MITSUBISHI MATERIALS

VPX Series

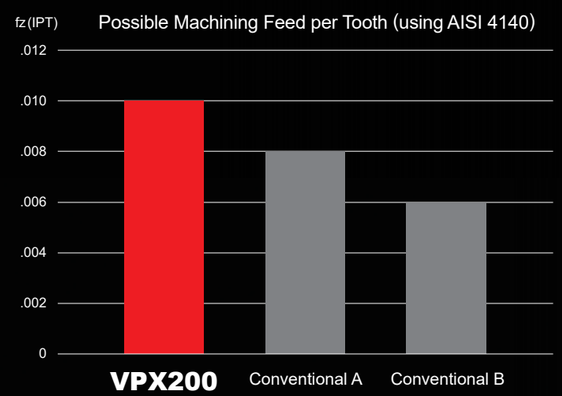
MULTI-FUNCTIONAL CUTTER FOR HIGH EFFICIENCY MACHINING

TOOL NEWS **B250A**

TOUGH & VERSATILE

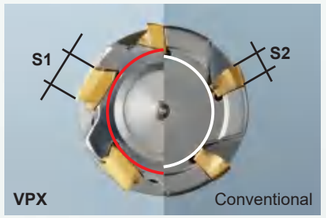
VPX Series

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.

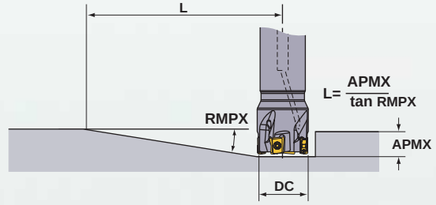
Comments from developers

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.

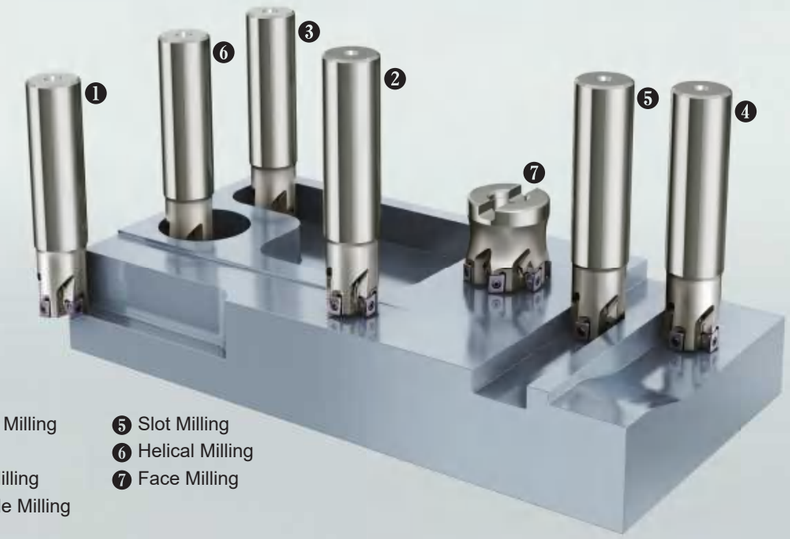


Comments from developers

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.

VPX series covers most milling applications.

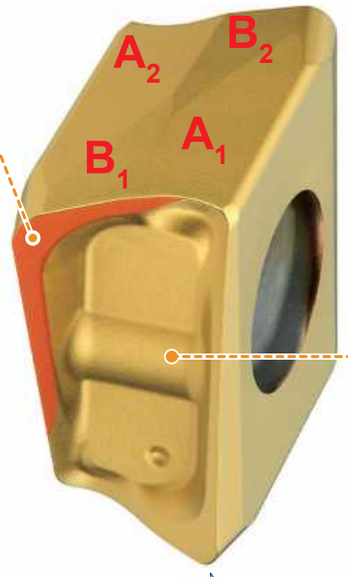


1. Shoulder Milling
2. Ramping
3. Pocket Milling
4. 3-D Profile Milling
5. Slot Milling
6. Helical Milling
7. Face Milling

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

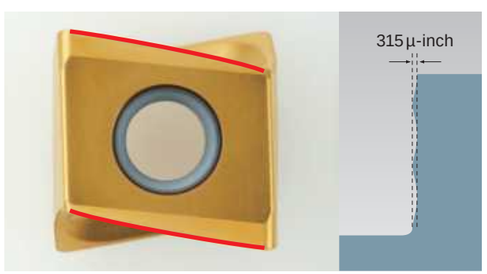
Convex Shaped Insert for Improved Chip Evacuation

Comments from developers

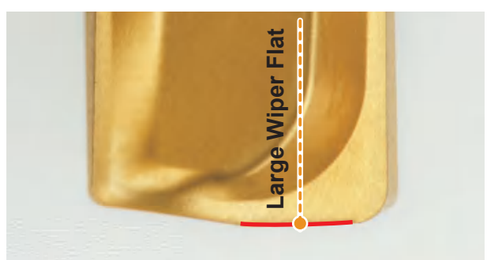
An insert shape that was possible to design, but difficult to commercialize.

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.

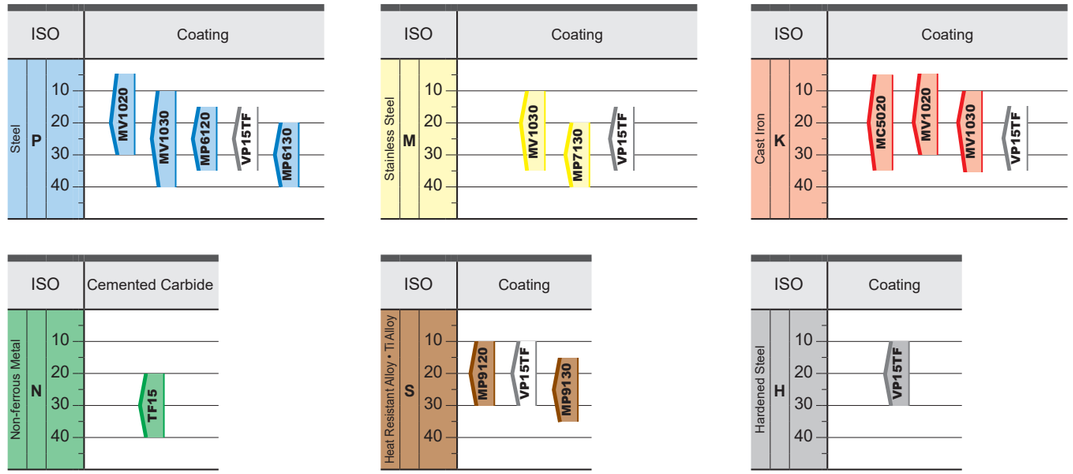
Good Wall Surface Finish



Large Wiper Flats Achieve a Better Finish Surface



Insert Grades for a Wide Range of Materials



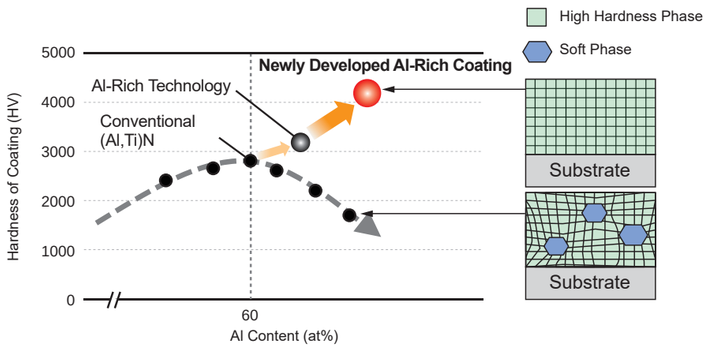
Coated Carbide Grade for Milling

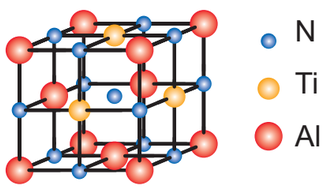
MV1020/MV1030

Newly Developed Al-Rich Coating

Advanced Wear and Thermal Shock Resistance

By adopting the newly developed Al-Rich coating technology, the (Al,Ti)N with a high Al content ratio displays a very high hardness. This greatly improves oxidation and wear resistance.
The extreme heat resistance of this new series achieves amazing stability not only during dry cutting, but also when wet cutting where inserts are usually prone to thermal cracking.
MV1020 offers overwhelmingly superior performance in high-speed cutting, and MV1030 achieves stable performance during interrupted and stainless steel machining.





Crystal image of **MV1000** series

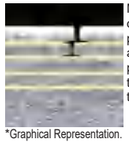
MP6100/MP7100/MP9100 -with Accumulated Al-Ti-Cr-N Based PVD Coating

TOUGH-Σ Technology

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

Base Layer
High Al-(Al, Ti)N

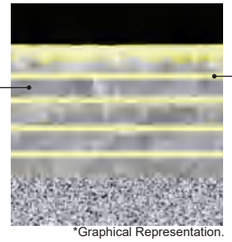
The new technology Al-(Al, Ti)N coating provides stabilization of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



Multilayering of the coating prevents any cracks penetrating through to the substrate.

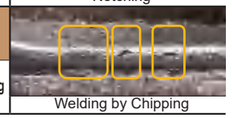
*Graphical Representation.

Al-Ti-Cr-N Based PVD Coating



*Graphical Representation.

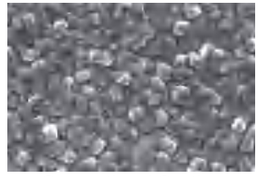
Best Layer of Each Material

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

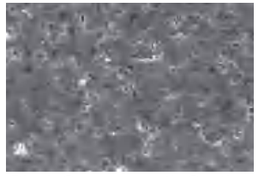
CVD Coating MC5020

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.

Chipbreaker System

New L chipbreaker with low cutting resistance has been added.

Focus on Cutting Edge Sharpness ⟷ Focus on Cutting Edge Strength

L chipbreaker

M chipbreaker

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 36, for chipbreaker selection table.

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX200

P M K N S H

Fig.1

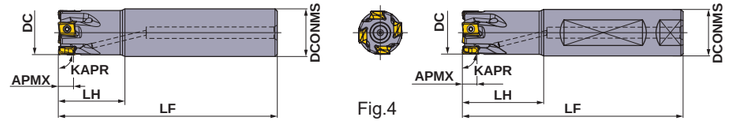


Fig.2

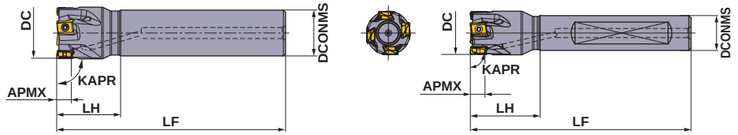


Fig.3

Fig.4

Shank Type

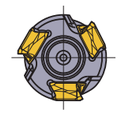
With Coolant Through

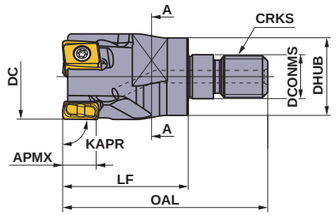
Right hand tool holder only.

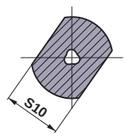
(inch)

DC	Order Number	Stock R	* No.T	DCONMS	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
● : USA Stock







A-A Section

Right hand tool holder only.

Screw-in Type

With Coolant Through

(inch)

DC	Order Number	Stock R	*1 No.T	DCONMS	DHUB	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 31—34.
∗1 Number of Teeth

Spare Parts

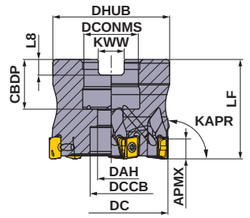
(inch)

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

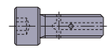
∗ Clamp Torque (lbf-in) : TPS27F1 = 8.9, TPS27F2 = 8.9

CUTTING CONDITIONS ➢ pp.37-64

Multi-Functional Cutter for High Efficiency Machining



Right hand tool holder only.

DCONMS	Set Bolt	Geometry
ϕ.500"	HSCU25011H	
ϕ.750"	HSCU37513H	
ϕ1.000"	HSCU50014H	With Coolant Through

Arbor Type

DCON=inch size, With Coolant Through

(inch)

DC	Order Number	Stock R	* No.T	LF	DCONMS	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.
* Number of Teeth

Mounting Dimensions

(inch)

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

● : **USA Stock**

DEEP SHOULDER MILLING

90° KAPR

VPX200

LONG CUTTING EDGE

P M K N S H

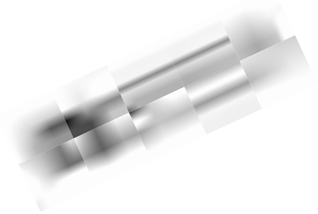


Fig.1

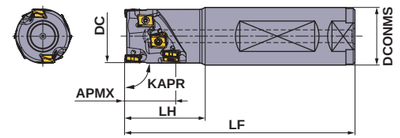
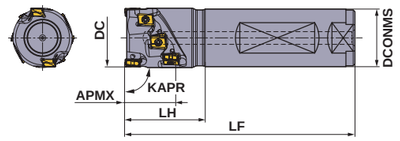


Fig.2



Right hand tool holder only.

Shank Type

With Coolant Through

(inch)

DC	Order Number	Stock R	*1 No.T	Total	DCONMS	LF	LH	APMX	RMPX	WT (lbs)	Fig.	*2 Insert Type
.875	**VPX200UR142FA12S0504**	●	2	4	.750	4.375	1.250	.551	1.14°	.485	2	LOGU09
1.000	**VPX200UR162FA16S0806**	●	2	6	1.000	4.750	1.500	.827	0.95°	.904	1	LOGU09
1.000	**VPX200UR162FA16S1108**	●	2	8	1.000	5.000	1.750	1.102	0.95°	.926	1	LOGU09
1.125	**VPX200UR182FA16S0806**	●	2	6	1.000	4.750	1.500	.827	0.82°	.948	2	LOGU09
1.125	**VPX200UR182FA16S1108**	●	2	8	1.000	5.000	1.750	1.102	0.82°	.992	2	LOGU09
1.250	**VPX200UR202FA20S1108**	●	2	8	1.250	5.000	1.750	1.102	0.71°	1.455	1	LOGU09
1.250	**VPX200UR203FA20S1112**	●	3	12	1.250	5.000	1.750	1.102	0.71°	1.433	1	LOGU09
1.250	**VPX200UR202FA20S1310**	●	2	10	1.250	5.250	2.000	1.378	0.71°	1.499	1	LOGU09
1.250	**VPX200UR203FA20S1315**	●	3	15	1.250	5.250	2.000	1.378	0.71°	1.477	1	LOGU09
1.375	**VPX200UR222FA20S1108**	●	2	8	1.250	5.000	1.750	1.102	0.64°	1.543	2	LOGU09
1.375	**VPX200UR223FA20S1112**	●	3	12	1.250	5.000	1.750	1.102	0.64°	1.587	2	LOGU09
1.375	**VPX200UR222FA20S1310**	●	2	10	1.250	5.250	2.000	1.378	0.64°	1.543	2	LOGU09
1.375	**VPX200UR223FA20S1315**	●	3	15	1.250	5.250	2.000	1.378	0.64°	1.587	2	LOGU09
1.500	**VPX200UR243FA20S1315**	●	3	15	1.250	5.250	2.000	1.378	0.57°	1.676	2	LOGU09
1.500	**VPX200UR244FA20S1320**	●	4	20	1.250	5.250	2.000	1.378	0.57°	1.676	2	LOGU09
1.500	**VPX200UR243FA20S1618**	●	3	18	1.250	5.500	2.250	1.654	0.57°	1.764	2	LOGU09
1.500	**VPX200UR244FA20S1624**	●	4	24	1.250	5.500	2.250	1.654	0.57°	1.742	2	LOGU09

*1 Number of Teeth
*2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

Spare Parts

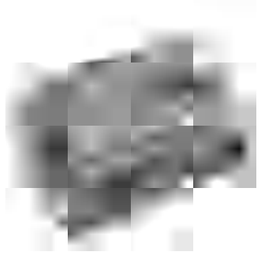
(inch)

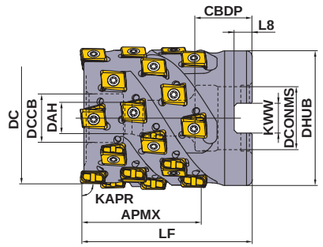
DC	Tool Holder Type	* 		
		Clamp Screw	Wrench	Anti-seize Lubricant
.875	**VPX200UR14**	TPS27F2	TIP07F	MK1KS
1.000	**VPX200UR16**	TPS27F2	TIP07F	MK1KS
1.125	**VPX200UR16**	TPS27F2	TIP07F	MK1KS
1.250	**VPX200UR20**	TPS27F2	TIP07F	MK1KS
1.375	**VPX200UR22**	TPS27F2	TIP07F	MK1KS
1.500	**VPX200UR24**	TPS27F2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

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

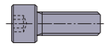
CUTTING CONDITIONS ➢ **pp.37-64**

VPX200
DEEP SHOULDER MILLING





Right hand tool holder only.

DC	APMX	Set Bolt	Geometry
1.250	1.378	HSCUF25020	
1.500	1.654	HSCUF25020	
2.000	1.654	HSCUF37520	With Coolant Through

Arbor Type

DCON = inch size, With Coolant Through (inch)

DC	Order Number	Stock R	∗1 No.T	Total	LF	DCONMS	WT (kg)	APMX	RMPX	Insert Type ∗2
1.250	**VPX200UR1.2502AA1310**	●	2	10	2.250	.500	.529	1.378	0.72°	LOGU09
1.250	**VPX200UR1.2503AA1315**	●	3	15	2.250	.500	.485	1.378	0.72°	LOGU09
1.500	**VPX200UR1.5003AA1618**	●	3	18	2.375	.500	.728	1.654	0.57°	LOGU09
1.500	**VPX200UR1.5004AA1624**	●	4	24	2.375	.500	.705	1.654	0.57°	LOGU09
2.000	**VPX200UR2.0004AA1624**	●	4	24	2.375	.750	1.279	1.654	0.41°	LOGU09
2.000	**VPX200UR2.0005AA1630**	●	5	30	2.375	.750	1.257	1.654	0.41°	LOGU09

∗1 Number of Teeth
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

Mounting Dimensions

(inch)

DC	Order Number	DCONMS	CBDP	DAH	DCCB	DHUB	KWW	L8
1.250	**VPX200UR1.2502AA1310**	.500	.630	.276	.433	1.438	.250	.156
1.250	**VPX200UR1.2503AA1315**	.500	.630	.276	.433	1.438	.250	.156
1.500	**VPX200UR1.5003AA1618**	.500	.630	.276	.433	1.438	.250	.156
1.500	**VPX200UR1.5004AA1624**	.500	.630	.276	.433	1.438	.250	.156
2.000	**VPX200UR2.0004AA1624**	.750	.748	.413	.630	1.750	.313	.187
2.000	**VPX200UR2.0005AA1630**	.750	.748	.413	.630	1.750	.313	.187

Spare Parts

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

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

● : USA Stock ★ : Stocked in Japan

Fig.1

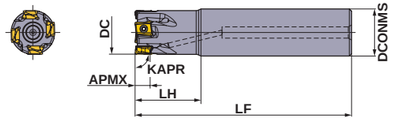
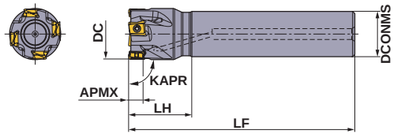


Fig.2



Right hand tool holder only.

Metric Standard

Shank Type

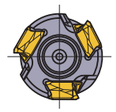
With Coolant Through (mm)

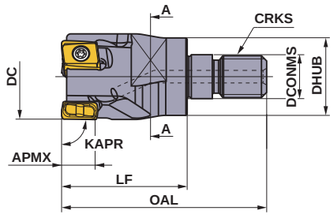
DC	Order Number	Stock R	∗ No.T	DCONMS	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (kg)	Fig.	Insert Type
16	**VPX200R1602SA16S**	★	2	16	85	25	8	1.85°	37900	0.11	1	LOGU09
18	**VPX200R1802SA16S**	★	2	16	85	25	8	1.56°	35300	0.12	2	LOGU09
18	**VPX200R1802SA16L**	★	2	16	120	25	8	1.56°	35300	0.17	2	LOGU09
20	**VPX200R2002SA16S**	★	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

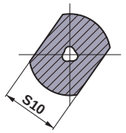
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
∗ Number of Teeth

CUTTING CONDITIONS ➢ pp.37-64

Multi-Functional Cutter for High Efficiency Machining







A-A Section

Metric Standard

Right hand tool holder only.

Screw-in Type

With Coolant Through

(mm)

DC	Order Number	Stock R	*1 No.T	DCONMS	DHUB	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 32—35.
*1 Number of Teeth

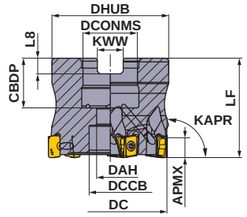
Spare Parts

(mm)

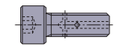
DC	Tool Holder Type	* Clamp Screw	Wrench	Anti-seize Lubricant
16	**VPX200R16**	TPS27F1	TIP07F	MK1KS
18	**VPX200R18**	TPS27F1	TIP07F	MK1KS
20	**VPX200R20**	TPS27F1	TIP07F	MK1KS
22	**VPX200R22**	TPS27F2	TIP07F	MK1KS
25	**VPX200R25**	TPS27F2	TIP07F	MK1KS
28	**VPX200R28**	TPS27F2	TIP07F	MK1KS
30	**VPX200R30**	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

★ : Stocked in Japan



Right hand tool holder only.

DC	Set Bolt	Geometry
ϕ32, ϕ40	HSC08025H	
ϕ50, ϕ63	HSC10030H	
		With Coolant Through

Metric Standard

For Metric Arbors

Arbor Type

DCON=mm size, With Coolant Through

(mm)

DC	Order Number	Stock R	* No.T	LF	DCONMS	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

Mounting Dimensions

(mm)

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

CUTTING CONDITIONS ➢ pp.37-64

DEEP SHOULDER MILLING

90° KAPR

VPX200

LONG CUTTING EDGE

P M K N S H

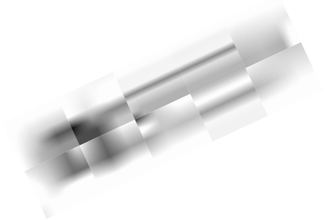


Fig.1

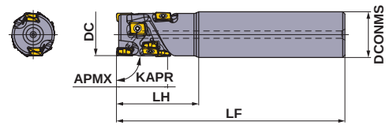
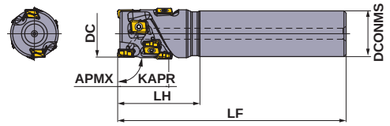


Fig.2



Right hand tool holder only.

Metric Standard

Shank Type

With Coolant Through

(mm)

DC	Order Number	Stock R	∗1 No.T	Total	DCONMS	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
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

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

★ : Stocked in Japan

VPX200
DEEP SHOULDER MILLING

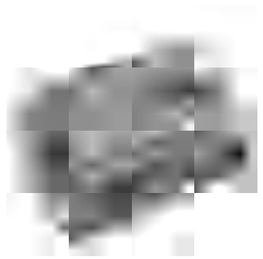


Fig.1

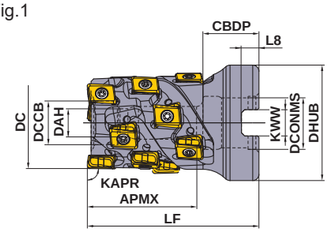
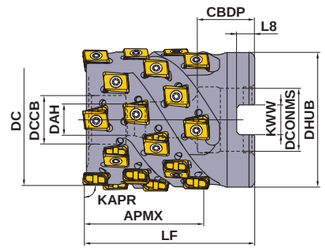
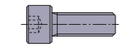


Fig.2



Right hand tool holder only.

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

Metric Standard

Arbor Type

DCON = mm size, With Coolant Through

(mm)

DC	Order Number	Stock R	∗1 No.T	Total	LF	DCONMS	WT (kg)	APMX	RMPX	Fig.	∗2 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
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

Mounting Dimensions

(mm)

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

CUTTING CONDITIONS ➢ pp.37-64

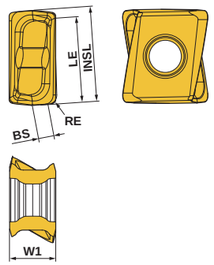
VPX200 Inserts

(inch)

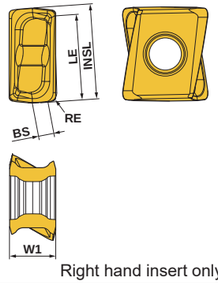
Material		
	P	Steel
	M	Stainless Steel
	K	Cast Iron
	N	Non-ferrous Metals
	S	Heat Resistant Alloys, Titanium Alloys
	H	Hardened Steel

This is the selection guideline for VPX.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.
Edge Preparation :
E : Round **F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated MV1020	MV1030	MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	Carbide TF15	INSL	RE	LE	W1	BS	Geometry
Low Cutting Resistance L	LOGU0904020PNER-L	G	E	●	●	●	●	●	●	●	●	●		.343	.008	.311	.169	.067	
	LOGU0904040PNER-L	G	E	●	●	●	●	●	●	●	●	●		.343	.016	.311	.169	.059	
	LOGU0904080PNER-L	G	E	●	●	●	●	●	●	●	●	●		.343	.031	.311	.169	.047	
	LOGU0904100PNER-L	G	E	●	●	●	●	●	●	●	●	●		.343	.039	.311	.169	.039	
	LOGU0904120PNER-L	G	E	●	●	●	●	●	●	●	●	●		.343	.047	.311	.169	.031	
	LOGU0904160PNER-L	G	E	●	●	●	●	●	●	●	●	●		.343	.063	.311	.169	.020	
	LOGU0904020PNFR-L	G	F										●	.343	.008	.311	.169	.067	
	LOGU0904040PNFR-L	G	F										●	.343	.016	.311	.169	.059	
	LOGU0904080PNFR-L	G	F										●	.343	.031	.311	.169	.047	
	LOGU0904100PNFR-L	G	F										●	.343	.039	.311	.169	.039	
	LOGU0904120PNFR-L	G	F										●	.343	.047	.311	.169	.031	
	LOGU0904160PNFR-L	G	F										●	.343	.063	.311	.169	.020	
General Use M	LOGU0904020PNER-M	G	E	●	●	●	●	●	●	●	●	●		.343	.008	.311	.169	.067	
	LOGU0904040PNER-M	G	E	●	●	●	●	●	●	●	●	●		.343	.016	.311	.169	.059	
	LOGU0904080PNER-M	G	E	●	●	●	●	●	●	●	●	●		.343	.031	.311	.169	.047	
	LOGU0904100PNER-M	G	E	●	●	●	●	●	●	●	●	●		.343	.039	.311	.169	.039	
	LOGU0904120PNER-M	G	E	●	●	●	●	●	●	●	●	●		.343	.047	.311	.169	.031	
	LOGU0904160PNER-M	G	E	●	●	●	●	●	●	●	●	●		.343	.063	.311	.169	.020	
	LOGU0904020PNFR-M	G	F										●	.343	.008	.311	.169	.067	
	LOGU0904040PNFR-M	G	F										●	.343	.016	.311	.169	.059	
	LOGU0904080PNFR-M	G	F										●	.343	.031	.311	.169	.047	
	LOGU0904100PNFR-M	G	F										●	.343	.039	.311	.169	.039	
	LOGU0904120PNFR-M	G	F										●	.343	.047	.311	.169	.031	
	LOGU0904160PNFR-M	G	F										●	.343	.063	.311	.169	.020	



Right hand insert only.



Right hand insert only.

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

MULTI-FUNCTIONAL MILLING

90° KAPR

VPX300

P M K N S H

Fig.1

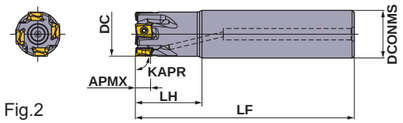


Fig.2

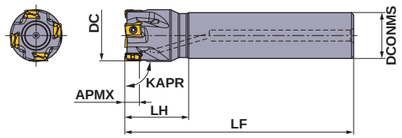


Fig.3

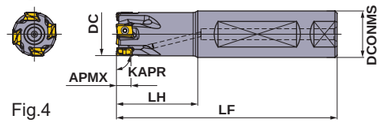
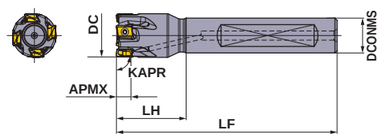


Fig.4



Right hand tool holder only.

Shank Type

With Coolant Through

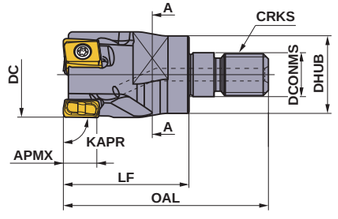
(inch)

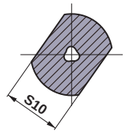
DC	Order Number	Stock R	* No.T	DCONMS	LF	LH	APMX	RMPX	RPMX (min^{-1})	WT (lbs)	Fig.	Insert Type
1.000	**VPX300UR1602FA16S**	●	2	1.000	4.750	1.750	.433	2.07°	23900	.8	3	LOGU12
1.000	**VPX300UR1602SA16S**	●	2	1.000	4.750	1.750	.433	2.07°	23900	.9	1	LOGU12
1.000	**VPX300UR1602SA16L**	●	2	1.000	8.500	2.500	.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 ➢ pp.37-64

Multi-Functional Cutter for High Efficiency Machining





A-A Section

Right hand tool holder only.

Screw-in Type

With Coolant Through

(inch)

DC	Order Number	Stock R	*1 No.T	DCONMS	DHUB	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

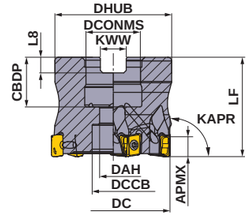
Note 1) For screw-in type arbors, refer to page 32—35.
*1 Number of Teeth

Spare Parts

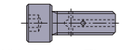
Tool Holder Type	 * Clamp Screw	 Wrench	 Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

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

● : USA Stock



Right hand tool holder only.

DCONMS	Set Bolt	Geometry
ϕ.500"	HSCU25011H	 With Coolant Through
ϕ.750"	HSCU37513H	
ϕ1.000"	HSCU50014H	

Arbor Type

DCON=inch size, With Coolant Through

(inch)

DC	Order Number	Stock R	* No.T	LF	DCONMS	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

Mounting Dimensions

(inch)

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

CUTTING CONDITIONS ➢ pp.37-64

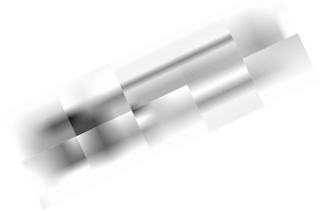
DEEP SHOULDER MILLING

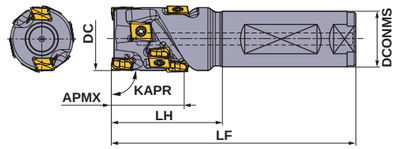
90° KAPR

VPX300

LONG CUTTING EDGE

P M K N S H





Right hand tool holder only.

Shank Type

With Coolant Through (inch)

DC	Order Number	Stock R	∗1 No.T	Total	DCONMS	LF	LH	APMX	RMPX	WT (lbs)	∗2 Insert Type
1.500	**VPX300UR242FA20S0804**	●	2	4	1.250	5.000	1.750	.827	1.13°	1.609	LOGU12
1.500	**VPX300UR242FA20S1206**	●	2	6	1.250	5.250	2.000	1.220	1.13°	1.653	LOGU12
1.500	**VPX300UR242FA20S1608**	●	2	8	1.250	5.500	2.500	1.654	1.13°	1.698	LOGU12

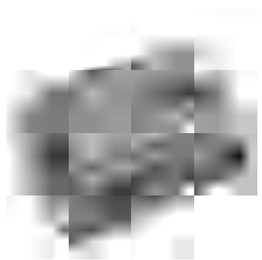
∗1 Number of Teeth
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

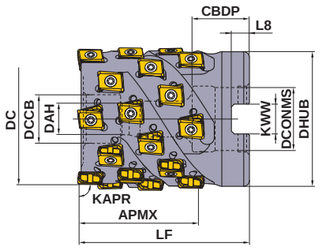
Spare Parts

Tool Holder Type	∗ Clamp Screw	Wrench	Anti-seize Lubricant
VPX200UR24	TPS40F1	TIP15W	MK1KS

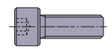
∗ Clamp Torque (lbf-in) : TPS40F1 = 26.6

● : USA Stock





Right hand tool holder only.

Order Number	APMX	Set Bolt	Geometry
VPX300UR1.5002AA1206	1.220	HSCUF25015	 With Coolant Through
VPX300UR1.5002AA1608	1.654	HSCUF25020	
VPX300UR2.0003AA1209	1.220	HSCUF37518	
VPX300UR2.0003AA1612	1.654	HSCUF37520	
VPX300UR2.0003AA2015	2.047	HSCUF37525	
VPX300UR2.5004AA1616	1.654	HSCUF50020	
VPX300UR2.5004AA2020	2.047	HSCUF50023	
VPX300UR3.0005AA2025	2.047	HSCUF62525	
VPX300UR3.0005AA2835	2.874	HSCUF62530	

Arbor Type

DCON=inch size, With Coolant Through (inch)

DC	Order Number	Stock R	∗1 No.T	Total	LF	DCONMS	WT (lbs)	APMX	RMPX	∗2 Insert Type
1.500	**VPX300UR1.5002AA1206**	●	2	6	2.000	.500	.573	1.220	1.13°	LOGU12
1.500	**VPX300UR1.5002AA1608**	●	2	8	2.375	.500	.661	1.654	1.13°	LOGU12
2.000	**VPX300UR2.0003AA1209**	●	3	9	2.250	.750	1.146	1.220	0.78°	LOGU12
2.000	**VPX300UR2.0003AA1612**	●	3	12	2.500	.750	1.213	1.654	0.78°	LOGU12
2.000	**VPX300UR2.0003AA2015**	●	3	15	3.000	.750	1.477	2.047	0.78°	LOGU12
2.500	**VPX300UR2.5004AA1616**	●	4	16	2.750	1.000	2.337	1.654	0.59°	LOGU12
2.500	**VPX300UR2.5004AA2020**	●	4	20	3.000	1.000	2.513	2.047	0.59°	LOGU12
3.000	**VPX300UR3.0005AA2025**	●	5	25	3.250	1.250	4.034	2.047	0.48°	LOGU12
3.000	**VPX300UR3.0005AA2835**	●	5	35	3.750	1.250	4.497	2.874	0.48°	LOGU12

∗1 Number of Teeth
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

Mounting Dimensions

(inch)

DC	Order Number	DCONMS	CBDP	DAH	DCCB	DHUB	KWW	L8
1.500	**VPX300UR1.5002AA1206**	.500	.630	.276	.433	1.438	.250	.156
1.500	**VPX300UR1.5002AA1608**	.500	.630	.276	.433	1.438	.250	.156
2.000	**VPX300UR2.0003AA1209**	.750	.748	.413	.630	1.750	.313	.187
2.000	**VPX300UR2.0003AA1612**	.750	.748	.413	.630	1.750	.313	.187
2.000	**VPX300UR2.0003AA2015**	.750	.748	.413	.630	1.750	.313	.187
2.500	**VPX300UR2.5004AA1616**	1.000	.945	.539	.787	2.375	.375	.219
2.500	**VPX300UR2.5004AA2020**	1.000	.945	.539	.787	2.375	.375	.219
3.000	**VPX300UR3.0005AA2025**	1.250	1.260	.669	1.024	2.875	.500	.281
3.000	**VPX300UR3.0005AA2835**	1.250	1.260	.669	1.024	2.875	.500	.281

Spare Parts

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

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

CUTTING CONDITIONS ➢ pp.37-64

Fig.1

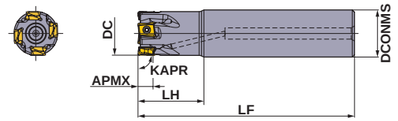
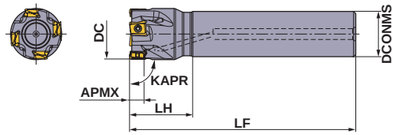


Fig.2



Right hand tool holder only.

Metric Standard

Shank Type

With Coolant Through

(mm)

DC	Order Number	Stock R	∗ No.T	DCONMS	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

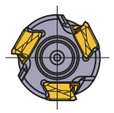
Note 1) The maximum spindle speeds **RPMX** are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and arbor are correctly balanced.
∗ Number of Teeth

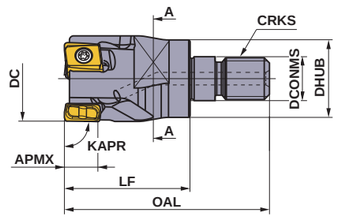
Spare Parts

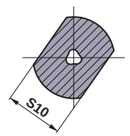
Tool Holder Type	 ∗		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300	TPS40F1	TIP15W	MK1KS

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

★ : **Stocked in Japan**







A-A Section

Right hand tool holder only.

Metric Standard

Screw-in Type

With Coolant Through

(mm)

DC	Order Number	Stock R	∗1 No.T	DCONMS	DHUB	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

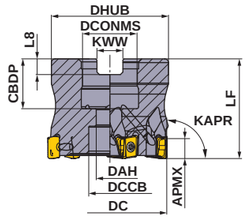
Note 1) For screw-in type arbors, refer to page 32—35.
∗1 Number of Teeth

CUTTING CONDITIONS ➢ pp.37-64

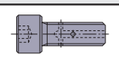
Multi-Functional Cutter for High Efficiency Machining

Metric Standard

For Metric Arbors



Right hand tool holder only.

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

Arbor Type

DCON=inch size, With Coolant Through (mm)

DC	Order Number	Stock R	∗1 No.T	LF	DCONMS	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, With Coolant Through (mm)

DC	Order Number	Stock R	∗1 No.T	LF	DCONMS	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

Mounting Dimensions

(mm)

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

★ : Stocked in Japan

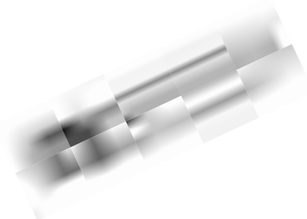
DEEP SHOULDER MILLING

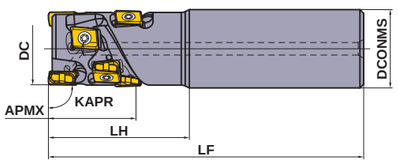
90° KAPR

VPX300

LONG CUTTING EDGE

P M K N S H





Right hand tool holder only.

Metric Standard

Shank Type

With Coolant Through (mm)

DC	Order Number	Stock R	∗1 No.T	Total	DCONMS	LF	LH	APMX	RMPX	WT (kg)	∗2 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
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

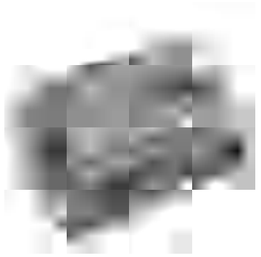
Spare Parts

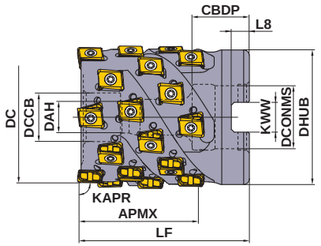
Tool Holder Type	 ∗		
	Clamp Screw	Wrench	Anti-seize Lubricant
VPX300R40	TPS40F1	TIP15W	MK1KS

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

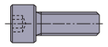
CUTTING CONDITIONS ➢ pp.37-64

Multi-Functional Cutter for High Efficiency Machining





Right hand tool holder only.

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

Metric Standard

Arbor Type

DCON=mm size, With Coolant Through

(mm)

DC	Order Number	Stock R	∗1 No.T	Total	LF	DCONMS	WT (kg)	APMX	RMPX	∗2 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 Through

(mm)

DC	Order Number	Stock R	∗1 No.T	Total	LF	DCONMS	WT (kg)	APMX	RMPX	∗2 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
∗2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

Mounting Dimensions

(mm)

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

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

VPX300 Inserts

(inch)

Material		
P	Steel	◆
M	Stainless Steel	◇
K	Cast Iron	◆
N	Non-ferrous Metals	◆
S	Heat Resistant Alloys, Titanium Alloys	◆
H	Hardened Steel	◆

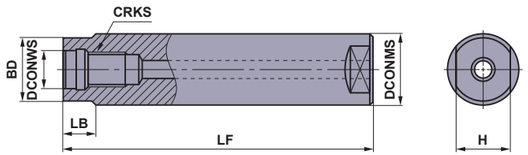
This is the selection guideline for VPX.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.
Edge Preparation :
E : Round　**F :** Sharp Edge

Shape	Order Number	Class	Edge Preparation	Coated MV1020	MV1030	MC5020	MP6120	MP6130	MP7130	MP9120	MP9130	VP15TF	Carbide TF15	INSL	RE	LE	W1	BS	Geometry
Low Cutting Resistance L	LOGU1207020PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.008	.445	.276	.118	
	LOGU1207040PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.016	.445	.276	.110	
	LOGU1207080PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.031	.445	.276	.102	
	LOGU1207100PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.039	.445	.276	.098	
	LOGU1207120PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.047	.445	.276	.094	
	LOGU1207160PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.063	.445	.276	.071	
	LOGU1207200PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.079	.445	.276	.055	
	LOGU1207240PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.094	.445	.276	.047	
	LOGU1207300PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.118	.445	.276	.024	
	LOGU1207320PNER-L	G	E	●	●	●	●	●	●	●	●	●		.488	.126	.445	.276	.016	
	LOGU1207020PNFR-L	G	F										●	.488	.008	.445	.276	.118	
	LOGU1207040PNFR-L	G	F										●	.488	.016	.445	.276	.110	
	LOGU1207080PNFR-L	G	F										●	.488	.031	.445	.276	.102	
	LOGU1207100PNFR-L	G	F										●	.488	.039	.445	.276	.098	
	LOGU1207120PNFR-L	G	F										●	.488	.047	.445	.276	.094	
	LOGU1207160PNFR-L	G	F										●	.488	.063	.445	.276	.071	
	LOGU1207200PNFR-L	G	F										●	.488	.079	.445	.276	.055	
	LOGU1207240PNFR-L	G	F										●	.488	.094	.445	.276	.047	
	LOGU1207300PNFR-L	G	F										●	.488	.118	.445	.276	.024	
	LOGU1207320PNFR-L	G	F										●	.488	.126	.445	.276	.016	Right hand insert only.
General Use M	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.

CUTTING CONDITIONS ➢ pp.37-64

SCREW-IN HOLDERS

STRAIGHT SHANK TYPE



Steel Shank Type

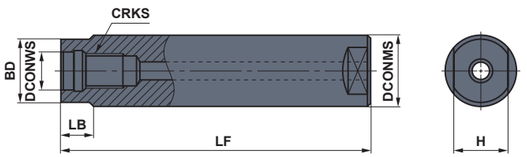
With Coolant Through (inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	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

With Coolant Through (mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	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



Carbide Shank Type

With Coolant Through (inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	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

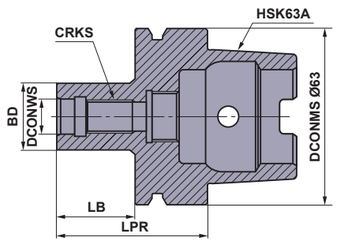
With Coolant Through (mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	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

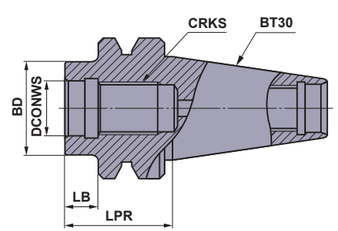
With Coolant Through

(mm)

CRKS	Order Number	Stock	DCONWS	BD	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

Note 1) The coolant tube has been already set.

BT30 Shank Arbor



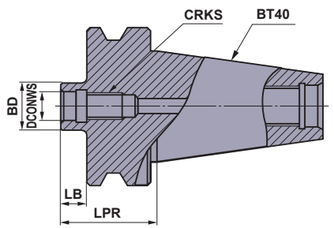
Metric Standard

With Coolant Through

(mm)

CRKS	Order Number	Stock	DCONWS	BD	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

With Coolant Through

(mm)

CRKS	Order Number	Stock	DCONWS	BD	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

★ : Stocked in Japan

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

Chipbreaker Recommendation

Chipbreaker Selection Table

	Material	Properties	Cutting Conditions	Chipbreaker 1st Recommended	Chipbreaker 2nd Recommended	Grade 1st Recommended	Grade 2nd Recommended
P	Mild Steel	Hardness ≤180HB	● ◔	L	M	MV1020, MV1030, MP6120	VP15TF
			✲	M	L	MP6130	—
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—350HB ≤350HB (Annealing)	● ◔	L	M	MV1020, MV1030, MP6120	VP15TF
			◔	M	L	MP6120	VP15TF
			✲	M	L	MP6130	—
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	M	L	MP6120	VP15TF
			✲	M	L	MP6130	—
M	Austenitic Stainless Steel	Hardness ≤200HB	○ ◔	L	M	MV1020, MV1030, MP7130	VP15TF
			❁	M	L	MP7130	—
		Hardness >200HB	○ ◔	L	M	MV1020, MV1030, MP7130	VP15TF
			❁	M	L	MP7130	—
	Duplex Stainless Steel	Hardness ≤280HB	○ ◔	L	M	MP7130	VP15TF
			❁	M	L	MP7130	—
	Ferritic and Martensitic Stainless Steel	—	○ ◔	L	M	MV1020, MV1030, MP7130	VP15TF
			❁	M	L	MP7130	—
	Precipitation Hardening Stainless Steel	Hardness <450HB	○ ◔	L	M	MP7130	VP15TF
			❁	M	L	MP7130	—
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	M	L	MC5020	VP15TF
			✲	M	L	VP15TF	—
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ◔	M	L	MC5020, MV1020, MV1030	VP15TF
			✲	M	L	VP15TF	—
N	Aluminum Alloys	Content Si<5%	● ◔	L	M	TF15	—
			✲	M	L	TF15	—
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ◔	L	M	MP9120	VP15TF
			✲	M	L	MP9130	—
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◔	L	M	MP9120	VP15TF
			✲	M	L	MP9130	—
	Heat Resistant Alloys	—	● ◔	M	L	MP9120	VP15TF
			✲	M	L	MP9130	—
H	Hardened Steel	Hardness 40—55HRC	● ◔ ✲	M	—	VP15TF	—

For cutting conditions please refer to page 37—64.

VPX200

Recommended Cutting Conditions

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

Dry Cutting
Cutting Speed

(inch)

	Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** (inch) ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
					Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ◔	MV1020	920 (720—1080)	885 (690—1050)	720 (560—850)	720 (560—850)
			● ◔	MV1030	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			● ◔	MP6120,VP15TF	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			✲	MP6130	655 (490—785)	620 (460—755)	490 (360—590)	490 (360—590)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	● ◔	MV1020	720 (560—850)	690 (525—785)	560 (425—655)	560 (425—655)
			● ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	560 (425—655)
			● ◔	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)
		Hardness 280—350HB ≤350HB (Annealing)	● ◔	MV1020	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			● ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			● ◔	MP6120,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			✲	MP6130	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	MP6120,VP15TF	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✲	MP6130	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steel	Hardness ≤200HB	○ ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			○ ◔ ❁	MP7130,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
		Hardness >200HB	○ ◔	MV1030	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
			○ ◔ ❁	MP7130,VP15TF	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
	Duplex Stainless Steel	Hardness ≤280HB	○ ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			○ ◔ ❁	MP7130,VP15TF	460 (360—560)	425 (295—490)	330 (230—395)	330 (230—395)
	Ferritic and Martensitic Stainless Steel	—	○ ◔ ❁	MP7130,VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
	Precipitation Hardening Stainless Steel	Hardness <450HB	○ ◔ ❁	MP7130,VP15TF	425 (330—525)	395 (260—460)	295 (195—360)	295 (195—360)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	820 (655—985)	785 (620—950)	690 (525—850)	690 (525—850)
			● ◔ ✲	VP15TF	655 (490—820)	620 (460—785)	525 (360—690)	525 (360—690)
	Ductile Cast Iron	Tensile Strength ≤450MPa	● ◔	MV1020	655 (490—920)	620 (460—885)	560 (425—785)	560 (425—785)
			● ◔	MV1030	490 (330—655)	460 (295—620)	410 (260—560)	330 (260—395)
			● ◔	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)
		Tensile Strength ≤800MPa	● ◔	MV1020	590 (460—820)	590 (425—785)	490 (395—690)	490 (395—690)
			● ◔	MV1030	490 (330—655)	490 (295—620)	410 (260—560)	490 (395—690)
			● ◔	MC5020	590 (490—655)	590 (460—620)	490 (395—560)	490 (395—560)
			● ◔ ✲	VP15TF	425 (330—490)	425 (295—460)	330 (260—395)	330 (260—395)
N	Aluminum Alloys	Content Si<5%	● ◔ ✲	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
H	Hardened Steel	Hardness 40—55HRC	● ◔ ✲	VP15TF	295 (230—330)	295 (195—330)	230 (165—260)	230 (165—260)

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

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

VPX200

Recommended Cutting Conditions

Dry Cutting
Depth of Cut / Feed per Tooth

(inch)

	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 Steel	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
		Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.25—.5DC	● ◐ ✲	≤.197	.003—.005	≤.315	.003—.005	≤.315	.004—.006
			.5—.75DC	● ◐ ✲	≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
			DC(Slot)	● ◐ ✲	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✲	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✲	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.006
				✲	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	○ ◔	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	○ ◔	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				✲	≤.157	.002—.003	≤.236	.002—.003	≤.236	.002—.003
			DC(Slot)	○ ◔	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✲	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003

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

(inch)

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

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

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

VPX200

Recommended Cutting Conditions

Wet Cutting
Cutting Speed

(inch)

	Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
					Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ◐	MV1020	690 (490—950)	655 (460—885)	490 (360—590)	490 (360—590)
			● ◐	MV1030	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			● ◐	MP6120, VP15TF				
			✲	MP6130				
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	● ◐	MV1020	590 (460—690)	560 (395—655)	490 (360—590)	490 (360—590)
			● ◐	MV1030	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ◐	MP6120, VP15TF				
			✲	MP6130				
		Hardness 280—350HB ≤350HB (Annealing)	● ◐	MV1020	460 (360—525)	425 (295—490)	395 (260—460)	395 (260—460)
			● ◐	MV1030	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ◐	MP6120, VP15TF				
			✲	MP6130				
	Pre-hardened Steel	Hardness 35—45HRC	● ◐	MP6120	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			● ◐	VP15TF				
			✲	MP6130				
M	Austenitic Stainless Steel	Hardness ≤200HB	● ◐ ✲	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ◐	VP15TF				
		Hardness >200HB	● ◐ ✲	MP7130	330 (260—425)	295 (230—360)	230 (165—330)	230 (165—330)
			● ◐	VP15TF				
	Duplex Stainless Steel	Hardness ≤280HB	● ◐ ✲	MP7130	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			● ◐	VP15TF				
	Ferritic and Martensitic Stainless Steel	—	● ◐ ✲	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			● ◐	VP15TF				
	Precipitation Hardening Stainless Steel	Hardness <450HB	● ◐ ✲	MP7130	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
			● ◐	VP15TF				
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◐	MC5020	590 (525—720)	560 (490—690)	490 (425—620)	490 (425—620)
			● ◐ ✲	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
	Ductile Cast Iron	Tensile Strength ≤450MPa	● ◐	MV1020	590 (490—785)	560 (460—755)	490 (425—655)	490 (425—655)
			● ◐	MC5020	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			● ◐	MV1030	425 (260—590)	395 (230—560)	345 (195—490)	345 (195—490)
			● ◐ ✲	VP15TF	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
		Tensile Strength ≤800MPa	● ◐	MV1020	525 (425—690)	490 (395—655)	425 (360—560)	425 (360—560)
			● ◐	MC5020	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			● ◐	MV1030	425 (260—590)	395 (230—560)	345 (195—490)	345 (195—490)
			● ◐ ✲	VP15TF	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
N	Aluminum Alloys	Content Si<5%	● ◐ ✲	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	● ◐	MP9120	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			● ◐	VP15TF	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			✲	MP9130	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	● ◐	MP9120	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			● ◐	VP15TF	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			✲	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
	Heat Resistant Alloys	—	● ◐	MP9120	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			● ◐	VP15TF	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			✲	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
H	Hardened Steel	Hardness 40—55HRC	● ◐ ✲	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

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

Depth of Cut / Feed per Tooth

(inch)

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

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

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

VPX200

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

Recommended Cutting Conditions

Wet Cutting
Depth of Cut / Feed per Tooth

(inch)

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

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

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

VPX300

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

Recommended Cutting Conditions

Dry Cutting
Cutting Speed

(inch)

	Material	Properties	Cutting Conditions	Grade	Cutting Width **ae** ≤.25DC Cutting Speed **vc** (SFM)	.25—.5DC	.5—.75DC	DC(Slot)
P	Mild Steel	Hardness ≤180HB	● ◔	MV1020	920 (720—1080)	885 (690—1050)	720 (560—850)	720 (560—850)
			● ◔	MV1030	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			● ◔	MP6120, VP15TF	755 (590—885)	720 (560—850)	590 (460—690)	590 (460—690)
			✲	MP6130	655 (490—785)	620 (560—850)	490 (360—590)	490 (360—590)
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	● ◔	MV1020	720 (560—850)	690 (525—785)	560 (425—655)	560 (425—655)
			● ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	560 (425—655)
			● ◔	MP6120, VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—590)
			✲	MP6130	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
		Hardness 280—350HB ≤350HB (Annealing)	● ◔	MV1020	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			● ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			● ◔	MP6120, VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—590)
			✲	MP6130	490 (360—590)	460 (330—560)	360 (260—425)	360 (260—425)
	Pre-hardened Steel	Hardness 35—45HRC	● ◔	MP6120, VP15TF	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			✲	MP6130	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steel	Hardness ≤200HB	○ ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			○ ◔ ✲	MP7130, VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
		Hardness >200HB	○ ◔	MV1030	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
			○ ◔ ✲	MP7130, VP15TF	490 (360—590)	460 (330—525)	360 (260—425)	360 (260—425)
	Duplex Stainless Steel	Hardness ≤280HB	○ ◔	MV1030	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			○ ◔ ✲	MP7130, VP15TF	460 (360—560)	425 (295—490)	330 (230—395)	330 (230—395)
	Ferritic and Martensitic Stainless Steel	—	○ ◔ ✲	MP7130, VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
	Precipitation Hardening Stainless Steel	Hardness <450HB	○ ◔ ✲	MP7130, VP15TF	425 (330—525)	395 (260—460)	295 (195—360)	295 (195—360)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	820 (655—985)	785 (620—950)	690 (525—850)	690 (525—850)
			● ◔ ✲	VP15TF	655 (490—820)	620 (460—785)	525 (360—690)	525 (360—690)
	Ductile Cast Iron	Tensile Strength ≤450MPa	● ◔	MV1020	655 (490—920)	620 (460—885)	560 (425—785)	560 (425—785)
			● ◔	MV1030	490 (330—655)	460 (295—620)	410 (260—560)	330 (260—395)
			● ◔	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)
		Tensile Strength ≤800MPa	● ◔	MV1020	590 (460—820)	560 (425—785)	490 (395—690)	490 (395—690)
			● ◔	MV1030	490 (330—655)	460 (295—620)	410 (260—560)	490 (395—690)
			● ◔	MC5020	590 (490—655)	560 (460—620)	490 (395—560)	490 (395—560)
			● ◔ ✲	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
N	Aluminum Alloys	Content Si<5%	● ◔ ✲	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
H	Hardened Steel	Hardness 40—55HRC	○ ◔ ✲	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

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

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

VPX300

Recommended Cutting Conditions

Dry Cutting
Depth of Cut / Feed per Tooth

(inch)

	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 Steel	Hardness ≤180HB	≤.25DC	● ◕ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◕ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◕ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◕ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ◕ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◕ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◕ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◕ ✲	≤.197	.002—.004	≤.197	.003—.006
		Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◕ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◕ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◕ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◕ ✲	≤.197	.002—.004	≤.197	.003—.005
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◕ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◕ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◕ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◕ ✲	≤.197	.002—.004	≤.197	.003—.005
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	○ ◔	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	○ ◔	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	○ ◔	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤.433	.004—.006	≤.433	.004—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	○ ◔	≤.433	.003—.005	≤.433	.003—.005
				✲	≤.433	.003—.005	≤.433	.002—.004
			.5—.75DC	○ ◔	≤.315	.002—.004	≤.315	.002—.004
				✲	≤.315	.002—.003	≤.315	.002—.003
			DC(Slot)	○ ◔	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003

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

(inch)

	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 Iron	Tensile Strength ≤350MPa	≤.25DC	● ◕	≤.433	.004—.008	≤.433	.004—.012
				✲	≤.433	.003—.006	≤.433	.004—.010
			.25—.5DC	● ◕	≤.433	.003—.006	≤.433	.004—.010
				✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◕	≤.315	.003—.005	≤.315	.004—.008
				✲	≤.315	.002—.004	≤.315	.003—.006
			DC(Slot)	● ◕	≤.197	.002—.004	≤.197	.003—.006
				✲	≤.197	.002—.003	≤.197	.003—.005
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	● ◕	≤.433	.004—.008	≤.433	.004—.010
				✲	≤.433	.004—.006	≤.433	.004—.008
			.25—.5DC	● ◕	≤.433	.004—.006	≤.433	.004—.008
				✲	≤.433	.003—.005	≤.433	.004—.006
			.5—.75DC	● ◕	≤.315	.003—.005	≤.315	.004—.006
				✲	≤.315	.003—.005	≤.315	.003—.005
			DC(Slot)	● ◕	≤.197	.002—.004	≤.197	.003—.005
				✲	≤.197	.002—.003	≤.197	.002—.004
N	Aluminum Alloys	Content Si < 5%	≤.25DC	● ◕	≤.433	.004—.010	≤.433	.004—.010
				✲	≤.433	.004—.008	≤.433	.004—.008
			.25—.5DC	● ◕	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.004—.006	≤.433	.004—.006
			.5—.75DC	● ◕	≤.315	.002—.006	≤.315	.003—.006
				✲	≤.315	.002—.006	≤.315	.003—.006
			DC(Slot)	● ◕	≤.197	.002—.006	≤.197	.003—.006
				✲	≤.197	.002—.006	≤.197	.003—.005
H	Hardened Steel	Hardness 40—55HRC	≤.25DC	● ◕	≤.197	.003—.006	≤.197	.003—.006
				✲	≤.197	.003—.005	≤.197	.003—.005
			.25—.5DC	● ◕	≤.157	.003—.005	≤.157	.003—.005
				✲	≤.157	.002—.004	≤.157	.002—.004
			.5—.75DC	● ◕	≤.118	.002—.004	≤.118	.002—.004
				✲	≤.118	.002—.003	≤.118	.002—.003
			DC(Slot)	● ◕	≤.079	.002—.004	≤.079	.002—.004
				✲	≤.079	.002—.003	≤.079	.002—.003

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

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

VPX300

Recommended Cutting Conditions

Wet Cutting
Cutting Speed

(inch)

	Material	Properties	Cutting Conditions	Insert Grade	Cutting Width **ae** ≤.25DC	.25—.5DC	.5—.75DC	DC(Slot)
					Cutting Speed **vc** (SFM)			
P	Mild Steel	Hardness ≤180HB	● ◐	MV1020	690 (490—950)	655 (460—885)	490 (360—590)	490 (360—590)
			● ◐	MV1030	460 (330—620)	425 (295—590)	330 (230—395)	330 (230—395)
			● ◐	MP6120, VP15TF				
			✲	MP6130				
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	● ◐	MV1020	590 (460—690)	560 (395—655)	490 (360—590)	490 (360—590)
			● ◐	MV1030	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ◐	MP6120, VP15TF				
			✲	MP6130				
		Hardness 280—350HB ≤350HB (Annealing)	● ◐	MV1020	460 (360—525)	425 (295—490)	395 (260—460)	395 (260—460)
			● ◐	MV1030	395 (295—460)	360 (260—425)	330 (230—395)	330 (230—395)
			● ◐	MP6120, VP15TF				
			✲	MP6130				
	Pre-hardened Steel	Hardness 35—45HRC	● ◐	MP6120	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			● ◐	VP15TF	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
			✲	MP6130	330 (260—395)	295 (230—360)	260 (195—330)	260 (195—330)
M	Austenitic Stainless Steel	Hardness ≤200HB	◐ ✲	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			◐	VP15TF	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
		Hardness >200HB	◐ ✲	MP7130	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			◐	VP15TF	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
	Duplex Stainless Steel	Hardness ≤280HB	◐ ✲	MP7130	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
			◐	VP15TF	330 (260—425)	295 (230—395)	230 (165—330)	230 (165—330)
	Ferritic and Martensitic Stainless Steel	—	◐ ✲	MP7130	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
			◐	VP15TF	395 (330—490)	360 (295—460)	295 (230—395)	295 (230—395)
	Precipitation Hardening Stainless Steel	Hardness <450HB	◐ ✲	MP7130	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
			◐	VP15TF	295 (230—395)	260 (195—360)	195 (130—295)	195 (130—295)
K	Gray Cast Iron	Tensile Strength ≤350MPa	●	MC5020	590 (525—720)	560 (490—690)	490 (425—620)	490 (425—620)
			● ✲	VP15TF	425 (330—490)	395 (295—460)	330 (260—395)	330 (260—395)
	Ductile Cast Iron	Tensile Strength ≤450MPa	●	MV1020	590 (490—785)	560 (460—755)	490 (425—655)	490 (425—655)
			●	MC5020	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			●	MV1030	425 (260—590)	395 (230—560)	345 (195—490)	345 (195—490)
			● ✲	VP15TF	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
		Tensile Strength ≤800MPa	●	MV1020	525 (425—690)	490 (395—655)	425 (360—560)	425 (360—560)
			●	MC5020	525 (460—590)	490 (425—560)	425 (360—490)	425 (360—490)
			●	MV1030	425 (260—590)	395 (230—560)	345 (195—490)	345 (195—490)
			● ✲	VP15TF	360 (260—460)	330 (230—425)	260 (195—395)	260 (195—395)
N	Aluminum Alloys	Content Si < 5%	● ✲	TF15	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)	1970 (1310—3280)
S	Titanium Alloys (Ti-6Al-4V,etc.)	—	●	MP9120	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			●	VP15TF	165 (130—230)	165 (130—230)	165 (130—230)	165 (130—230)
			✲	MP9130	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr,etc.)	—	●	MP9120	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			●	VP15TF	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
			✲	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
	Heat Resistant Alloys	—	●	MP9120	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			●	VP15TF	130 (100—195)	130 (100—195)	130 (100—195)	130 (100—195)
			✲	MP9130	100 (65—130)	100 (65—130)	100 (65—130)	100 (65—130)
H	Hardened Steel	Hardness 40—55HRC	● ◐ ✲	VP15TF	295 (230—330)	280 (195—330)	230 (165—260)	230 (165—260)

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

Depth of Cut / Feed per Tooth

(inch)

	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 Steel	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◐ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◐ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◐ ✲	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ◐ ✲	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ◐ ✲	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ◐ ✲	≤.197	.002—.004	≤.197	.003—.006
		Hardness 280—350HB ≤350HB (Annealing)	≤.25DC	● ◐ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◐ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◐ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◐ ✲	≤.197	.002—.004	≤.197	.003—.005
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤.433	.004—.006	≤.433	.004—.010
			.25—.5DC	● ◐ ✲	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◐ ✲	≤.315	.002—.004	≤.315	.004—.006
			DC(Slot)	● ◐ ✲	≤.197	.002—.004	≤.197	.003—.005
M	Austenitic Stainless Steel	—	≤.25DC	◐	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	◐	≤.433	.003—.005	≤.433	.003—.006
				✲	≤.433	.002—.004	≤.433	.003—.005
			.5—.75DC	◐	≤.315	.002—.004	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	◐	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	◐	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	◐	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	◐	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	◐	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	◐	≤.433	.004—.008	≤.433	.004—.008
				✲	≤.433	.003—.006	≤.433	.003—.006
			.25—.5DC	◐	≤.433	.003—.006	≤.433	.003—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	◐	≤.315	.003—.005	≤.315	.003—.005
				✲	≤.315	.002—.004	≤.315	.002—.004
			DC(Slot)	◐	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	◐	≤.433	.004—.006	≤.433	.004—.006
				✲	≤.433	.003—.005	≤.433	.003—.005
			.25—.5DC	◐	≤.433	.003—.005	≤.433	.003—.005
				✲	≤.433	.003—.005	≤.433	.003—.005
			.5—.75DC	◐	≤.315	.002—.004	≤.315	.002—.004
				✲	≤.315	.002—.003	≤.315	.002—.003
			DC(Slot)	◐	≤.197	.002—.004	≤.197	.002—.004
				✲	≤.197	.002—.003	≤.197	.002—.003

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

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

VPX300

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

Recommended Cutting Conditions

Wet Cutting
Depth of Cut / Feed per Tooth

(inch)

	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 Iron	Tensile Strength ≤350MPa	≤.25DC	● ◔	≤.433	.004—.008	≤.433	.004—.012
				✤	≤.433	.003—.006	≤.433	.004—.010
			.25—.5DC	● ◔	≤.433	.003—.006	≤.433	.004—.010
				✤	≤.433	.003—.005	≤.433	.004—.008
			.5—.75DC	● ◔	≤.315	.003—.005	≤.315	.004—.008
				✤	≤.315	.002—.004	≤.315	.003—.006
			DC(Slot)	● ◔	≤.197	.002—.004	≤.197	.003—.006
				✤	≤.197	.002—.003	≤.197	.003—.005
	Ductile Cast Iron	Tensile Strength ≤800MPa	≤.25DC	● ◔	≤.433	.004—.008	≤.433	.004—.010
				✤	≤.433	.004—.006	≤.433	.004—.008
			.25—.5DC	● ◔	≤.433	.004—.006	≤.433	.004—.008
				✤	≤.433	.003—.005	≤.433	.004—.006
			.5—.75DC	● ◔	≤.315	.003—.005	≤.315	.004—.006
				✤	≤.315	.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 Steel	Hardness 40—55HRC	≤.25DC	● ◔	≤.197	.003—.006	≤.197	.003—.006
				✤	≤.197	.003—.005	≤.197	.003—.005
			.25—.5DC	● ◔	≤.157	.003—.005	≤.157	.003—.005
				✤	≤.157	.002—.004	≤.157	.002—.004
			.5—.75DC	● ◔	≤.118	.002—.004	≤.118	.002—.004
				✤	≤.118	.002—.004	≤.118	.002—.003
			DC(Slot)	● ◔	≤.079	.002—.004	≤.079	.002—.004
				✤	≤.079	.002—.004	≤.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.

VPX200/300 DEEP SHOULDER MILLING

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

Recommended Cutting Conditions

Cutting Speed

(inch)

	Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** ≤.25DC Cutting Speed **vc** (SFM)	Width of Cut **ae** .25—.5DC Cutting Speed **vc** (SFM)	Width of Cut **ae** .5—.75DC Cutting Speed **vc** (SFM)	Width of Cut **ae** DC(Slot) Cutting Speed **vc** (SFM)	Cutting Mode
P	Mild Steel	Hardness ≤180HB	● ◔	MV1020	920(720—1080)	885(690—1050)	720(560—850)	720(560—850)	Dry
					690(490—950)	655(460—885)	490(360—590)	490(360—590)	Wet
			● ◔	MV1030	755(590—885)	720(560—850)	590(460—690)	590(460—690)	Dry
					460(330—620)	425(295—590)	330(230—395)	330(230—395)	Wet
			● ◔	MP6120,VP15TF	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, Wet
			✤	MP6130	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, Wet
	Carbon Steel Alloy Steel	Hardness 180—280HB	● ◔	MV1020	720(560—850)	690(525—785)	560(425—655)	560(425—655)	Dry
					590(460—690)	560(395—655)	490(360—590)	490(360—590)	Wet
			● ◔	MV1030	590(460—690)	560(425—655)	460(360—525)	460(360—525)	Dry
					395(295—460)	360(260—425)	330(230—395)	330(230—395)	Wet
			● ◔	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
		Hardness 280—350HB ≤350HB (Annealing	● ◔	MV1020, MV1030	590(460—590)	560(425—655)	460(360—525)	460(360—525)	Dry
			● ◔	MV1020	460(360—525)	425(295—490)	395(260—460)	395(260—460)	Wet
			● ◔	MV1030	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Wet
			● ◔	MP6120,VP15TF	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Dry, Wet
			✤	MP6130	395(295—460)	360(260—425)	330(230—395)	330(230—395)	Dry, Wet
	Pre-hardened Steel	Hardness 180—350HB	● ◔	MP6120,VP15TF	330(260—395)	295(230—360)	260(195—330)	260(195—330)	Dry, Wet
			✤	MP6130	330(260—395)	295(230—360)	260(195—330)	260(195—330)	Dry, Wet
M	Austenitic Stainless Steel	Hardness ≤200HB	◔ ◔	MV1030	590(460—690)	560(425—655)	460(360—525)	460(360—525)	Dry
			◔ ◔	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	◔ ◔	MV1030	490(360—590)	460(330—525)	360(260—425)	360(260—425)	Dry
			◔ ◔	MP7130,VP15TF	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
			✣	MP7130	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
	Ferritic and Martensitic Stainless Steel	—	◔ ◔	MP7130,VP15TF	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
			✣	MP7130	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet
	Duplex Stainless Steel	Hardness ≤280HB	◔ ◔	MP7130,VP15TF	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
			✣	MP7130	330(260—425)	295(230—395)	230(165—330)	230(165—330)	Dry, Wet
	Precipitation Hardening Stainless Steel	Hardness <450HB	◔ ◔	MP7130,VP15TF	295(230—395)	260(195—360)	195(130—295)	195(130—295)	Dry, Wet
			✣	MP7130	295(230—395)	260(195—360)	195(130—295)	195(130—295)	Dry, Wet
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ◔	MC5020	590(525—720)	560(490—690)	490(425—620)	490(425—620)	Dry, Wet
			◔ ✤	VP15TF	425(330—490)	395(295—460)	330(260—395)	330(260—395)	Dry, Wet
	Ductile Cast Iron	Tensile Strength ≤450MPa	● ◔	MV1020	655(490—920)	620(460—885)	560(425—785)	560(425—785)	Dry
					590(490—785)	560(460—755)	490(425—655)	490(425—655)	Wet
			● ◔	MC5020	525(460—590)	490(425—560)	425(360—490)	425(360—490)	Dry, Wet
			● ◔	MV1030	490(330—655)	460(295—620)	410(260—560)	330(260—395)	Dry
					425(260—590)	395(230—560)	345(195—490)	345(195—490)	Wet
			◔ ✤	VP15TF	360(260—460)	330(230—425)	260(195—395)	260(195—395)	Dry, Wet
		Tensile Strength ≤800MPa	● ◔	MV1020	590(460—820)	560(425—785)	490(395—690)	490(395—690)	Dry
					525(425—690)	490(395—655)	425(360—560)	425(360—560)	Wet
			● ◔	MC5020	525(460—590)	490(425—560)	425(360—490)	425(360—490)	Dry, Wet
			● ◔	MV1030	490(330—655)	460(295—620)	410(260—560)	410(260—560)	Dry
					425(260—590)	395(230—560)	345(195—490)	345(195—490)	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

VPX200
DEEP SHOULDER MILLING

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth

(inch)

	Material	Properties	Width of Cut **ae**	Cutting Conditions	DC ø20—ø28mm, ø.875—ø1.125" Depth of Cut **ap**	DC ø20—ø28mm, ø.875—ø1.125" Feed per Tooth **fz** (IPT)	DC ø32—ø50mm, ø1.250—ø1.500" Depth of Cut **ap**	DC ø32—ø50mm, ø1.250—ø1.500" Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Carbon Steel Alloy Steel	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Carbon Steel Alloy Steel	Hardness 280—350HB	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.004(.003—.005)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.004)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤.551	.005(.004—.006)	≤APMX	.005(.004—.006)
				✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	○ ◔	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	○ ◔	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
				✲	≤.236	.003(.002—.003)	≤.551	.003(.002—.003)
			DC(Slot)	○ ◔	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)

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

(inch)

	Material	Properties	Width of Cut **ae**	Cutting Conditions	DC ø20—ø28mm, ø.875—ø1.125" Depth of Cut **ap**	DC ø20—ø28mm, ø.875—ø1.125" Feed per Tooth **fz** (IPT)	DC ø32—ø50mm, ø1.250—ø1.500" Depth of Cut **ap**	DC ø32—ø50mm, ø1.250—ø1.500" Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐	≤.315	.004(.003—.005)	≤1.102	.005(.003—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
	Ductile Cast Iron	—	≤.25DC	● ◐	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
				✲	≤.551	.004(.003—.005)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
				✲	≤.315	.003(.002—.004)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.003—.005)
				✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
				✲	≤.157	.003(.002—.003)	≤.157	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◐	≤.551	.006(.004—.008)	≤APMX	.007(.004—.010)
				✲	≤.551	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤.315	.005(.004—.006)	≤1.102	.006(.004—.008)
				✲	≤.315	.004(.003—.005)	≤1.102	.005(.004—.006)
			.5—.75DC	● ◐	≤.236	.004(.003—.005)	≤.551	.004(.002—.006)
				✲	≤.236	.003(.002—.004)	≤.551	.004(.002—.006)
			DC(Slot)	● ◐	≤.157	.003(.002—.004)	≤.157	.004(.002—.006)
				✲	≤.157	.003(.002—.003)	≤.157	.004(.002—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ◐ ✲	≤.551	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ◐ ✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✲	≤.551	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤.315	.004(.003—.005)	≤1.102	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.236	.003(.002—.004)	≤.551	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.157	.003(.002—.004)	≤.157	.003(.002—.004)

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

VPX300
DEEP SHOULDER MILLING

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth

(inch)

	Material	Properties	Width of Cut **ae**	Cutting Conditions	DC ø40mm, ø.1.500" Depth of Cut **ap**	DC ø40mm, ø.1.500" Feed per Tooth **fz** (IPT)	DC ø50—ø80mm, ø2.000—ø3.000" Depth of Cut **ap**	DC ø50—ø80mm, ø2.000—ø3.000" Feed per Tooth **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ◐ ✲	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
			.25—.5DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤1.220	.006(.004—.008)
			.5—.75DC	● ◐ ✲	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.004(.003—.005)
	Carbon Steel Alloy Steel	Hardness 180—280HB	≤.25DC	● ◐ ✲	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
			.25—.5DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤1.220	.006(.004—.008)
			.5—.75DC	● ◐ ✲	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.004(.003—.005)
	Carbon Steel Alloy Steel	Hardness 280—350HB	≤.25DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Pre-hardened Steel	Hardness 35—45HRC	≤.25DC	● ◐ ✲	≤APMX	.005(.004—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
M	Austenitic Stainless Steel	—	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Ferritic and Martensitic Stainless Steel	Hardness ≤200HB	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	○ ◔	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	○ ◔	≤APMX	.005(.003—.006)	≤1.220	.005(.003—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	○ ◔	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
				✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	○ ◔	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	○ ◔	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
				✲	≤.827	.003(.002—.003)	≤.827	.003(.002—.003)
			DC(Slot)	○ ◔	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)

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

(inch)

	Material	Properties	Width of Cut **ae**	Cutting Conditions	DC ø40mm, ø.1.500" Depth of Cut **ap**	DC ø40mm, ø.1.500" Feed per Tooth **fz** (IPT)	DC ø50—ø80mm, ø2.000—ø3.000" Depth of Cut **ap**	DC ø50—ø80mm, ø2.000—ø3.000" Feed per Tooth **fz** (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ◐	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
				✲	≤APMX	.005(.003—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤APMX	.005(.003—.006)	≤1.220	.006(.004—.008)
				✲	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
				✲	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ◐	≤.197	.003(.002—.004)	≤.197	.005(.003—.006)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.004)
	Ductile Cast Iron	—	≤.25DC	● ◐	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				✲	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ◐	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
				✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				✲	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ◐	≤APMX	.007(.004—.010)	≤APMX	.007(.004—.010)
				✲	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
			.25—.5DC	● ◐	≤APMX	.006(.004—.008)	≤1.220	.006(.004—.008)
				✲	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
			.5—.75DC	● ◐	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
				✲	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
			DC(Slot)	● ◐	≤.197	.004(.002—.006)	≤.197	.005(.003—.006)
				✲	≤.197	.004(.002—.005)	≤.197	.004(.003—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ◐ ✲	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ◐ ✲	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ◐ ✲	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ◐ ✲	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)

Note 1) If there is chatter, insert chipping, etc. during machining, alter conditions accordingly.
Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.
- When tool overhang is long
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

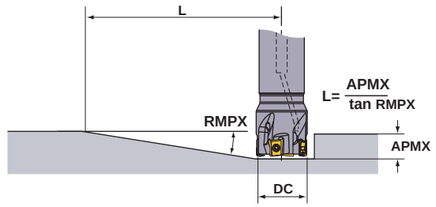
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions,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

VPX200

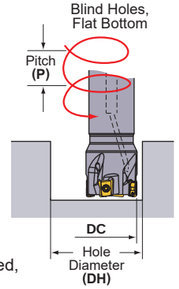
Recommended Cutting Conditions

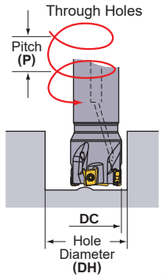
Ramping / Helical Milling

● 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 RMPX).

(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

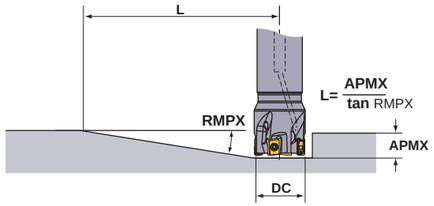
Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan RMPX).

VPX200

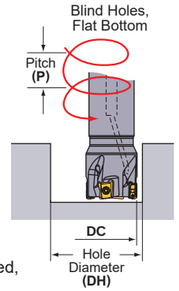
Recommended Cutting Conditions

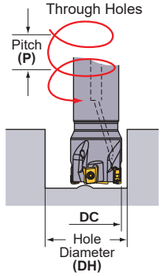
Ramping / Helical Milling

● 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

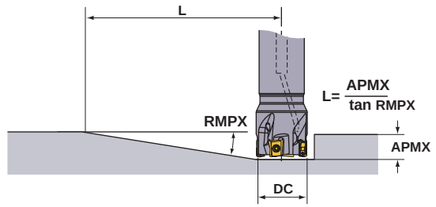
Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan RMPX).

VPX300

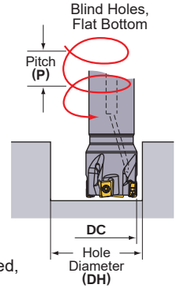
Recommended Cutting Conditions

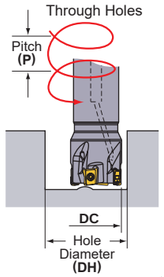
Ramping / Helical Milling

● **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 RMPX).

(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

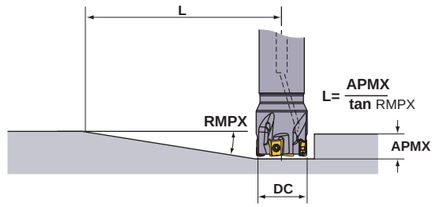
Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
∗ Shows the distance until a maximum depth of cut of .433" is achieved at the maximum ramping angle L (= .433"/tan RMPX).

VPX300

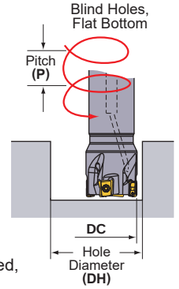
Recommended Cutting Conditions

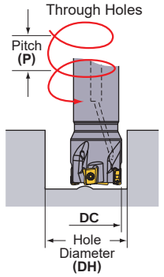
Ramping / Helical Milling

● 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

(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.
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 RMPX).

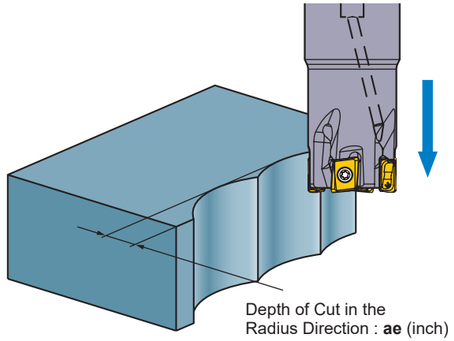
VPX200

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**

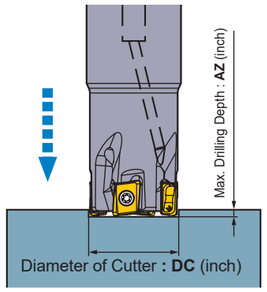


(inch)

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 through for when machining aluminum alloy).

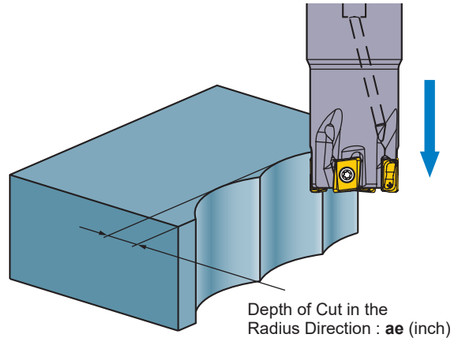
VPX300

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**

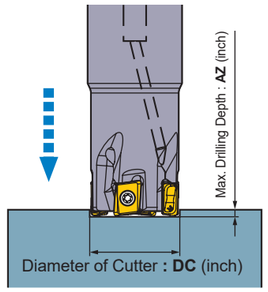


(inch)

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**

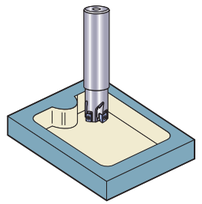
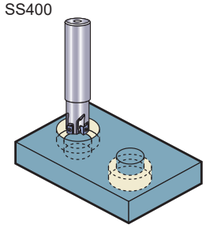
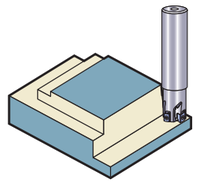


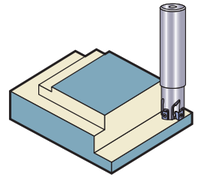
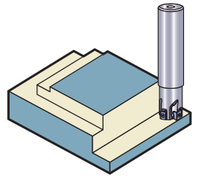
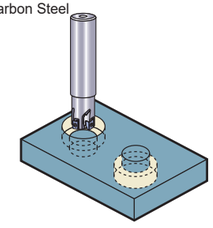
(inch)

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 through for when machining aluminum alloy).

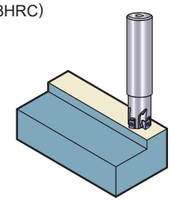
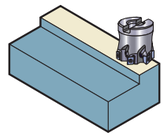
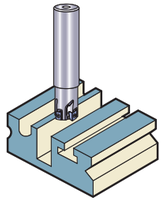
Application Examples

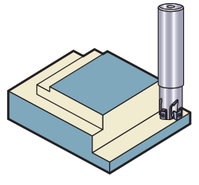
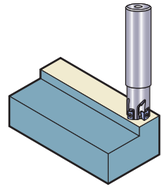
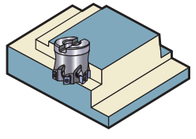
Holder		VPX200R2503SA25S	VPX200R1602SA16S	VPX200R1602SA16S
Insert (Grade)		LOGU0904080PNER-M(MP6120)	LOGU0904080PNER-M(MP6130)	LOGU0904080PNER-M(MP7130)
Workpiece		AISI 1045 	JIS SS400 	JIS SS400+Stainless Steel 
Component		Chucked Parts	Machined Parts	Machined Parts
Cutting Conditions	Cutting Speed **vc** (SFM)	490	280	655
	Feed per Tooth **fz** (IPT)	.0043	.0037	.0039
	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
	Feed per Tooth **fz** (IPT)	.0070	.0068	.0051
	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 minutes before breaking, whereas VPX can maintain sustained machining for over 400 minites.	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
	Feed per Tooth **fz** (IPT)	.0024	.0055	.0063
	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
	Feed per Tooth **fz** (IPT)	.0236	.0059	.0051
	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.

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

MTEC

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Welcome to our new world-class Machining Technology and Education Center (MTEC) in Mooresville, NC providing year round support and services to North America.

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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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