2	13,44	.529	1,29	.051	4,00	.157	6,90	.272	1,20	.047	0,06	.003	5415314	-	-	6180150
XDPT110416PDSRMM	XDPT1104SRMM	2	13,51	.532	0,85	.034	4,13	.163	6,95	.274	1,60	.062	0,06	.003	-	5415253	5642233	6180172
XDPT110424PDSRMM	XDPT1106SRMM	2	13,37	.526	–	–	4,01	.158	6,94	.273	2,40	.094	0,06	.003	5901355	-	-	-
XDPT110431PDSRMM	XDPT1108SRMM	2	12,94	.509	–	–	4,01	.158	6,94	.273	3,10	.122	0,06	.003	-	-	5642234	-

Inserts • XDPT-MH



● first choice
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ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	BS mm	BS in	S mm	S in	W mm	W in	Rε mm	Rε in	hm mm	hm in	WP40PM	WS40PM
XDPT110408PDSRMH	XDPT1102SRMH	2	13,44	.529	1,68	.066	4,00	.157	6,90	.272	0,79	.031	0,13	.005	5545064	-
XDPT110412PDSRMH	XDPT1103SRMH	2	13,44	.529	1,29	.051	4,00	.157	6,90	.272	1,20	.047	0,13	.005	-	6408099
XDPT110416PDSRMH	XDPT1104SRMH	2	13,44	.529	0,90	.035	4,00	.157	6,90	.272	1,59	.062	0,13	.005	5642236	-

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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M690

4-edged 0° Shoulder Mill

- Provides optimal chip evacuation, excellent shoulder finish, free cutting action, and solid tool design for optimal insert support.
- SDMX inserts — helical cutting edges for smooth cutting.
- Strong insert and tool design for maximum productivity.
- Excellent for slot and profile milling
- Four cutting edges enable excellent machining economy.

Weldon® End Mills SD1204: 1.5"

M690 SD1204..

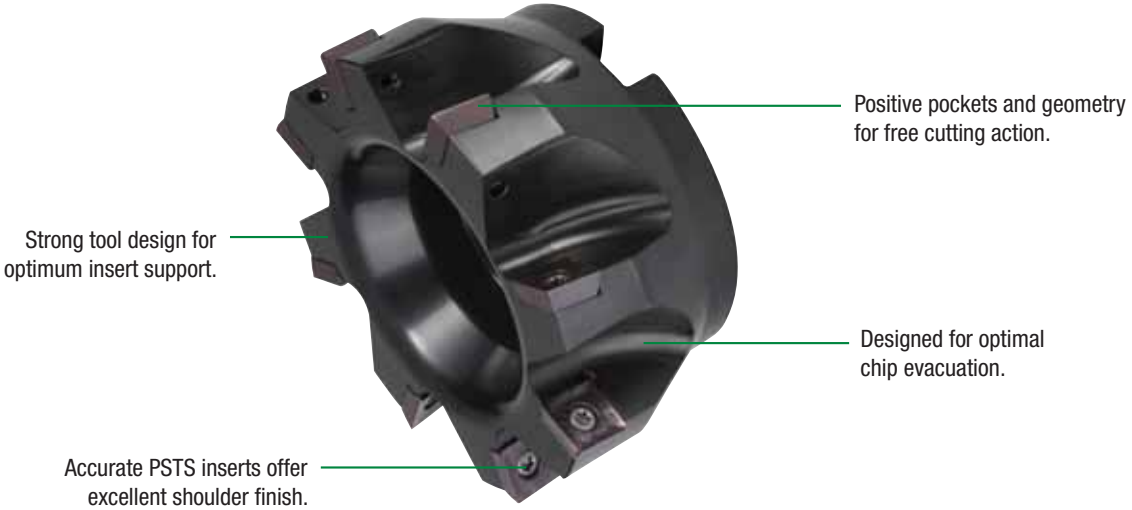
Max depth of cut: .400"

Diameter: 1.50–6"

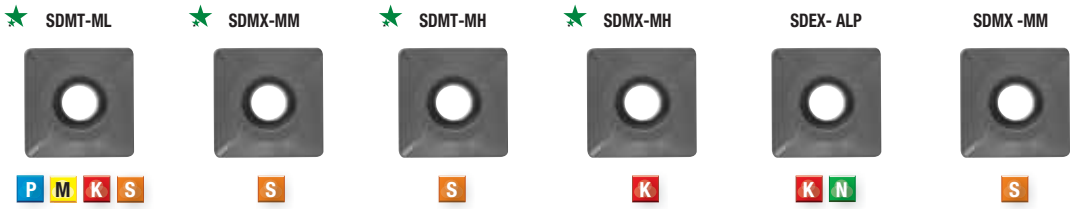
M690 SD1506..

Max depth of cut: .500"

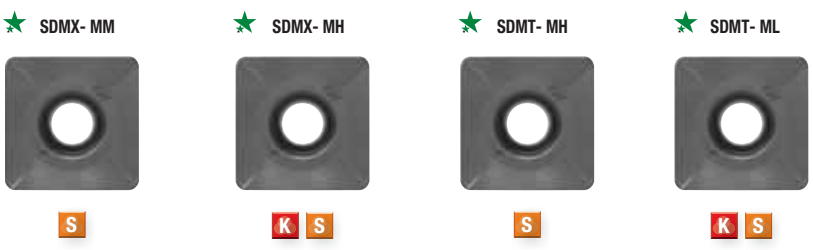
Diameter: 2–10"



SD1204.. 12mm iC Insert



SD1506.. 15mm iC insert



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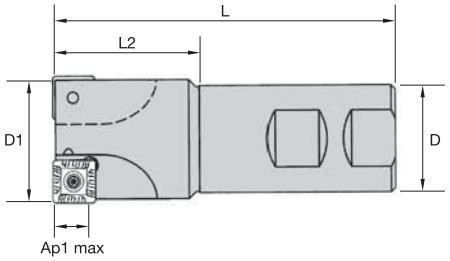
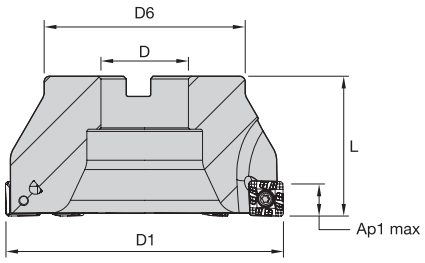
Weldon® End Mills • Inch



order number	catalog number	D1	D	L	L2	Ap1 max	Z	max RPM	coolant supply	lbs
2646782	**M690D150Z03W125SD12**	1.500	1.250	4.000	1.720	.400	3	22400	Yes	1.40

Shell Mills • Inch



order number	catalog number	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
2646785	**M690D200Z05S075SD12**	2.000	.750	1.700	1.500	.400	5	22400	Yes	.50
2646788	**M690D250Z06S100SD12**	2.500	1.000	2.200	1.750	.400	6	20000	Yes	1.35
2646790	**M690D300Z06SD12**	3.000	1.000	2.205	2.000	.400	6	17700	No	1.93

NOTE: Standard milling cutters will accept insert nose radius up to 0.79" without modification. For larger radii, clearance must be added.

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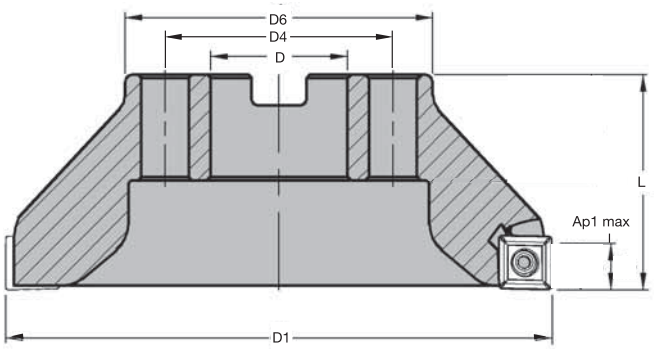
Shell Mills • Inch



order number	catalog number	D1	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
2646791	**M690D300Z06S100SD15**	3.000	1.000	—	2.300	2.000	.500	6	17700	Yes	2.00
2646793	**M690D400Z08S150SD15**	4.000	1.500	—	3.100	2.000	.500	8	15800	No	2.70

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THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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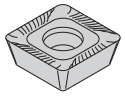
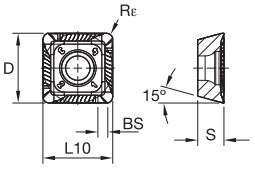
Inserts • SDMT-ML





● first choice
○ alternate choice

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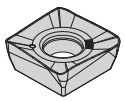
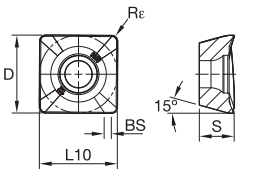
ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WS40PM
SDMT1204PDRML	**SDMT43PDRML**	4	13	.500	12,70	.500	4,77	.188	1,10	.043	1,20	.047	0,08	.003	6180319

Inserts • SDMX-MM



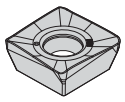


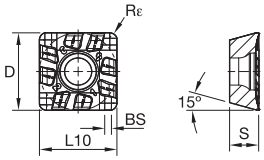
● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540
SDMX120408RMM	**SDMX432RMM**	4	13	.500	12,70	.500	4,76	.188	1,93	.076	0,80	.031	0,10	.004	3950589
SDMX120412RMM	**SDMX433RMM**	4	13	.500	12,70	.500	4,76	.188	1,50	.061	1,20	.048	0,10	.004	3950597

Inserts • SDMX-MH





● first choice
○ alternate choice

P		
M		
K		●
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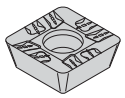
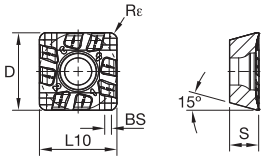
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6520
SDMX120412RMH	SDMX433RMH	4	13	.500	12,70	.500	4,76	.188	1,54	.061	1,20	.047	0,14	.006	3950614

Inserts • SDMT-MH





● first choice
○ alternate choice

P		●
M		●
K		○
N		
S		●
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540
SDMT1204PDRMH	SDMT43PDRMH	4	13	.500	12,70	.500	4,81	.189	1,10	.043	1,20	.047	0,14	.006	3326330

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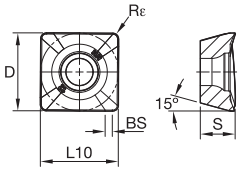
Inserts • SDMX-MM

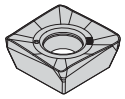


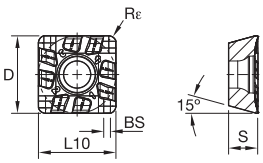
● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540
SDMX150612RMM	SDMX543RMM	4	16	.625	15,88	.625	6,35	.250	1,45	.057	1,20	.047	0,14	.006	3949807

Inserts • SDMX-MH



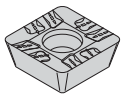


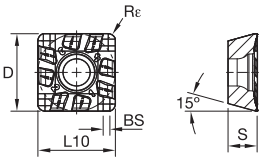
● first choice
○ alternate choice

P	●	
M	●	
K	○	●
N		
S	●	
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540	WK15CM
SDMX150612RMH	SDMX543RMH	4	16	.625	15,88	.625	6,35	.250	1,45	.057	1,20	.047	0,20	.008	3949811	5427426
SDMX150616RMH	SDMX544RMH	4	16	.625	15,88	.625	6,35	.250	1,51	.059	1,60	.063	0,20	.008	-	6052028

Inserts • SDMT-MH





● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540
SDMT1506PDRMH	SDMT54PDRMH	4	16	.625	15,88	.625	6,35	.250	1,10	.043	1,20	.047	0,20	.008	3378676

90° HIGH-SPEED CUTTING MILLS

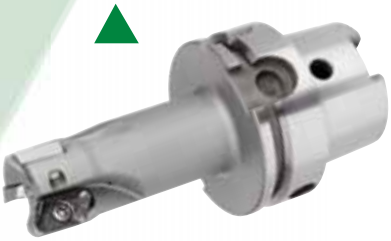
VHSC

Pages A40–A43

Developed to achieve high-speed cutting of aluminum components

ALL-STAR

AEROSPACE TECHNOLOGY



VHSC milling tools are designed for true HSC pocketing and profiling of aluminum alloy components in the aerospace industry, making it a first choice for components like airframe floor brackets.

AEROSPACE

WIDIA™ offers machining strategies and innovative tooling technology specifically engineered for the aerospace industry to increase productivity and reduce costs.

TO SEE ALL PRODUCTS LINES, VISIT OUR DIGITAL RESOURCES

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Download for iOS or Android:
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WIDIA™

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VHSC

High-speed cutter for aluminum components

- Developed specifically to achieve true HSC cutting of aluminum components.
- Latest cutter body technology allows for heavy feeding and ramping.
- Flutes and internal coolant channels engineered to support improved chip evacuation.
- Best-in-class solution for thin-walled machining.
- Productivity booster up to 525 in^3/min MRR.
- First choice for non-ferrous materials.
- Wear-resistant micro-grain carbide grade on inserts.

Up to vc = 9843 SFM

High-Speed Cutting

Cylindrical End Mills: 1–1.5"

High-Speed Cutting Monoblocks: .98–1.97"

High-Speed Shell Mills: 1.5–4"

High-Speed Cutting Inserts XDET-ALP

★ **FR-ALP**

N

Sharp cutting edge "F" preparation for roughing and finishing jobs.

★ **ER-ALP**

N

Honed cutting edge "E" preparation for heavy roughing jobs and demanding castings.

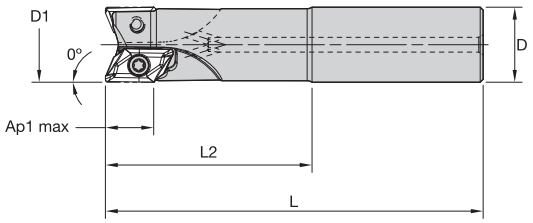
Finishing Capabilities/Lower Cutting Forces

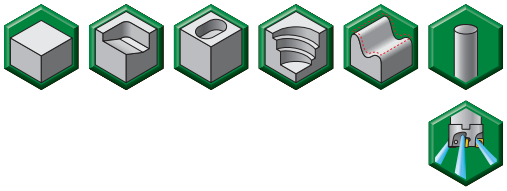
Geometry Strengthening

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Cylindrical End Mills • Inch

Pre-Balanced at
G6.3/30000 RPM

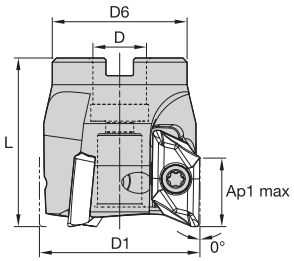


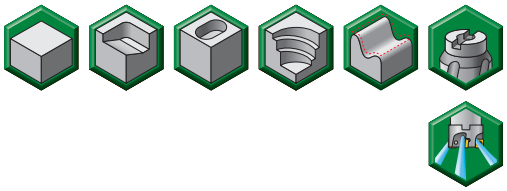


order number	catalog number	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
6425425	**VHSC100Z02C100XD16**	1.000	1.000	5.030	2.750	.630	2	14.7°	50000	Yes	.87

NOTE: Pre-balanced to G6.3/30,000 RPM.

Shell Mills • Inch





order number	catalog number	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
6425430	**VHSC200Z04S075XD16**	2.000	.750	1.772	1.575	.630	4	7.7°	30000	Yes	.62
6425432	**VHSC300Z05S100XD16**	3.000	1.000	1.969	1.969	.630	5	4.6°	23000	Yes	1.78
6425433	**VHSC400Z05S125XD16**	4.000	1.250	2.441	1.969	.630	5	3.7°	23000	Yes	3.51

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

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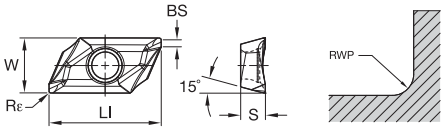
Inserts • XDET-ALP



● first choice
○ alternate choice

P		
M		
K		
N		●
S		
H		

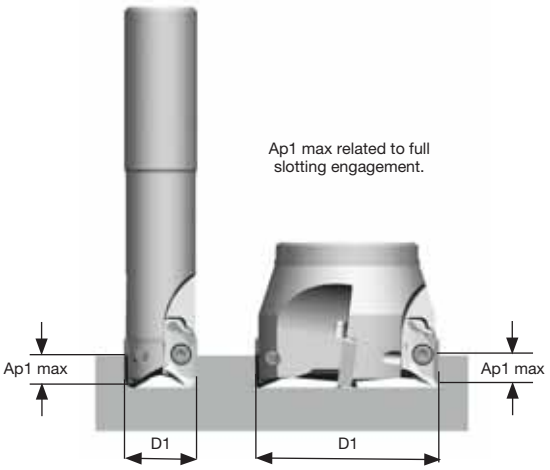
WIDIA VICTORY

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	W mm	W in	BS mm	BS in	Rε mm	Rε in	RWP* mm	RWP* in	hm mm	hm in	WN10HM
XDET16M5PDFRALP	XDET16M5PDFRALP	2	22,92	.902	5,00	.197	11,25	.443	1,42	.056	0,30	.010	0,30	.010	0,02	.001	6425772
XDET16M504FRALP	XDET16M504FRALP	2	23,02	.906	5,00	.197	11,25	.443	1,27	.050	0,40	.020	0,40	.020	0,02	.001	6425773
XDET16M508FRALP	XDET16M508FRALP	2	23,02	.906	5,00	.197	11,25	.443	0,87	.034	0,80	.032	0,80	.032	0,02	.001	6425774
XDET16M520FRALP	XDET16M520FRALP	2	23,02	.906	5,00	.197	11,25	.443	0,58	.023	2,10	.083	2,00	.079	0,02	.001	6425775
XDET16M530FRALP	XDET16M530FRALP	2	23,02	.906	5,00	.197	11,25	.443	0,48	.019	3,10	.123	3,00	.118	0,02	.001	6425777

NOTE: RWP = Resultant workpiece radius.*

▼ Ap1 max at Full Slotting

cutting diameter (D1)	Number of inserts Z	Ap1 max
1.000	2	.300
1.250	2	.435
1.250	3	.240
1.500	3	.350
2.000	4	.350
2.500	4	.435
3.000	5	.435
4.000	5	.435



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THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
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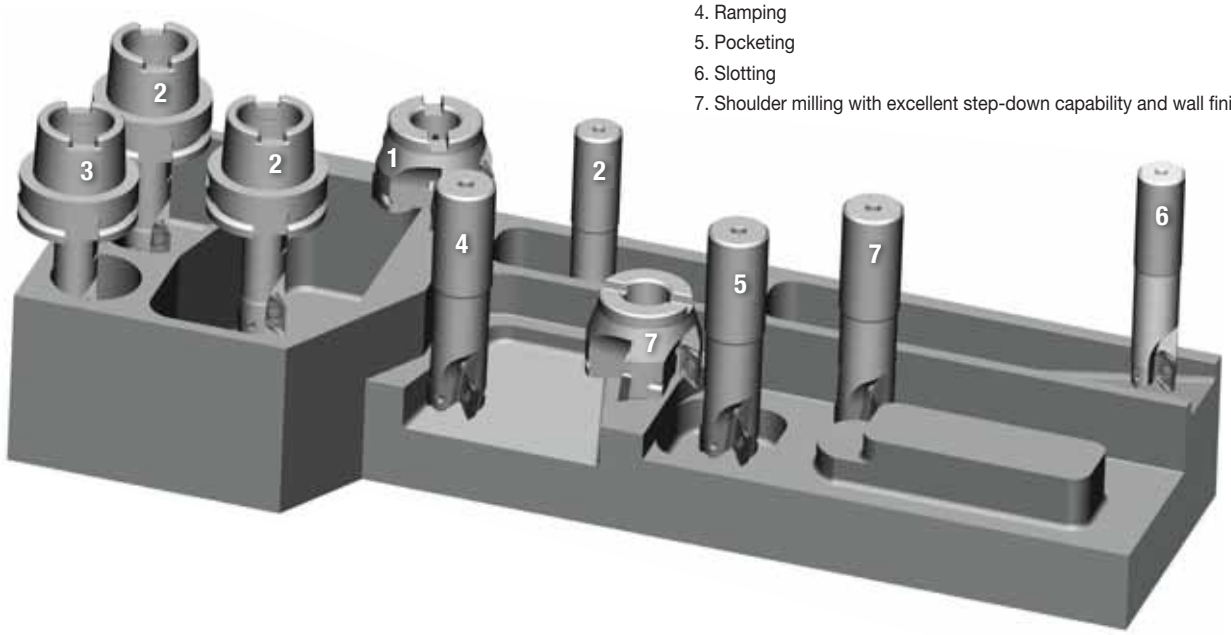
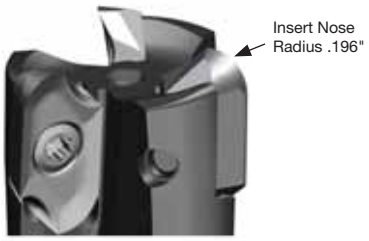
Applications

1. Face milling
2. First choice for deep pocketing and thin wall machining
3. Boring by circular interpolation into full material
4. Ramping
5. Pocketing
6. Slotting
7. Shoulder milling with excellent step-down capability and wall finish

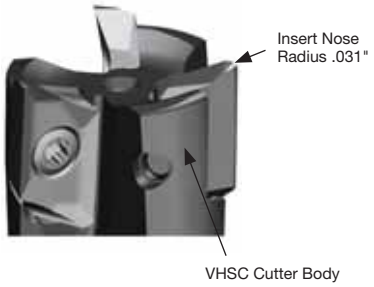


User-friendly Setup Makes a Big Difference

Large Corner Radius

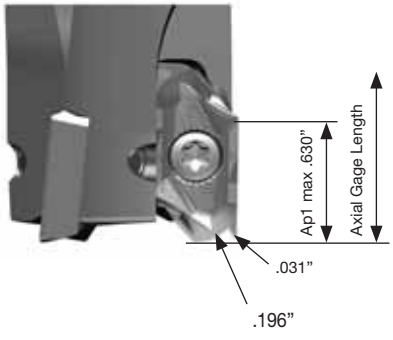


Small Corner Radius



- Unique feature has a great impact on significant cost savings.
- Only one cutter body needed to load inserts with corner nose radii from R.020" to R.236" max.
- All other suppliers require modification and rebalance of the cutter body.

Insert Overlay



- Axial gage length on the cutter body will always be the same, no matter which insert nose radius is applied.
- Preferred by CNC programmers and operators.
- Ap1 max will always remain .630", no matter which insert nose radius is applied.

FACE MILLS

M1200 MINI

Pages A46–A49

- .500 IC
- Ap1 max up to .185"

M1200

Pages A50–A55

- .625 IC
- Ap1 max up to .240"

ALL-STAR

TURBINE BLADE MACHINING WITH M1200 MINI

ENERGY

M1200 MINI HF

12 True Cutting Edges

15° Lead

Insert HN.J0704

Ap1 max = 0.068"

High Feed Face Mill

M1200 MINI 45º

12 True Cutting Edges

45° Lead

Insert HN.J0704

Ap1 max = 0.138"

M1200 MINI 30º

12 True Cutting Edges

60° Lead

Insert HN.J0704

For Higher Axial DOC

Ap1 max = 0.185"

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M1200 Mini

Best-in-class face milling platform to boost productivity on taper 40 spindle milling machines and driven tools.

- First choice for low depth of cut face milling.
- Low cost per edge and high productivity.
- Reduced cutting forces due to soft cutting action.
- Significantly increased Metal Removal Rates (MRR).
- Excellent tool life in light to heavy machining.
- Shorter machining cycle times.

Latest soft cutting edge insert design for all material groups

★ FNLDJ	★ ENLD	★ SNGD	★ SNHD
			
N	P M K S	P M K S	P M K S
Machining Aluminum	Light Machining	General Purpose	Heavy Machining

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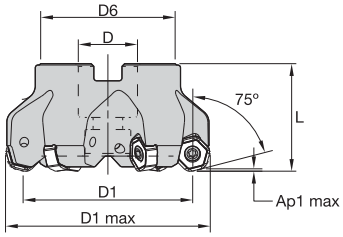
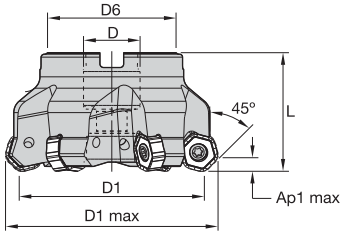
15° • High Feed • Shell Mills • Inch



order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
4136457	**M1200HF150Z05S050HN07**	1.500	2.057	.750	1.440	1.575	.068	5	15800	Yes	.57
4136458	**M1200HF200Z05S075HN07**	2.000	2.557	.750	1.750	1.575	.068	5	12500	Yes	1.12

45° • Shell Mills • Inch



order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
3954485	**M1200D200Z04S075HN07**	2.000	2.343	.750	1.750	1.575	.138	4	12500	Yes	1.00
3954486	**M1200D200Z05S075HN07**	2.000	2.343	.750	1.750	1.575	.138	5	12500	Yes	1.02
3954491	**M1200D300Z05S100HN07**	3.000	3.343	1.000	2.189	1.750	.138	5	8300	Yes	2.00
3954492	**M1200D300Z08S100HN07**	3.000	3.343	1.000	2.189	1.750	.138	8	8300	Yes	2.25

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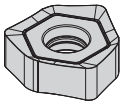
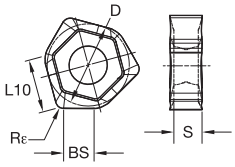
45° • Inserts • XNGJ-LD3 Wiper



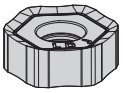


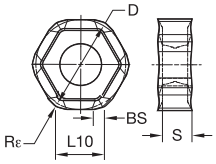
● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540
XNGJ0704ANENLD3W	XNGJ0704ANENLD3W	3	13	.500	6,78	.267	4,47	.176	6,78	.267	1,30	.051	0,08	.003	3954427

15°/75 • 45°• 30°/60° Inserts • HNGJ-LDJ



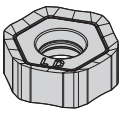


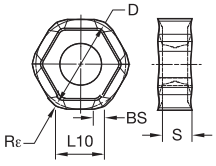
● first choice
○ alternate choice

P		
M		
K		
N	●	●
S		
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6501	THM-U
HNGJ0704ANFNLDJ	HNGJ0704ANFNLDJ	12	13	.500	6,80	.268	4,48	.176	1,60	.064	1,20	.047	0,08	.003	3954414	3954332

15°/75 • 45°• 30°/60° Inserts • HNGJ-LD



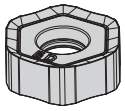


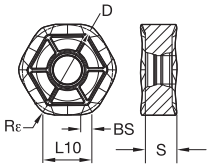
● first choice
○ alternate choice

P			●	●	●	○
M			●	●	●	●
K	●	○	○			
N						
S			●	●	○	●
H				○		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6520	TN6540	WP25PM	WP40PM	WS40PM
HNGJ0704ANENLD	HNGJ0704ANENLD	12	13	.500	6,80	.268	4,48	.176	1,60	.064	1,20	.047	0,08	.003	3954420	3954422	5895291	5550905	6180295

15°/75 • 45°• 30°/60° Inserts • HNPJ-GD



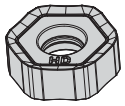


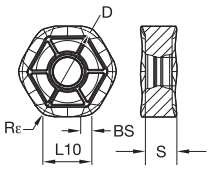
● first choice
○ alternate choice

P		●	●		●	●	●	○										
M		●	○		●	●	●	●										
K		○	○	●	○													
N																		
S		●			●	●	○	●										
H					○													

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WP40PM	WS40PM
HNPJ0704ANSNGD	HNPJ0704ANSNGD	12	13	.500	6,80	.269	4,45	.175	1,27	.050	1,20	.047	0,10	.004	3954474	3954475	5427374	5895293	5895294	5550906	6180297

15°/75 • 45°• 30°/60° Inserts • HNPJ-HD





● first choice
○ alternate choice

P		●	●	●	○													
M		●	○	●	●													
K		○	○															
N																		
S		●		○	●													
H																		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6540	TN7535	WP40PM	WS40PM
HNPJ0704ANSNHD	HNPJ0704ANSNHD	12	13	.500	6,80	.269	4,41	.174	1,25	.049	1,20	.047	0,14	.006	3954479	-	5550907	6180299
HNPJ070432ANSNHD	HNPJ070432ANSNHD	12	13	.500	6,80	.269	4,42	.174	—	—	3,20	.126	0,14	.006	-	3954484	-	-

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

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M1200

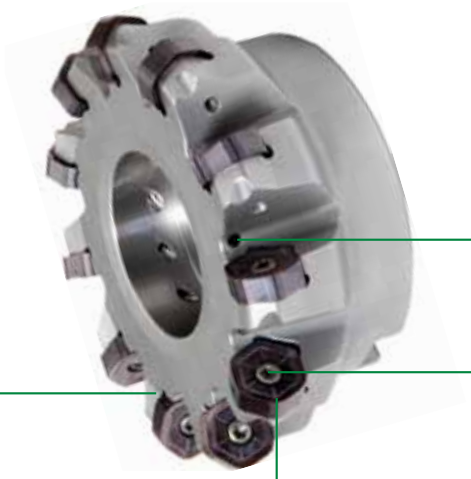
Best-in-class face milling platform to boost productivity on taper 50 spindle milling machines and driven tools.

- Low cost per edge, high productivity solution.
- High feed rates for rough face milling.
- 75°, 45°, and 31° lead angles.
- One series meets every face milling need.
- Available in WIDIA™ premium milling grades.
- Better tool life in light to heavy machining.

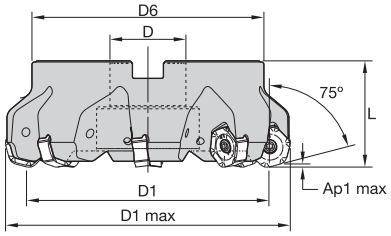
Materials:

P M K N S H

12 Effective cutting edges

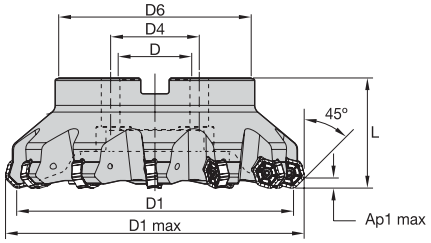


15° • High Feed • Shell Mills • Inch



order number	catalog number	D1	D1 max	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
3954512	M1200HF300Z06S100HN09	3.000	3.704	1.000	2.189	1.750	.087	6	7400	Yes	2.23
3954563	M1200HF400Z08S150HN09	4.000	4.703	1.500	3.661	1.750	.086	8	5800	Yes	3.96

45° • Shell Mills • Inch



order number	catalog number	D1	D1 max	D	D4	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
3323871	M1200D200Z04S075HN09	2.000	2.434	.750	—	1.750	1.570	.177	4	12500	Yes	.81
3323872	M1200D200Z05S075HN09	2.000	2.434	.750	—	1.750	1.570	.177	5	12500	Yes	.82
3650540	M1200D300Z05S100HN09	3.000	3.433	1.000	—	2.189	1.750	.177	5	8300	Yes	1.86
3323875	M1200D300Z06S100HN09	3.000	3.433	1.000	—	2.189	1.750	.177	6	8300	Yes	1.79
3650541	M1200D400Z06S125HN09	4.000	4.432	1.250	—	2.722	1.750	.177	6	6300	Yes	3.17
3954508	M1200D1000Z20S250HN09	10.000	10.433	2.500	4.000	7.120	2.380	.177	20	2510	Yes	24.52

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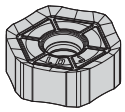
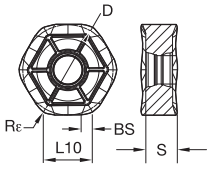
15°/75 • 45°• 30°/60° Inserts • HNGJ-LDJ



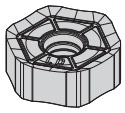


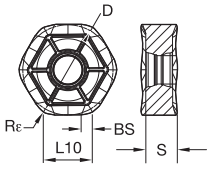
● first choice
○ alternate choice

P	
M	
K	
N	● ●
S	
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6501	THM-U
HNGJ0905ANFNLDJ	HNGJ535ANFNLDJ	12	16	.625	8,58	.338	5,56	.219	1,80	.071	1,20	.047	0,02	.001	3865373	3606383

15°/75 • 45°• 30°/60° Inserts • HNGJ-LD



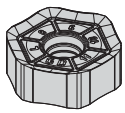


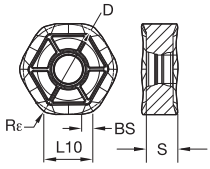
● first choice
○ alternate choice

P	● ○
M	● ●
K	● ○
N	
S	● ●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6520	TN6540	WS40PM
HNGJ0905ANENLD	HNGJ535ANENLD	12	16	.625	8,58	.338	5,56	.219	1,80	.071	1,20	.047	0,05	.002	3093559	3030034	6180276

15°/75 • 45°• 30°/60° Inserts • HNPJ-GD





● first choice
○ alternate choice

P		●	●		●	●	● ○
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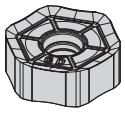
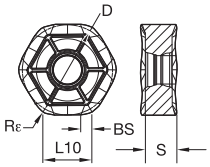
N							
S		●			●	●	○ ●
H					○		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6520	TN6540	TN7535	WK15CM	WP25PM	WP35CM	WP40PM	WS40PM
HNPJ0905ANSNGD	HNPJ535ANSNGD	12	16	.625	8,58	.338	5,56	.219	1,80	.071	1,20	.047	0,10	.004	3761185	3761187	3761188	5427372	5895374	5895375	5550908	6180278

15°/75 • 45°• 30°/60° Inserts • HNGJ-GD



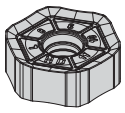


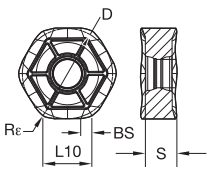
● first choice
○ alternate choice

P		●	●	●		●	●	○											
M		○	●	○		●	●	●											
K		○	○	○	●														
N																			
S			●			●	○	●											
H																			

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6525	TN6540	TN7535	WK15CM	WP35CM	WP40PM	WS40PM
HNGJ0905ANSNGD	HNGJ535ANSNGD	12	16	.625	8,58	.338	5,56	.219	1,80	.071	1,20	.047	0,10	.004	3614650	3037596	3093721	5427370	5895349	5895350	6180280

15°/75 • 45°• 30°/60° Inserts • HNPJ-HD





● first choice
○ alternate choice

P			●		●	●	●	○											
M			●		●	●	●	●											
K		●	○	●	○														
N																			
S			●		●	●	○	●											
H					○														

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6520	TN6540	WK15CM	WP25PM	WP35CM	WP40PM	WS40PM
HNPJ090543ANSNHD	HNPJ53511ANSNHD	12	16	.625	8,50	.334	5,44	.214	—	—	4,34	.171	0,13	.005	-	-	-	5895378	5895379	5895380	6180294
HNPJ0905ANSNHD	HNPJ535ANSNHD	12	16	.625	8,59	.338	5,46	.215	1,66	.065	1,20	.047	0,18	.007	3670864	3670842	5427371	-	-	5550909	6180279

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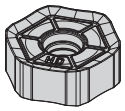
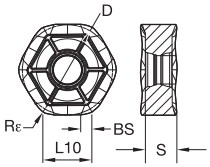
15°/75 • 45°• 30°/60° Inserts • HNGJ-HD



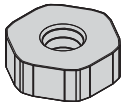


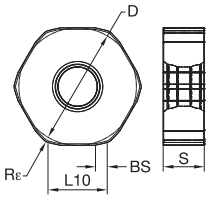
● first choice
○ alternate choice

P		●	●	○															
M		○	●	●															
K		○	○																
N																			
S			●	●															
H																			

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6525	TN6540	WS40PM
HNGJ090543ANSNHD	HNGJ53511ANSNHD	12	16	.625	8,50	.334	5,44	.214	—	—	4,35	.171	0,20	.008	-	-	6180292
HNGJ0905ANSNHD	HNGJ535ANSNHD	12	16	.625	8,59	.338	5,46	.215	1,66	.065	1,20	.047	0,17	.007	3563901	3563902	-

15° • 45° • 60° • Inserts • HNEW-AN





● first choice
○ alternate choice

P																			
M																			
K				●															
N																			
S																			
H																			

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	WK25YM
HNEC0905ANSN	HNEC535ANSN	12	16	.625	9,17	.361	5,56	.219	1,95	.077	1,20	.047	0,19	.008	5910033

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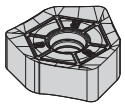
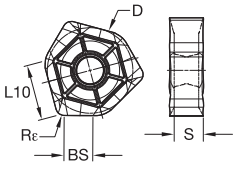
45° • Inserts • XNGJ-GD3 Wiper





● first choice
○ alternate choice

P		●	●
M		●	●
K	●	○	○
N			
S		●	●
H			○

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	L10 mm	L10 in	S mm	S in	BS mm	BS in	Rε mm	Rε in	hm mm	hm in	TN6510	TN6540	WP25PM
XNGJ0905ANSNGD3W	XNGJ535ANSNGD3W	3	16	.625	9,60	.377	5,51	.217	6,00	.230	1,60	.063	0,09	.004	3117962	3066479	5895381

COPY MILLS

VXF™

Pages A58–A60

4-Edged, Victory™ X-Feed™ Mill

M370™

Pages A62–A67

Double-sided high-feed rougher
with 6 edges per insert.

ALL-STAR

M200™

Pages A68–A73

8 cutting edges

M100™

Pages A74–A78

Thick inserts for reliability and higher MRR

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VXF™

VXF is a high-feed productivity booster designed to establish new industry standards with market-leading milling grades.

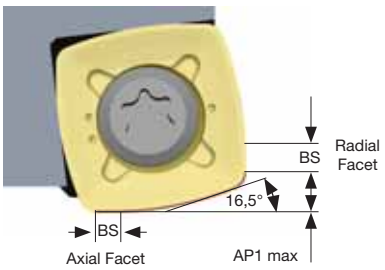
- 16.5° lead angle redistributes cutting forces in the spindle z-axis direction.
- PSTS inserts for powerful low cost per edge high-feed milling.
- Cutters with internal coolant supply.
- Greatly reduces tool deflection and vibrations for improved tool life.
- Suitable for long tool reach.
- Unique integrated radial wiping facet to achieve a nice wall finish at pocket and helical interpolation milling.
- Durable cutting edges qualified to machine a wide range of materials.

VXF-12:

Ap1 max: .098"

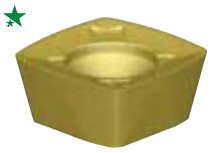
fz max: .078" IPT

Perfect combination of round and square insert style.



Specifically engineered chipbreakers for powerful high-feed milling.

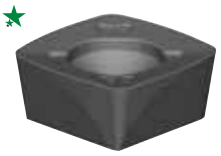
-MM



P M S

First choice for Soft Steel, Stainless Steel, and High-Temp Alloys. Best fit for pocketing and profiling operations.

-MH



P

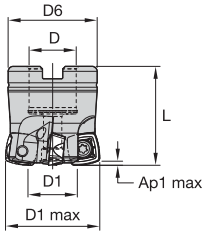
First choice for P3 and P4 materials. Stronger edge protection for heavy roughing jobs.

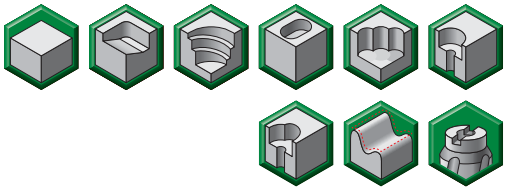
Lower Cutting Forces

Geometry Strengthening/Stronger Cutting Edge Protection

= ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Shell Mills • Inch





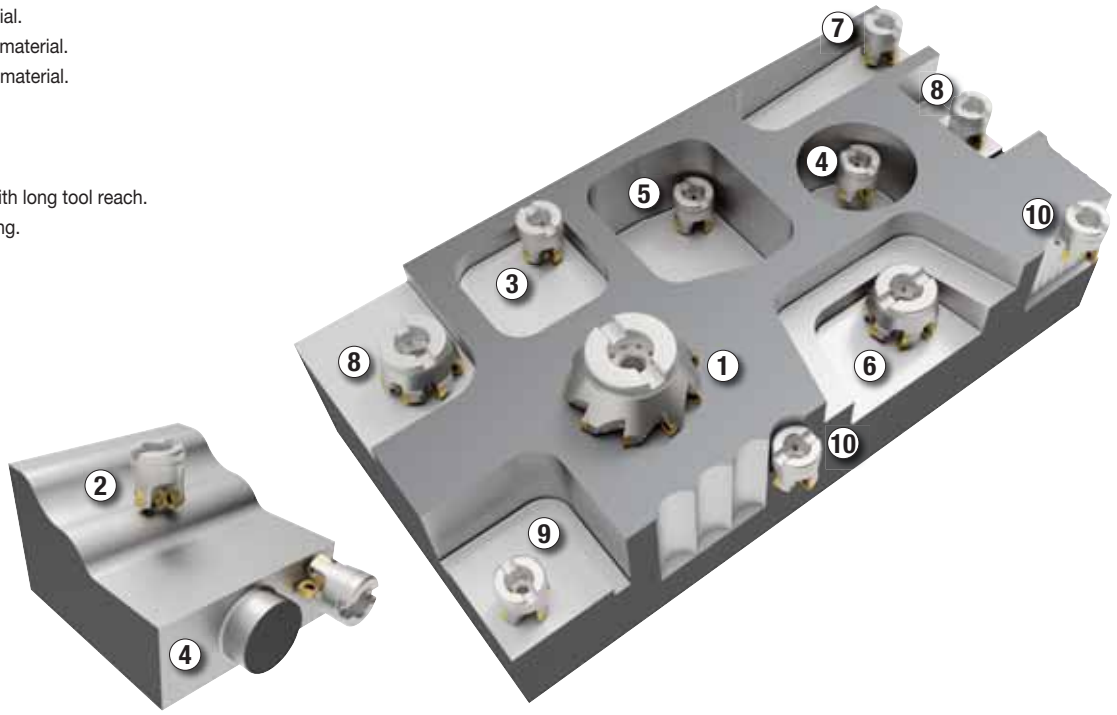
order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
6596763	**VXF150Z04S075XD12**	1.500	.785	.750	1.417	1.575	.098	4	1.0	27500	Yes	.38
6596764	**VXF200Z05S075XD12**	2.000	1.284	.750	1.811	1.575	.098	5	.9	22500	Yes	.69
6596765	**VXF200Z06S075XD12**	2.000	1.284	.750	1.811	1.575	.098	6	.9	22500	Yes	.72
6596766	**VXF250Z05S100XD12**	2.500	1.784	1.000	1.969	1.575	.098	5	.6	19500	Yes	.92
6596768	**VXF300Z05S100XD12**	3.000	2.283	1.000	2.087	1.969	.098	5	.5	17500	Yes	1.56
6596769	**VXF300Z08S100XD12**	3.000	2.283	1.000	2.087	1.969	.098	8	.5	17500	Yes	1.76

FOR MORE INFORMATION ON THE PRODUCTS SHOWN, PLEASE SEE PAGES F4–F45 OF THE TECHNICAL CATALOG.

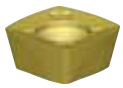
THE ALL-STAR PROGRAM FEATURES ONLY THE MOST POPULAR PLATFORMS, GRADES, AND SIZES.
FOR THE COMPLETE OFFERING, VISIT WIDIA NOVO™ OR WIDIA.COM.

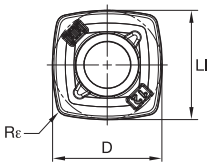
Applications

1. Face milling.
2. 3D profile milling.
3. Pocket milling into full material.
4. Helical interpolation into full material.
5. Deep pocket milling into full material.
6. Dynamic/trochoidal milling.
7. Aggressive ramp milling.
8. Contour Milling.
9. Face milling deep cavities with long tool reach.
10. Z-axis contour plunge milling.



Inserts • XDPT-MM • Best Fit for Pocketing and Profiling Operations



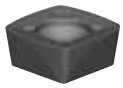


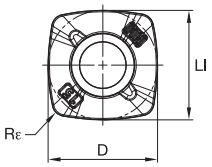
● first choice
○ alternate choice

P	●	○
M	●	●
K	○	
N		
S	●	●
H		

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	D mm	D in	Rε mm	Rε in	WP25PM	WS40PM
XDPT120512ERMM	XDPT120512ERMM	4	12,70	.500	5,56	.219	12,70	.500	1,20	.047	6596438	6596439

Inserts • XDPT-MH • Dedicated Geometry for Heavy Roughing





● first choice
○ alternate choice

P	●
M	●
K	
N	
S	○
H	

ISO catalog number	ANSI catalog number	cutting edges	LI mm	LI in	S mm	S in	D mm	D in	Rε mm	Rε in	WP40PM
XDPT120515SRMH	XDPT120515SRMH	4	12,70	.500	5,56	.219	12,70	.500	1,50	.059	6596440

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Designed to Make Your Workplace More Productive

WIDIA™ X-Feed™

WIDIA-branded X-Feed tooling was created as an application-specific portfolio to remove as much material as possible in the shortest amount of time, using a shallow depth of cut to achieve higher MRR and boost productivity.

FEED → HIGH-FEED MILLING → BOOST PRODUCTIVITY

Victory™ X-Feed For Machining Stainless Steel and Titanium

AEROSPACE

70NS Series

Designed for circular plunging and ramping, 3D machining, face milling, and pocketing applications.

Victory X-Feed To Speed Up High-Feed Machining

VXF™-7 and VXF™-12 Series

VXF is a high-feed productivity booster designed to establish new industry standards with market-leading milling grades like WS40PM.

widia.com

WIDIA™

M370™

Designed for high feed rate productivity, the M370 Series provides the latest insert technology with outstanding performance and reliability. Its double-sided concept and six cutting edges provide security and optimal metal removal with an efficient cost per edge.

- Double-sided design offers six cutting edges per insert.
- Extremely high metal removal rates.
- First choice for high-feed roughing applications.

★ 8mm iC Insert WOEJ0804

Up to .049" Ap max
Diameter range 1–3"

-MM

P M S

Provides lower cutting forces, first choice for steel, stainless steel, and high-temp alloys.

-MH

P M K S

First choice for high-strength steel and cast iron.

★ 12mm iC Insert WOEJ1207

Up to .078" Ap max
Diameter range 1.5–5"

-MM

P M K S

Provides lower cutting forces, first choice for steel, stainless steel, and high-temp alloys.

-MH

P M K S

First choice for high-strength steel and cast iron.

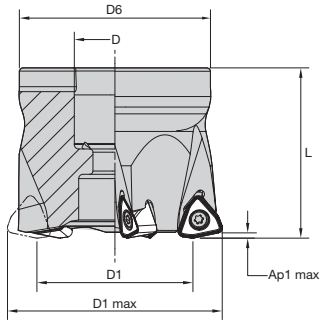
-MR

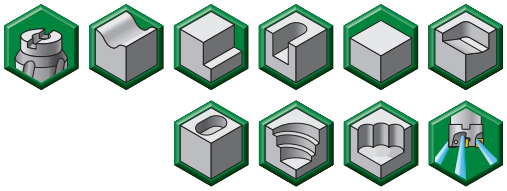
P M S

Strongest edge protection for heavy roughing jobs with ugly skin or forged steel components.

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

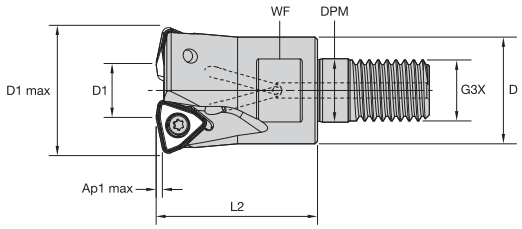
Shell Mills • Medium • Metric

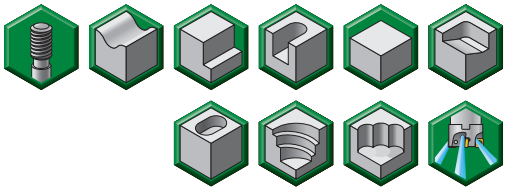




order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
4056194	M370D052Z05WO08	2.047	1.499	.866	1.732	1.968	.049	5	28600	Yes	.90

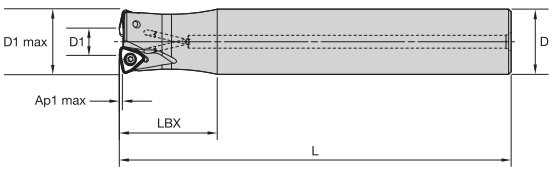
Screw-On End Mills • Medium • Inch

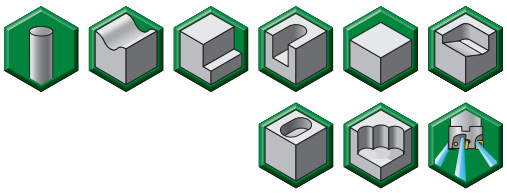




order number	catalog number	D1 max	D1	D	DPM	G3X	L2	WF	Ap1 max	Z	max RPM	coolant supply	lbs
4171164	M370D100Z03M12WO08	1.000	.460	.827	.492	M12.000	1.378	.667	.049	3	46000	Yes	.19

Cylindrical End Mills • Medium • Inch





order number	catalog number	D1 max	D1	D	L	LBX	Ap1 max	Z	max RPM	coolant supply	lbs
4047656	M370D100Z03C100WO08L600	1.000	.460	1.000	6.000	1.500	.049	3	45500	Yes	1.16

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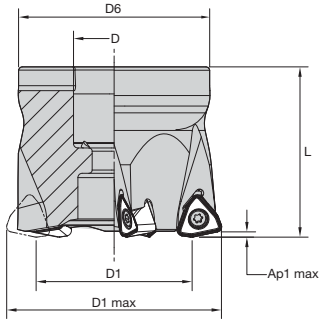
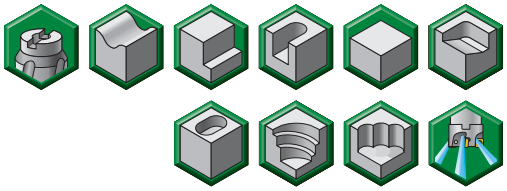
Shell Mills • Medium • Inch





order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
4047660	**M370D150Z04S050WO08**	1.500	.950	.500	1.417	1.575	.049	4	34500	Yes	.41
4047661	**M370D200Z05S075WO08**	2.000	1.450	.750	1.732	1.575	.049	5	29000	Yes	.82
4047662	**M370D200Z07S075WO08**	2.000	1.450	.750	1.732	1.575	.049	7	29000	Yes	.83

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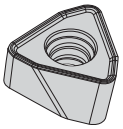
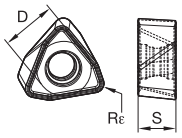
Inserts • Medium • WOEJ-MH



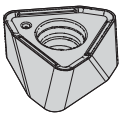


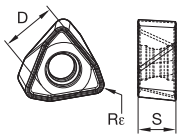
● first choice
○ alternate choice

P		●	●	●									
M		○	●	●									
K		○	○										
N													
S			●	○									
H			○										

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	Rε mm	Rε in	TN7535	WP25PM	WP40PM
WOEJ080412SRMH	WOEJ080412SRMH	6	7,79	.307	4,75	.187	1,22	.048	4068517	5564596	5544752

Inserts • Medium • WOEJ-MM



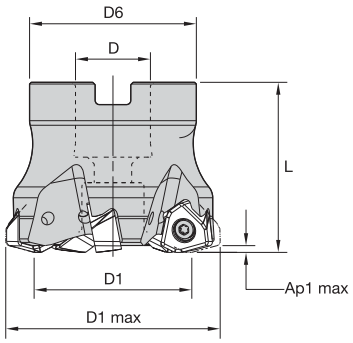


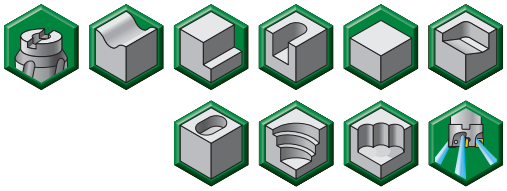
● first choice
○ alternate choice

P		●		○	●								
M		●	○	●	●								
K		○											
N													
S		●	●	●	○								
H		○											

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	Rε mm	Rε in	WP25PM	WS30PM	WS40PM	WP40PM
WOEJ080412SRMM	WOEJ080412SRMM	6	7,79	.307	4,70	.185	1,22	.048	5564597	5520248	6333665	5544753

Shell Mills • Large • Inch





order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max RPM	coolant supply	lbs
5352397	**M370D200Z04S075WO12**	2.000	1.335	.750	1.750	1.575	.078	4	19380	Yes	.69
5698432	**M370D200Z04S075WO12L200**	2.000	1.335	.750	1.750	2.000	.078	4	19380	Yes	.92
5352399	**M370D250Z05S100WO12**	2.500	1.834	1.000	2.190	1.750	.078	5	17330	Yes	1.27
5352420	**M370D300Z06S100WO12**	3.000	2.333	1.000	2.750	1.750	.078	6	15820	Yes	2.08

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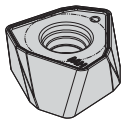
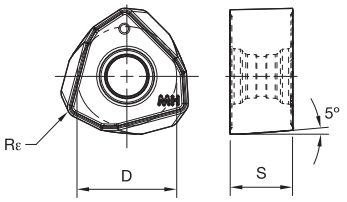
Inserts • Large • WOEJ-MH



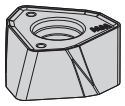


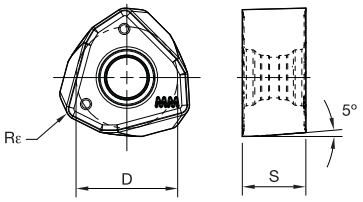
● first choice
○ alternate choice

P	●
M	○
K	● ○
N	
S	
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	Rε mm	Rε in	WK15CM	WP35CM
WOEJ120712SRMH	WOEJ120712SRMH	6	12,00	.472	7,30	.287	1,27	.050	5338860	5338862

Inserts • Large • WOEJ-MM



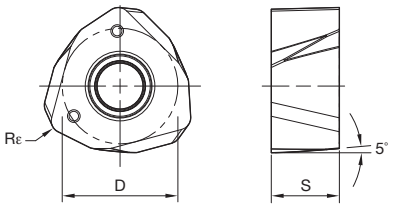


● first choice
○ alternate choice

P	●	●	●	○
M	●	●	●	●
K	○			
N				
S	●	●	○	●
H	○			

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	Rε mm	Rε in	WP25PM	WU35PM	WP40PM	WS40PM
WOEJ120712SRMM	WOEJ120712SRMM	6	12,00	.472	7,30	.287	1,27	.050	5419648	5419649	5542346	6284471

Inserts • Large • WOEJ-MR



● first choice
○ alternate choice

P	●
M	●
K	
N	
S	○
H	

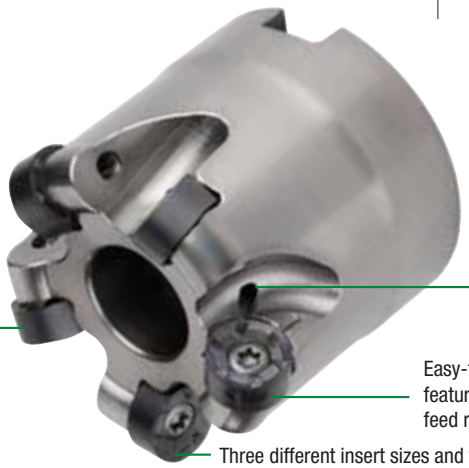
ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	Rε mm	Rε in	WP40PM
WOEJ120712SRMR	WOEJ120712SRMR	6	12,00	.472	7,10	.280	1,27	.050	5698342

M200™

- Up to 12 cutting edges per insert.
- First choice for roughing applications.
- Effective anti-rotation feature.
- Able to apply in all type of materials and milling applications.

Max depth of cut: .200"

Diameter: 1–4"



Higher clearance in bodies to permit pocketing, profiling, and 5-axis machining.

Screw-on, end mill, and shell mill cutters with internal coolant.

Easy-to-use and unique anti-rotation feature for excellent stability for higher feed rates and cutting forces.

Three different insert sizes and three insert topography styles with the new WIDIA™ Victory™ milling grades cover any type of component and application.

★ M200 iC 10

10mm iC insert
8 cutting edges

-MM

P M S

Provides lower cutting forces, first choice for steel, stainless steel, and high-temp alloys.

-MH

P M K S

First choice for high-strength steel and cast iron.

★ M200 iC 12

12mm iC insert
12 cutting edges

-MM

P M S

Provides lower cutting forces, first choice for steel, stainless steel, and high-temp alloys.

-MH

P M K S

First choice for high-strength steel and cast iron.

-MR

P K

Is designed for heavy-duty steel and cast iron applications.

M200 iC 16

16mm iC insert
12 cutting edges

-MM

P M S

First choice for general purpose, especially steel.

-ML

P M S

First choice for stainless steel and high-temp alloys.

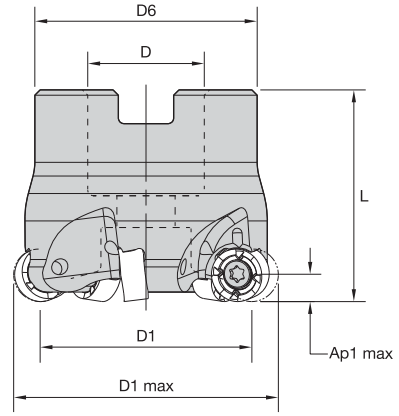
-MH

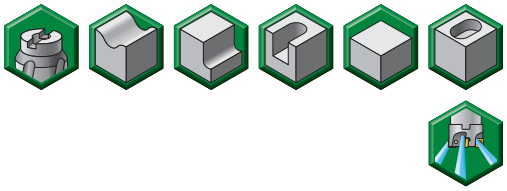
P M K S

First choice for heavy applications and cast iron.

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

Shell Mills • Inch





order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5283482	**M200D150Z05S050RN10**	1.500	1.106	.500	1.300	1.570	.200	5	.37	44300	Yes	.43
5283484	**M200D200Z06S075RN10**	2.000	1.606	.750	1.654	2.000	.200	6	.32	38300	Yes	1.02

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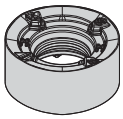
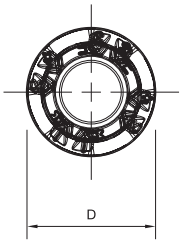
Inserts • RNPJ-MM





● first choice
○ alternate choice

P	●
M	○
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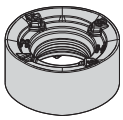
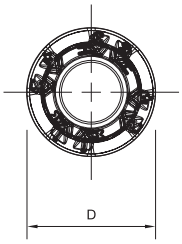
ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WP35CM
RNPJ10T3M0SMM	RNPJ10T3M0SMM	2	10,00	.394	3,93	.155	0,09	.003	5276196

Inserts • RNPJ-MH





● first choice
○ alternate choice

P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WK15CM
RNPJ10T3M0SMH	RNPJ10T3M0SMH	2	10,00	.394	3,93	.155	0,18	.007	5276243

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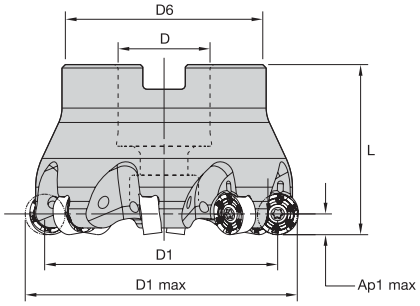
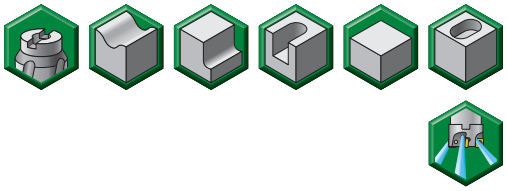
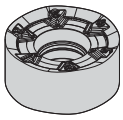
Shell Mills • Inch

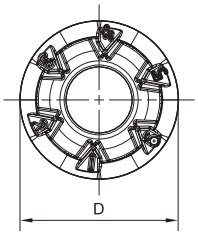




order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
5068403	**M200D200Z05S075RN12**	2.000	1.528	.750	1.750	2.000	.117	5	.40	31080	Yes	1.03
5068405	**M200D300Z08S100RN12**	3.000	2.528	1.000	2.189	2.000	.117	8	.24	25370	Yes	2.08

Inserts • RNGJ-ML



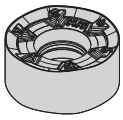


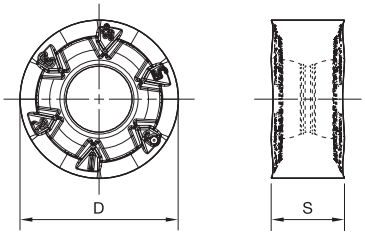
● first choice
○ alternate choice

P	○
M	●
K	
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WS40PM
RNGJ1204M0EML	RNGJ1204M0EML	2	12,00	.472	4,75	.187	0,04	.001	6408153

Inserts • RNGJ-MM



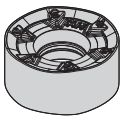


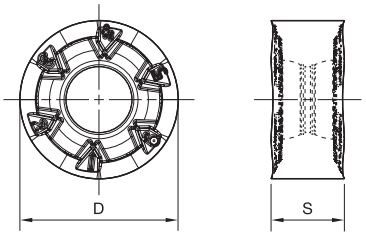
● first choice
○ alternate choice

P	●	○	●
M	●	●	●
K	○		
N			
S	●	●	●
H	○		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WP25PM	WS40PM	WU35PM
RNGJ1204M0SMM	RNGJ1204M0SMM	2	12,00	.472	4,75	.187	0,09	.003	5123867	6301432	5123868

Inserts • RNGJ-MH



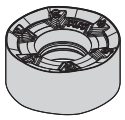


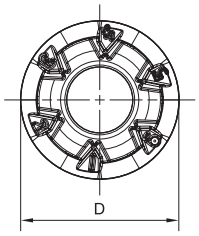
● first choice
○ alternate choice

P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WK15PM
RNGJ1204M0SMH	RNGJ1204M0SMH	2	12,00	.472	4,75	.187	0,19	.007	5123900

Inserts • RNPJ-MM





● first choice
○ alternate choice

P	●
M	●
K	
N	
S	○
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WP40PM
RNPJ1204M0SMM	**RNPJ1204M0SMM**	2	12,00	.472	4,75	.187	0,09	.003	5542329

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M100™

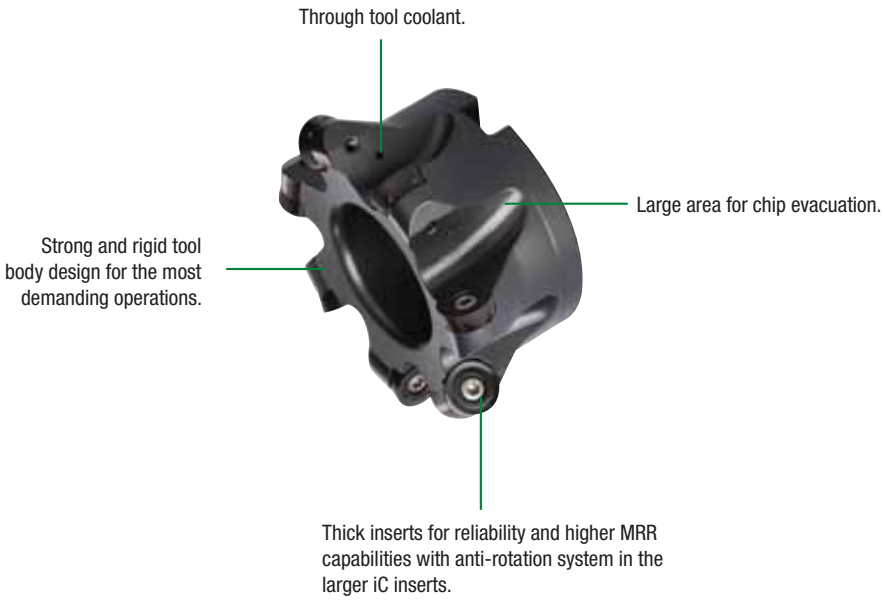
A trusted multipurpose solution for profiling and copy applications, the M100 Series ensures a reliable platform for all of your copy milling, face milling, helical interpolation, and roughing needs.

- Thick inserts ensure reliability and consistent results.
- General purpose face and copy milling.
- Anti-rotation feature for security.
- Anti-rotation systems in larger iC inserts provide higher MRR capabilities.
- Increased chip evacuation and through tool coolant for enhanced performance.

Materials:

P M K S H

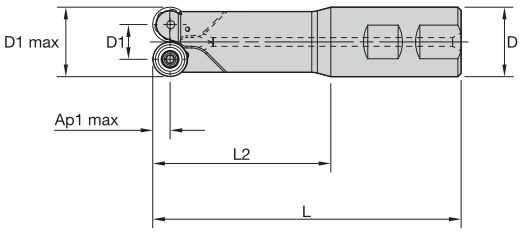
Diameter: 1–8"

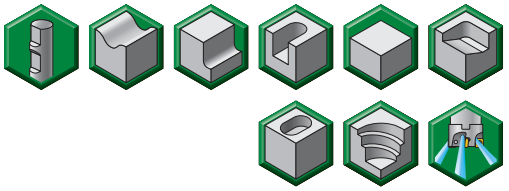


08mm iC	★ 10mm iC	★ 12mm iC	★ 16mm iC	★ 16mm iC
				
P M K S H	P M K S H	P M K S H	P M K S H	P M K S H
RD Insert Type Ground and PSTS	RD Insert Type Ground and PSTS	RD Insert Type Anti-rotation Feature Ground and PSTS	RD Insert Type Anti-rotation Feature Ground and PSTS	RC Insert Type Anti-rotation Feature Ground and PSTS

★ = ALL-STAR PORTFOLIO PRODUCT. ALL-STAR PRODUCTS ARE PROVEN SOLUTIONS THAT ARE ALWAYS AVAILABLE.

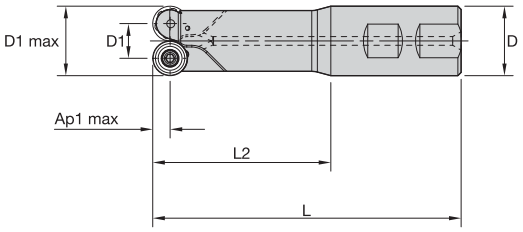
Weldon® End Mills • Inch

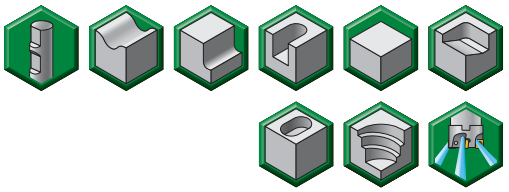




order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
2646596	M100D075Z02W075RD08L453	.750	.435	.750	4.530	2.500	.158	2	22.0	26000	Yes	.85

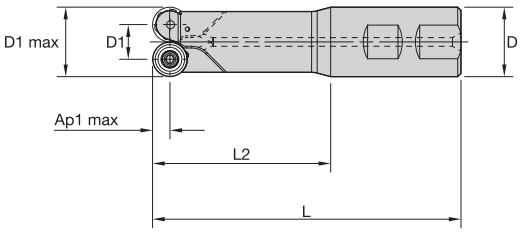
Weldon End Mills • Inch

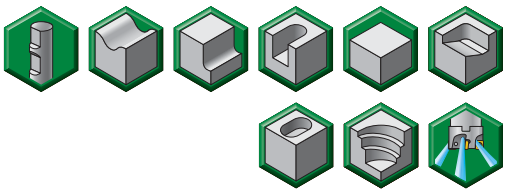




order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
2646602	M100D075Z02W100RD10L628	.750	.356	1.000	6.280	4.000	.197	2	40.0	26000	Yes	1.10

Weldon End Mills • Inch





order number	catalog number	D1 max	D1	D	L	L2	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
2646611	M100D100Z02W100RD12L553	1.000	.528	1.000	5.530	3.250	.236	2	50.0	23000	Yes	1.25
2646617	M100D125Z02W125RD12L615	1.250	.778	1.250	6.150	3.870	.236	2	23.0	19000	Yes	1.60

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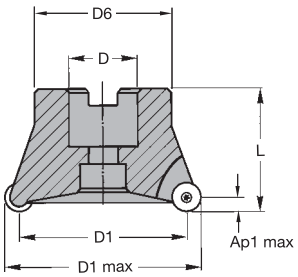
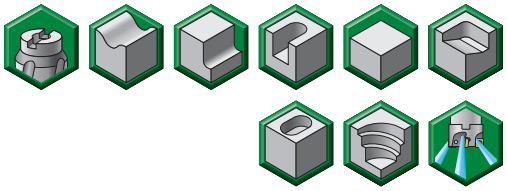
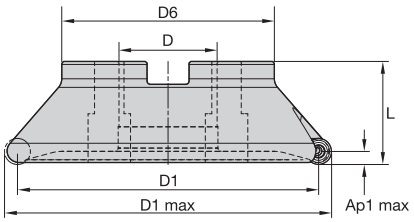
Shell Mills • Inch

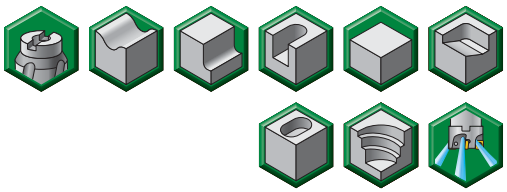




order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
2646725	**M100D200Z05S075RD12**	2.000	1.530	.750	1.700	1.630	.236	5	10.0	15000	Yes	.55

Shell Mills • Inch





order number	catalog number	D1 max	D1	D	D6	L	Ap1 max	Z	max ramp angle	max RPM	coolant supply	lbs
2646723	**M100D200Z04S075RC16**	2.000	1.370	.750	1.700	1.630	.315	4	12.0	15000	Yes	.60

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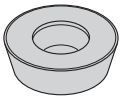
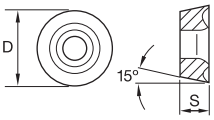
Inserts • RDMW/-T



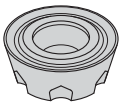


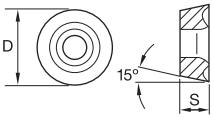
● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	TN6540
RDMW1003M0T	RDMW1003M0T	1	10,00	.394	3,18	.125	0,14	.006	3353279

Inserts • RDMT-TX



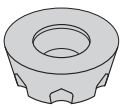


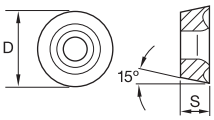
● first choice
○ alternate choice

P	●	●
M	●	○
K	○	
N		
S	●	
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	TN6540	TN7525
RDMT1204M0TX	RDMT1204M0TX	1	12,00	.472	4,76	.188	0,15	.006	2957432	2020763

Inserts • RDMW-TX



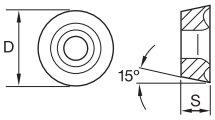


● first choice
○ alternate choice

P	
M	
K	●
N	
S	
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	WK15CM
RDMW1204M0TX	RDMW1204M0TX	1	12,00	.472	4,76	.188	0,15	.006	5427441

Inserts • RDMT-TX

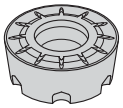


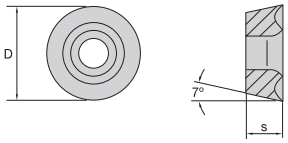
● first choice
○ alternate choice

P	●	●
M	●	○
K	○	
N		
S	●	
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	TN6540	TN7525
RDMT1605M0TX	RDMT1605M0TX	1	16,00	.630	5,56	.219	0,18	.007	■	2020767

Inserts • RCMT-43



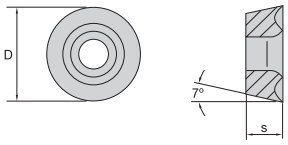


● first choice
○ alternate choice

P	●
M	●
K	○
N	
S	●
H	

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	TN6540
RCMT1606M043M	RCMT1606M043M	1	16,00	.630	6,35	.250	0,20	.008	2957537

Inserts • RCMT-TX



● first choice
○ alternate choice

P	●	●
M	●	○
K	○	
N		
S	●	
H		

ISO catalog number	ANSI catalog number	cutting edges	D mm	D in	S mm	S in	hm mm	hm in	TN6540	TN7525
RCMT1606M0TX	RCMT1606M0TX	1	16,00	.630	6,35	.250	0,24	.009	2957427	2012418

Indexable Milling Icons

	Counterboring		Spiral Circular		Face Milling		Helical Milling		Plunge Milling
	Ramping Blank		Slotting: Ball Nose		Side Milling/ Shoulder Milling: Ball Nose		Side Milling/ Shoulder Milling: Square End		Chamfer Milling
	Side Milling: Roughing		3D Profiling		3D Profiling: Inclined Square End Mill		Plain Shank		Pocketing
	Shell Mill Shank		Weldon® Shank		Weldon Shank: 2 Flat		Screw-On Shank		Through Coolant: Radial: Indexable Milling

ANSI

P Steel	K Cast Iron	S High-Temp Alloys
M Stainless Steel	N Non-Ferrous	H Hardened Materials

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	A36, 1008, 1010, 1018 through 1029; 1108, 1117
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	10L18, 1200 Series, 1213, 12L14
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	15–5 PH, 13–8 PH, 17–4 PH, 400 and 500 Series
M1	Austenitic Stainless Steel	–	<600	130–200	–	200 Series, 301, 302, 304, 304L, 309
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21
M3	Duplex Stainless Steel	–	<800	135–275	<30	323, 329, F55, 2205, S329000
K1	Grey Cast Iron	–	125–500	120–290	<32	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	60-40-18, 65-45-12, 80-55-06, SAE J434:D4018, D4512, D5506, ASTM A47: Grade 32510, 35018, SAE J158: Grade M3210, M4504, M5003, M5503, M7002, ASTMA842: Grade 250, 300, 350, 400, 450
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	ASTM A536:100-70-03, 120-90-02, SAE J434: D7003, SAE J158: Grade M8501AST A897: 125-80-10, 150-100-7, 175-125-4, 200-150-1, 230-185
N1	Wrought Aluminum	–	–	–	–	2025, 5050, 7050, 1000, 2017
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12,2%	–	–	–	2024, 6061, 7075
N3	High-Silicon Aluminum Alloys and Magnesium Alloys	Si >12,2%	–	–	–	–
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	C81500
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	–	–	–	–	–
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	Graphite, CFK, CFRP
N7	Metal Matrix Composites (MMC)	–	–	–	–	C63000
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	A-286, INCOLOY® 800 Series, A608, A567, Discaloy™, INVAR®, N-155, 16-25-6, 19-9 DL; Cast: ASTM A-297, A-351, A-567, A-608
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 25 (L605), Haynes 188, J-1570, Stellite, AiResist 213; Cast: AiResist 13, Haynes 21, MAR-M302, MAR-M509, NASA Co-W-Re, WI-52
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	Astroloy™, Hastelloy® B/C/ C-276 /X, INCONEL® 600 and 700 Series, IN102, INCOLOY 900 Series, Rene 41, Waspalloy®, Monel®, K-500, MAR-M20, NIMONIC®, UDIMET®
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Pure: Ti 98.8, Ti 98.9,Ti 99.9; Alloyed: Ti 5Al-2.5Sn, Ti6Al-4V, Ti6Al-2Sn-4Zr-2Mo, Ti-3Al-8V-6Cr-4Mo-4Zr, Ti-10V-2Fe-3Al, Ti-13V-11Cr-3Al
H1	Hardened Materials	–	–	–	44–48	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H2	Hardened Materials	–	–	–	48–55	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H3	Hardened Materials	–	–	–	56–60	Tool Steel H10, H11, H13, D2, D3, 4340, P20
H4	Hardened Materials	–	–	–	>60	Tool Steel H10, H11, H13, D2, D3, 4340, P20

DIN

P Steel	K Cast Iron	S High-Temp Alloys
M Stainless Steel	N Non-Ferrous	H Hardened Materials

material group	description	content	tensile strength RM (MPa)*	hardness (HB)	hardness (HRC)	material number
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	–	–
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	–	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	Medium- and High-Carbon Steels	C >0,25%	>530	<220	<25	ST52, S355JR, C35, GS60, Cf53
P3	Alloy Steels and Tool Steels	C >0,25%	600–850	<330	<35	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	Alloy Steels and Tool Steels	C >0,25%	850–1400	340–450	35–48	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	Ferritic, Martensitic, and PH Stainless Steels	–	600–900	<330	<35	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	–	900–1350	350–450	35–48	X102CrMo17, G-X120Cr29
M1	Austenitic Stainless Steel	–	<600	130–200	–	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	–	600–800	150–230	<25	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	Duplex Stainless Steel	–	<800	135–275	<30	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	Gray Cast Iron	–	125–500	120–290	<32	GG15, GG25, GG30, GG40, GTW40
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	–	<600	130–260	<28	GGG40, GTS35
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	–	>600	180–350	<43	GGG60, GTW55, GTS65
N1	Wrought Aluminum	–	–	–	–	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, ALMg-SiPb
N2	Low-Silicon Aluminum Alloys and Magnesium Alloys	Si <12,2%	–	–	–	GAlSiCu4, GDAlSi10Mg
N3	High-Silicon Aluminum Alloys and Magnesium Alloys	Si >12,2%	–	–	–	G-ALSi12, G-AlSi17Cu4, G-AlSi21CuNiMg
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70–100	–	–	–	–	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fiberglass	–	–	–	–	Lexan®, Hostalen™, Polystyrol, Makralon®
N6	Carbon, Graphite Composites, CFRP	–	–	–	–	CFK, GFK
N7	Metal Matrix Composites (MMC)	–	–	–	–	–
S1	Iron-Based, Heat-Resistant Alloys	–	500–1200	160–260	25–48	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Cobalt-Based, Heat-Resistant Alloys	–	1000–1450	250–450	25–48	Haynes® 188, Stellite® 6,21,31
S3	Nickel-Based, Heat-Resistant Alloys	–	600–1700	160–450	<48	INCONEL® 690, INCONEL 625, Hastelloy®, Nimonic® 75
S4	Titanium and Titanium Alloys	–	900–1600	300–400	33–48	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Hardened Materials	–	–	–	44–48	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, Hardox® 400
H2	Hardened Materials	–	–	–	48–55	–
H3	Hardened Materials	–	–	–	56–60	–
H4	Hardened Materials	–	–	–	>60	–

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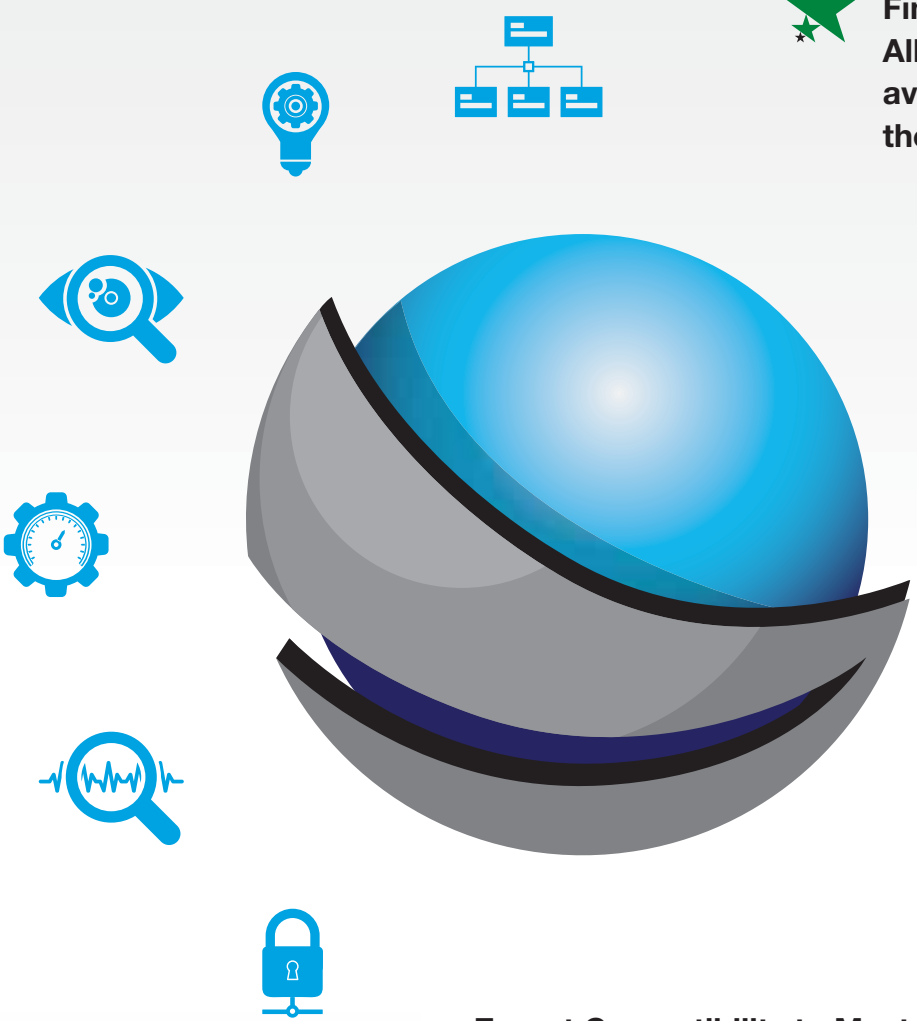

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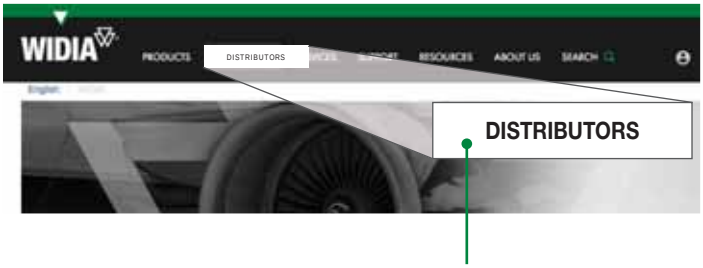

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IMPORTANT SAFETY INSTRUCTIONS: READ BEFORE USING THE TOOLS IN THIS CATALOG

METALCUTTING SAFETY

Projectile and Fragmentation Hazards

Modern metalcutting operations involve high spindle and cutter speeds and high temperatures and cutting forces. Hot metal chips may fly off the workpiece during metalcutting. Although cutting tools are designed and manufactured to withstand high cutting forces and temperatures, they can sometimes fragment, particularly if they are subjected to over-stress, severe impact, or other abuse.

To avoid injury:

- Always wear appropriate personal protective equipment, including safety goggles, when operating metalcutting machines or working nearby.
- Always make sure all machine guards are in place.

Breathing and Skin Contact Hazards

Grinding carbide or other advanced cutting tool materials produces dust or mist containing metallic particles. Breathing this dust or mist — especially over an extended period — can cause temporary or permanent lung disease or make existing medical conditions worse. Contact with this dust or mist can irritate eyes, skin, and mucous membranes and may make existing skin conditions worse.

To avoid injury:

- Always wear breathing protection and safety goggles when grinding.
- Provide ventilation control and collect and properly dispose of dust, mist, or sludge from grinding.
- Avoid skin contact with dust or mist.

For more information, read the applicable Material Safety Data Sheet provided by WIDIA and consult General Industry Safety and Health Regulations, Part 1910, Title 29 of the Code of Federal Regulations.

These safety instructions are general guidelines. Many variables affect machining operations. It is impossible to cover every specific situation. The technical information included in this catalog and recommendations on machining practices may not apply to your particular operation.

For more information, consult the WIDIA Metalcutting Safety booklet, available free from WIDIA at +1 724 539 5747 or fax +1 724 539 5439. For specific product safety and environmental questions, contact our Corporate Environmental Health and Safety Office at +1 724 539 5066 or fax +1 724 539 5372.

WIDIA™

ALL-STAR

VOL 1

WORLD HEADQUARTERS
WIDIA Products Group
Kennametal Inc.
1600 Technology Way
Latrobe, PA 15650 USA
Tel: 1 800 979 4342
w-na.service@widia.com

EUROPEAN HEADQUARTERS
WIDIA Products Group
Kennametal Europe GmbH
Rheingoldstrasse 50
CH 8212 Neuhausen am Rheinfall
Switzerland
Tel: +41 52 6750 100
w-ch.service@widia.com

ASIA-PACIFIC HEADQUARTERS
WIDIA Products Group
Kennametal (Singapore) Pte. Ltd.
3A International Business Park
Unit #01-02/03/05, ICON@IBP
Singapore 609935
Tel: +65 6265 9222
w-sg.service@widia.com

INDIA HEADQUARTERS
WIDIA Products Group
Kennametal India Limited
CIN: L27109KA1964PLC001546
8/9th Mile, Tumkur Road
Bangalore - 560 073
Tel: +91 80 2839 4321
w-in.service@widia.com

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widia.com