DIA EDGE

VPX SERIES

MULTI-FUNCTIONAL CUTTER FOR
HIGH EFFICIENCY MACHINING
AND DEEP SHOULDER MILLING

ABOUT OUR BRAND

Your manufacturing success is our success.

It's simple. We want to provide high-quality cutting tool products that help deliver unparalleled performance and control for you to manufacture precisely perfect products every day.

Our long heritage of building partnerships through cutting tool solutions to metal working manufacturers, like yours, has given Mitsubishi Materials USA a solid reputation as an industry leader. We understand the importance of getting it right the first time by delivering high-quality cutting tool product brands to help overcome machining challenges to improve machining processes.

Your success is our success and is the driving force behind our innovative products. Our product brands, DIAEDGE and MOLDINO, are trusted globally in the metal manufacturing and die & mold industries for delivering expertly-designed manufactured tools of the trade for highly specialized industries like yours.

With the acquisition of MOLDINO Tool Engineering, Ltd, our traditional Mitsubishi Materials USA cutting tool product line is now sold under the DIAEDGE product brand name.

Brands you can trust:

MITSUBISHI MATERIALS U.S.A.

TRUSTED PRODUCT BRANDS

DIAEDGE MOLDINO

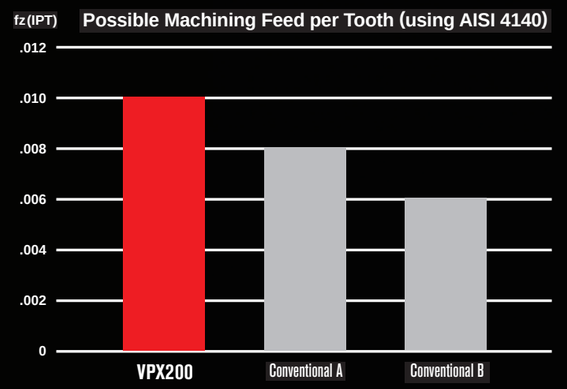
TOUGH & VERSATILE

BOOST YOUR MILLING WITH A TOUGH TANGENTIAL INSERT!

DIA EDGE

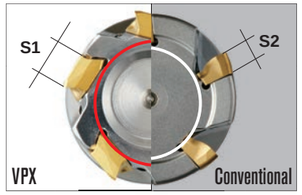
VPX SERIES

Our thoroughly tested design will completely change how you see the tangential cutter.



ABOUT TOUGH

THE TANGENTIAL MOUNT CUTTER - REINVENTED!



Wider seating surface for less insert movement in the pocket.

The tangentially mounted insert makes the cutter body core larger for more rigidity (S1>S2).

This means stability in cut =

- longer insert tool life,
- longer cutter body tool life,
- better surface finish and
- higher feed rates.

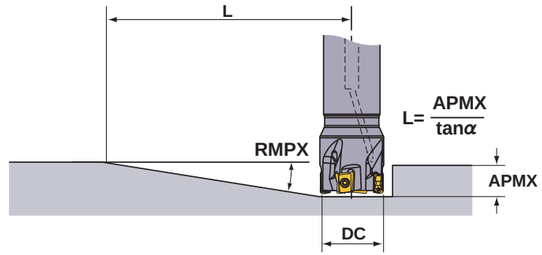
COMMENTS FROM DEVELOPERS

Durability born through repeated destructive tests.

In order to improve durability, we began development by first applying a load to the cutter until it broke. After analyzing the reasons it broke, we produced an improved version then broke that as well. We repeated this process until we were satisfied with the results. As a result of this pursuit of durability through thorough destructive tests, we were able to come up with a cutter that is ideal for unmanned operation and high efficiency machining.

ABOUT VERSATILE

SOLVING PROBLEMS AS A MULTI-FUNCTIONAL CUTTER.



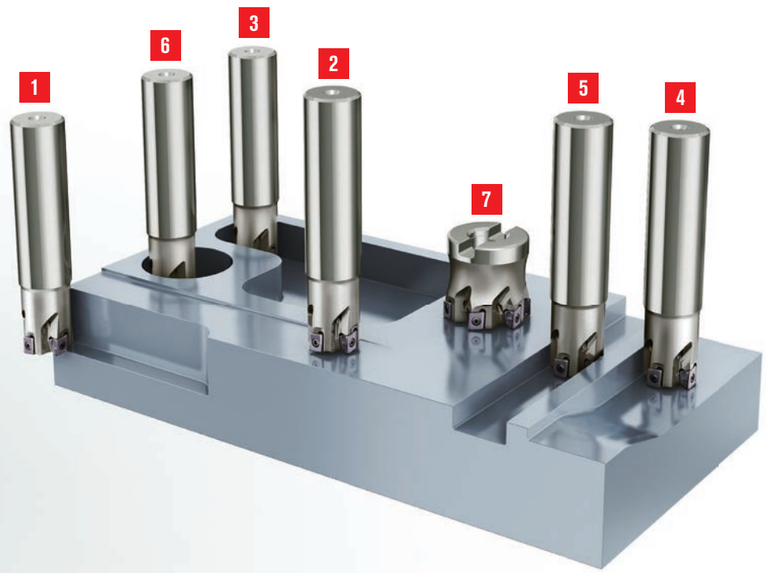
COMMENTS FROM DEVELOPERS

Through trial and error, we've solved machining problems.

Most tangential mount cutters must be changed out with dedicated inserts for ramping. We made it a priority to unify these two styles of inserts, so as to avoid the trouble of managing two sets of inserts, and prevent installation mistakes. By focusing on the surface design of these new inserts, and through repeated trial and error, we were able to resolve one of the major issues in the industry.

DIAEDGE VPX series covers most milling applications.

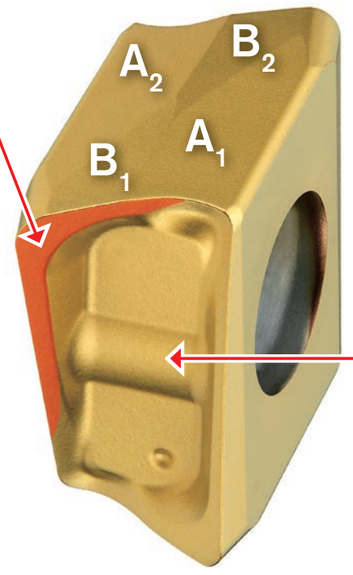
1. Shoulder Milling
2. Ramping
3. Pocket Milling
4. Step Copy Milling
5. Slot Milling
6. Helical Milling
7. Face Milling



INSERTS

DOUBLE-SIDED INSERT THAT HAS REVOLUTIONIZED TANGENTIAL INSERT MACHINING.

Single Flat Surface Improves Chip Evacuation and Protects Cutter Body



Two-sided Structure Supports Insert Performance

A Makes Possible Ramping

B Wiper Flats for Good Finish Surface

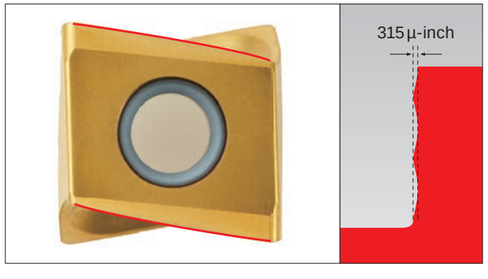
Convex Shaped Insert for Improved Chip Evacuation

COMMENTS FROM DEVELOPERS

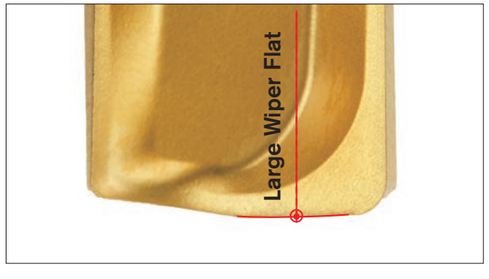
An insert shape that was possible to design, but difficult to commercialize.

The shape of the insert makes it tough while still enabling versatility. We have conquered many challenges from prototype to production--a testimony to Mitsubishi Materials commitment to precision.

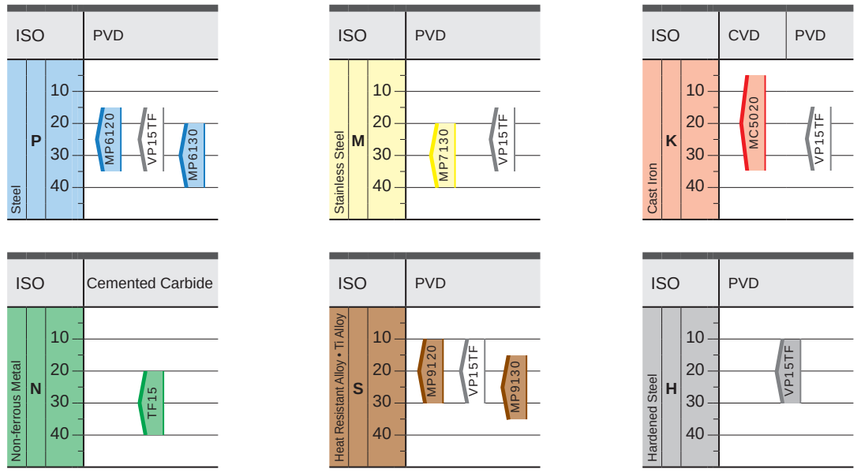
Good Wall Surface Finish



Large Wiper Flats Achieve a Better Finish Surface



Insert Grades for a Wide Range of Materials



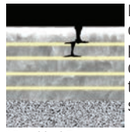
MP6100/MP7100/MP9100 Series

TOUGH-∑ Technology

A fusion of the separate coating technologies; PVD and multi layering provides extra toughness.

Base Layer
High Al-(Al, Ti)N

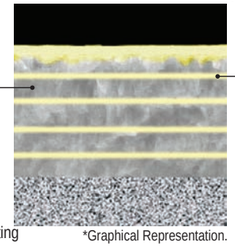
The new technology Al-(Al, Ti) N coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



Multi layering of the coating prevents any cracks penetrating through to the substrate.

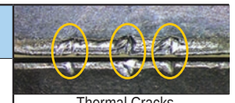
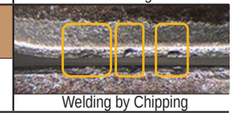
*Graphical Representation.

Al-Ti-Cr-N Based PVD Coating



*Graphical Representation.

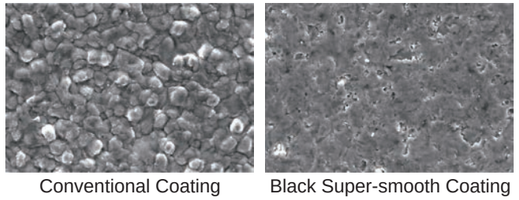
Best Layer of Each Workpiece Material

P	(Al,Cr)N Tough! Thermal Cracks	 Thermal Cracks
M	TiN Tough! Notching	 Notching
S	CrN Tough! Resistant Chipping	 Welding by Chipping

CVD Coating MC5020

First recommendation for cast irons milling. MC5020 has excellent wear resistance and also controls thermal cracking and chipping that are common when machining ductile cast irons.

Comparison of Coating Surface



Conventional Coating | Black Super-smooth Coating

Black Super-smooth Coating

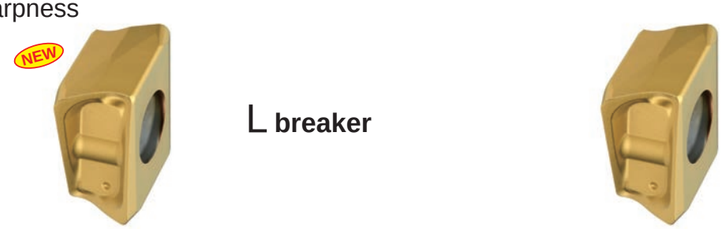
Black super-smooth coating prevents abnormal damage such as weld chipping.

Multi-Functional Cutter for High Efficiency Machining

Chip Breaker System

New L breaker with low cutting resistance has been added.

Focus on Cutting Edge Sharpness ⟷ Focus on Cutting Edge Strength



L breaker

M breaker

Workpiece Material	Cutting Conditions		
	Stable Cutting	General	Unstable Cutting
P	L, M		
M	L, M		
K	L, M		
N	L, M		
S Heat Resistant Alloys	L, M		
S Titanium Alloys	L, M		
H	M		

Refer to page 29 for chip breaker selection table.

MULTI-FUNCTIONAL MILLING

VPX200

90° KAPR

P M K N S H

Fig.1

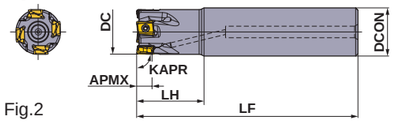


Fig.2

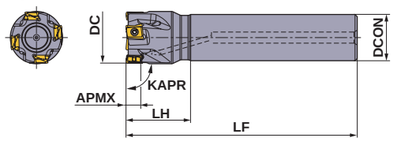


Fig.3

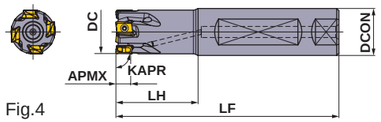
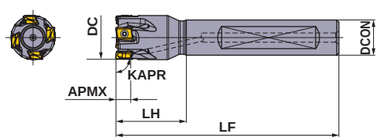


Fig.4



■ Shank Type

With Coolant Hole

Right hand tool holder only.

(inch)

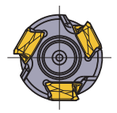
DC	Order Number	Stock R	* No.T	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (lbs)	Fig.	Insert Type
.625	**VPX200UR1002FA10S**	●	2	.625	3.625	1.250	.315	1.87°	38100	.3	3	LOGU09
.625	**VPX200UR1002SA10S**	●	2	.625	3.625	1.250	.315	1.87°	38100	.3	1	LOGU09
.625	**VPX200UR1002SA10L**	●	2	.625	6.000	1.500	.315	1.87°	38100	.5	1	LOGU09
.750	**VPX200UR1202FA10S**	●	2	.625	4.375	1.250	.315	1.43°	34200	.3	4	LOGU09
.750	**VPX200UR1202SA10S**	●	2	.625	4.375	1.250	.315	1.43°	34200	.4	2	LOGU09
.750	**VPX200UR1203FA10S**	●	3	.625	4.375	1.250	.315	1.43°	34200	.3	4	LOGU09
.750	**VPX200UR1203SA10S**	●	3	.625	4.375	1.250	.315	1.43°	34200	.3	2	LOGU09
.750	**VPX200UR1202FA12S**	●	2	.750	4.375	1.500	.315	1.43°	34200	.4	3	LOGU09
.750	**VPX200UR1202SA12S**	●	2	.750	4.375	1.500	.315	1.43°	34200	.5	1	LOGU09
.750	**VPX200UR1203FA12S**	●	3	.750	4.375	1.500	.315	1.43°	34200	.4	3	LOGU09
.750	**VPX200UR1203SA12S**	●	3	.750	4.375	1.500	.315	1.43°	34200	.5	1	LOGU09
.750	**VPX200UR1202SA12L**	●	2	.750	7.250	2.000	.315	1.43°	34200	.8	1	LOGU09
.875	**VPX200UR1402SA12L**	●	2	.750	7.250	1.500	.315	1.14°	31200	.8	2	LOGU09
1.000	**VPX200UR1603FA12S**	●	3	.750	4.750	1.500	.315	0.95°	28800	.6	4	LOGU09
1.000	**VPX200UR1603SA12S**	●	3	.750	4.750	1.500	.315	0.95°	28800	.6	2	LOGU09
1.000	**VPX200UR1604FA12S**	●	4	.750	4.750	1.500	.315	0.95°	28800	.6	4	LOGU09
1.000	**VPX200UR1604SA12S**	●	4	.750	4.750	1.500	.315	0.95°	28800	.6	2	LOGU09
1.000	**VPX200UR1603SA12L**	●	3	.750	8.500	1.500	.315	0.95°	28800	1.0	2	LOGU09
1.000	**VPX200UR1603FA16S**	●	3	1.000	4.750	1.750	.315	0.95°	28800	.9	3	LOGU09
1.000	**VPX200UR1603SA16S**	●	3	1.000	4.750	1.750	.315	0.95°	28800	.9	1	LOGU09
1.000	**VPX200UR1604FA16S**	●	4	1.000	4.750	1.750	.315	0.95°	28800	.9	3	LOGU09
1.000	**VPX200UR1604SA16S**	●	4	1.000	4.750	1.750	.315	0.95°	28800	.9	1	LOGU09
1.000	**VPX200UR1603SA16L**	●	3	1.000	8.500	2.500	.315	0.95°	28800	1.7	1	LOGU09
1.125	**VPX200UR1803SA16L**	●	3	1.000	8.500	1.750	.315	0.82°	26800	1.8	2	LOGU09
1.250	**VPX200UR2003FA16S**	●	3	1.000	5.125	1.750	.315	0.71°	25200	1.1	4	LOGU09
1.250	**VPX200UR2003SA16S**	●	3	1.000	5.125	1.750	.315	0.71°	25200	1.1	2	LOGU09
1.250	**VPX200UR2005FA16S**	●	5	1.000	5.125	1.750	.315	0.71°	25200	1.1	4	LOGU09
1.250	**VPX200UR2005SA16S**	●	5	1.000	5.125	1.750	.315	0.71°	25200	1.1	2	LOGU09
1.250	**VPX200UR2003SA16L**	●	3	1.000	9.000	1.750	.315	0.71°	25200	1.9	2	LOGU09
1.250	**VPX200UR2003FA20S**	●	3	1.250	5.125	2.000	.315	0.71°	25200	1.5	3	LOGU09
1.250	**VPX200UR2003SA20S**	●	3	1.250	5.125	2.000	.315	0.71°	25200	1.6	1	LOGU09
1.250	**VPX200UR2004FA20S**	●	4	1.250	5.125	2.000	.315	0.71°	25200	1.5	3	LOGU09
1.250	**VPX200UR2004SA20S**	●	4	1.250	5.125	2.000	.315	0.71°	25200	1.6	1	LOGU09
1.250	**VPX200UR2005FA20S**	●	5	1.250	5.125	2.000	.315	0.71°	25200	1.5	3	LOGU09
1.250	**VPX200UR2005SA20S**	●	5	1.250	5.125	2.000	.315	0.71°	25200	1.6	1	LOGU09
1.250	**VPX200UR2003SA20L**	●	3	1.250	9.000	3.000	.315	0.71°	25200	2.8	1	LOGU09
1.500	**VPX200UR2404FA20S**	●	4	1.250	5.125	2.000	.315	0.57°	22600	1.7	4	LOGU09
1.500	**VPX200UR2404SA20S**	●	4	1.250	5.125	2.000	.315	0.57°	22600	1.8	2	LOGU09
1.500	**VPX200UR2406FA20S**	●	6	1.250	5.125	2.000	.315	0.57°	22600	1.7	4	LOGU09
1.500	**VPX200UR2406SA20S**	●	6	1.250	5.125	2.000	.315	0.57°	22600	1.7	2	LOGU09
1.500	**VPX200UR2404SA20L**	●	4	1.250	9.000	2.000	.315	0.57°	22600	3.1	2	LOGU09

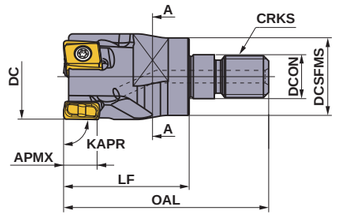
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Number of Teeth

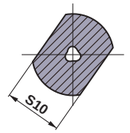
CUTTING CONDITIONS // P33

● : **USA Stock**

Multi-Functional Cutter for High Efficiency Machining







A-A Section

Right hand tool holder only.

■ Screw-in Type

With Coolant Hole

(inch)

DC	Order Number	Stock R	*1 No.T	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (lbs)	APMX	RMPX	Insert Type
.625	**VPX200UR1002AM0830**	●	2	.335	.571	1.890	1.181	.394	M08	.1	.315	1.87°	LOGU09
.750	**VPX200UR1202AM1030**	●	2	.413	.728	1.929	1.181	.551	M10	.1	.315	1.43°	LOGU09
.750	**VPX200UR1203AM1030**	●	3	.413	.728	1.929	1.181	.551	M10	.1	.315	1.43°	LOGU09
.875	**VPX200UR1402AM1030**	●	2	.413	.728	1.929	1.181	.551	M10	.2	.315	1.14°	LOGU09
.875	**VPX200UR1403AM1030**	●	3	.413	.728	1.929	1.181	.551	M10	.1	.315	1.14°	LOGU09
1.000	**VPX200UR1603AM1235**	●	3	.492	.925	2.244	1.378	.748	M12	.2	.315	0.95°	LOGU09
1.000	**VPX200UR1604AM1235**	●	4	.492	.925	2.244	1.378	.748	M12	.2	.315	0.95°	LOGU09
1.125	**VPX200UR1803AM1235**	●	3	.492	.925	2.244	1.378	.748	M12	.3	.315	0.82°	LOGU09
1.125	**VPX200UR1804AM1235**	●	4	.492	.925	2.244	1.378	.748	M12	.3	.315	0.82°	LOGU09
1.250	**VPX200UR2003AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.315	0.71°	LOGU09
1.250	**VPX200UR2004AM1640**	●	4	.669	1.122	2.480	1.575	.945	M16	.5	.315	0.71°	LOGU09
1.250	**VPX200UR2005AM1640**	●	5	.669	1.122	2.480	1.575	.945	M16	.5	.315	0.71°	LOGU09
1.375	**VPX200UR2203AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.315	0.64°	LOGU09
1.375	**VPX200UR2205AM1640**	●	5	.669	1.122	2.480	1.575	.945	M16	.5	.315	0.64°	LOGU09
1.500	**VPX200UR2404AM1640**	●	4	.669	1.122	2.480	1.575	.945	M16	.6	.315	0.57°	LOGU09
1.500	**VPX200UR2406AM1640**	●	6	.669	1.122	2.480	1.575	.945	M16	.6	.315	0.57°	LOGU09

Note 1) For screw-in type arbors, refer to page 22—25.

CUTTING CONDITIONS // P33

*1 Number of Teeth

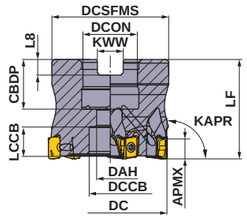
Spare Parts

(inch)

DC	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
.625	**VPX200UR10**	TPS27F1	TIP07F	MK1KS
.750	**VPX200UR12**	TPS27F1	TIP07F	MK1KS
.875	**VPX200UR14**	TPS27F2	TIP07F	MK1KS
1.000	**VPX200UR16**	TPS27F2	TIP07F	MK1KS
1.125	**VPX200UR18**	TPS27F2	TIP07F	MK1KS
1.250	**VPX200UR20**	TPS27F2	TIP07F	MK1KS
1.375	**VPX200UR22**	TPS27F2	TIP07F	MK1KS
1.500	**VPX200UR24**	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F1 = 8.9,TPS27F2 = 8.9

● : USA Stock



Right hand tool holder only.

DCON	Set Bolt	Geometry
ϕ.500"	HSCU25011H	
ϕ.750"	HSCU37513H	
ϕ1.000"	HSCU50014H	

■ Arbor Type

With Coolant Hole

GAMP : –6° T : +5°
GAMF : –25° I : +4°

DCON = Inch

(inch)

DC	Order Number	Stock R	* No.T	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})	Insert Type
1.250	**VPX200UR1.2503SA**	●	3	1.375	.500	.120	.315	0.72°	25200	LOGU09
1.250	**VPX200UR1.2505SA**	●	5	1.375	.500	.120	.315	0.72°	25200	LOGU09
1.500	**VPX200UR1.5004SA**	●	4	1.750	.500	.260	.315	0.57°	22600	LOGU09
1.500	**VPX200UR1.5006SA**	●	6	1.750	.500	.250	.315	0.57°	22600	LOGU09
1.500	**VPX200UR1.5004AA**	●	4	1.750	.750	.220	.315	0.57°	22600	LOGU09
1.500	**VPX200UR1.5006AA**	●	6	1.750	.750	.210	.315	0.57°	22600	LOGU09
2.000	**VPX200UR2.0005AA**	●	5	1.750	.750	.410	.315	0.41°	19000	LOGU09
2.000	**VPX200UR2.0007AA**	●	7	1.750	.750	.410	.315	0.41°	19000	LOGU09
2.500	**VPX200UR2.5006CA**	●	6	2.000	1.000	.740	.315	0.32°	16700	LOGU09
2.500	**VPX200UR2.5009CA**	●	9	2.000	1.000	.740	.315	0.32°	16700	LOGU09

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.

CUTTING CONDITIONS // P33

* Number of Teeth

Mounting Dimensions

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
1.250	**VPX200UR1.2503SA**	.500	.630	.276	.433	.304	1.125	.250	.156
1.250	**VPX200UR1.2505SA**	.500	.630	.276	.433	.304	1.125	.250	.156
1.500	**VPX200UR1.5004SA**	.500	.630	.276	.433	.679	1.438	.250	.156
1.500	**VPX200UR1.5006SA**	.500	.630	.276	.433	.679	1.438	.250	.156
1.500	**VPX200UR1.5004AA**	.750	.748	.413	.630	.561	1.438	.313	.187
1.500	**VPX200UR1.5006AA**	.750	.748	.413	.630	.561	1.438	.313	.187
2.000	**VPX200UR2.0005AA**	.750	.748	.413	.630	.561	1.750	.313	.187
2.000	**VPX200UR2.0007AA**	.750	.748	.413	.630	.561	1.750	.313	.187
2.500	**VPX200UR2.5006CA**	1.000	.945	.539	.787	.693	2.188	.375	.219
2.500	**VPX200UR2.5009CA**	1.000	.945	.539	.787	.693	2.188	.375	.219

Spare Parts

Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

* Clamp Torque (lbf-in) : TPS27F2 = 8.9

Multi-Functional Cutter for High Efficiency Machining

Fig.1

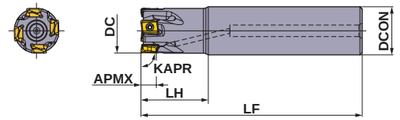
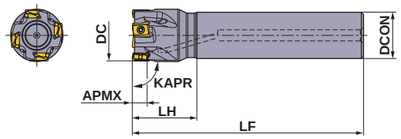


Fig.2



Right hand tool holder only.

Metric Standard

■ Shank Type

With Coolant Hole

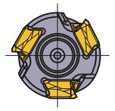
(mm)

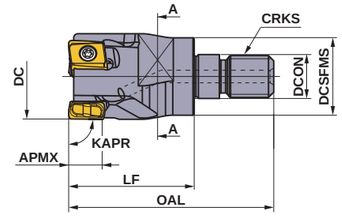
DC	Order Number	Stock R	✶ No.T	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (kg)	Fig.	Insert Type
16	**VPX200R1602SA16S**	★	2	16	85	25	8	1.85°	37900	0.11	1	LOGU09
18	**VPX200R1802SA16S**	★	2	16	85	25	8	1.56°	35300	0.12	2	LOGU09
18	**VPX200R1802SA16L**	★	2	16	120	25	8	1.56°	35300	0.17	2	LOGU09
20	**VPX200R2002SA16S**	★	2	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2003SA16S**	★	3	16	100	25	8	1.35°	33200	0.14	2	LOGU09
20	**VPX200R2002SA20S**	★	2	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2003SA20S**	★	3	20	100	30	8	1.35°	33200	0.21	1	LOGU09
20	**VPX200R2002SA20L**	★	2	20	150	60	8	1.35°	33200	0.32	1	LOGU09
22	**VPX200R2202SA20S**	★	2	20	115	30	8	1.16°	31400	0.26	2	LOGU09
22	**VPX200R2203SA20S**	★	3	20	115	30	8	1.16°	31400	0.25	2	LOGU09
22	**VPX200R2202SA20L**	★	2	20	150	30	8	1.16°	31400	0.34	2	LOGU09
25	**VPX200R2503SA20S**	★	3	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2504SA20S**	★	4	20	115	30	8	0.97°	29000	0.26	2	LOGU09
25	**VPX200R2503SA25S**	★	3	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2504SA25S**	★	4	25	115	35	8	0.97°	29000	0.39	1	LOGU09
25	**VPX200R2503SA25L**	★	3	25	170	70	8	0.97°	29000	0.57	1	LOGU09
28	**VPX200R2803SA25S**	★	3	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2804SA25S**	★	4	25	115	35	8	0.84°	27200	0.41	2	LOGU09
28	**VPX200R2803SA25L**	★	3	25	170	35	8	0.84°	27200	0.61	2	LOGU09
30	**VPX200R3003SA25S**	★	3	25	125	35	8	0.77°	26000	0.46	2	LOGU09
30	**VPX200R3004SA25S**	★	4	25	125	35	8	0.77°	26000	0.46	2	LOGU09
32	**VPX200R3203SA32S**	★	3	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3204SA32S**	★	4	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3205SA32S**	★	5	32	125	45	8	0.71°	25100	0.70	1	LOGU09
32	**VPX200R3203SA32L**	★	3	32	190	90	8	0.71°	25100	1.06	1	LOGU09
35	**VPX200R3503SA32L**	★	3	32	190	45	8	0.63°	23800	1.14	2	LOGU09
40	**VPX200R4004SA32S**	★	4	32	125	45	8	0.54°	22000	0.81	2	LOGU09
40	**VPX200R4006SA32S**	★	6	32	125	45	8	0.54°	22000	0.80	2	LOGU09
50	**VPX200R5005SA32S**	★	5	32	125	45	8	0.42°	19200	0.91	2	LOGU09
50	**VPX200R5007SA32S**	★	7	32	125	45	8	0.42°	19200	0.91	2	LOGU09

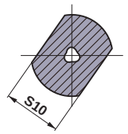
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
✶ Number of Teeth

CUTTING CONDITIONS // P33

★ : Stocked in Japan







A-A Section

Right hand tool holder only.

Metric Standard

■ Screw-in Type

With Coolant Hole

(mm)

DC	Order Number	Stock R	✶1 No.T	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX	RMPX	Insert Type
16	**VPX200R1602AM0830**	★	2	8.5	14.5	48	30	10	M08	0.03	8	1.85°	LOGU09
18	**VPX200R1802AM0830**	★	2	8.5	14.5	48	30	10	M08	0.04	8	1.56°	LOGU09
20	**VPX200R2002AM1030**	★	2	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
20	**VPX200R2003AM1030**	★	3	10.5	18.5	49	30	14	M10	0.06	8	1.35°	LOGU09
22	**VPX200R2202AM1030**	★	2	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
22	**VPX200R2203AM1030**	★	3	10.5	18.5	49	30	14	M10	0.06	8	1.16°	LOGU09
25	**VPX200R2503AM1235**	★	3	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
25	**VPX200R2504AM1235**	★	4	12.5	23.5	57	35	19	M12	0.11	8	0.97°	LOGU09
32	**VPX200R3203AM1640**	★	3	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3204AM1640**	★	4	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
32	**VPX200R3205AM1640**	★	5	17.0	28.5	63	40	24	M16	0.21	8	0.71°	LOGU09
35	**VPX200R3503AM1640**	★	3	17.0	28.5	63	40	24	M16	0.24	8	0.63°	LOGU09
35	**VPX200R3505AM1640**	★	5	17.0	28.5	63	40	24	M16	0.23	8	0.63°	LOGU09
40	**VPX200R4004AM1640**	★	4	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09
40	**VPX200R4006AM1640**	★	6	17.0	28.5	63	40	24	M16	0.26	8	0.54°	LOGU09

Note 1) For screw-in type arbors, refer to page 25—28.
✶1 Number of Teeth

CUTTING CONDITIONS // P33

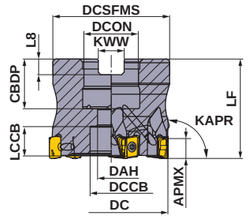
Spare Parts

(mm)

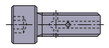
DC	Tool Holder Type	✶ Clamp Screw	Wrench	Anti-seize Lubricant
16	**VPX200R16**	TPS27F1	TIP07F	MK1KS
18	**VPX200R18**	TPS27F1	TIP07F	MK1KS
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
30	**VPX200R30**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS
50	**VPX200R50**	TPS27F2	TIP07F	MK1KS

✶ Clamp Torque (lbf-in) : TPS27F1 = 8.9,TPS27F2 = 8.9

Multi-Functional Cutter for High Efficiency Machining



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ32, ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	

Metric Standard

For Metric Arbors

■Arbor Type

With Coolant Hole
DCON=mm

GAMP:–6° T:+5°
GAMF:–25° I:+4°

(mm)

DC	Order Number	Stock R	⁎ No.T	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Insert Type
32	**VPX200-032A03AR**	★	3	35	16	0.11	8	0.71°	25100	LOGU09
32	**VPX200-032A05AR**	★	5	35	16	0.11	8	0.71°	25100	LOGU09
40	**VPX200-040A04AR**	★	4	40	16	0.23	8	0.54°	22000	LOGU09
40	**VPX200-040A06AR**	★	6	40	16	0.22	8	0.54°	22000	LOGU09
50	**VPX200-050A05AR**	★	5	40	22	0.36	8	0.42°	19200	LOGU09
50	**VPX200-050A07AR**	★	7	40	22	0.36	8	0.42°	19200	LOGU09
63	**VPX200-063A06AR**	★	6	40	22	0.66	8	0.32°	16700	LOGU09
63	**VPX200-063A09AR**	★	9	40	22	0.66	8	0.32°	16700	LOGU09

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
⁎ Number of Teeth

CUTTING CONDITIONS // P33

Mounting Dimensions

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A03AR**	16	18	9	14	8	30	8.4	5.6
32	**VPX200-032A05AR**	16	18	9	14	8	30	8.4	5.6
40	**VPX200-040A04AR**	16	18	9	14	13	37	8.4	5.6
40	**VPX200-040A06AR**	16	18	9	14	13	37	8.4	5.6
50	**VPX200-050A05AR**	22	20	11	17	11	47	10.4	6.3
50	**VPX200-050A07AR**	22	20	11	17	11	47	10.4	6.3
63	**VPX200-063A06AR**	22	20	11	17	11	60	10.4	6.3
63	**VPX200-063A09AR**	22	20	11	17	11	60	10.4	6.3

Spare Parts

Tool Holder Type	⁎  Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

⁎ Clamp Torque (lbf-in) : TPS27F2 = 8.9

★ : Stocked in Japan

DEEP SHOULDER MILLING

90° KAPR R

VPX200 LONG CUTTING EDGE

P M K N S H

Fig.1

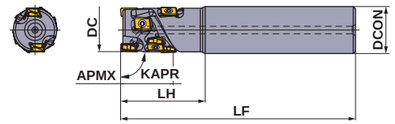
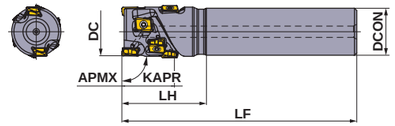


Fig.2



Right hand tool holder only.

Metric Standard

■Shank Type

KAPR: 90°
With Coolant Hole

(mm)

DC	Order Number	Stock R	⁎1 No.T	Total	DCON	LF	LH	APMX	RMPX	WT (kg)	Fig.	Insert Type
20	**VPX200R202SA20S01404**	★	2	4	20	100	30	14	1.35°	0.21	1	LOGU09
22	**VPX200R222SA20S01404**	★	2	4	20	115	30	14	1.16°	0.26	2	LOGU09
25	**VPX200R252SA25S02106**	★	2	6	25	115	35	21	0.97°	0.39	1	LOGU09
25	**VPX200R252SA25S02808**	★	2	8	25	125	45	28	0.97°	0.41	1	LOGU09
28	**VPX200R282SA25S02106**	★	2	6	25	115	35	21	0.84°	0.40	2	LOGU09
28	**VPX200R282SA25S02808**	★	2	8	25	125	45	28	0.84°	0.43	2	LOGU09
32	**VPX200R322SA32S02808**	★	2	8	32	125	45	28	0.71°	0.68	1	LOGU09
32	**VPX200R323SA32S02812**	★	3	12	32	125	45	28	0.71°	0.67	1	LOGU09
32	**VPX200R322SA32S03510**	★	2	10	32	130	50	35	0.71°	0.70	1	LOGU09
32	**VPX200R323SA32S03515**	★	3	15	32	130	50	35	0.71°	0.68	1	LOGU09
35	**VPX200R352SA32S02808**	★	2	8	32	125	45	28	0.63°	0.72	2	LOGU09
35	**VPX200R353SA32S02812**	★	3	12	32	125	45	28	0.63°	0.71	2	LOGU09
35	**VPX200R352SA32S03510**	★	2	10	32	130	50	35	0.63°	0.74	2	LOGU09
35	**VPX200R353SA32S03515**	★	3	15	32	130	50	35	0.63°	0.73	2	LOGU09
40	**VPX200R403SA32S03515**	★	3	15	32	130	50	35	0.54°	0.81	2	LOGU09
40	**VPX200R404SA32S03520**	★	4	20	32	130	50	35	0.54°	0.80	2	LOGU09
40	**VPX200R403SA32S04218**	★	3	18	32	140	60	42	0.54°	0.88	2	LOGU09
40	**VPX200R404SA32S04224**	★	4	24	32	140	60	42	0.54°	0.86	2	LOGU09

⁎1 Number of Teeth

CUTTING CONDITIONS // P47

Spare Parts

(mm)

DC	Tool Holder Type	⁎  Clamp Screw	 Wrench	 Anti-seize Lubricant
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
32	**VPX200R32**	TPS27F2	TIP07F	MK1KS
35	**VPX200R35**	TPS27F2	TIP07F	MK1KS
40	**VPX200R40**	TPS27F2	TIP07F	MK1KS

⁎ Clamp Torque (lbf-in) : TPS27F1 = 8.9,TPS27F2 = 8.9

Multi-Functional Cutter for High Efficiency Machining

VPX200
DEEP SHOULDER MILLING

Fig.1

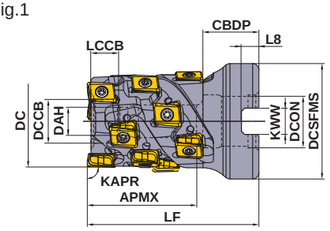
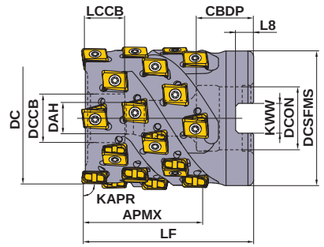
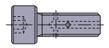


Fig.2



Right hand tool holder only.

DC	APMX	Set Bolt	Geometry
ϕ32	35	HSC08045	
ϕ40	42	HSC08050	
ϕ50	42	HSC10045	

Metric Standard

■Arbor Type

KAPR: 90°
GAMP: –6°, GAMF: –25°
DCON = mm size, With Coolant Hole

(mm)

DC	Order Number	Stock R	⁎1 No.T	Total	LF	DCON	WT (kg)	APMX	RMPX	Fig.	Insert Type
32	**VPX200-032A02A035R10**	★	2	10	55	16	0.22	35	0.71°	1	LOGU09
32	**VPX200-032A03A035R15**	★	3	15	55	16	0.20	35	0.71°	1	LOGU09
40	**VPX200-040A03A042R18**	★	3	18	60	16	0.34	42	0.54°	2	LOGU09
40	**VPX200-040A04A042R24**	★	4	24	60	16	0.33	42	0.54°	2	LOGU09
50	**VPX200-050A04A042R24**	★	4	24	60	22	0.55	42	0.42°	2	LOGU09
50	**VPX200-050A05A042R30**	★	5	30	60	22	0.54	42	0.42°	2	LOGU09

⁎1 Number of Teeth

CUTTING CONDITIONS // P47

Mounting Dimensions

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
32	**VPX200-032A02A035R10**	16	18	9	14	8	37	8.4	5.6
32	**VPX200-032A03A035R15**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A03A042R18**	16	18	9	14	8	37	8.4	5.6
40	**VPX200-040A04A042R24**	16	18	9	14	8	37	8.4	5.6
50	**VPX200-050A04A042R24**	22	20	11	17	13	47	10.4	6.3
50	**VPX200-050A05A042R30**	22	20	11	17	13	47	10.4	6.3

Spare Parts

Tool Holder Type	⁎		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX200	TPS27F2	TIP07F	MK1KS

⁎ Clamp Torque (lbf-in) : TPS27F2 = 8.9

● : USA Stock ★ : Stocked in Japan (10 inserts in one case)

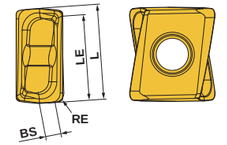
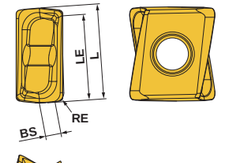
■Inserts

(inch)

Workpiece Material		
P	Steels	● ● ● ●
M	Stainless Steels	● ● ●
K	Cast Irons	● ● ●
N	Non-ferrous Metals	●
S	Heat Resistant Alloys, Titanium Alloys	● ● ●
H	Hardened Steels	●

Cutting Conditions (Guide) :
● : Stable Cutting ● : General Cutting ✱ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	Carbide TF15	L	RE	LE	S	BS	Geometry
Low Cutting Resistance L Breaker	**LOGU0904020PNER-L**	G	E	●	●	●	●	●	●	●		.343	.008	.299	.169	.067	
	LOGU0904040PNER-L	G	E	●	●	●	●	●	●	●		.343	.016	.299	.169	.063	
	LOGU0904080PNER-L	G	E	●	●	●	●	●	●	●		.343	.031	.299	.169	.047	
	LOGU0904100PNER-L	G	E	●	●	●	●	●	●	●		.343	.039	.299	.169	.039	
	LOGU0904120PNER-L	G	E	●	●	●	●	●	●	●		.343	.047	.299	.169	.035	
	LOGU0904160PNER-L	G	E	●	●	●	●	●	●	●		.343	.063	.299	.169	.020	
	LOGU0904020PNFR-L	G	F								●	.343	.008	.299	.169	.067	
	LOGU0904040PNFR-L	G	F								●	.343	.016	.299	.169	.063	
	LOGU0904080PNFR-L	G	F								●	.343	.031	.299	.169	.047	
	LOGU0904100PNFR-L	G	F								●	.343	.039	.299	.169	.039	
	LOGU0904120PNFR-L	G	F								●	.343	.047	.299	.169	.035	
	LOGU0904160PNFR-L	G	F								●	.343	.063	.299	.169	.020	Right hand insert only.
General Use M Breaker	**LOGU0904020PNER-M**	G	E	●	●	●	●	●	●	●		.343	.008	.299	.169	.067	
	LOGU0904040PNER-M	G	E	●	●	●	●	●	●	●		.343	.016	.299	.169	.063	
	LOGU0904080PNER-M	G	E	●	●	●	●	●	●	●		.343	.031	.299	.169	.047	
	LOGU0904100PNER-M	G	E	●	●	●	●	●	●	●		.343	.039	.299	.169	.039	
	LOGU0904120PNER-M	G	E	●	●	●	●	●	●	●		.343	.047	.299	.169	.035	
	LOGU0904160PNER-M	G	E	●	●	●	●	●	●	●		.343	.063	.299	.169	.020	
	LOGU0904020PNFR-M	G	F								●	.343	.008	.299	.169	.067	
	LOGU0904040PNFR-M	G	F								●	.343	.016	.299	.169	.063	
	LOGU0904080PNFR-M	G	F								●	.343	.031	.299	.169	.047	
	LOGU0904100PNFR-M	G	F								●	.343	.039	.299	.169	.039	
	LOGU0904120PNFR-M	G	F								●	.343	.047	.299	.169	.035	
	LOGU0904160PNFR-M	G	F								●	.343	.063	.299	.169	.020	Right hand insert only.

Multi-Functional Cutter for High Efficiency Machining

MULTI-FUNCTIONAL MILLING

90° KAPR

R

VPX300

P M K N S H

Fig.1

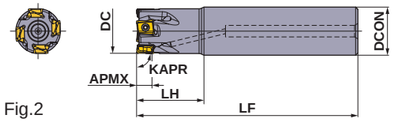


Fig.2

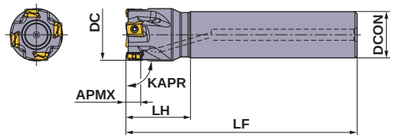


Fig.3

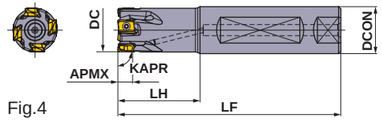
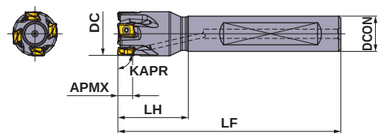


Fig.4



Right hand tool holder only.

■ Shank Type

With Coolant Hole

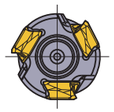
(inch)

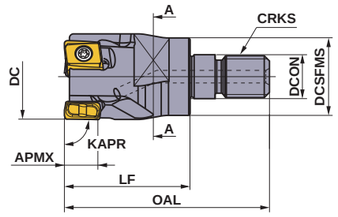
DC	Order Number	Stock R	* No.T	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (lbs)	Fig.	Insert Type
1.000	**VPX300UR1602FA16S**	●	2	1.000	4.750	1.750	.433	2.07°	23900	.8	3	LOGU12
1.000	**VPX300UR1602SA16S**	●	2	1.000	4.750	1.750	.433	2.07°	23900	.9	1	LOGU12
1.000	**VPX300UR1602SA16L**	●	2	1.000	8.500	2.500	.433	2.07°	23900	1.7	1	LOGU12
1.125	**VPX300UR1802SA16L**	●	2	1.000	8.500	1.750	.433	1.73°	22200	1.9	2	LOGU12
1.250	**VPX300UR2002FA16S**	●	2	1.000	5.125	1.750	.433	1.49°	20700	1.1	4	LOGU12
1.250	**VPX300UR2002SA16S**	●	2	1.000	5.125	1.750	.433	1.49°	20700	1.1	2	LOGU12
1.250	**VPX300UR2003FA16S**	●	3	1.000	5.125	1.750	.433	1.49°	20700	1.1	4	LOGU12
1.250	**VPX300UR2003SA16S**	●	3	1.000	5.125	1.750	.433	1.49°	20700	1.1	2	LOGU12
1.250	**VPX300UR2003SA16L**	●	3	1.000	9.000	1.750	.433	1.49°	20700	1.9	2	LOGU12
1.250	**VPX300UR2002FA20S**	●	2	1.250	5.125	2.000	.433	1.49°	20700	1.5	3	LOGU12
1.250	**VPX300UR2002SA20S**	●	2	1.250	5.125	2.000	.433	1.49°	20700	1.5	1	LOGU12
1.250	**VPX300UR2003FA20S**	●	3	1.250	5.125	2.000	.433	1.49°	20700	1.5	3	LOGU12
1.250	**VPX300UR2003SA20S**	●	3	1.250	5.125	2.000	.433	1.49°	20700	1.5	1	LOGU12
1.250	**VPX300UR2003SA20L**	●	3	1.250	9.000	3.000	.433	1.49°	20700	2.8	1	LOGU12
1.500	**VPX300UR2402FA20S**	●	2	1.250	5.125	2.000	.433	1.13°	18500	1.7	4	LOGU12
1.500	**VPX300UR2402SA20S**	●	2	1.250	5.125	2.000	.433	1.13°	18500	1.7	2	LOGU12
1.500	**VPX300UR2403FA20S**	●	3	1.250	5.125	2.000	.433	1.13°	18500	1.7	4	LOGU12
1.500	**VPX300UR2403SA20S**	●	3	1.250	5.125	2.000	.433	1.13°	18500	1.7	2	LOGU12
1.500	**VPX300UR2403SA20L**	●	3	1.250	9.000	2.000	.433	1.13°	18500	3.0	2	LOGU12

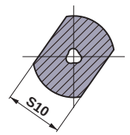
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Number of Teeth

CUTTING CONDITIONS // P40

● : **USA Stock**







A-A Section

Right hand tool holder only.

■ Screw-in Type

With Coolant Hole

(inch)

DC	Order Number	Stock R	*1 No.T	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (lbs)	APMX	RMPX	Insert Type
1.000	**VPX300UR1602AM1235**	●	2	.492	.925	2.244	1.378	.748	M12	.2	.433	2.07°	LOGU12
1.125	**VPX300UR1802AM1235**	●	2	.492	.925	2.244	1.378	.748	M12	.3	.433	1.73°	LOGU12
1.250	**VPX300UR2002AM1640**	●	2	.669	1.122	2.480	1.575	.945	M16	.4	.433	1.49°	LOGU12
1.250	**VPX300UR2003AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.4	.433	1.49°	LOGU12
1.375	**VPX300UR2202AM1640**	●	2	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.28°	LOGU12
1.375	**VPX300UR2203AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.28°	LOGU12
1.500	**VPX300UR2403AM1640**	●	3	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.13°	LOGU12
1.500	**VPX300UR2404AM1640**	●	4	.669	1.122	2.480	1.575	.945	M16	.5	.433	1.13°	LOGU12

Note 1) For screw-in type arbors, refer to page 25—28.
*1 Number of Teeth

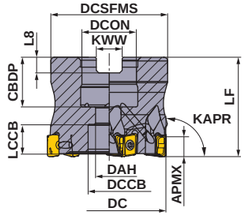
CUTTING CONDITIONS // P40

Spare Parts

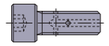
Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

Multi-Functional Cutter for High Efficiency Machining



Right hand tool holder only.

DCON	Set Bolt	Geometry
ϕ.500"	HSCU25011H	
ϕ.750"	HSCU37513H	
ϕ1.000"	HSCU50014H	

■Arbor Type

With Coolant Hole

GAMP : –6° T : +5°
GAMF : –22.5° I : +5°

DCON = Inch

(inch)

DC	Order Number	Stock R	* No.T	LF	DCON	WT (lbs)	APMX	RMPX	RPMX (min^{-1})	Insert Type
1.500	**VPX300UR1.5003SA**	●	3	1.750	.500	.240	.433	1.13°	18500	LOGU12
1.500	**VPX300UR1.5004SA**	●	4	1.750	.500	.240	.433	1.13°	18500	LOGU12
2.000	**VPX300UR2.0004AA**	●	4	1.750	.750	.400	.433	0.78°	15400	LOGU12
2.000	**VPX300UR2.0006AA**	●	6	1.750	.750	.390	.433	0.78°	15400	LOGU12
2.500	**VPX300UR2.5006CA**	●	6	2.000	1.000	.700	.433	0.59°	13400	LOGU12
2.500	**VPX300UR2.5008CA**	●	8	2.000	1.000	.720	.433	0.59°	13400	LOGU12
3.000	**VPX300UR3.0007CA**	●	7	2.000	1.000	.940	.433	0.48°	11900	LOGU12
3.000	**VPX300UR3.0010CA**	●	10	2.000	1.000	.950	.433	0.48°	11900	LOGU12

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Number of Teeth

CUTTING CONDITIONS // P40

Mounting Dimensions

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
1.500	**VPX300UR1.5003SA**	.500	.630	.276	.433	.663	1.438	.250	.156
1.500	**VPX300UR1.5004SA**	.500	.630	.276	.433	.663	1.438	.250	.156
2.000	**VPX300UR2.0004AA**	.750	.748	.413	.630	.545	1.750	.313	.187
2.000	**VPX300UR2.0006AA**	.750	.748	.413	.630	.545	1.750	.313	.187
2.500	**VPX300UR2.5006CA**	1.000	.945	.539	.787	.677	2.188	.375	.219
2.500	**VPX300UR2.5008CA**	1.000	.945	.539	.787	.677	2.188	.375	.219
3.000	**VPX300UR3.0007CA**	1.000	.945	.539	.787	.677	2.188	.375	.219
3.000	**VPX300UR3.0010CA**	1.000	.945	.539	.787	.677	2.188	.375	.219

● : USA Stock ★ : Stocked in Japan

Fig.1 

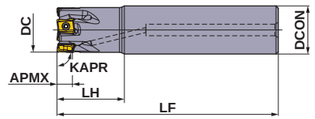
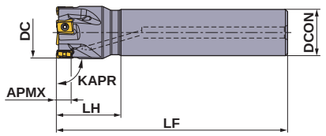


Fig.2 



Right hand tool holder only.

Metric Standard

■Shank Type

With Coolant Hole

(mm)

DC	Order Number	Stock R	* No.T	DCON	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (kg)	Fig.	Insert Type
25	**VPX300R2502SA25S**	★	2	25	115	35	11	2.13°	24100	0.38	1	LOGU12
25	**VPX300R2502SA25L**	★	2	25	170	70	11	2.13°	24100	0.56	1	LOGU12
28	**VPX300R2802SA25S**	★	2	25	115	35	11	1.77°	22500	0.40	2	LOGU12
28	**VPX300R2802SA25L**	★	2	25	170	35	11	1.77°	22500	0.60	2	LOGU12
30	**VPX300R3002SA25S**	★	2	25	125	35	11	1.61°	21500	0.45	2	LOGU12
30	**VPX300R3003SA25S**	★	3	25	125	35	11	1.61°	21500	0.44	2	LOGU12
32	**VPX300R3202SA32S**	★	2	32	125	45	11	1.47°	20600	0.69	1	LOGU12
32	**VPX300R3203SA32S**	★	3	32	125	45	11	1.47°	20600	0.68	1	LOGU12
32	**VPX300R3203SA32L**	★	3	32	190	90	11	1.47°	20600	1.04	1	LOGU12
35	**VPX300R3503SA32L**	★	3	32	190	45	11	1.28°	19500	1.10	2	LOGU12
40	**VPX300R4003SA32S**	★	3	32	125	45	11	1.06°	17900	0.76	2	LOGU12
40	**VPX300R4004SA32S**	★	4	32	125	45	11	1.06°	17900	0.76	2	LOGU12
50	**VPX300R5004SA32S**	★	4	32	125	45	11	0.79°	15500	0.89	2	LOGU12
50	**VPX300R5006SA32S**	★	6	32	125	45	11	0.79°	15500	0.88	2	LOGU12

Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
* Number of Teeth

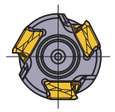
CUTTING CONDITIONS // P40

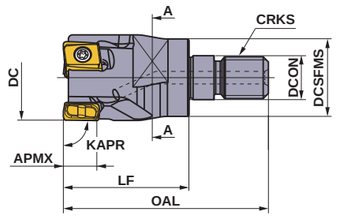
Spare Parts

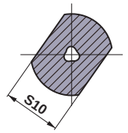
Tool Holder Type	 * Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

* Clamp Torque (lbf-in) : TPS40F1 = 26.6

Multi-Functional Cutter for High Efficiency Machining







A-A Section

Right hand tool holder only.

Metric Standard

■ Screw-in Type

With Coolant Hole

(mm)

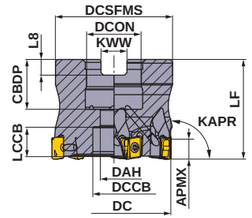
DC	Order Number	Stock R	∗1 No.T	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX	RMPX	Insert Type
25	**VPX300R2502AM1235**	★	2	12.5	23.5	57	35	19	M12	0.10	11	2.13°	LOGU12
28	**VPX300R2802AM1235**	★	2	12.5	23.5	57	35	19	M12	0.12	11	1.77°	LOGU12
32	**VPX300R3202AM1640**	★	2	17.0	28.5	63	40	24	M16	0.20	11	1.47°	LOGU12
32	**VPX300R3203AM1640**	★	3	17.0	28.5	63	40	24	M16	0.19	11	1.47°	LOGU12
35	**VPX300R3502AM1640**	★	2	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
35	**VPX300R3503AM1640**	★	3	17.0	28.5	63	40	24	M16	0.22	11	1.28°	LOGU12
40	**VPX300R4003AM1640**	★	3	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12
40	**VPX300R4004AM1640**	★	4	17.0	28.5	63	40	24	M16	0.26	11	1.06°	LOGU12

Note 1) For screw-in type arbors, refer to page 25—28.
∗1 Number of Teeth

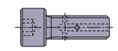
CUTTING CONDITIONS // P40

Metric Standard

For Metric Arbors



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	
ϕ80	HSC12035H	

■ Arbor Type

KAPR: 90°
GAMP : -6° GAMF : -22.5°
With Coolant Hole
DCON = Inch size

(mm)

DC	Order Number	Stock R	∗1 No.T	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Insert Type
80	**VPX300R08007CA**	★	7	50	25.4	1.00	11	0.45°	11500	LOGU12
80	**VPX300R08010CA**	★	10	50	25.4	1.00	11	0.45°	11500	LOGU12

DCON = mm size

(mm)

DC	Order Number	Stock R	∗1 No.T	LF	DCON	WT (kg)	APMX	RMPX	RPMX (min^{-1})	Insert Type
40	**VPX300-040A03AR**	★	3	40	16	0.21	11	1.06°	17900	LOGU12
40	**VPX300-040A04AR**	★	4	40	16	0.21	11	1.06°	17900	LOGU12
50	**VPX300-050A04AR**	★	4	40	22	0.34	11	0.79°	15500	LOGU12
50	**VPX300-050A06AR**	★	6	40	22	0.33	11	0.79°	15500	LOGU12
63	**VPX300-063A06AR**	★	6	40	22	0.61	11	0.60°	13400	LOGU12
63	**VPX300-063A08AR**	★	8	40	22	0.62	11	0.60°	13400	LOGU12
80	**VPX300-080A07AR**	★	7	50	27	0.99	11	0.45°	11500	LOGU12
80	**VPX300-080A10AR**	★	10	50	27	0.99	11	0.45°	11500	LOGU12

Note 1) The maximum spindle speeds are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
∗1 Number of Teeth

CUTTING CONDITIONS // P40

Mounting Dimensions

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**VPX300-040A03AR**	16	18	9	14	12.4	37	8.4	5.6
40	**VPX300-040A04AR**	16	18	9	14	12.4	37	8.4	5.6
50	**VPX300-050A04AR**	22	20	11	17	10.4	47	10.4	6.3
50	**VPX300-050A06AR**	22	20	11	17	10.4	47	10.4	6.3
63	**VPX300-063A06AR**	22	20	11	17	10.4	60	10.4	6.3
63	**VPX300-063A08AR**	22	20	11	17	10.4	60	10.4	6.3
80	**VPX300R08007CA**	25.4	26	13	20	13.4	56	9.5	6.0
80	**VPX300R08010CA**	25.4	26	13	20	13.4	56	9.5	6.0
80	**VPX300-080A07AR**	27	23	13	20	13.4	56	12.4	7.0
80	**VPX300-080A10AR**	27	23	13	20	13.4	56	12.4	7.0

Spare Parts

Tool Holder Type	 ∗		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

∗ Clamp Torque (N • m) : TPS40F1 = 3.0

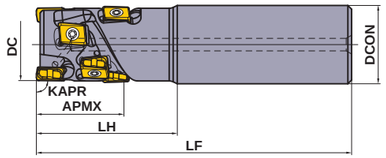
Multi-Functional Cutter for High Efficiency Machining

DEEP SHOULDER MILLING

90° KAPR

VPX300 LONG CUTTING EDGE

P M K N S H



Right hand tool holder only.

Metric Standard

■ Shank Type

KAPR: 90°
With Coolant Hole

(mm)

DC	Order Number	Stock R	⁎1 No.T	Total	DCON	LF	LH	APMX	RMPX	WT (kg)	Insert Type
40	**VPX300R402SA32S02104**	★	2	4	32	125	45	21	1.06°	0.78	LOGU12
40	**VPX300R402SA32S03106**	★	2	6	32	130	50	31	1.06°	0.79	LOGU12
40	**VPX300R402SA32S04208**	★	2	8	32	140	60	42	1.06°	0.84	LOGU12

⁎1 Number of Teeth

CUTTING CONDITIONS // P47

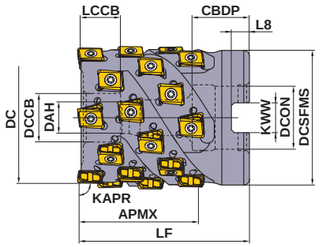
Spare Parts

(mm)

DC	Tool Holder Type	Clamp Screw ⁎	Wrench	Anti-seize Lubricant
40	**VPX300R40**	TPS40F1	TIP15W	MK1KS

⁎ Clamp Torque (lbf-in) : TPS40F1 = 31.0

★ : Stocked in Japan



Right hand tool holder only.

Metric Standard

■ Arbor Type

KAPR: 90°
GAMP: –6°, GAMF: –22.5°
DCON = mm size, With Coolant Hole

(mm)

DC	Order Number	Stock R	⁎1 No.T	Total	LF	DCON	WT (kg)	APMX	RMPX	Insert Type
40	**VPX300-040A02A031R06**	★	2	6	50	16	0.26	31	1.06°	LOGU12
40	**VPX300-040A02A042R08**	★	2	8	60	16	0.31	42	1.06°	LOGU12
50	**VPX300-050A03A031R09**	★	3	9	55	22	0.47	31	0.79°	LOGU12
50	**VPX300-050A03A042R12**	★	3	12	65	22	0.55	42	0.79°	LOGU12
50	**VPX300-050A03A052R15**	★	3	15	75	22	0.63	52	0.79°	LOGU12
63	**VPX300-063A04A042R16**	★	4	16	65	27	0.92	42	0.6°	LOGU12
63	**VPX300-063A04A052R20**	★	4	20	75	27	1.06	52	0.6°	LOGU12
80	**VPX300-080A05A052R25**	★	5	25	75	27	1.94	52	0.45°	LOGU12
80	**VPX300-080A05A063R30**	★	5	30	85	27	2.20	63	0.45°	LOGU12

DCON = inch size, With Coolant Hole

(mm)

DC	Order Number	Stock R	⁎1 No.T	Total	LF	DCON	WT (kg)	APMX	RMPX	Insert Type
80	**VPX300R08005CA05225**	★	5	25	75	31.75	1.81	52	0.45°	LOGU12
80	**VPX300R08005CA06330**	★	5	30	85	31.75	2.06	63	0.45°	LOGU12

⁎1 Number of Teeth

CUTTING CONDITIONS // P47

Mounting Dimensions

(mm)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8
40	**VPX300-040A02A031R06**	16	18	9	14	8.4	37	8.4	5.6
40	**VPX300-040A02A042R08**	16	18	9	14	8.4	37	8.4	5.6
50	**VPX300-050A03A031R09**	22	20	11	17	12.4	47	10.4	6.3
50	**VPX300-050A03A042R12**	22	20	11	17	12.4	47	10.4	6.3
50	**VPX300-050A03A052R15**	22	20	11	17	12.4	47	10.4	6.3
63	**VPX300-063A04A042R16**	27	23	13	20	12.4	76	12.4	7.0
63	**VPX300-063A04A052R20**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300-080A05A052R25**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300-080A05A063R30**	27	23	13	20	12.4	76	12.4	7.0
80	**VPX300R08005CA05225**	31.75	32	17	26	17.4	76	12.7	8.0
80	**VPX300R08005CA06330**	31.75	32	17	26	17.4	76	12.7	8.0

Order Number	APMX	Set Bolt	Geometry
VPX300-040A02A031	31	HSC08040	
VPX300-040A02A042	42	HSC08050	
VPX300-050A03A031	31	HSC10040	
VPX300-050A03A042	42	HSC10050	
VPX300-050A03A052	52	HSC10060	
VPX300-063A04A042	42	HSC12050	
VPX300-063A04A052	52	HSC12060	
VPX300-080A05A052	52	HSC12060	
VPX300-080A05A063	63	HSC12070	
VPX300R08005CA052	52	HSC16055	
VPX300R08005CA063	63	HSC16065	

Multi-Functional Cutter for High Efficiency Machining

■ Inserts

(inch)

Workpiece Material		
P	Steels	
M	Stainless Steels	
K	Cast Irons	
N	Non-ferrous Metals	
S	Heat Resistant Alloys, Titanium Alloys	
H	Hardened Steels	

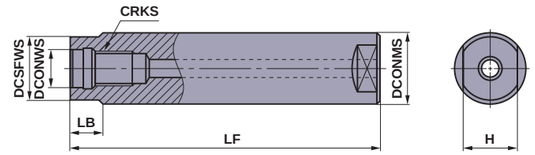
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✣ : Unstable Cutting

Edge Preparation :
E : Round **F :** Sharp

Shape		Order Number	Class	Edge Preparation	Coated MC5020	Coated MP6120	Coated MP6130	Coated MP7130	Coated MP9120	Coated MP9130	Coated VP15TF	Carbide TF15		L	RE	LE	S	BS	Geometry
Low Cutting Resistance L Breaker	NEW	LOGU1207020PNER-L	G	E	●	●	●	●	●	●	●			.488	.008	.445	.276	.118	
	NEW	LOGU1207040PNER-L	G	E	●	●	●	●	●	●	●			.488	.016	.445	.276	.110	
	NEW	LOGU1207080PNER-L	G	E	●	●	●	●	●	●	●			.488	.031	.445	.276	.102	
	NEW	LOGU1207100PNER-L	G	E	●	●	●	●	●	●	●			.488	.039	.445	.276	.098	
	NEW	LOGU1207120PNER-L	G	E	●	●	●	●	●	●	●			.488	.047	.445	.276	.094	
	NEW	LOGU1207160PNER-L	G	E	●	●	●	●	●	●	●			.488	.063	.445	.276	.071	
	NEW	LOGU1207200PNER-L	G	E	●	●	●	●	●	●	●			.488	.079	.445	.276	.055	
	NEW	LOGU1207240PNER-L	G	E	●	●	●	●	●	●	●			.488	.094	.445	.276	.047	
	NEW	LOGU1207300PNER-L	G	E	●	●	●	●	●	●	●			.488	.118	.445	.276	.024	
	NEW	LOGU1207320PNER-L	G	E	●	●	●	●	●	●	●			.488	.126	.445	.276	.016	
	NEW	LOGU1207020PNFR-L	G	F								●		.488	.008	.445	.276	.118	
	NEW	LOGU1207040PNFR-L	G	F								●		.488	.016	.445	.276	.110	
	NEW	LOGU1207080PNFR-L	G	F								●		.488	.031	.445	.276	.102	
	NEW	LOGU1207100PNFR-L	G	F								●		.488	.039	.445	.276	.098	
	NEW	LOGU1207120PNFR-L	G	F								●		.488	.047	.445	.276	.094	
	NEW	LOGU1207160PNFR-L	G	F								●		.488	.063	.445	.276	.071	
	NEW	LOGU1207200PNFR-L	G	F								●		.488	.079	.445	.276	.055	
	NEW	LOGU1207240PNFR-L	G	F								●		.488	.094	.445	.276	.047	
	NEW	LOGU1207300PNFR-L	G	F								●		.488	.118	.445	.276	.024	
	NEW	LOGU1207320PNFR-L	G	F								●		.488	.126	.445	.276	.016	Right hand insert only.
General Use M Breaker		LOGU1207020PNER-M	G	E	●	●	●	●	●	●	●			.488	.008	.445	.276	.118	
		LOGU1207040PNER-M	G	E	●	●	●	●	●	●	●			.488	.016	.445	.276	.110	
		LOGU1207080PNER-M	G	E	●	●	●	●	●	●	●			.488	.031	.445	.276	.094	
		LOGU1207100PNER-M	G	E	●	●	●	●	●	●	●			.488	.039	.445	.276	.091	
		LOGU1207120PNER-M	G	E	●	●	●	●	●	●	●			.488	.047	.445	.276	.083	
		LOGU1207160PNER-M	G	E	●	●	●	●	●	●	●			.488	.063	.445	.276	.067	
		LOGU1207200PNER-M	G	E	●	●	●	●	●	●	●			.488	.079	.445	.276	.055	
		LOGU1207240PNER-M	G	E	●	●	●	●	●	●	●			.488	.094	.445	.276	.039	
		LOGU1207300PNER-M	G	E	●	●	●	●	●	●	●			.488	.118	.445	.276	.020	
		LOGU1207320PNER-M	G	E	●	●	●	●	●	●	●			.488	.126	.445	.276	.012	
		LOGU1207020PNFR-M	G	F								●		.488	.008	.445	.276	.118	
		LOGU1207040PNFR-M	G	F								●		.488	.016	.445	.276	.110	
		LOGU1207080PNFR-M	G	F								●		.488	.031	.445	.276	.094	
		LOGU1207100PNFR-M	G	F								●		.488	.039	.445	.276	.091	
		LOGU1207120PNFR-M	G	F								●		.488	.047	.445	.276	.083	
		LOGU1207160PNFR-M	G	F								●		.488	.063	.445	.276	.067	
		LOGU1207200PNFR-M	G	F								●		.488	.079	.445	.276	.055	
		LOGU1207240PNFR-M	G	F								●		.488	.094	.445	.276	.039	
		LOGU1207300PNFR-M	G	F								●		.488	.118	.445	.276	.020	
		LOGU1207320PNFR-M	G	F								●		.488	.126	.445	.276	.012	Right hand insert only.

● : USA Stock ★ : Stocked in Japan (10 inserts in one case)

SCREW-IN HOLDERS
STRAIGHT SHANK TYPE



■ Steel Shank Type

(inch)

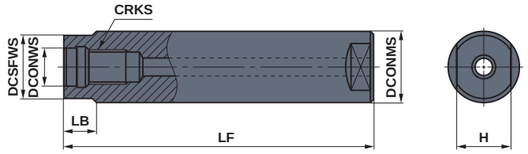
CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (lbs)
M8	**SCU10M08S100S**	●	.625	3.937	.335	.571	.394	.394	.2
M8	**SCU10M08S200L**	●	.625	7.874	.335	.571	.394	.394	.7
M10	**SCU12M10S120S**	●	.750	4.724	.413	.728	.394	.551	.4
M10	**SCU12M10S220L**	●	.750	8.661	.413	.728	.394	.551	.9
M12	**SCU16M12S125S**	●	1.000	4.921	.492	.925	.394	.748	.9
M12	**SCU16M12S245L**	●	1.000	9.646	.492	.925	.394	.748	2.0
M16	**SCU20M16S140S**	●	1.250	5.512	.669	1.122	.591	.945	1.8
M16	**SCU20M16S280L**	●	1.250	11.024	.669	1.122	.591	.945	3.5

Metric Standard

(mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (kg)
M8	**SC16M08S100S**	★	16	100	8.5	14.5	10	10	0.1
M8	**SC16M08S200L**	★	16	200	8.5	14.5	10	10	0.3
M10	**SC20M10S120S**	★	20	120	10.5	18.5	10	14	0.3
M10	**SC20M10S220L**	★	20	220	10.5	18.5	10	14	0.5
M12	**SC25M12S125S**	★	25	125	12.5	23.5	10	19	0.4
M12	**SC25M12S245L**	★	25	245	12.5	23.5	10	19	0.8
M16	**SC32M16S140S**	★	32	140	17.0	28.5	15	24	0.8
M16	**SC32M16S280L**	★	32	280	17.0	28.5	15	24	1.6

Multi-Functional Cutter for High Efficiency Machining



■Carbide Shank Type

(inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (lbs)
M8	**SCU10M08S100SW**	●	.625	3.937	.335	.571	.394	.394	.4
M8	**SCU10M08S200LW**	●	.625	7.874	.335	.571	.394	.394	1.1
M10	**SCU12M10S120SW**	●	.750	4.724	.413	.728	.394	.551	.9
M10	**SCU12M10S220LW**	●	.750	8.661	.413	.728	.394	.551	1.8
M12	**SCU16M12S125SW**	●	1.000	4.921	.492	.925	.394	.748	1.8
M12	**SCU16M12S245LW**	●	1.000	9.646	.492	.925	.394	.748	3.5
M16	**SCU20M16S140SW**	●	1.250	5.512	.669	1.122	.591	.945	3.1
M16	**SCU20M16S280LW**	●	1.250	11.024	1.250	1.122	.591	.945	6.4

Metric Standard

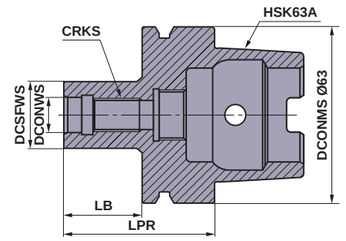
(mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (kg)
M8	**SC16M08S100SW**	★	16	100	8.5	14.5	10	10	0.2
M8	**SC16M08S200LW**	★	16	200	8.5	14.5	10	10	0.5
M10	**SC20M10S120SW**	★	20	120	10.5	18.5	10	14	0.5
M10	**SC20M10S220LW**	★	20	220	10.5	18.5	10	14	0.9
M12	**SC25M12S125SW**	★	25	125	12.5	23.5	10	19	0.8
M12	**SC25M12S245LW**	★	25	245	12.5	23.5	10	19	1.5
M16	**SC32M16S140SW**	★	32	140	17.0	28.5	15	24	1.4
M16	**SC32M16S280LW**	★	32	280	17.0	28.5	15	24	2.8

● : USA Stock ★ : Stocked in Japan

SCREW-IN HOLDERS

■HSK63A Shank Arbor



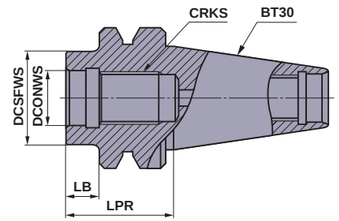
Metric Standard

The coolant tube has been already set.

(mm)

CRKS	Order Number	Stock	DCONWS	DCSFWS	LPR	LB	WT (kg)
M8	**SC16M08S22-HSK63A**	★	8.5	14.5	48	22	0.7
M10	**SC20M10S24-HSK63A**	★	10.5	18.5	50	24	0.7
M12	**SC25M12S27-HSK63A**	★	12.5	23.5	53	27	0.7
M16	**SC32M16S28-HSK63A**	★	17.0	28.5	54	28	0.8

■BT30 Shank Arbor

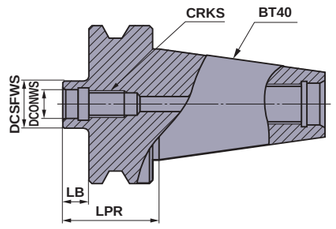


Metric Standard

(mm)

CRKS	Order Number	Stock	DCONWS	DCSFWS	LPR	LB	WT (kg)
M8	**SC16M08S10-BT30**	★	8.5	14.5	32	10	0.4
M10	**SC20M10S10-BT30**	★	10.5	18.5	32	10	0.4
M12	**SC25M12S10-BT30**	★	12.5	23.5	32	10	0.4
M16	**SC32M16S10-BT30**	★	17.0	28.5	32	10	0.4

■BT40 Shank Arbor



Metric Standard

(mm)

CRKS	Order Number	Stock	DCONWS	DCSFWS	LPR	LB	WT (kg)
M8	**SC16M08S10-BT40**	★	8.5	14.5	37	10	1
M10	**SC20M10S10-BT40**	★	10.5	18.5	37	10	1
M12	**SC25M12S10-BT40**	★	12.5	23.5	37	10	1
M16	**SC32M16S10-BT40**	★	17.0	28.5	37	10	1

Multi-Functional Cutter for High Efficiency Machining

How to Install the Screw-in Head

①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.

②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

(inch)

Screw Size	Recommended Torque (lbf-ft)	Wrench Size
M8	17.0	.394
M10	33.9	.551
M12	59.0	.748
M16	66.4	.945

●Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce risk of injuries or burns.

●Do not handle the cutting tools with bare hands as this may cause injuries.

VPX200/VPX300

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✤ : Unstable Cutting

Chip Breaker Recommendation

■ Chip Breaker Selection Table

Workpiece Material		Properties	Cutting Conditions	Chip Breaker 1st Recommended	Chip Breaker 2nd Recommended	Grade 1st Recommended	Grade 2nd Recommended
P	Mild Steels	Hardness ≤180HB	● ◔	L	M	MP6120	VP15TF
			✤	M	L	MP6130	—
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180-350HB ≤350HB (Annealing)	●	L	M	MP6120	VP15TF
			◔	M	L	MP6120	VP15TF
			✤	M	L	MP6130	—
	Pre-hardened Steels	Hardness 35—45HRC	● ◔	M	L	MP6120	VP15TF
			✤	M	L	MP6130	—
M	Austenitic Stainless Steels	Hardness ≤280HB	○ ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
		Hardness >200HB	○ ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Duplex Stainless Steels	Hardness ≤280HB	○ ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Ferritic and Martensitic Stainless Steels	—	○ ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
	Precipitation Hardening Stainless Steels	Hardness <450HB	○ ◔	L	M	MP7130	VP15TF
			✣	M	L	MP7130	—
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◔	M	L	MC5020	VP15TF
			✤	M	L	VP15TF	—
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◔	M	L	MC5020	VP15TF
			✤	M	L	VP15TF	—
N	Aluminum Alloys	Content Si<5%	● ◔	L	M	TF15	—
			✤	M	L	TF15	—
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ◔	L	M	MP9120	VP15TF
			✤	M	L	MP9130	—
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◔	L	M	MP9120	VP15TF
			✤	M	L	MP9130	—
	Heat Resistant Alloys	—	● ◔	M	L	MP9120	VP15TF
			✤	M	L	MP9130	—
H	Hardened Steels	Hardness 40—55HRC	● ◔ ✤	M	—	VP15TF	—

For cutting conditions please refer to page 30—38.

Multi-Functional Cutter for High Efficiency Machining

VPX200

Recommended Cutting Conditions

■ Dry Cutting
Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
					Cutting Speed **vc** (SFM)			
P	Mild Steels	Hardness ≤180HB	● ◔	MP6120,VP15TF	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			✣	MP6130	655 (490—785)	620 (460—755)	490 (360—590)	490 (360—590)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◔	MP6120,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			✣	MP6130	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
	Pre-hardened Steels	Hardness 35—45HRC	● ◔	MP6120,VP15TF	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✣	MP6130	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steels	Hardness ≤200HB	○ ◔ ✣	MP7130,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
		Hardness >200HB	○ ◔ ✣	MP7130,VP15TF	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
	Duplex Stainless Steels	Hardness ≤280HB	○ ◔ ✣	MP7130,VP15TF	460 (360—560)	425 (295—490)	330 (230—395)	330 (230—395)
	Ferritic and Martensitic Stainless Steels	—	○ ◔ ✣	MP7130,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
	Precipitation Hardening Stainless Steels	Hardness <450HB	○ ◔ ✣	MP7130,VP15TF	425 (330—525)	395 (260—460)	295 (195—360)	295 (195—360)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◔	MC5020	820 (655—985)	785 (620—950)	690 (525—850)	690 (525—850)
			● ◔ ✣	VP15TF	655 (490—820)	620 (460—785)	525 (360—690)	525 (360—690)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◔	MC5020	590 (490—655)	560 (460—620)	490 (395—560)	490 (395—560)
			● ◔ ✣	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
N	Aluminum Alloys	Content Si<5%	● ◔ ✣	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
H	Hardened Steels	Hardness 40—55HRC	● ◔ ✣	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✣ : Unstable Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16mm-ø18mm) Depth of Cut **ap**	ø.625-ø.750(ø16mm-ø18mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20mm-ø25mm) Depth of Cut **ap**	ø.875-ø1.000(ø20mm-ø25mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28mm-ø63mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28mm-ø63mm) Feed per Tooth **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	≤.25DC	● ◔ ✣	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◔ ✣	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◔ ✣	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◔ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—280HB	≤.25DC	● ◔ ✣	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◔ ✣	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◔ ✣	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◔ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◔ ✣	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◔ ✣	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◔ ✣	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◔ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Pre-hardened Steels	Hardness 35—45HRC	≤.25DC	● ◔ ✣	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◔ ✣	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◔ ✣	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◔ ✣	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
M	Austenitic Stainless Steels	—	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✣	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✣	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Duplex Stainless Steels	Hardness ≤280HB	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✣	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✣	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Ferritic and Martensitic Stainless Steels	—	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✣	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✣	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Precipitation Hardening Stainless Steels	Hardness <450HB	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.006
				✣	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				✣	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				✣	≤.157	.002—.003	≤.236	.002—.003	≤.236	.002—.003
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✣	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

VPX200

Recommended Cutting Conditions

■ Dry Cutting
Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16mm-ø18mm) Depth of Cut **ap**	ø.625-ø.750(ø16mm-ø18mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20mm-ø25mm) Depth of Cut **ap**	ø.875-ø1.000(ø20mm-ø25mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28mm-ø63mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28mm-ø63mm) Feed per Tooth **fz** (IPT)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤.25DC	● ◕	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.004—.008
			.25—.5DC	● ◕	≤.197	.003—.005	≤.315	.003—.006	≤.315	.004—.008
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◕	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◕	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.003—.004
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤.25DC	● ◕	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.25—.5DC	● ◕	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◕	≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◕	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
N	Aluminum Alloys	Content Si< 5%	≤.25DC	● ◕	≤.236	.004—.008	≤.315	.004—.010	≤.315	.004—.010
				✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
			.25—.5DC	● ◕	≤.197	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.5—.75DC	● ◕	≤.157	.003—.005	≤.236	.002—.006	≤.236	.003—.006
				✲	≤.157	.002—.004	≤.236	.002—.006	≤.236	.003—.006
			DC(Slot)	● ◕	≤.079	.002—.004	≤.157	.002—.006	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.005	≤.157	.003—.005
H	Hardened Steels	Hardness 40—55HRC	≤.25DC	● ◕	≤.157	.003—.006	≤.157	.003—.006	≤.157	.003—.006
				✲	≤.157	.003—.005	≤.157	.003—.005	≤.157	.003—.005
			.25—.5DC	● ◕	≤.118	.003—.005	≤.118	.003—.005	≤.118	.003—.005
				✲	≤.118	.002—.004	≤.118	.003—.004	≤.118	.002—.004
			.5—.75DC	● ◕	≤.079	.002—.004	≤.079	.003—.004	≤.079	.002—.004
				✲	≤.079	.002—.003	≤.079	.002—.003	≤.079	.002—.003
			DC(Slot)	● ◕	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				✲	≤.039	.002—.003	≤.039	.002—.003	≤.039	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✲ : Unstable Cutting

■ Wet Cutting
Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** ≤.25DC Cutting Speed **vc** (SFM)	.25—.5DC	.5—.75DC	DC(Slot)
P	Mild Steels	Hardness ≤180HB	● ◕	MP6120	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			● ◕	VP15TF				
			✲	MP6130				
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◕	MP6120	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ◕	VP15TF				
			✲	MP6130				
	Pre-hardened Steels	Hardness 35—45HRC	● ◕	MP6120	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			● ◕	VP15TF				
			✲	MP6130				
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◕ ✲	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ◕	VP15TF				
		Hardness >200HB	● ◕ ✲	MP7130	330 (260—425)	295 (230—360)	230 (165—330)	230 (165—330)
			● ◕	VP15TF				
	Duplex Stainless Steels	Hardness ≤280HB	● ◕ ✲	MP7130	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ◕	VP15TF				
	Ferritic and Martensitic Stainless Steels	—	● ◕ ✲	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ◕	VP15TF				
	Precipitation Hardening Stainless Steels	Hardness <450HB	● ◕ ✲	MP7130	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
			● ◕	VP15TF				
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◕	MC5020	590 (525—720)	560 (490—690)	490 (425—620)	490 (425—620)
			● ◕ ✲	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◕	MC5020	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			● ◕ ✲	VP15TF	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
N	Aluminum Alloys	Content Si<5%	● ◕ ✲	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ◕	MP9120	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			● ◕	VP15TF	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			✲	MP9130	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◕	MP9120	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			● ◕	VP15TF	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			✲	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
	Heat Resistant Alloys	—	● ◕	MP9120	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			● ◕	VP15TF	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			✲	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
H	Hardened Steels	Hardness 40—55HRC	● ◕ ✲	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

VPX200

Recommended Cutting Conditions

■ Wet Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16mm-ø18mm) Depth of Cut **ap**	ø.625-ø.750(ø16mm-ø18mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20mm-ø25mm) Depth of Cut **ap**	ø.875-ø1.000(ø20mm-ø25mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28mm-ø63mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28mm-ø63mm) Feed per Tooth **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◐ ✲	≤.197	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Pre-hardened Steels	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
M	Austenitic Stainless Steels	—	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Duplex Stainless Steels	Hardness ≤280HB	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.005
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Ferritic and Martensitic Stainless Steels	—	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Precipitation Hardening Stainless Steels	Hardness <450HB	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				✲	≤.157	.002—.003	≤.236	.002—.003	≤.236	.002—.003
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø.625-ø.750(ø16mm-ø18mm) Depth of Cut **ap**	ø.625-ø.750(ø16mm-ø18mm) Feed per Tooth **fz** (IPT)	ø.875-ø1.000(ø20mm-ø25mm) Depth of Cut **ap**	ø.875-ø1.000(ø20mm-ø25mm) Feed per Tooth **fz** (IPT)	ø1.125-ø2.500(ø28mm-ø63mm) Depth of Cut **ap**	ø1.125-ø2.500(ø28mm-ø63mm) Feed per Tooth **fz** (IPT)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.004—.008
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.003—.006	≤.315	.004—.008
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐	≤.157	.003—.005	≤.236	.002—.004	≤.236	.004—.006
				✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.004
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤.25DC	● ◐	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.25—.5DC	● ◐	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐	≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.002—.004
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
N	Aluminum Alloys	Content Si< 5%	≤.25DC	● ◐	≤.236	.004—.008	≤.315	.004—.010	≤.315	.004—.010
				✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
			.25—.5DC	● ◐	≤.197	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			.5—.75DC	● ◐	≤.157	.003—.005	≤.236	.002—.006	≤.236	.003—.006
				✲	≤.157	.002—.004	≤.236	.002—.006	≤.236	.003—.006
			DC(Slot)	● ◐	≤.079	.002—.004	≤.157	.002—.006	≤.157	.003—.006
				✲	≤.079	.002—.003	≤.157	.002—.005	≤.157	.003—.005
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	≤.25DC	● ◐ ✲	≤.236	.003—.006	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐ ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤.25DC	● ◐ ✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐ ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ◐ ✲	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
H	Hardened Steels	Hardness 40—55HRC	≤.25DC	● ◐	≤.157	.003—.006	≤.157	.003—.006	≤.157	.003—.006
				✲	≤.157	.003—.005	≤.157	.003—.005	≤.157	.003—.005
			.25—.5DC	● ◐	≤.118	.003—.005	≤.118	.003—.005	≤.118	.003—.005
				✲	≤.118	.002—.004	≤.118	.002—.004	≤.118	.002—.004
			.5—.75DC	● ◐	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
				✲	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
			DC(Slot)	● ◐	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				✲	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

VPX300

Recommended Cutting Conditions

■ Dry Cutting

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	Insert Chip Breaker	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
						Cutting Speed **vc** (SFM)			
P	Mild Steels	Hardness ≤180HB	● ◔	MP6120 VP15TF	M	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			✲	MP6130	M	655 (490—785)	620 (560—850)	490 (360—590)	490 (360—590)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◔	MP6120 VP15TF	M	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—590)
			✲	MP6130	M	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
	Pre-hardened Steels	Hardness 35—45HRC	● ◔	MP6120 VP15TF	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✲	MP6130	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steels	Hardness ≤200HB	○ ◔ ✲	MP7130 VP15TF	M	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
		Hardness >200HB	○ ◔ ✲	MP7130 VP15TF	M	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
	Duplex Stainless Steels	Hardness ≤280HB	○ ◔ ✲	MP7130 VP15TF	M	460 (360—560)	425 (295—490)	330 (230—395)	330 (230—395)
	Ferritic and Martensitic Stainless Steels	—	○ ◔ ✲	MP7130 VP15TF	M	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
	Precipitation Hardening Stainless Steels	Hardness <450HB	○ ◔ ✲	MP7130 VP15TF	M	425 (330—525)	395 (260—460)	295 (195—360)	295 (195—360)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◔	MC5020	M	820 (655—985)	785 (620—950)	690 (525—850)	690 (525—850)
			● ◔ ✲	VP15TF	M	655 (490—820)	620 (460—785)	525 (360—690)	525 (360—690)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◔	MC5020	M	590 (490—655)	560 (460—620)	490 (395—560)	490 (395—560)
			● ◔ ✲	VP15TF	M	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
N	Aluminum Alloys	Content Si<5%	● ◔ ✲	TF15	M	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
H	Hardened Steels	Hardness 40—55HRC	● ◔ ✲	VP15TF	M	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø1.000 (ø25mm) Depth of Cut **ap**	ø1.000 (ø25mm) Feed per Tooth. **fz** (IPT)	ø1.125—ø3.000 (ø28mm-ø80mm) Depth of Cut **ap**	ø1.125—ø3.000 (ø28mm-ø80mm) Feed per Tooth. **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	≤.25DC	● ◔ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◔ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—280HB	≤.25DC	● ◔ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◔ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.005
	Pre-hardened Steels	Hardness 35—45HRC	≤.25DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.005
M	Austenitic Stainless Steels	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Duplex Stainless Steels	Hardness ≤280HB	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Ferritic and Martensitic Stainless Steels	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Precipitation Hardening Stainless Steels	Hardness <450HB	≤.25DC	○ ◔	≤.433	.004—.006	≤.433	.004—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.005
				✲	≤.433	.003—.005	≤.433	.002—.004
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.002—.004
				✲	≤.315	.002—.003	≤.315	.002—.003
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
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Multi-Functional Cutter for High Efficiency Machining

VPX300

Recommended Cutting Conditions

■ Dry Cutting
Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø1.000 (ø25mm) Depth of Cut **ap**	ø1.000 (ø25mm) Feed per Tooth. **fz** (IPT)	ø1.125–ø3.000 (ø28mm-ø80mm) Depth of Cut **ap**	ø1.125–ø3.000 (ø28mm-ø80mm) Feed per Tooth. **fz** (IPT)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.433	.004—.008	≤.433	.004—.012
				✲	≤.433	.003—.006	≤.433	.004—.010
			.25—.5DC	● ◐	≤.433	.003—.006	≤.433	.004—.010
				✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◐	≤.315	.003—.005	≤.315	.004—.008
				✲	≤.315	.002—.004	≤.315	.003—.006
			DC(Slot)	● ◐	≤.197	.002—.004	≤.197	.003—.006
				✲	≤.197	.002—.003	≤.197	.003—.005
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤.25DC	● ◐	≤.433	.004—.008	≤.433	.004—.010
				✲	≤.433	.004—.006	≤.433	.004—.008
			.25—.5DC	● ◐	≤.433	.004—.006	≤.433	.004—.008
				✲	≤.433	.003—.005	≤.433	.004—.006
			.5—.75DC	● ◐	≤.315	.003—.005	≤.315	.004—.006
				✲	≤.315	.003—.005	≤.315	.003—.005
			DC(Slot)	● ◐	≤.197	.002—.004	≤.197	.003—.005
				✲	≤.197	.002—.003	≤.197	.002—.004
N	Aluminum Alloys	Content Si＜5%	≤.25DC	● ◐	≤.433	.004—.010	≤.433	.004—.010
				✤	≤.433	.004—.008	≤.433	.004—.008
			.25—.5DC	● ◐	≤.433	.004—.008	≤.433	.004—.008
				✤	≤.433	.004—.006	≤.433	.004—.006
			.5—.75DC	● ◐	≤.315	.002—.006	≤.315	.003—.006
				✤	≤.315	.002—.006	≤.315	.003—.006
			DC(Slot)	● ◐	≤.197	.002—.006	≤.197	.003—.006
				✤	≤.197	.002—.006	≤.197	.003—.005
H	Hardened Steels	Hardness 40—55HRC	≤.25DC	● ◐	≤.197	.003—.006	≤.197	.003—.006
				✲	≤.197	.003—.005	≤.197	.003—.005
			.25—.5DC	● ◐	≤.157	.003—.005	≤.157	.003—.005
				✲	≤.157	.002—.004	≤.157	.002—.004
			.5—.75DC	● ◐	≤.118	.002—.004	≤.118	.002—.004
				✲	≤.118	.002—.003	≤.118	.002—.003
			DC(Slot)	● ◐	≤.079	.002—.004	≤.079	.002—.004
				✲	≤.079	.002—.003	≤.079	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

■ Wet Cutting
Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Insert Grade	Insert Chip Breaker	Cutting Width **ae** ≤.25DC Cutting Speed **vc** (SFM)	.25—.5DC	.5—.75DC	DC(Slot)
P	Mild Steels	Hardness ≤180HB	● ◐	MP6120	M	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			● ◐	VP15TF	M	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			✲	MP6130	M	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—350HB ≤350HB (Annealing)	● ◐	MP6120	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ◐	VP15TF	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✲	MP6130	M	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
	Pre-hardened Steels	Hardness 35—45HRC	● ◐	MP6120	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			● ◐	VP15TF	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			✲	MP6130	M	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐ ✲	MP7130	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ◐	VP15TF	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
		Hardness ＞200HB	● ◐ ✲	MP7130	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ◐	VP15TF	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
	Duplex Stainless Steels	Hardness ≤280HB	● ◐ ✲	MP7130	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ◐	VP15TF	M	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
	Ferritic and Martensitic Stainless Steels	—	● ◐ ✲	MP7130	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ◐	VP15TF	M	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
	Precipitation Hardening Stainless Steels	Hardness <450HB	● ◐ ✲	MP7130	M	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
			● ◐	VP15TF	M	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	M	590 (525—720)	560 (490—690)	490 (425—620)	490 (425—620)
			● ◐ ✲	VP15TF	M	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	M	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			● ◐ ✲	VP15TF	M	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
N	Aluminum Alloys	Content Si＜5%	● ◐ ✲	TF15	M	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ◐	MP9120	M	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			● ◐	VP15TF	M	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			✲	MP9130	M	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◐	MP9120	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			● ◐	VP15TF	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			✲	MP9130	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
	Heat Resistant Alloys	—	● ◐	MP9120	M	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			● ◐	VP15TF	M	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			✲	MP9130	M	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
H	Hardened Steels	Hardness 40—55HRC	● ◐ ✲	VP15TF	M	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

VPX300

Recommended Cutting Conditions

■ Wet Cutting

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø1.000 (ø25mm) Depth of Cut **ap**	ø1.000 (ø25mm) Feed per Tooth. **fz** (IPT)	ø1.125—ø3.000 (ø28mm-ø80mm) Depth of Cut **ap**	ø1.125—ø3.000 (ø28mm-ø80mm) Feed per Tooth. **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	≤.25DC	● ◔ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◔ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 180—280HB	≤.25DC	● ◔ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◔ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.005
	Pre-hardened Steels	Hardness 35—45HRC	≤.25DC	● ◔ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.003—.005
M	Austenitic Stainless Steels	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.006
				✲	≤.433	.002—.004	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Duplex Stainless Steels	Hardness ≤280HB	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Ferritic and Martensitic Stainless Steels	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Precipitation Hardening Stainless Steels	Hardness <450HB	≤.25DC	○ ◔	≤.433	.004—.006	≤.433	.004—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.005
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.002—.004
				✲	≤.315	.002—.003	≤.315	.002—.003
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003

Note 1) These cutting conditions should be referenced for standard shank types (last letter in designation is S) and arbor shank types. If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
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Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Cutting Conditions (Guide) :
● : Stable Cutting ◔ : General Cutting ✲ : Unstable Cutting

(inch)

	Workpiece Material	Properties	Cutting Width **ae**	Cutting Conditions	Cutter Diameter **DC** ø1.000 (ø25mm) Depth of Cut **ap**	ø1.000 (ø25mm) Feed per Tooth. **fz** (IPT)	ø1.125—ø3.000 (ø28mm-ø80mm) Depth of Cut **ap**	ø1.125—ø3.000 (ø28mm-ø80mm) Feed per Tooth. **fz** (IPT)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤.25DC	● ◔	≤.433	.004—.008	≤.433	.004—.012
				✲	≤.433	.003—.006	≤.433	.004—.010
			.25—.5DC	● ◔	≤.433	.003—.006	≤.433	.004—.010
				✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔	≤.315	.003—.005	≤.315	.004—.008
				✲	≤.315	.002—.004	≤.315	.003—.006
			DC(Slot)	● ◔	≤.197	.002—.004	≤.197	.003—.006
				✲	≤.197	.002—.003	≤.197	.003—.005
	Ductile Cast Irons	Tensile Strength ≤800MPa	≤.25DC	● ◔	≤.433	.004—.008	≤.433	.004—.010
				✲	≤.433	.004—.006	≤.433	.004—.008
			.25—.5DC	● ◔	≤.433	.004—.006	≤.433	.004—.008
				✲	≤.433	.003—.005	≤.433	.004—.006
			.5—.75DC	● ◔	≤.315	.003—.005	≤.315	.004—.006
				✲	≤.315	.002—.004	≤.315	.003—.005
			DC(Slot)	● ◔	≤.197	.002—.004	≤.197	.003—.005
				✲	≤.197	.002—.003	≤.197	.002—.004
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◔	≤.433	.004—.010	≤.433	.004—.010
				✲	≤.433	.004—.008	≤.433	.004—.008
			.25—.5DC	● ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.004—.006	≤.433	.004—.006
			.5—.75DC	● ◔	≤.315	.002—.006	≤.315	.003—.006
				✲	≤.315	.002—.006	≤.315	.003—.006
			DC(Slot)	● ◔	≤.197	.002—.006	≤.197	.003—.006
				✲	≤.197	.002—.006	≤.197	.003—.005
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	≤.25DC	● ◔ ✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.002—.004
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	≤.25DC	● ◔ ✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.002—.004
	Heat Resistant Alloys	—	≤.25DC	● ◔ ✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	● ◔ ✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	● ◔ ✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	● ◔ ✲	≤.197	.002—.004	≤.197	.002—.004
H	Hardened Steels	Hardness 40—55HRC	≤.25DC	● ◔	≤.197	.003—.006	≤.197	.003—.006
				✲	≤.197	.003—.005	≤.197	.003—.005
			.25—.5DC	● ◔	≤.157	.003—.005	≤.157	.003—.005
				✲	≤.157	.002—.004	≤.157	.002—.004
			.5—.75DC	● ◔	≤.118	.002—.004	≤.118	.002—.004
				✲	≤.118	.002—.004	≤.118	.002—.003
			DC(Slot)	● ◔	≤.079	.002—.004	≤.079	.002—.004
				✲	≤.079	.002—.004	≤.079	.002—.003

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Memo

VPX200/300
DEEP SHOULDER MILLING

Cutting Conditions (Guide) :
● : Stable Cutting ◕ : General Cutting ✤ : Unstable Cutting

Recommended Cutting Conditions

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)	Cutting Mode
					Cutting Speed **vc** (SFM)				
P	Mild Steels	Hardness ≤180HB	● ◕	MP6120,VP15TF	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, Wet
			✤	MP6130	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, Wet
	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◕	MP6120,VP15TF	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Dry, Wet
			✤	MP6130	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Dry, Wet
	Pre-hardened Steels	Hardness 180—350HB	● ◕	MP6120,VP15TF	330(260—395)	295(230—360)	260(195—330)	260(195—330)	Dry, Wet
			✤	MP6130	330(260—395)	295(230—360)	260(195—330)	260(195—330)	Dry, Wet
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◕	MP7130,VP15TF	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
			✤	MP7130	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
		Hardness >200HB	● ◕	MP7130,VP15TF	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
			✤	MP7130	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
	Ferritic and Martensitic Stainless Steels	—	● ◕	MP7130,VP15TF	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
			✤	MP7130	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
	Duplex Stainless Steels	Hardness ≤280HB	● ◕	MP7130,VP15TF	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
			✤	MP7130	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
	Precipitation Hardening Stainless Steels	Hardness <450HB	● ◕	MP7130,VP15TF	295(230—395)	260(195—360)	195(130—295)	195(130—295)	Dry, Wet
			✤	MP7130	295(230—395)	260(195—360)	195(130—295)	195(130—295)	Dry, Wet
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◕	MC5020	590(525—720)	560(490—690)	490(425—620)	490(425—620)	Dry, Wet
			◕ ✤	VP15TF	425(330—490)	395(295—460)	330(260—395)	330(260—395)	Dry, Wet
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◕	MC5020	525(460—590)	490(425—560)	425(360—490)	425(360—490)	Dry, Wet
			◕ ✤	VP15TF	360(260—460)	330(230—425)	260(195—395)	260(195—395)	Dry, Wet
N	Aluminum Alloys	Content Si<5%	● ◕ ✤	TF15	1970(1310—3280)	1970(1310—3280)	1970(1310—3280)	1970(1310—3280)	Dry, Wet
S	Titanium Alloys (Ti-6Al-4V etc.)	—	● ◕	MP9120	165(130—230)	165(130—230)	165(130—230)	165(130—230)	Wet
			●	VP15TF	165(130—230)	165(130—230)	165(130—230)	165(130—230)	Wet
			◕ ✤	MP9130	165(130—230)	165(130—230)	165(130—230)	165(130—230)	Wet
	Titanium Alloys (Ti-6Al-5V-5Mo-3Cr etc.)	—	● ◕	MP9120	100(65—130)	100(65—130)	100(65—130)	100(65—130)	Wet
			●	VP15TF	100(65—130)	100(65—130)	100(65—130)	100(65—130)	Wet
			◕ ✤	MP9130	100(65—130)	100(65—130)	100(65—130)	100(65—130)	Wet
	Heat Resistant Alloys	—	● ◕	MP9120	130(100—195)	130(100—195)	130(100—195)	130(100—195)	Wet
			●	VP15TF	130(100—195)	130(100—195)	130(100—195)	130(100—195)	Wet
			◕ ✤	MP9130	130(100—195)	130(100—195)	130(100—195)	130(100—195)	Wet

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
· When tool overhang is long
· Rigidity of machine, workpiece material or attachment of workpiece material is low
· Corner radius during pocket milling
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

VPX200
DEEP SHOULDER MILLING

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth

(inch)

	Workpiece Material	Properties	Width of Cut **ae**	Cutting Conditions	DC ø20—ø28mm, ø.787—ø1.102" Depth of Cut **ap**	DC ø20—ø28mm, ø.787—ø1.102" Feed per Tooth **fz** (IPT)	DC ø32—ø50mm, ø1.260—ø1.969" Depth of Cut **ap**	DC ø32—ø50mm, ø1.260—ø1.969" Feed per Tooth **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Pre-hardened Steels	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
M	Austenitic Stainless Steels	—	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Duplex Stainless Steels	Hardness ≤280HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Precipitation Hardening Stainless Steels	Hardness <450HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
				✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.003)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)

(inch)

	Workpiece Material	Properties	Width of Cut **ae**	Cutting Conditions	DC ø20—ø28mm, ø.787—ø1.102" Depth of Cut **ap**	DC ø20—ø28mm, ø.787—ø1.102" Feed per Tooth **fz** (IPT)	DC ø32—ø50mm, ø1.260—ø1.969" Depth of Cut **ap**	DC ø32—ø50mm, ø1.260—ø1.969" Feed per Tooth **fz** (IPT)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Ductile Cast Irons	—	≤.25DC	● ◐	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◐	≤.551	.006(.004—.008)	≤APMX	.007(.004—.010)
				✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤.315	.005(.004—.006)	≤1.102	.006(.004—.008)
				✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.002—.006)
				✲	≤.236	.003(.002—.004)	≤.551	.004(.002—.006)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.004(.002—.006)
				✲	≤.157	.003(.002—.003)	≤.157	.004(.002—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ◐ ✲	≤.551	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ◐ ✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
· When tool overhang is long
· Rigidity of machine, workpiece material or attachment of workpiece material is low
· Corner radius during pocket milling
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

VPX300
DEEP SHOULDER MILLING

Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✲ : Unstable Cutting

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth

(inch)

Workpiece Material		Properties	Width of Cut **ae**	Cutting Conditions	DC ø40mm, ø.1.575" Depth of Cut **ap**	DC ø40mm, ø.1.575" Feed per Tooth **fz** (IPT)	DC ø50—ø80mm, ø1.969—ø3.150" Depth of Cut **ap**	DC ø50—ø80mm, ø1.969—ø3.150" Feed per Tooth **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
			.25—.5DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤1.220	.006(.004—.008)
			.5—.75DC	● ◐ ✲	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.004(.003—.005)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
			.25—.5DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤1.220	.006(.004—.008)
			.5—.75DC	● ◐ ✲	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.004(.003—.005)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤.25DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Pre-hardened Steels	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
M	Austenitic Stainless Steels	—	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Duplex Stainless Steels	Hardness ≤280HB	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Precipitation Hardening Stainless Steels	Hardness <450HB	≤.25DC	○ ◔	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
				✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	○ ◔	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
				✲	≤.827	.003(.002—.003)	≤.827	.003(.002—.003)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)

(inch)

Workpiece Material		Properties	Width of Cut **ae**	Cutting Conditions	DC ø40mm, ø.1.575" Depth of Cut **ap**	DC ø40mm, ø.1.575" Feed per Tooth **fz** (IPT)	DC ø50—ø80mm, ø1.969—ø3.150" Depth of Cut **ap**	DC ø50—ø80mm, ø1.969—ø3.150" Feed per Tooth **fz** (IPT)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
				✲	≤APMX	.005(.003—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤APMX	.005(.003—.006)	≤1.220	.006(.004—.008)
				✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
				✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐	≤.197	.003(.002—.004)	≤.197	.005(.003—.006)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.004)
	Ductile Cast Irons	—	≤.25DC	● ◐	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◐	≤APMX	.007(.004—.010)	≤APMX	.007(.004—.010)
				✲	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤APMX	.006(.004—.008)	≤1.220	.006(.004—.008)
				✲	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
				✲	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
			DC(Slot)	● ◐	≤.197	.004(.002—.006)	≤.197	.005(.003—.006)
				✲	≤.197	.004(.002—.005)	≤.197	.004(.003—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ◐ ✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
· When tool overhang is long
· Rigidity of machine, workpiece material or attachment of workpiece material is low
· Corner radius during pocket milling
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

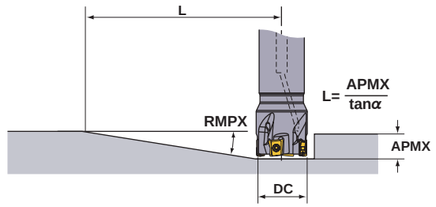
Multi-Functional Cutter for High Efficiency Machining

VPX200

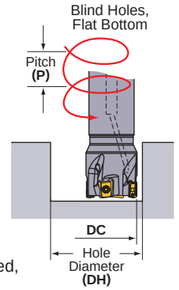
Recommended Cutting Conditions

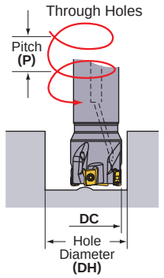
Ramping / Helical Milling

● **Ramping**



● **Helical Milling**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(inch)

Cutting Edge Diameter DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle RMPX	Minimum Distance * L	Maximum Hole Diameter DH max.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.
.625	.008	1.87°	9.7	1.213	.060	1.072	.046	.942	.032
	.016	1.87°	9.7	1.197	.059	1.073	.046	.942	.032
	.031	1.87°	9.7	1.165	.055	1.073	.046	.942	.032
	.039	1.87°	9.7	1.150	.054	1.073	.046	.942	.032
	.047	1.87°	9.7	1.134	.052	1.073	.046	.942	.032
	.063	1.87°	9.7	1.102	.049	1.073	.046	.942	.032
.750	.008	1.43°	12.6	1.463	.056	1.323	.045	1.187	.034
	.016	1.43°	12.6	1.447	.055	1.323	.045	1.187	.034
	.031	1.43°	12.6	1.415	.052	1.323	.045	1.187	.034
	.039	1.43°	12.6	1.400	.051	1.323	.045	1.187	.034
	.047	1.43°	12.6	1.384	.050	1.323	.045	1.187	.034
	.063	1.43°	12.6	1.352	.047	1.323	.045	1.187	.034
.875	.008	1.14°	15.9	1.713	.052	1.574	.044	1.435	.035
	.016	1.14°	15.9	1.697	.051	1.574	.044	1.435	.035
	.031	1.14°	15.9	1.665	.049	1.574	.044	1.435	.035
	.039	1.14°	15.9	1.650	.048	1.574	.044	1.435	.035
	.047	1.14°	15.9	1.634	.047	1.574	.044	1.435	.035
	.063	1.14°	15.9	1.602	.045	1.575	.044	1.435	.035
1.000	.008	0.95°	19.0	1.963	.050	1.824	.043	1.685	.036
	.016	0.95°	19.0	1.947	.049	1.824	.043	1.685	.036
	.031	0.95°	19.0	1.915	.048	1.824	.043	1.685	.036
	.039	0.95°	19.0	1.900	.047	1.824	.043	1.685	.036
	.047	0.95°	19.0	1.884	.046	1.824	.043	1.685	.036
	.063	0.95°	19.0	1.852	.044	1.825	.043	1.685	.036
1.125	.008	0.82°	22.0	2.213	.049	2.074	.043	1.935	.036
	.016	0.82°	22.0	2.197	.048	2.074	.043	1.935	.036
	.031	0.82°	22.0	2.165	.047	2.074	.043	1.935	.036
	.039	0.82°	22.0	2.150	.046	2.074	.043	1.935	.036
	.047	0.82°	22.0	2.134	.045	2.074	.043	1.935	.036
	.063	0.82°	22.0	2.102	.044	2.075	.043	1.935	.036
1.250	.008	0.71°	25.4	2.463	.047	2.320	.042	2.183	.036
	.016	0.71°	25.4	2.447	.047	2.320	.042	2.183	.036
	.031	0.71°	25.4	2.415	.045	2.320	.042	2.183	.036
	.039	0.71°	25.4	2.400	.045	2.320	.042	2.183	.036
	.047	0.71°	25.4	2.384	.044	2.320	.042	2.183	.036
	.063	0.71°	25.4	2.352	.043	2.321	.042	2.183	.036

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan α).

(inch)

Cutting Edge Diameter DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle RMPX	Minimum Distance * L	Maximum Hole Diameter DH max.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.
1.375	.008	0.64°	28.2	2.713	.047	2.574	.042	2.435	.037
	.016	0.64°	28.2	2.697	.046	2.574	.042	2.435	.037
	.031	0.64°	28.2	2.665	.045	2.574	.042	2.435	.037
	.039	0.64°	28.2	2.650	.045	2.574	.042	2.435	.037
	.047	0.64°	28.2	2.634	.044	2.574	.042	2.435	.037
	.063	0.64°	28.2	2.602	.043	2.574	.042	2.435	.037
1.500	.008	0.57°	31.7	2.963	.046	2.820	.041	2.683	.037
	.016	0.57°	31.7	2.947	.045	2.820	.041	2.683	.037
	.031	0.57°	31.7	2.915	.044	2.820	.041	2.683	.037
	.039	0.57°	31.7	2.900	.044	2.820	.041	2.683	.037
	.047	0.57°	31.7	2.884	.043	2.820	.041	2.683	.037
	.063	0.57°	31.7	2.852	.042	2.821	.041	2.683	.037
2.000	.008	0.41°	44.0	3.963	.044	3.820	.041	3.683	.038
	.016	0.41°	44.0	3.947	.044	3.820	.041	3.683	.038
	.031	0.41°	44.0	3.915	.043	3.820	.041	3.683	.038
	.039	0.41°	44.0	3.900	.043	3.820	.041	3.683	.038
	.047	0.41°	44.0	3.884	.042	3.820	.041	3.683	.038
	.063	0.41°	44.0	3.852	.042	3.820	.041	3.683	.038
2.500	.008	0.32°	56.4	4.963	.043	4.820	.041	4.683	.038
	.016	0.32°	56.4	4.947	.043	4.820	.041	4.683	.038
	.031	0.32°	56.4	4.915	.042	4.820	.041	4.683	.038
	.039	0.32°	56.4	4.900	.042	4.820	.041	4.683	.038
	.047	0.32°	56.4	4.884	.042	4.820	.041	4.683	.038
	.063	0.32°	56.4	4.852	.041	4.820	.041	4.683	.038

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan α).

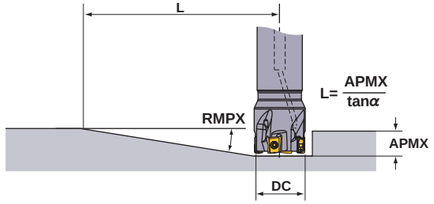
Multi-Functional Cutter for High Efficiency Machining

VPX200

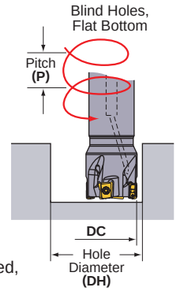
Recommended Cutting Conditions

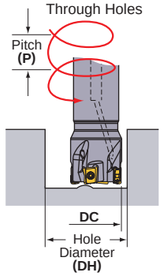
Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(mm)

DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L *	DH max.	P max.	DH min.	P max.	DH min.	P max.
16	0.2	1.85°	248	31.0	1.5	27.5	1.2	24.2	0.8
	0.4	1.85°	248	30.6	1.5	27.5	1.2	24.2	0.8
	0.8	1.85°	248	29.8	1.4	27.5	1.2	24.2	0.8
	1.0	1.85°	248	29.4	1.4	27.5	1.2	24.2	0.8
	1.2	1.85°	248	29.0	1.3	27.5	1.2	24.2	0.8
	1.6	1.85°	248	28.2	1.2	27.5	1.2	24.2	0.8
18	0.2	1.56°	294	35.0	1.5	31.5	1.2	28.1	0.9
	0.4	1.56°	294	34.6	1.4	31.5	1.2	28.1	0.9
	0.8	1.56°	294	33.8	1.4	31.5	1.2	28.1	0.9
	1.0	1.56°	294	33.4	1.3	31.5	1.2	28.1	0.9
	1.2	1.56°	294	33.0	1.3	31.5	1.2	28.1	0.9
	1.6	1.56°	294	32.2	1.2	31.5	1.2	28.1	0.9
20	0.2	1.35°	340	39.0	1.4	35.5	1.1	32.0	0.9
	0.4	1.35°	340	38.6	1.4	35.5	1.1	32.0	0.9
	0.8	1.35°	340	37.8	1.3	35.5	1.1	32.0	0.9
	1.0	1.35°	340	37.4	1.3	35.5	1.1	32.0	0.9
	1.2	1.35°	340	37.0	1.3	35.5	1.1	32.0	0.9
	1.6	1.35°	340	36.2	1.2	35.5	1.1	32.0	0.9
22	0.2	1.16°	396	43.0	1.3	39.5	1.1	36.0	0.9
	0.4	1.16°	396	42.6	1.3	39.5	1.1	36.0	0.9
	0.8	1.16°	396	41.8	1.3	39.5	1.1	36.0	0.9
	1.0	1.16°	396	41.4	1.2	39.5	1.1	36.0	0.9
	1.2	1.16°	396	41.0	1.2	39.5	1.1	36.0	0.9
	1.6	1.16°	396	40.2	1.2	39.5	1.1	36.0	0.9
25	0.2	0.97°	473	49.0	1.3	45.5	1.1	42.0	0.9
	0.4	0.97°	473	48.6	1.3	45.5	1.1	42.0	0.9
	0.8	0.97°	473	47.8	1.2	45.5	1.1	42.0	0.9
	1.0	0.97°	473	47.4	1.2	45.5	1.1	42.0	0.9
	1.2	0.97°	473	47.0	1.2	45.5	1.1	42.0	0.9
	1.6	0.97°	473	46.2	1.1	45.5	1.1	42.0	0.9
28	0.2	0.84°	546	55.0	1.2	51.5	1.1	48.0	0.9
	0.4	0.84°	546	54.6	1.2	51.5	1.1	48.0	0.9
	0.8	0.84°	546	53.8	1.2	51.5	1.1	48.0	0.9
	1.0	0.84°	546	53.4	1.2	51.5	1.1	48.0	0.9
	1.2	0.84°	546	53.0	1.2	51.5	1.1	48.0	0.9
	1.6	0.84°	546	52.2	1.1	51.5	1.1	48.0	0.9
30	0.2	0.77°	596	59.0	1.2	55.5	1.1	52.0	0.9
	0.4	0.77°	596	58.6	1.2	55.5	1.1	52.0	0.9
	0.8	0.77°	596	57.8	1.2	55.5	1.1	52.0	0.9
	1.0	0.77°	596	57.4	1.2	55.5	1.1	52.0	0.9
	1.2	0.77°	596	57.0	1.1	55.5	1.1	52.0	0.9
	1.6	0.77°	596	56.2	1.1	55.5	1.1	52.0	0.9

(mm)

DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L *	DH max.	P max.	DH min.	P max.	DH min.	P max.
32	0.2	0.71°	646	62.8	1.2	59.4	1.1	56.0	0.9
	0.4	0.71°	646	62.4	1.2	59.4	1.1	56.0	0.9
	0.8	0.71°	646	61.6	1.2	59.4	1.1	56.0	0.9
	1.0	0.71°	646	61.2	1.1	59.4	1.1	56.0	0.9
	1.2	0.71°	646	60.8	1.1	59.4	1.1	56.0	0.9
	1.6	0.71°	646	60.0	1.1	59.4	1.1	56.0	0.9
35	0.2	0.63°	728	69.0	1.2	65.5	1.1	62.0	0.9
	0.4	0.63°	728	68.6	1.2	65.5	1.1	62.0	0.9
	0.8	0.63°	728	67.8	1.1	65.5	1.1	62.0	0.9
	1.0	0.63°	728	67.4	1.1	65.5	1.1	62.0	0.9
	1.2	0.63°	728	67.0	1.1	65.5	1.1	62.0	0.9
	1.6	0.63°	728	66.2	1.1	65.5	1.1	62.0	0.9
40	0.2	0.54°	849	78.8	1.2	75.4	1.0	72.0	0.9
	0.4	0.54°	849	78.4	1.1	75.4	1.0	72.0	0.9
	0.8	0.54°	849	77.6	1.1	75.4	1.0	72.0	0.9
	1.0	0.54°	849	77.2	1.1	75.4	1.0	72.0	0.9
	1.2	0.54°	849	76.8	1.1	75.4	1.0	72.0	0.9
	1.6	0.54°	849	76.0	1.1	75.4	1.0	72.0	0.9
50	0.2	0.42°	1092	98.8	1.1	95.4	1.0	92.0	1.0
	0.4	0.42°	1092	98.4	1.1	95.4	1.0	92.0	1.0
	0.8	0.42°	1092	97.6	1.1	95.4	1.0	92.0	1.0
	1.0	0.42°	1092	97.2	1.1	95.4	1.0	92.0	1.0
	1.2	0.42°	1092	96.8	1.1	95.4	1.0	92.0	1.0
	1.6	0.42°	1092	96.0	1.1	95.4	1.0	92.0	1.0
63	0.2	0.32°	1433	124.8	1.1	121.4	1.0	118.0	1.0
	0.4	0.32°	1433	124.4	1.1	121.4	1.0	118.0	1.0
	0.8	0.32°	1433	123.6	1.1	121.4	1.0	118.0	1.0
	1.0	0.32°	1433	123.2	1.1	121.4	1.0	118.0	1.0
	1.2	0.32°	1433	122.8	1.1	121.4	1.0	118.0	1.0
	1.6	0.32°	1433	122.0	1.0	121.4	1.0	118.0	1.0

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan α).

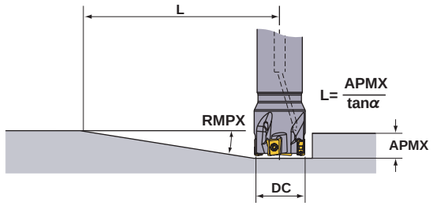
Multi-Functional Cutter for High Efficiency Machining

VPX300

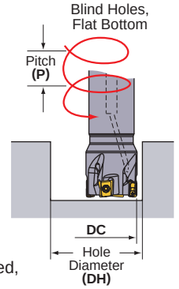
Recommended Cutting Conditions

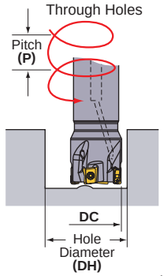
Ramping / Helical Milling

● **Ramping**



● **Helical Milling**





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(inch)

Cutting Edge Diameter **DC**	**RE**	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle **RMPX**	Minimum Distance * **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
1.000	.008	2.07°	12.0	1.963	.109	1.713	.081	1.483	.055
	.016	2.07°	12.0	1.947	.108	1.713	.081	1.483	.055
	.031	2.07°	12.0	1.915	.104	1.713	.081	1.483	.055
	.039	2.07°	12.0	1.900	.102	1.713	.081	1.483	.055
	.047	2.07°	12.0	1.884	.100	1.713	.081	1.483	.055
	.063	2.07°	12.0	1.852	.097	1.713	.081	1.483	.055
	.079	2.07°	12.0	1.821	.093	1.713	.081	1.483	.055
	.094	2.07°	12.0	1.789	.090	1.713	.081	1.483	.055
	.118	2.07°	12.0	1.742	.084	1.713	.081	1.483	.055
	.126	2.07°	12.0	1.726	.082	1.713	.081	1.483	.055
1.125	.008	1.73°	14.4	2.213	.103	1.963	.080	1.726	.057
	.016	1.73°	14.4	2.197	.102	1.963	.080	1.726	.057
	.031	1.73°	14.4	2.165	.099	1.963	.080	1.726	.057
	.039	1.73°	14.4	2.150	.097	1.963	.080	1.726	.057
	.047	1.73°	14.4	2.134	.096	1.963	.080	1.726	.057
	.063	1.73°	14.4	2.102	.093	1.963	.080	1.726	.057
	.079	1.73°	14.4	2.071	.090	1.963	.080	1.726	.057
	.094	1.73°	14.4	2.039	.087	1.963	.080	1.726	.057
	.118	1.73°	14.4	1.992	.082	1.963	.080	1.726	.057
	.126	1.73°	14.4	1.976	.081	1.963	.079	1.726	.057
1.250	.008	1.49°	16.7	2.463	.099	2.214	.079	1.973	.059
	.016	1.49°	16.7	2.447	.098	2.214	.079	1.973	.059
	.031	1.49°	16.7	2.415	.095	2.214	.079	1.973	.059
	.039	1.49°	16.7	2.400	.094	2.214	.079	1.973	.059
	.047	1.49°	16.7	2.384	.093	2.214	.079	1.973	.059
	.063	1.49°	16.7	2.352	.090	2.214	.079	1.973	.059
	.079	1.49°	16.7	2.321	.088	2.214	.079	1.973	.059
	.094	1.49°	16.7	2.289	.085	2.214	.079	1.973	.059
	.118	1.49°	16.7	2.242	.081	2.214	.079	1.973	.059
	.126	1.49°	16.7	2.226	.080	2.214	.079	1.973	.059
1.375	.008	1.28°	19.4	2.713	.094	2.465	.076	2.221	.059
	.016	1.28°	19.4	2.697	.093	2.465	.076	2.221	.059
	.031	1.28°	19.4	2.665	.091	2.465	.076	2.221	.059
	.039	1.28°	19.4	2.650	.089	2.465	.076	2.221	.059
	.047	1.28°	19.4	2.634	.088	2.465	.076	2.221	.059
	.063	1.28°	19.4	2.602	.086	2.465	.076	2.221	.059
	.079	1.28°	19.4	2.571	.084	2.465	.076	2.221	.059
	.094	1.28°	19.4	2.539	.082	2.465	.076	2.221	.059
	.118	1.28°	19.4	2.492	.078	2.465	.077	2.221	.059
	.126	1.28°	19.4	2.476	.077	2.465	.077	2.221	.059

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .433" is achieved at the maximum ramping angle L (= .433"/tan α).

(inch)

Cutting Edge Diameter **DC**	**RE**	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle **RMPX**	Minimum Distance * **L**	Maximum Hole Diameter **DH max.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**	Minimum Hole Diameter **DH min.**	Maximum Pitch **P max.**
1.500	.008	1.13°	22.0	2.963	.091	2.711	.075	2.469	.060
	.016	1.13°	22.0	2.947	.090	2.711	.075	2.469	.060
	.031	1.13°	22.0	2.915	.088	2.711	.075	2.469	.060
	.039	1.13°	22.0	2.900	.087	2.711	.075	2.469	.060
	.047	1.13°	22.0	2.884	.086	2.711	.075	2.469	.060
	.063	1.13°	22.0	2.852	.084	2.711	.075	2.469	.060
	.079	1.13°	22.0	2.821	.082	2.711	.075	2.469	.060
	.094	1.13°	22.0	2.789	.080	2.711	.075	2.469	.060
	.118	1.13°	22.0	2.742	.077	2.711	.075	2.469	.060
	.126	1.13°	22.0	2.726	.076	2.711	.075	2.469	.060
2.000	.008	0.78°	31.8	3.963	.084	3.711	.073	3.469	.063
	.016	0.78°	31.8	3.947	.083	3.711	.073	3.469	.063
	.031	0.78°	31.8	3.915	.082	3.711	.073	3.469	.063
	.039	0.78°	31.8	3.900	.081	3.711	.073	3.469	.063
	.047	0.78°	31.8	3.884	.081	3.711	.073	3.469	.063
	.063	0.78°	31.8	3.852	.079	3.711	.073	3.469	.063
	.079	0.78°	31.8	3.821	.078	3.711	.073	3.469	.063
	.094	0.78°	31.8	3.789	.077	3.711	.073	3.469	.063
	.118	0.78°	31.8	3.742	.075	3.711	.073	3.469	.063
	.126	0.78°	31.8	3.726	.074	3.711	.073	3.469	.063
2.500	.008	0.59°	42.1	4.963	.080	4.711	.072	4.469	.064
	.016	0.59°	42.1	4.947	.079	4.711	.072	4.469	.064
	.031	0.59°	42.1	4.915	.078	4.711	.072	4.469	.064
	.039	0.59°	42.1	4.900	.078	4.711	.072	4.469	.064
	.047	0.59°	42.1	4.884	.077	4.711	.072	4.469	.064
	.063	0.59°	42.1	4.852	.076	4.711	.072	4.469	.064
	.079	0.59°	42.1	4.821	.075	4.711	.072	4.469	.064
	.094	0.59°	42.1	4.789	.074	4.711	.072	4.469	.064
	.118	0.59°	42.1	4.742	.073	4.711	.072	4.469	.064
	.126	0.59°	42.1	4.726	.072	4.711	.072	4.469	.064
3.000	.008	0.48°	51.7	5.955	.078	5.711	.071	5.469	.065
	.016	0.48°	51.7	5.939	.077	5.711	.071	5.469	.065
	.031	0.48°	51.7	5.907	.077	5.711	.071	5.469	.065
	.039	0.48°	51.7	5.892	.076	5.711	.071	5.469	.065
	.047	0.48°	51.7	5.876	.076	5.711	.071	5.469	.065
	.063	0.48°	51.7	5.844	.075	5.711	.071	5.469	.065
	.079	0.48°	51.7	5.813	.074	5.711	.071	5.469	.065
	.094	0.48°	51.7	5.781	.073	5.711	.071	5.469	.065
	.118	0.48°	51.7	5.734	.072	5.711	.071	5.469	.065
	.126	0.48°	51.7	5.718	.072	5.711	.071	5.469	.065

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .433" is achieved at the maximum ramping angle L (= .433"/tan α).

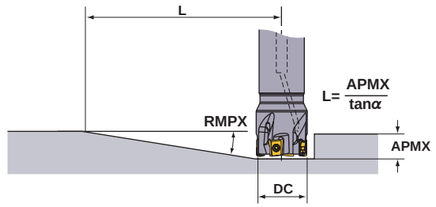
Multi-Functional Cutter for High Efficiency Machining

VPX300

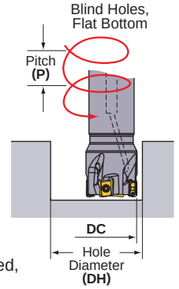
Recommended Cutting Conditions

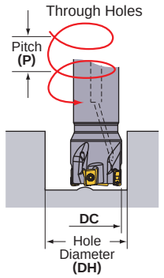
Ramping / Helical Milling

● Ramping



● Helical Milling





Refer to the table below for cutting conditions. For feed per tooth and cutting speed, follow the cutting conditions for slot milling.

(mm)

DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L *	DH max.	P max.	DH min.	P max.	DH min.	P max.
25	0.2	2.13°	296	49.0	2.8	42.7	2.1	36.9	1.4
	0.4	2.13°	296	48.6	2.8	42.7	2.1	36.9	1.4
	0.8	2.13°	296	47.8	2.7	42.7	2.1	36.9	1.4
	1.0	2.13°	296	47.4	2.6	42.7	2.1	36.9	1.4
	1.2	2.13°	296	47.0	2.6	42.7	2.1	36.9	1.4
	1.6	2.13°	296	46.2	2.5	42.7	2.1	36.9	1.4
	2.0	2.13°	296	45.4	2.4	42.7	2.1	36.9	1.4
	2.4	2.13°	296	44.6	2.3	42.7	2.1	36.9	1.4
	3.0	2.13°	296	43.4	2.2	42.7	2.1	36.9	1.4
	3.2	2.13°	296	43.0	2.1	42.7	2.1	36.9	1.4
28	0.2	1.77°	356	55.0	2.6	48.7	2.0	42.7	1.4
	0.4	1.77°	356	54.6	2.6	48.7	2.0	42.7	1.4
	0.8	1.77°	356	53.8	2.5	48.7	2.0	42.7	1.4
	1.0	1.77°	356	53.4	2.5	48.7	2.0	42.7	1.4
	1.2	1.77°	356	53.0	2.4	48.7	2.0	42.7	1.4
	1.6	1.77°	356	52.2	2.4	48.7	2.0	42.7	1.4
	2.0	1.77°	356	51.4	2.3	48.7	2.0	42.7	1.4
	2.4	1.77°	356	50.6	2.2	48.7	2.0	42.7	1.4
	3.0	1.77°	356	49.4	2.1	48.7	2.0	42.7	1.4
	3.2	1.77°	356	49.0	2.0	48.7	2.0	42.7	1.4
30	0.2	1.61°	392	59.0	2.6	52.7	2.0	46.6	1.5
	0.4	1.61°	392	58.6	2.5	52.7	2.0	46.6	1.5
	0.8	1.61°	392	57.8	2.5	52.7	2.0	46.6	1.5
	1.0	1.61°	392	57.4	2.4	52.7	2.0	46.6	1.5
	1.2	1.61°	392	57.0	2.4	52.7	2.0	46.6	1.5
	1.6	1.61°	392	56.2	2.3	52.7	2.0	46.6	1.5
	2.0	1.61°	392	55.4	2.2	52.7	2.0	46.6	1.5
	2.4	1.61°	392	54.6	2.2	52.7	2.0	46.6	1.5
	3.0	1.61°	392	53.4	2.1	52.7	2.0	46.6	1.5
	3.2	1.61°	392	53.0	2.0	52.7	2.0	46.6	1.5
32	0.2	1.47°	429	63.0	2.5	56.7	2.0	50.6	1.5
	0.4	1.47°	429	62.6	2.5	56.7	2.0	50.6	1.5
	0.8	1.47°	429	61.8	2.4	56.7	2.0	50.6	1.5
	1.0	1.47°	429	61.4	2.4	56.7	2.0	50.6	1.5
	1.2	1.47°	429	61.0	2.3	56.7	2.0	50.6	1.5
	1.6	1.47°	429	60.2	2.3	56.7	2.0	50.6	1.5
	2.0	1.47°	429	59.4	2.2	56.7	2.0	50.6	1.5
	2.4	1.47°	429	58.6	2.1	56.7	2.0	50.6	1.5
	3.0	1.47°	429	57.4	2.1	56.7	2.0	50.6	1.5
	3.2	1.47°	429	57.0	2.0	56.7	2.0	50.6	1.5
35	0.2	1.28°	493	69.0	2.4	62.8	1.9	56.6	1.5
	0.4	1.28°	493	68.6	2.4	62.8	1.9	56.6	1.5
	0.8	1.28°	493	67.8	2.3	62.8	1.9	56.6	1.5
	1.0	1.28°	493	67.4	2.3	62.8	1.9	56.6	1.5
	1.2	1.28°	493	67.0	2.2	62.8	1.9	56.6	1.5
	1.6	1.28°	493	66.2	2.2	62.8	1.9	56.6	1.5
	2.0	1.28°	493	65.4	2.1	62.8	1.9	56.6	1.5
	2.4	1.28°	493	64.6	2.1	62.8	1.9	56.6	1.5
	3.0	1.28°	493	63.4	2.0	62.8	1.9	56.6	1.5
	3.2	1.28°	493	63.0	2.0	62.8	1.9	56.6	1.5
40	0.2	1.06°	595	78.8	2.3	72.7	1.9	66.5	1.5
	0.4	1.06°	595	78.4	2.2	72.7	1.9	66.5	1.5
	0.8	1.06°	595	77.6	2.2	72.7	1.9	66.5	1.5
	1.0	1.06°	595	77.2	2.2	72.7	1.9	66.5	1.5
	1.2	1.06°	595	76.8	2.1	72.7	1.9	66.5	1.5
	1.6	1.06°	595	76.0	2.1	72.7	1.9	66.5	1.5
	2.0	1.06°	595	75.2	2.0	72.7	1.9	66.5	1.5
	2.4	1.06°	595	74.4	2.0	72.7	1.9	66.5	1.5
	3.0	1.06°	595	73.2	1.9	72.7	1.9	66.5	1.5
	3.2	1.06°	595	72.8	1.9	72.7	1.9	66.5	1.5
50	0.2	0.79°	798	98.8	2.1	92.7	1.8	86.5	1.6
	0.4	0.79°	798	98.4	2.1	92.7	1.8	86.5	1.6
	0.8	0.79°	798	97.6	2.1	92.7	1.8	86.5	1.6
	1.0	0.79°	798	97.2	2.0	92.7	1.8	86.5	1.6
	1.2	0.79°	798	96.8	2.0	92.7	1.8	86.5	1.6
	1.6	0.79°	798	96.0	2.0	92.7	1.8	86.5	1.6
	2.0	0.79°	798	95.2	2.0	92.7	1.8	86.5	1.6
	2.4	0.79°	798	94.4	1.9	92.7	1.8	86.5	1.6
	3.0	0.79°	798	93.2	1.9	92.7	1.8	86.5	1.6
	3.2	0.79°	798	92.8	1.9	92.7	1.8	86.5	1.6
63	0.2	0.6°	1051	124.8	2.0	118.7	1.8	112.5	1.6
	0.4	0.6°	1051	124.4	2.0	118.7	1.8	112.5	1.6
	0.8	0.6°	1051	123.6	2.0	118.7	1.8	112.5	1.6
	1.0	0.6°	1051	123.2	2.0	118.7	1.8	112.5	1.6
	1.2	0.6°	1051	122.8	2.0	118.7	1.8	112.5	1.6
	1.6	0.6°	1051	122.0	1.9	118.7	1.8	112.5	1.6
	2.0	0.6°	1051	121.2	1.9	118.7	1.8	112.5	1.6
	2.4	0.6°	1051	120.4	1.9	118.7	1.8	112.5	1.6
	3.0	0.6°	1051	119.2	1.9	118.7	1.8	112.5	1.6
	3.2	0.6°	1051	118.8	1.8	118.7	1.8	112.5	1.6
80	0.2	0.45°	1401	158.8	1.9	152.6	1.8	146.5	1.6
	0.4	0.45°	1401	158.4	1.9	152.7	1.8	146.5	1.6
	0.8	0.45°	1401	157.6	1.9	152.7	1.8	146.5	1.6
	1.0	0.45°	1401	157.2	1.9	152.7	1.8	146.5	1.6
	1.2	0.45°	1401	156.8	1.9	152.7	1.8	146.5	1.6
	1.6	0.45°	1401	156.0	1.9	152.7	1.8	146.5	1.6
	2.0	0.45°	1401	155.2	1.9	152.7	1.8	146.5	1.6
	2.4	0.45	1401	154.4	1.8	152.7	1.8	146.5	1.6
	3.0	0.45	1401	153.2	1.8	152.7	1.8	146.5	1.6
	3.2	0.45	1401	152.8	1.8	152.7	1.8	146.5	1.6

Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of 11 mm is achieved at the maximum ramping angle L (= 11/tan α).

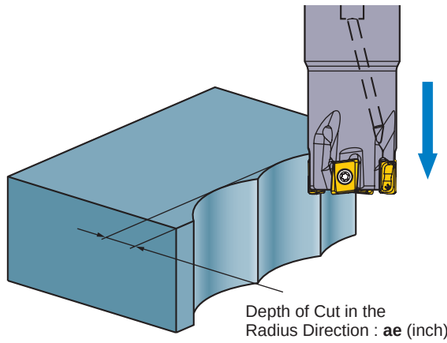
VPX200

Recommended Cutting Conditions

For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● **Plunging**

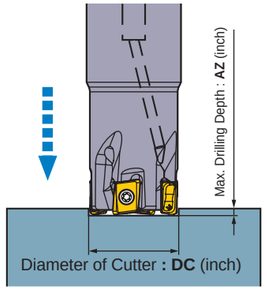


(inch)

DC	ae max.
.625	.154
.750	.154
.875	.157
1.000	.157
1.125	.157
1.250	.157
1.375	.157
1.500	.157
2.000	.157
2.500	.157

Note 1) No step feed necessary.

● **Drilling**



(inch)

DC	AZ max.
.625	.012
.750	.012
.875	.012
1.000	.012
1.125	.012
1.250	.012
1.375	.012
1.500	.012
2.000	.012
2.500	.012

Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminum alloy).

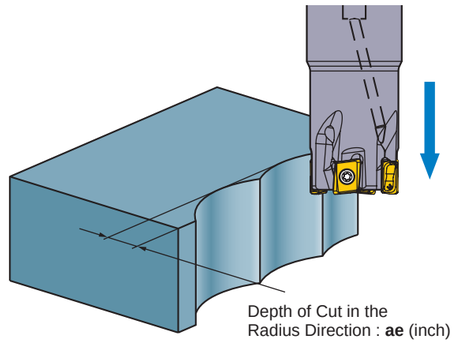
VPX300

Recommended Cutting Conditions

For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● **Plunging**

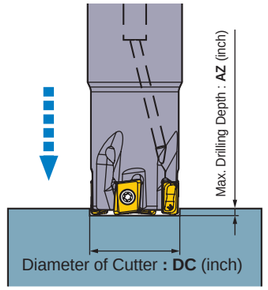


(inch)

DC	ae max.
1.000	.256
1.125	.260
1.250	.260
1.375	.260
1.500	.264
2.000	.264
2.500	.264
3.000	.264

Note 1) No step feed necessary.

● **Drilling**



(inch)

DC	AZ max.
1.000	.022
1.125	.022
1.250	.022
1.375	.022
1.500	.022
2.000	.022
2.500	.022
3.000	.022

Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminum alloy).

Multi-Functional Cutter for High Efficiency Machining

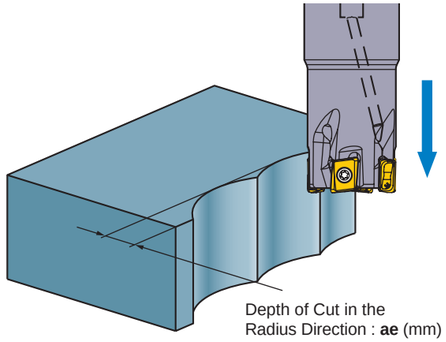
VPX200/300

Recommended Cutting Conditions

For Plunging and Drilling

See the tables to the right for cutting conditions. Follow the cutting conditions for slot milling regarding feed per tooth and cutting speed.

● Plunging



VPX200 (mm)

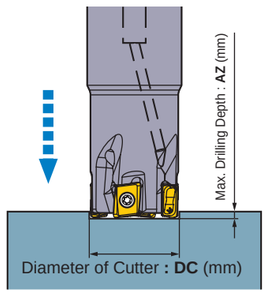
DC	ae max.
16	3.9
18	3.9
20	3.9
22	4.0
25	4.0
28	4.0
30	4.0
32	4.0
35	4.0
40	4.0
50	4.0
63	4.0

VPX300 (mm)

DC	ae max.
25	6.5
28	6.6
30	6.6
32	6.6
35	6.7
40	6.7
50	6.7
63	6.7
80	6.7

Note1) No step feed necessary.

● Drilling



VPX200 (mm)

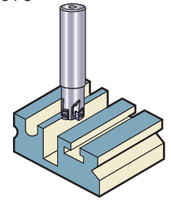
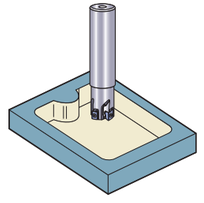
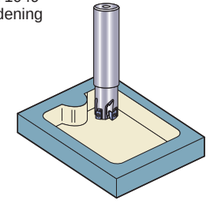
DC	AZ max.
16	0.3
18	0.3
20	0.3
22	0.3
25	0.3
28	0.3
30	0.3
32	0.3
35	0.3
40	0.3
50	0.3
63	0.3

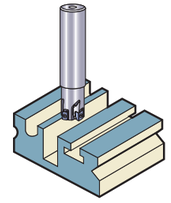
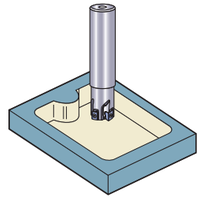
VPX300 (mm)

DC	AZ max.
25	0.55
28	0.55
30	0.55
32	0.55
35	0.55
40	0.55
50	0.55
63	0.55
80	0.55

Note 1) Exercise due caution as chips scatter easily.
Note 2) Use compressed air to eliminate chips (or coolant for when machining aluminium alloy).

Application Examples

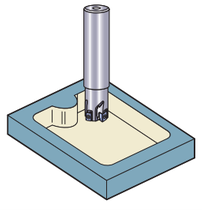
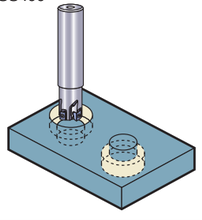
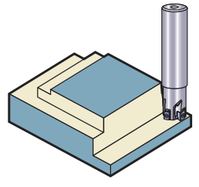
Holder		VPX300R4004SA32S	VPX300R2502SA25S	VPX200R2504SA25S
Insert (Grade)		LOGU1207080PNER-M(MP6120)	LOGU1207080PNER-M(VP15TF)	LOGU0904080PNER-M(MP6120)
Workpiece		13CrMo4-5 	Alloy Tool Steel (55HRC) 	AISI 1049 Hardening 
Component		Machined Parts	Dies	Dies
Cutting Conditions	Cutting Speed **vc** (SFM)	525 → 590	230	655
	Feed per Tooth **fz** (IPT)	.0047 → .0059	.0031	.0059
	Depth of Cut (inch)	ap = .118 → .165 , ae = 1.575	ap = .197 , ae = .738	ap = .118
Cutting Mode		Wet Cutting	Dry Cutting	Dry Cutting
Results		Achieves 2X the insert tool life of conventional product, even when changing to high efficiency conditions.	When machining hardened steel, it achieves 2X the machining of conventional product whose insert tool life is limited by defects.	There is no seating flattening or deformation even when machining for 2500 minutes. And the number of tools has been reduced by increasing corner count to four.

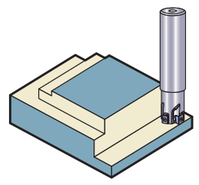
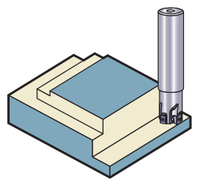
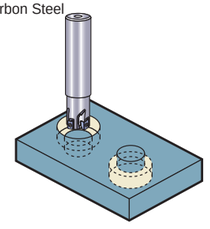
Holder		VPX200R1602SA16S	VPX200R3203SA32S
Insert (Grade)		LOGU0904040PNER-L(VP15TF)	LOGU0904040PNER-L (MP6120)
Workpiece		AISI D2 Mild Steel 	AISI 1045 
Component		Machined Parts	Machined Parts
Cutting Conditions	Cutting Speed **vc** (SFM)	655	460
	Feed per Tooth **fz** (IPT)	.004 → .006	.004
	Depth of Cut (inch)	ap = .004	ap = .055
Cutting Mode		Dry Cutting	Dry Cutting
Results		Compared to conventional product, cutting noise is reduced and chattering vibration is suppressed. Furthermore, cutting conditions have been improved and high efficiency machining has been achieved.	Compared to conventional product, the sharpness is better and the surface accuracy has been improved.

The above application examples are customer's applications, so it can be different from the recommended conditions.

Multi-Functional Cutter for High Efficiency Machining

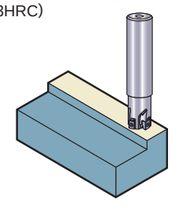
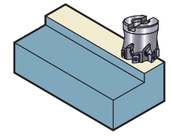
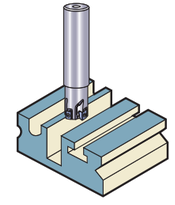
Application Examples

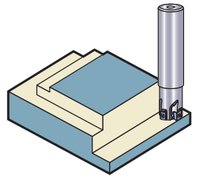
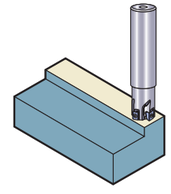
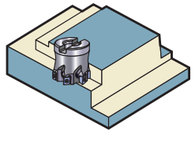
Holder	VPX200R2503SA25S	VPX200R1602SA16S	VPX200R1602SA16S
Insert (Grade)	LOGU0904080PNER-M(MP6120)	LOGU0904080PNER-M(MP6130)	LOGU0904080PNER-M(MP7130)
Workpiece	AISI 1045 	JIS SS400 	JIS SS400+Stainless Steel 
Component	Chucked Parts	Machined Parts	Machined Parts
Cutting Conditions: Cutting Speed **vc** (SFM)	490	280	655
Cutting Conditions: Feed per Tooth **fz** (IPT)	.0043	.0037	.0039
Cutting Conditions: Depth of Cut (inch)	ap = .177 , ae = .984 Max.	ap = .167	ap = .059—.118
Cutting Mode	Dry Cutting	Wet Cutting	Wet Cutting
Results	Compared with conventional product with varying insert tool life due to breakage, VPX has a stable insert tool life that allows for 1.7X more machining.	Solves the problem of easily damaged clamp screws for conventional product, ensuring an excellent finish.	The number of machining has achieved more than 3X the tool life of the conventional product caused by the defect, and the finished surface is also improved.

Holder	VPX200R2003SA20S	VPX200R2504SA25S	VPX200R2504SA25S
Insert (Grade)	LOGU0904080PNER-M(MP6120)	LOGU0904080PNER-M(MP6120)	LOGU0904080PNER-M(MP6120)
Workpiece	20MnCr5(Alloy Steel) 	Cast Iron 	Carbon Steel 
Component	Machined Parts	Automotive Components	Machined Parts
Cutting Conditions: Cutting Speed **vc** (SFM)	575	655	335
Cutting Conditions: Feed per Tooth **fz** (IPT)	.0070	.0068	.0051
Cutting Conditions: Depth of Cut (inch)	ap = .079	ap = .118	ap = .055 , ae = .433
Cutting Mode	Dry Cutting	Dry Cutting	Wet Cutting
Results	Conventional product has achieved machining times of 330 min before breaking, whereas VPX can maintain sustained machining for over 400 mins.	It is capable of cutting speeds of 655 SFM compared to 560 SFM for conventional product, increasing machining efficiency. Good machining accuracy makes possible stable machining.	VPX has less load on its main shaft than conventional product, achieving more than 3X as much machining. It also has excellent clamp rigidity compared to other conventional product suppressing clamp screw breakage.

The above application examples are customer's applications, so it can be different from the recommended conditions.

Application Examples

Holder	VPX200R3004SA25S	VPX200-050A05AR	VPX200R2503SA25S
Insert (Grade)	LOGU0904080PNER-M(MP9130)	LOGU0904040PNER-M(VP15TF)	LOGU0904080PNER-M(MP6120)
Workpiece	Precipitation Hardening Stainless Steel (38-43HRC) 	AISI 60-40-18 	JIS SS400, AISI 1050 
Component	Machined Parts	Parts	Machined Parts
Cutting Conditions: Cutting Speed **vc** (SFM)	130	1130	385
Cutting Conditions: Feed per Tooth **fz** (IPT)	.0024	.0055	.0063
Cutting Conditions: Depth of Cut (inch)	ap = .071	ap = .079—.118 , ae = 1.575	ap = .236
Cutting Mode	Dry Cutting	Wet Cutting	Dry Cutting
Results	Good sharpness compared to conventional product allows VPX to achieve 2X their insert tool life.	Conventional product can only be used for roughing, but VPX can be used for finishing as well, eliminating processing steps.	VPX achieves better chip evacuation and better surface finish compared to conventional product, better insert tool life.

Holder	VPX200R2503SA25S	VPX300R4004SA32S	VPX300-080A10AR
Insert (Grade)	LOGU0904040PNER-M(MP7130)	LOGU1207080PNER-M(MP6120)	LOGU1207080PNER-M(MP6120)
Workpiece	AISI 304 	AISI 4140 	Alloy Tool Steel 
Component	Machined Parts	Center Block	Machined Parts
Cutting Conditions: Cutting Speed **vc** (SFM)	590	490	740
Cutting Conditions: Feed per Tooth **fz** (IPT)	.0236	.0059	.0051
Cutting Conditions: Depth of Cut (inch)	ap = .106	ap = .197	ap = .197 , ae = 2.756
Cutting Mode	—	Dry Cutting	—
Results	Less cutting noise than conventional product, allowing cutting conditions to be improved. Also, insert tool life has been lengthened when using the same inserts to machine AISI 1045.	Compared to conventional product, less vibration and good wall surface finish, achieving more than 3X insert tool life.	The number of machining has achieved 2.7X the tool life of the conventional product caused by finish degradation.

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For Your Safety

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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