

VPX Series

MULTI-FUNCTIONAL CUTTER FOR
HIGH EFFICIENCY MACHINING

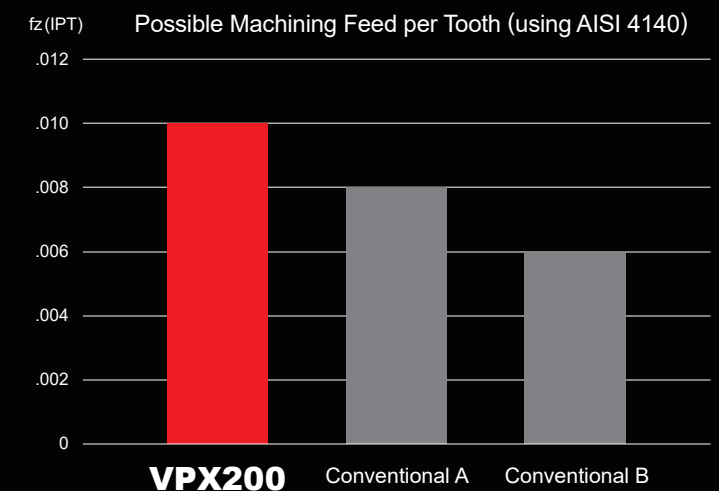


TOUGH & VERSATILE



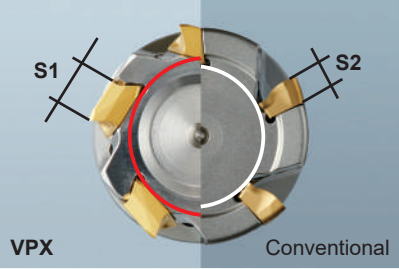
VPX Series

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

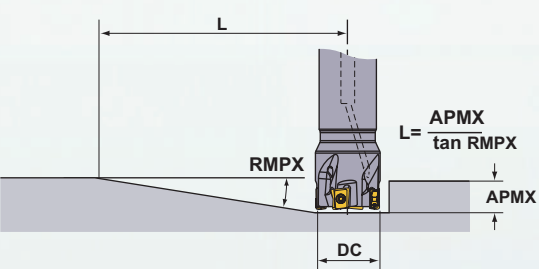
Durability born through repeated destructive tests.

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.

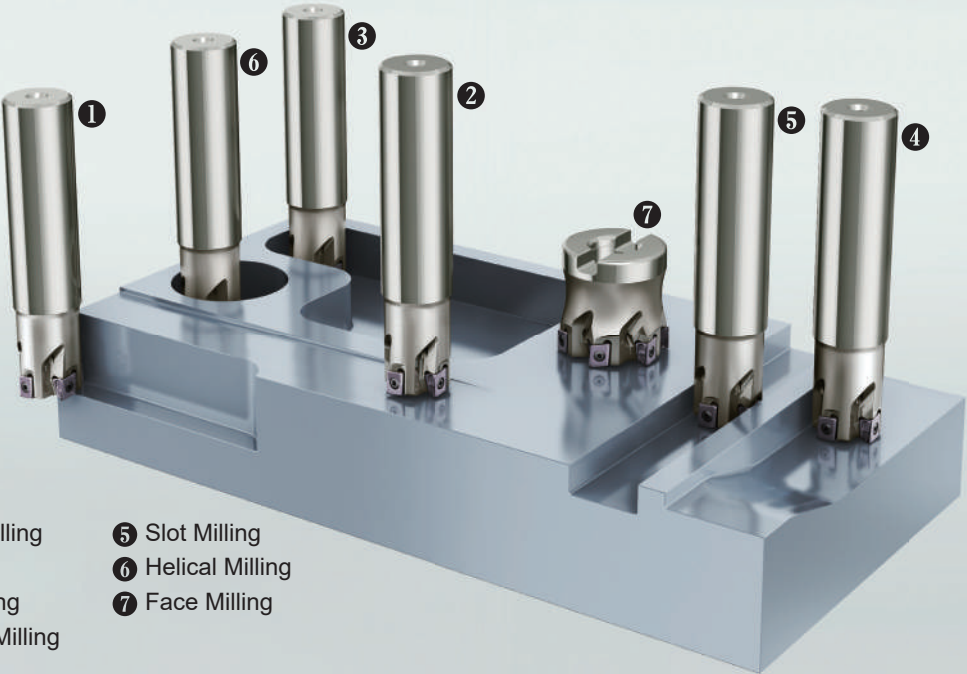


Comments from developers

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.

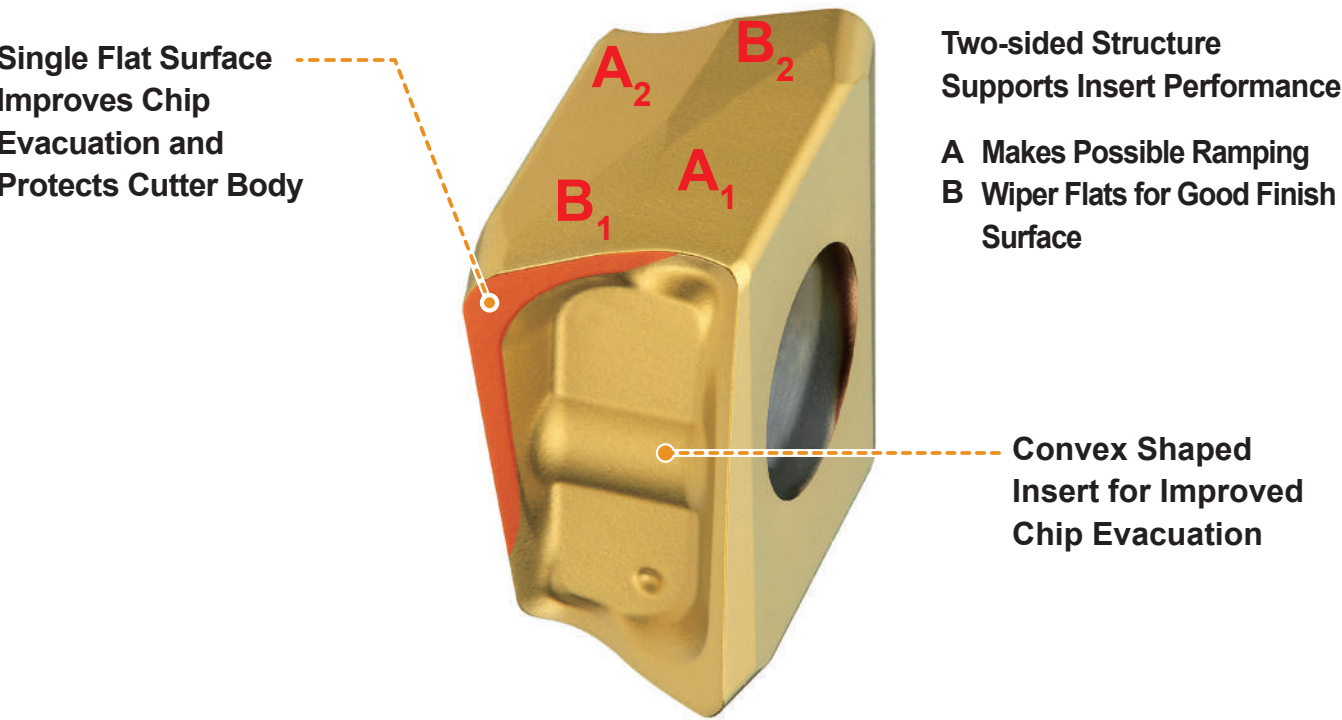
VPX series covers most milling applications.



- 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.

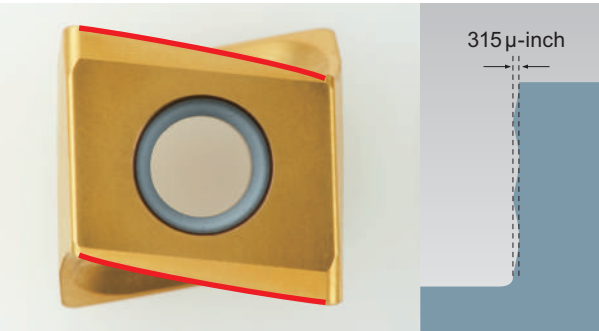


Comments from developers

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.

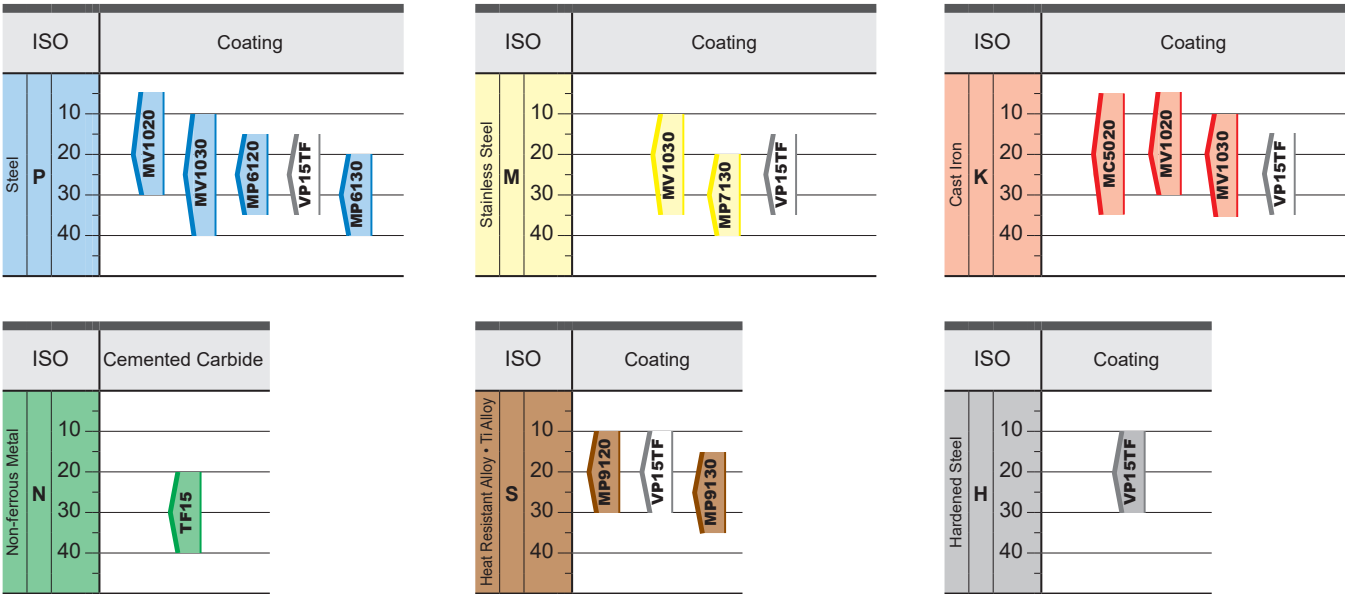
Good Wall Surface Finish



Large Wiper Flats Achieve a Better Finish Surface



Insert Grades for a Wide Range of Materials

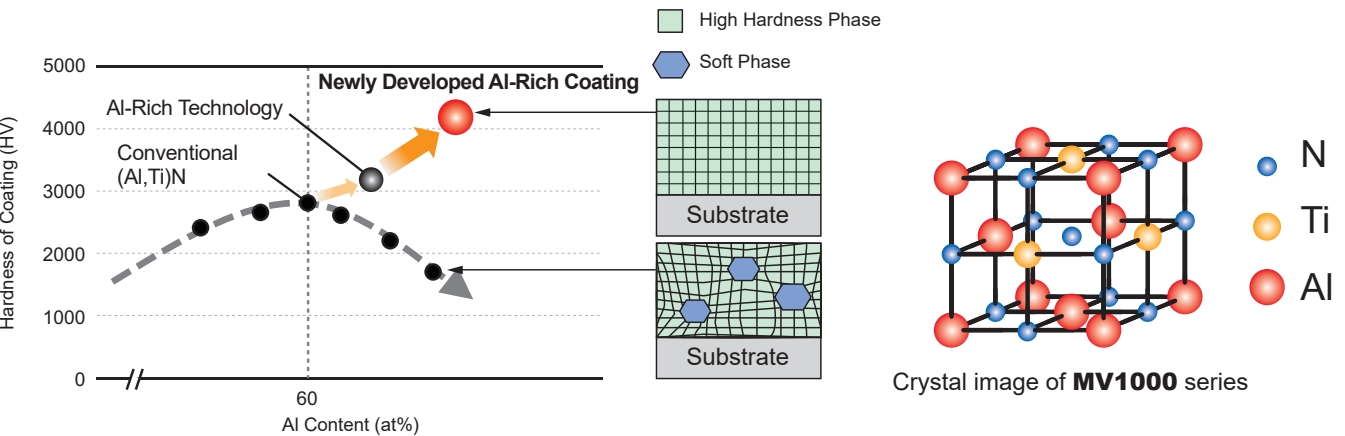


Coated Carbide Grade for Milling MV1020/MV1030

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.



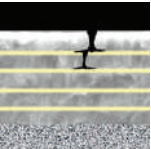
MP6100/MP7100/MP9100 -with Accumulated Al-Ti-Cr-N Based PVD Coating

TOUGH-Σ Technology

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

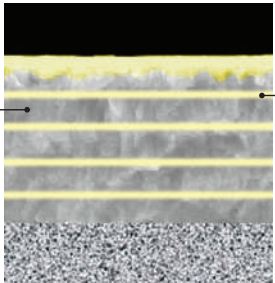
Base Layer
High Al-(Al, Ti)N

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.



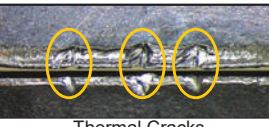
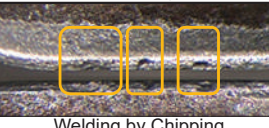
*Graphical Representation.

Al-Ti-Cr-N Based PVD Coating



*Graphical Representation.

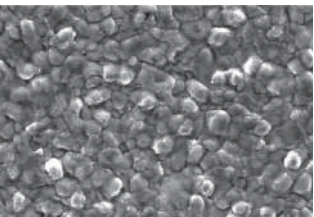
Best Layer of Each Material

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

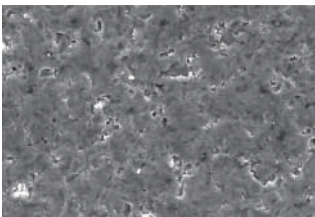
CVD Coating MC5020

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



L chipbreaker



Focus on Cutting Edge Strength



M chipbreaker

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

Refer to page 36, for chipbreaker selection table.

Multi-Functional Cutter for High Efficiency Machining

MULTI-FUNCTIONAL MILLING

VPX200

P M K N S H



Fig.1

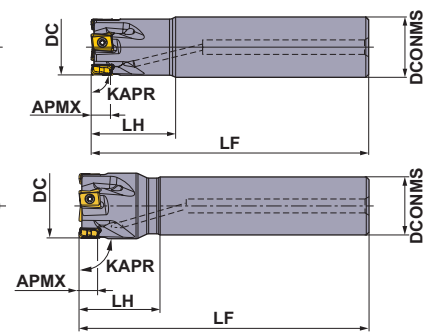


Fig.2

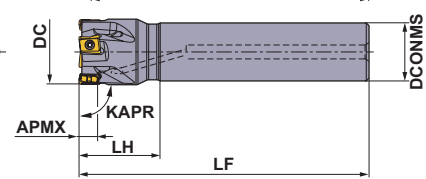


Fig.3

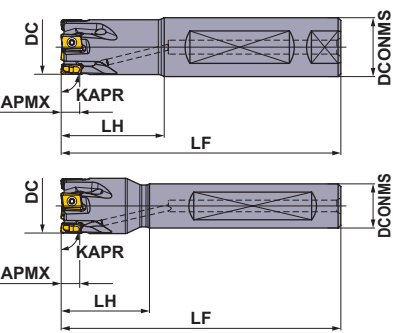
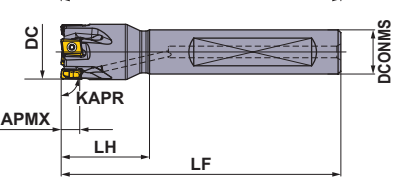


Fig.4



Shank Type

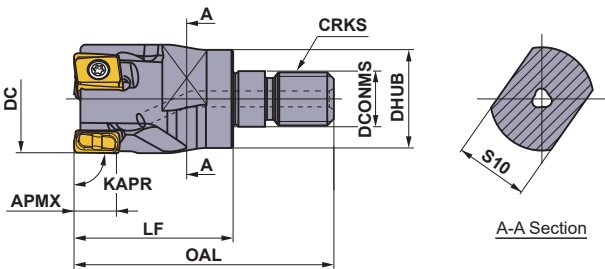
With Coolant Through

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



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

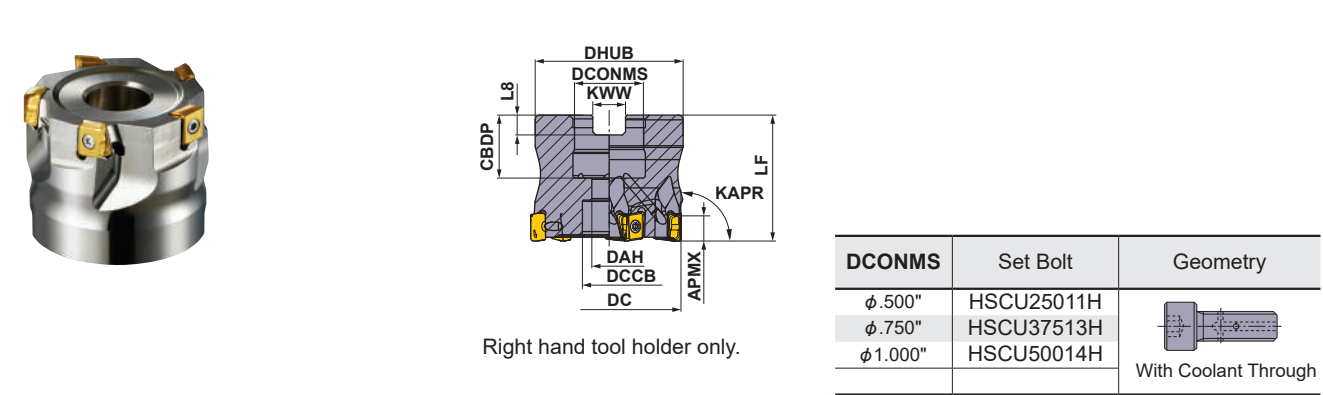
Spare Parts

(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

Multi-Functional Cutter for High Efficiency Machining



Arbor Type

DCON=inch size, With Coolant Through (inch)

DC	Order Number	Stock	* No.T	LF	DCONMS	WT (lbs)	APMX	RMPX	RPMX (min ⁻¹)	Insert Type
		R								
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

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

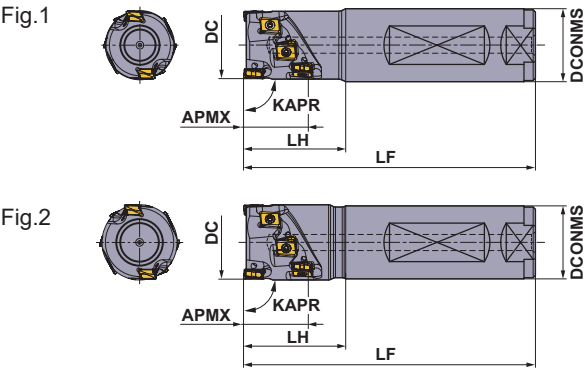
● : USA Stock

DEEP SHOULDER MILLING

VPX200

P M K N S H

LONG CUTTING EDGE



Right hand tool holder only.

Shank Type

With Coolant Through (inch)

DC	Order Number	Stock	*1 No.T	Total	DCONMS	LF	LH	APMX	RMPX	WT (lbs)	Fig.	Insert Type	*2
		R											
.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

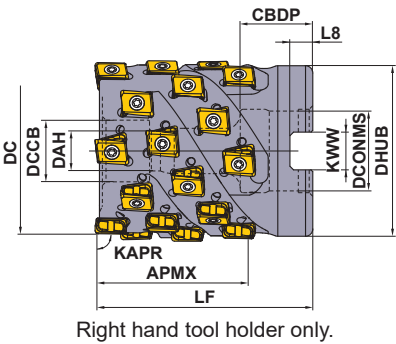
DC	Tool Holder Type			
		Clamp Screw	Wrench	Anti-seize Lubricant
.875	VPX200UR14	TPS27F2	TIP07F	MK1KS
1.000	VPX200UR16	TPS27F2	TIP07F	MK1KS
1.125	VPX200UR16	TPS27F2	TIP07F	MK1KS
1.250	VPX200UR20	TPS27F2	TIP07F	MK1KS
1.375	VPX200UR22	TPS27F2	TIP07F	MK1KS
1.500	VPX200UR24	TPS27F2	TIP07F	MK1KS

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

CUTTING CONDITIONS ➤ pp.37-64

Multi-Functional Cutter for High Efficiency Machining

VPX200
DEEP SHOULDER MILLING



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

Arbor Type

DCON=inch size, With Coolant Through (inch)

DC	Order Number	Stock	*1 No.T	Total	LF	DCONMS	WT (kg)	APMX	RMPX	Insert Type *2
		R								
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

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



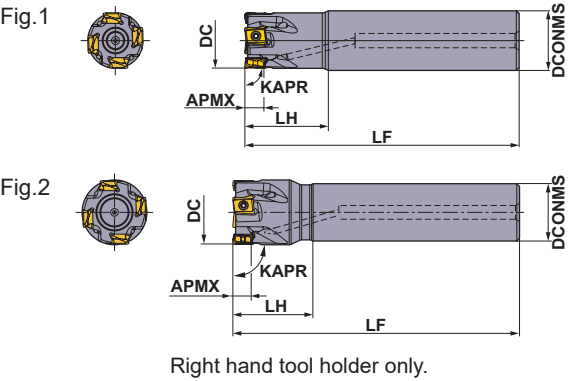
Metric Standard

Shank Type

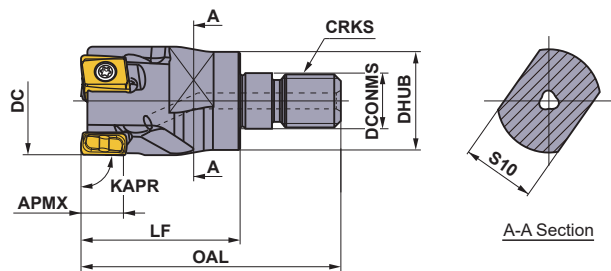
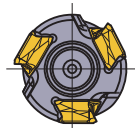
With Coolant Through

DC	Order Number	Stock	* No.T	DCONMS	LF	LH	APMX	RMPX	RPMX (min ⁻¹)	WT (kg)	Fig.	Insert Type
		R										
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



Multi-Functional Cutter for High Efficiency Machining



Right hand tool holder only.

Metric Standard

Screw-in Type

With Coolant Through

DC	Order Number	Stock	★1 No.T	DCONMS	DHUB	OAL	LF	S10	CRKS	WT (kg)	APMX	RMPX	Insert Type
		R											
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.

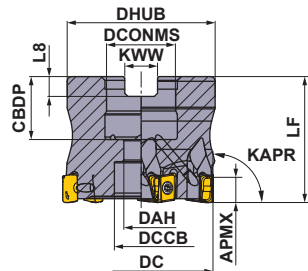
★1 Number of Teeth

Spare Parts

DC	Tool Holder Type	★		
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.

Metric Standard

For Metric Arbors

Arbor Type

DCON=mm size, With Coolant Through

DC	Order Number	Stock	★ No.T	LF	DCONMS	WT (kg)	APMX	RMPX	RMPX (min ⁻¹)	Insert Type
		R								
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 **RMPX** 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

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	★		
VPX200	TPS27F2	TIP07F	MK1KS

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

CUTTING CONDITIONS ➤ pp.37-64

Multi-Functional Cutter for High Efficiency Machining

DEEP SHOULDER MILLING

VPX200



LONG CUTTING EDGE

- P M K N S H



Metric Standard

Shank Type

With Coolant Through

DC	Order Number	Stock	*1 No.T	Total	DCONMS	LF	LH	APMX	RMPX	WT (kg)	Fig.	Insert Type
		R										
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

DC	Tool Holder Type	*		
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

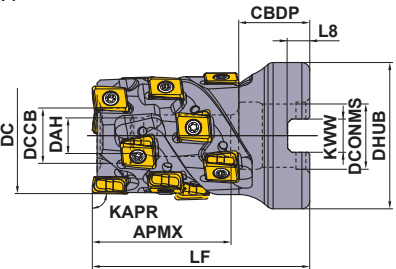
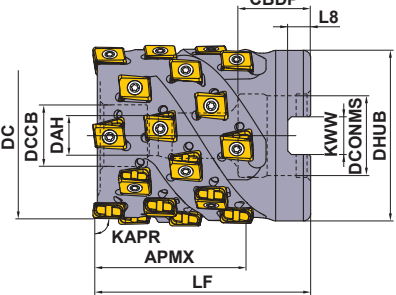


Fig.2



Right hand tool holder only.

Metric Standard

Arbor Type

DCON=mm size, With Coolant Through

DC	Order Number	Stock	*1 No.T	Total	LF	DCONMS	WT (kg)	APMX	RMPX	Fig.	Insert Type
		R									
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

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	*		
VPX200	TPS27F2	TIP07F	MK1KS

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

CUTTING CONDITIONS ➤ pp.37-64

Multi-Functional Cutter for High Efficiency Machining

MULTI-FUNCTIONAL MILLING



VPX300

- P
- M
- K
- N
- S
- H



Fig.1

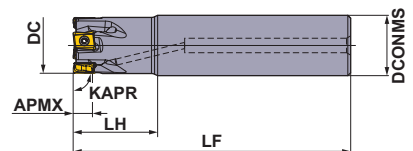


Fig.2

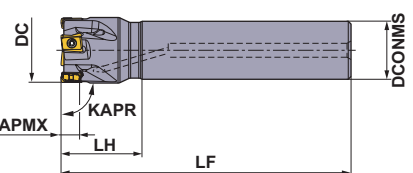


Fig.3

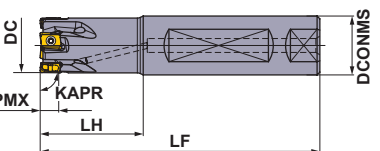
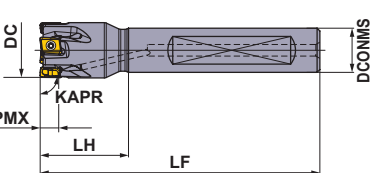


Fig.4



Right hand tool holder only.

Shank Type

With Coolant Through

(inch)

DC	Order Number	Stock	* No.T	DCONMS	LF	LH	APMX	RMPX	RPMX (min ⁻¹)	WT (lbs)	Fig.	Insert Type
		R										
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

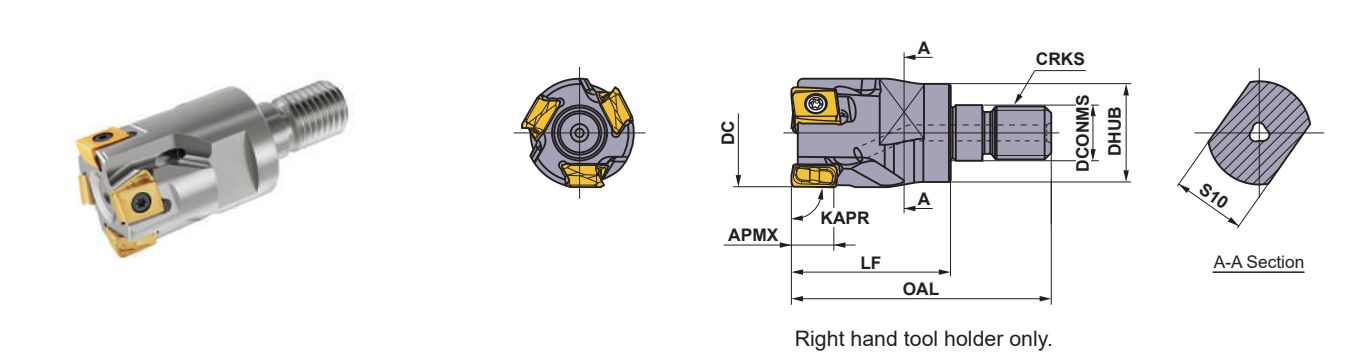
VPX200 Inserts

(inch)

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

Multi-Functional Cutter for High Efficiency Machining



Screw-in Type

With Coolant Through (inch)

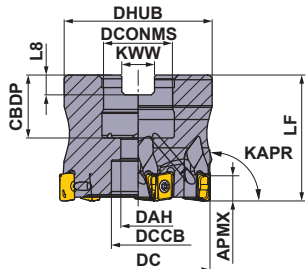
DC	Order Number	Stock R	*1 No.T	DCONMS	DHUB	OAL	LF	S10	CRKS	WT (lbs)	APMX	RMPX	Insert Type
1.000	VPX300UR1602AM1235	●	2	.492	.925	2.244	1.378	.748	M12	.2	.433	2.07°	LOGU12
1.125	VPX300UR1802AM1235	●	2	.492	.925	2.244	1.378	.748	M12	.3	.433	1.73°	LOGU12
1.250	VPX300UR2002AM1640	●	2	.669	1.122	2.480	1.575	.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

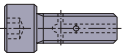
Spare Parts

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

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



Right hand tool holder only.

DCONMS	Set Bolt	Geometry
φ .500"	HSCU25011H	
φ .750"	HSCU37513H	
φ 1.000"	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

● : USA Stock

CUTTING CONDITIONS ➤ pp.37-64

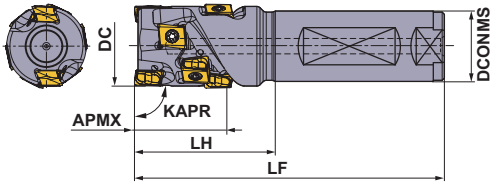
Multi-Functional Cutter for High Efficiency Machining

DEEP SHOULDER MILLING

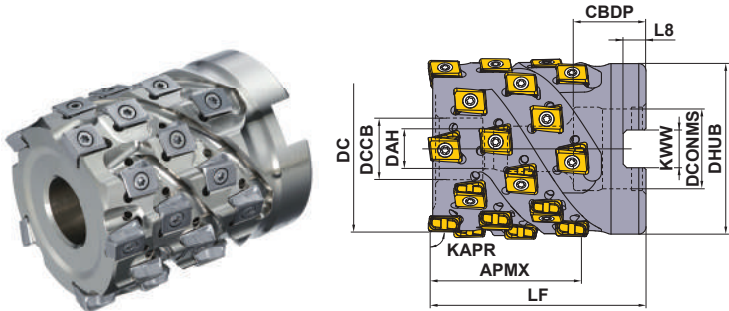
VPX300

LONG CUTTING EDGE

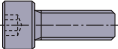
- P
- M
- K
- N
- S
- H



Right hand tool holder only.



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	

Shank Type

With Coolant Through (inch)

DC	Order Number	Stock	No.T	Total	DCONMS	LF	LH	APMX	RMPX	WT (lbs)	Insert Type
		R									
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

Arbor Type

DCON=inch size, With Coolant Through (inch)

DC	Order Number	Stock	No.T	Total	LF	DCONMS	WT (lbs)	APMX	RMPX	Insert Type
		R								
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

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

● : USA Stock

CUTTING CONDITIONS ➤ pp.37-64

Multi-Functional Cutter for High Efficiency Machining



Metric Standard

Shank Type

With Coolant Through

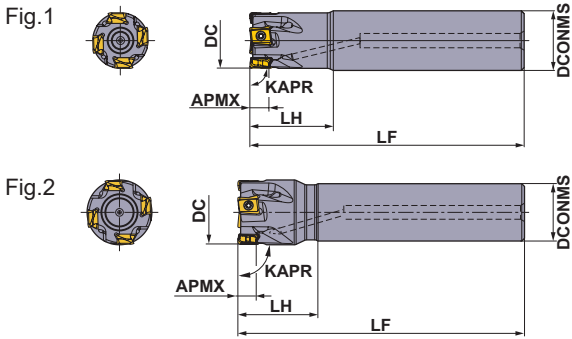
DC	Order Number	Stock	★ No.T	DCONMS	LF	LH	APMX	RMPX	RPMX (min ⁻¹)	WT (kg)	Fig.	Insert Type
		R										
25	VPX300R2502SA25S	★	2	25	115	35	11	2.13°	24100	0.38	1	LOGU12
25	VPX300R2502SA25L	★	2	25	170	70	11	2.13°	24100	0.56	1	LOGU12
28	VPX300R2802SA25S	★	2	25	115	35	11	1.77°	22500	0.40	2	LOGU12
28	VPX300R2802SA25L	★	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	★		
VPX300	TPS40F1	TIP15W	MK1KS

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



Right hand tool holder only.



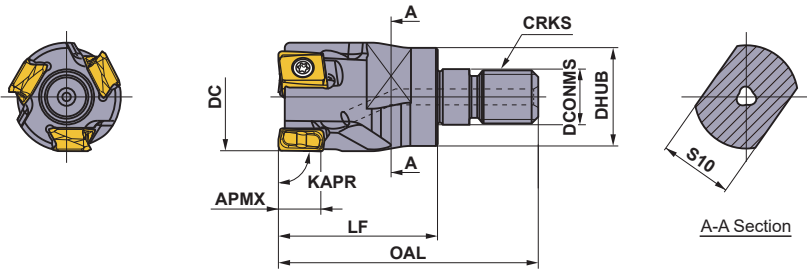
Metric Standard

Screw-in Type

With Coolant Through

DC	Order Number	Stock	★1 No.T	DCONMS	DHUB	OAL	LF	S10	CRKS	WT (kg)	APMX	RMPX	Insert Type
		R											
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



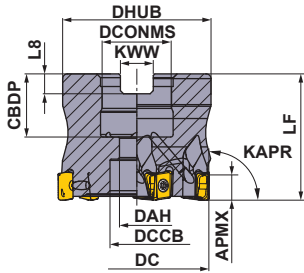
Right hand tool holder only.

Multi-Functional Cutter for High Efficiency Machining

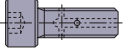


Metric Standard

For Metric Arbors



Right hand tool holder only.

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

Arbor Type

DCON=inch size, With Coolant Through

DC	Order Number	Stock	*1	LF	DCONMS	WT (kg)	APMX	RMPX	RPMX (min ⁻¹)	Insert Type
		R	No.T							
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

DC	Order Number	Stock	*1	LF	DCONMS	WT (kg)	APMX	RMPX	RPMX (min ⁻¹)	Insert Type
		R	No.T							
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

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

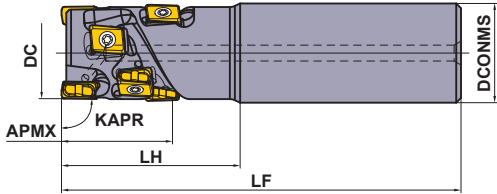
DEEP SHOULDER
MILLING



VPX300

LONG CUTTING EDGE

P	M	K	N	S	H
---	---	---	---	---	---



Right hand tool holder only.

Metric Standard

Shank Type

With Coolant Through

DC	Order Number	Stock	*1	Total	DCONMS	LF	LH	APMX	RMPX	WT (kg)	Insert Type
		R	No.T								
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

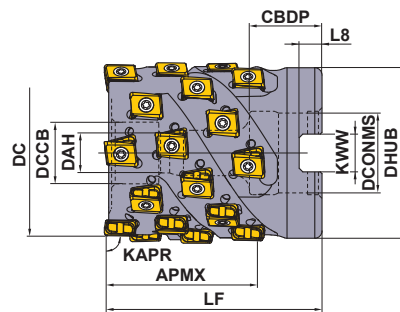
*2 Corner radius RE .031 inch is recommended for the peripheral cutting edges except the bottom cutting edge (end cutting).
Insert RE .008 inch and .016 inch can also be used for the peripheral cutting edges.

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



Metric Standard

DCON=mm size, With Coolant Through

DCON=inch size, With Coolant Through

*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.

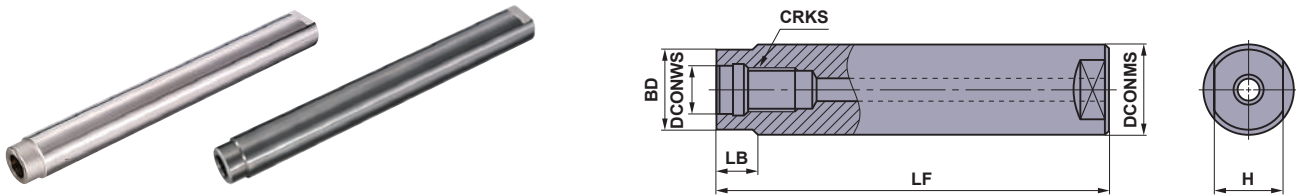
DC	Order Number	DCONMS	CBDP	DAH	DCCB	DHUB	KWW	L8
40	VPX300-040A02A031R06	16	18	9	14	37	8.4	5.6
40	VPX300-040A02A042R08	16	18	9	14	37	8.4	5.6
50	VPX300-050A03A031R09	22	20	11	17	47	10.4	6.3
50	VPX300-050A03A042R12	22	20	11	17	47	10.4	6.3
50	VPX300-050A03A052R15	22	20	11	17	47	10.4	6.3
63	VPX300-063A04A042R16	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

30

(inch)

CUTTING CONDITIONS ➤ pp.37-64

SCREW-IN HOLDERS
STRAIGHT SHANK TYPE



Steel Shank Type

With Coolant Through

(inch)

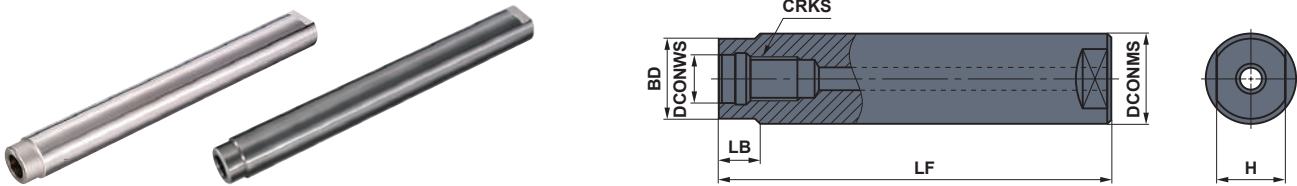
CRKS	Order Number	Stock	DCONMS	LF	DCONWS	BD	LB	H	WT (lbs)
M8	SCU10M08S100S	●	.625	3.937	.335	.571	.394	.394	.2
M8	SCU10M08S200L	●	.625	7.874	.335	.571	.394	.394	.7
M10	SCU12M10S120S	●	.750	4.724	.413	.728	.394	.551	.4
M10	SCU12M10S220L	●	.750	8.661	.413	.728	.394	.551	.9
M12	SCU16M12S125S	●	1.000	4.921	.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

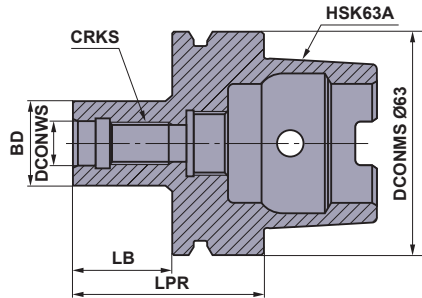
(mm)

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



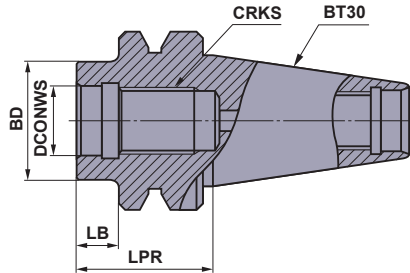
Metric Standard

With Coolant Through

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

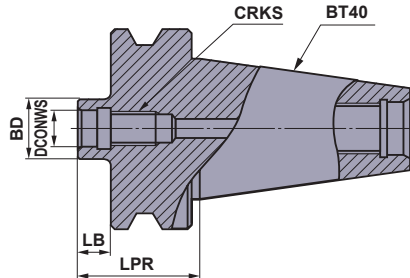


Metric Standard

With Coolant Through

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

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.



Screw Size	Recommended Torque (lbf-ft)	Wrench Size (inch)
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		Grade	
				1st Recommended	2nd Recommended	1st Recommended	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	—
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

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 (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)
		Hardness >200HB	MP7130, VP15TF	590 (460—690)	560 (425—655)	460 (360—525)	460 (360—525)
			MV1030	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)		ø.875-ø1.000(ø20mm-ø25mm)		ø1.125-ø2.500(ø28mm-ø63mm)		
				Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)	
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ● ✱	≤.197	.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)		ø.875-ø1.000(ø20mm-ø25mm)		ø1.125-ø2.500(ø28mm-ø63mm)	
					Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)
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)		ø.875-ø1.000(ø20mm-ø25mm)		ø1.125-ø2.500(ø28mm-ø63mm)	
					Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ● ✱	≤.197	.004—.006	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ● ✱	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ● ✱	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
			.25—.5DC	● ● ✱	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.008
			.5—.75DC	● ● ✱	≤.157	.003—.005	≤.236	.003—.005	≤.236	.004—.006
			DC(Slot)	● ● ✱	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.005
		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
M	Austenitic Stainless Steel	—	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✱	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ● ✱	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✱	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✱	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✱	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✱	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✱	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Duplex Stainless Steel	Hardness ≤280HB	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✱	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ● ✱	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.005
				✱	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✱	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✱	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✱	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✱	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Ferritic and Martensitic Stainless Steel	—	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				✱	≤.236	.003—.005	≤.315	.003—.006	≤.315	.003—.006
			.25—.5DC	● ● ✱	≤.197	.003—.005	≤.315	.003—.006	≤.315	.003—.006
				✱	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✱	≤.157	.002—.004	≤.236	.003—.005	≤.236	.003—.005
				✱	≤.157	.002—.003	≤.236	.002—.004	≤.236	.002—.004
			DC(Slot)	● ● ✱	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✱	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Precipitation Hardening Stainless Steel	Hardness <450HB	≤.25DC	● ● ✱	≤.236	.004—.006	≤.315	.004—.006	≤.315	.004—.006
				✱	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			.25—.5DC	● ● ✱	≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				✱	≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
			.5—.75DC	● ● ✱	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				✱	≤.157	.002—.003	≤.236	.002—.003	≤.236	.002—.003
			DC(Slot)	● ● ✱	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				✱	≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003

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

Note 2) Chattering vibration is more likely under the following circumstances. Use a cut and feed per tooth that are at minimum recommended conditions or below.

- When tool overhang is long (using a long shank, screw-in type, etc.)
- Rigidity of machine, workpiece material or attachment of workpiece material is low
- Corner radius during pocket milling

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is .5 DC or more.

Note 4) Wet cutting is recommended, when focusing on the surface finish. (Tool life is shorter than for dry cutting.)

Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the clamp screw may become fatigued and break during machining. Please change out the clamp screw periodically.

Multi-Functional Cutter for High Efficiency Machining

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)		ø.875-ø1.000(ø20mm-ø25mm)		ø1.125-ø2.500(ø28mm-ø63mm)	
				Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)
K	Gray Cast Iron	Tensile Strength ≤350MPa	● ● ✖	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.010
				≤.236	.003—.005	≤.315	.003—.006	≤.315	.004—.008
			● ● ✖	≤.197	.003—.005	≤.315	.003—.006	≤.315	.004—.008
				≤.197	.002—.004	≤.315	.003—.005	≤.315	.004—.006
			● ● ✖	≤.157	.003—.005	≤.236	.002—.004	≤.236	.004—.006
				≤.157	.003—.005	≤.236	.002—.004	≤.236	.003—.005
	Ductile Cast Iron	Tensile Strength ≤800MPa	● ● ✖	≤.079	.002—.004	≤.157	.002—.004	≤.157	.003—.006
				≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.004
			● ● ✖	≤.236	.004—.006	≤.315	.004—.008	≤.315	.004—.008
				≤.236	.003—.005	≤.315	.004—.006	≤.315	.004—.006
			● ● ✖	≤.197	.003—.005	≤.315	.004—.006	≤.315	.004—.006
				≤.197	.002—.004	≤.315	.003—.005	≤.315	.003—.005
N	Aluminum Alloys	Content Si < 5%	● ● ✖	≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
				≤.157	.003—.005	≤.236	.003—.005	≤.236	.003—.005
			● ● ✖	≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
				≤.079	.002—.003	≤.157	.002—.003	≤.157	.002—.003
	Titanium Alloys (Ti-6Al-4V, etc.)	—	● ● ✖	≤.236	.003—.006	≤.315	.003—.006	≤.315	.003—.006
				≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			● ● ✖	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr, etc.)	—	● ● ✖	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			● ● ✖	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
S	Heat Resistant Alloys	—	● ● ✖	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
			● ● ✖	≤.157	.002—.004	≤.236	.002—.004	≤.236	.002—.004
				≤.079	.002—.004	≤.157	.002—.004	≤.157	.002—.004
	Titanium Alloys (Ti-6Al-4V, etc.)	—	● ● ✖	≤.236	.003—.005	≤.315	.003—.005	≤.315	.003—.005
				≤.197	.003—.005	≤.315	.003—.005	≤.315	.003—.005
H	Hardened Steel	Hardness 40—55HRC	● ● ✖	≤.157	.003—.006	≤.157	.003—.006	≤.157	.003—.006
				≤.157	.003—.005	≤.157	.003—.005	≤.157	.003—.005
			● ● ✖	≤.118	.003—.005	≤.118	.003—.005	≤.118	.003—.005
				≤.118	.002—.004	≤.118	.002—.004	≤.118	.002—.004
			● ● ✖	≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
				≤.079	.002—.004	≤.079	.002—.004	≤.079	.002—.004
	Hardened Steel	Hardness 40—55HRC	● ● ✖	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
			● ● ✖	≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
				≤.039	.002—.004	≤.039	.002—.004	≤.039	.002—.004
			● ● ✖	≤.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	.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 (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)		ø1.125—ø3.000 (ø28mm-ø80mm)		
				Depth of Cut ap	Feed per Tooth. fz (IPT)	Depth of Cut ap	Feed per Tooth. fz (IPT)	
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✱	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ● ✱	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ● ✱	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ● ✱	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ● ✱	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ● ✱	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ● ✱	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ● ✱	≤.197	.002—.004	≤.197	.003—.006
		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)		ø1.125—ø3.000 (ø28mm-ø80mm)				
					Depth of Cut ap	Feed per Tooth. fz (IPT)	Depth of Cut ap	Feed per Tooth. fz (IPT)			
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ●	≤.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

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)
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)		ø1.125—ø3.000 (ø28mm-ø80mm)		
				Depth of Cut ap	Feed per Tooth. fz (IPT)	Depth of Cut ap	Feed per Tooth. fz (IPT)	
P	Mild Steel	Hardness ≤180HB	≤.25DC	● ● ✖	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ● ✖	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ● ✖	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ● ✖	≤.197	.002—.004	≤.197	.003—.006
	Carbon Steel Alloy Steel Alloy Tool Steel	Hardness 180—280HB	≤.25DC	● ● ✖	≤.433	.004—.008	≤.433	.004—.012
			.25—.5DC	● ● ✖	≤.433	.004—.006	≤.433	.004—.010
			.5—.75DC	● ● ✖	≤.315	.003—.005	≤.315	.004—.008
			DC(Slot)	● ● ✖	≤.197	.002—.004	≤.197	.003—.006
		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.

Multi-Functional Cutter for High Efficiency Machining

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)		ø1.125—ø3.000 (ø28mm-ø80mm)							
					Depth of Cut ap	Feed per Tooth. fz (IPT)	Depth of Cut ap	Feed per Tooth. fz (IPT)						
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ●	≤.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						
			Mild Steel	Hardness ≤180HB		● ●			MC5020	590(525—720)	560(490—690)	490(425—620)	Dry, Wet	
						✖			VP15TF	425(330—490)	395(295—460)	330(260—395)	330(260—395)	Dry, Wet
						● ●			MV1020	655(490—920)	620(460—885)	560(425—785)	560(425—785)	Dry
						✖			MC5020	590(490—785)	560(460—755)	490(425—655)	490(425—655)	Wet
	Carbon Steel Alloy Steel	Hardness 180—280HB		● ●			MP9120,VP15TF	755(590—885)	720(560—850)	590(460—690)	590(460—690)	Dry		
				✖			MP6130	460(330—620)	425(295—590)	330(230—395)	330(230—395)	Dry, 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		
Austenitic Stainless Steel	Hardness ≤200HB		● ●			MP7130,VP15TF	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet			
			✖			MP7130	395(330—490)	360(295—460)	295(230—395)	295(230—395)	Dry, Wet			
			● ●			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			
Ferritic and Martensitic Stainless Steel	Hardness >200HB		● ●			MP7130	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			
			● ●			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			

Multi-Functional Cutter for High Efficiency Machining

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

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

VPX300
DEEP SHOULDER MILLING

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth (inch)

Material	Properties	Width of Cut ae	Cutting Conditions	DC			
				ø40mm, ø1.500"		ø50—ø80mm, ø2.000—ø3.000"	
				Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)
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)
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

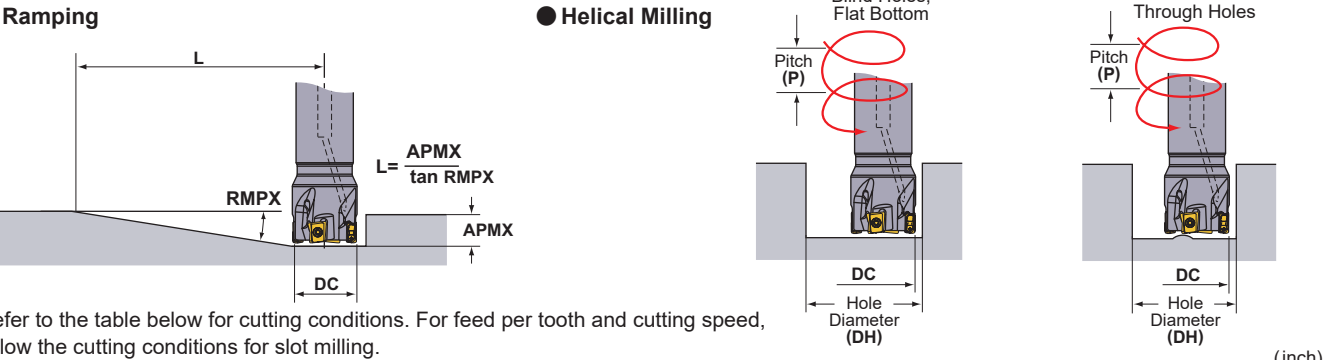
(inch)								
Material	Properties	Width of Cut ae	Cutting Conditions	DC				
				ø40mm, ø1.500"		ø50—ø80mm, ø2.000—ø3.000"		
				Depth of Cut ap	Feed per Tooth fz (IPT)	Depth of Cut ap	Feed per Tooth fz (IPT)	
K	Gray Cast Iron	Tensile Strength ≤350MPa	≤.25DC	● ● ✖	≤APMX	.006(.004—.008)	≤APMX	.007(.004—.010)
				● ● ✖	≤APMX	.005(.003—.006)	≤APMX	.006(.004—.008)
			.25—.5DC	● ● ✖	≤APMX	.005(.003—.006)	≤1.220	.006(.004—.008)
				● ● ✖	≤APMX	.004(.003—.005)	≤1.220	.005(.004—.006)
			.5—.75DC	● ● ✖	≤.827	.004(.003—.005)	≤.827	.005(.004—.006)
				● ● ✖	≤.827	.003(.002—.004)	≤.827	.004(.003—.005)
			DC(Slot)	● ● ✖	≤.197	.003(.002—.004)	≤.197	.005(.003—.006)
				● ● ✖	≤.197	.003(.002—.003)	≤.197	.003(.002—.004)
	Ductile Cast Iron	—	≤.25DC	● ● ✖	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
				● ● ✖	≤APMX	.005(.004—.006)	≤APMX	.005(.004—.006)
			.25—.5DC	● ● ✖	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
				● ● ✖	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ● ✖	≤.827	.004(.003—.005)	≤.827	.004(.003—.005)
				● ● ✖	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ● ✖	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
				● ● ✖	≤.197	.003(.002—.003)	≤.197	.003(.002—.003)
N	Aluminum Alloys	Content Si<5%	≤.25DC	● ● ✖	≤APMX	.007(.004—.010)	≤APMX	.007(.004—.010)
				● ● ✖	≤APMX	.006(.004—.008)	≤APMX	.006(.004—.008)
			.25—.5DC	● ● ✖	≤APMX	.006(.004—.008)	≤1.220	.006(.004—.008)
				● ● ✖	≤APMX	.005(.004—.006)	≤1.220	.005(.004—.006)
			.5—.75DC	● ● ✖	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
				● ● ✖	≤.827	.004(.002—.006)	≤.827	.005(.003—.006)
			DC(Slot)	● ● ✖	≤.197	.004(.002—.006)	≤.197	.005(.003—.006)
				● ● ✖	≤.197	.004(.002—.005)	≤.197	.004(.003—.005)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤.25DC	● ● ✖	≤APMX	.005(.003—.006)	≤APMX	.005(.003—.006)
			.25—.5DC	● ● ✖	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ● ✖	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ● ✖	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤.25DC	● ● ✖	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ● ✖	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ● ✖	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ● ✖	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)
	Heat Resistant Alloys	—	≤.25DC	● ● ✖	≤APMX	.004(.003—.005)	≤APMX	.004(.003—.005)
			.25—.5DC	● ● ✖	≤APMX	.004(.003—.005)	≤1.220	.004(.003—.005)
			.5—.75DC	● ● ✖	≤.827	.003(.002—.004)	≤.827	.003(.002—.004)
			DC(Slot)	● ● ✖	≤.197	.003(.002—.004)	≤.197	.003(.002—.004)

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

VPX200

Recommended Cutting Conditions

Ramping / Helical Milling



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).

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

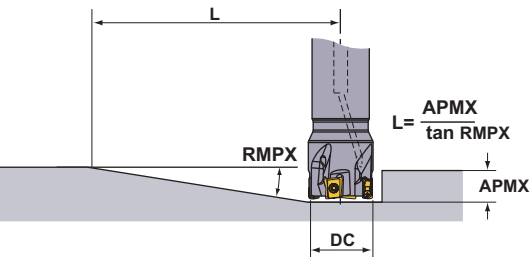
Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of .315" is achieved at the maximum ramping angle L (= .315"/tan RMPX).

VPX200

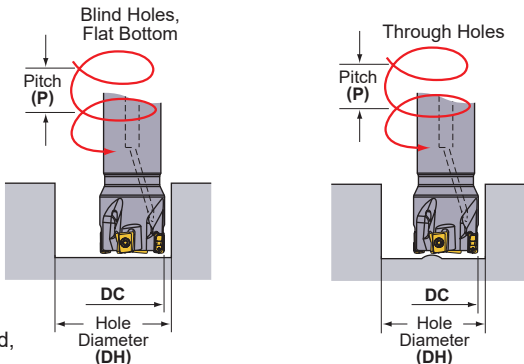
Recommended Cutting Conditions

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.

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

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

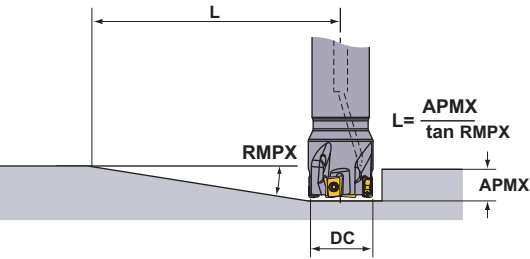
Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips may be elongated.
* Shows the distance until a maximum depth of cut of 8 mm is achieved at the maximum ramping angle L (= 8/tan RMPX).

VPX300

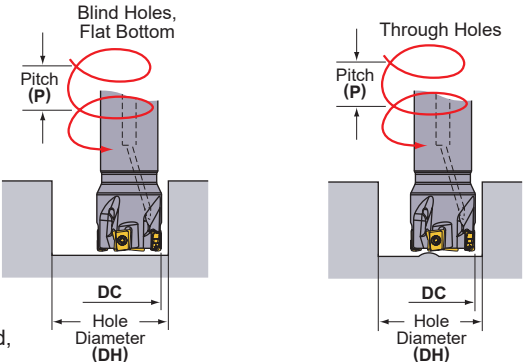
Recommended Cutting Conditions

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.

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).

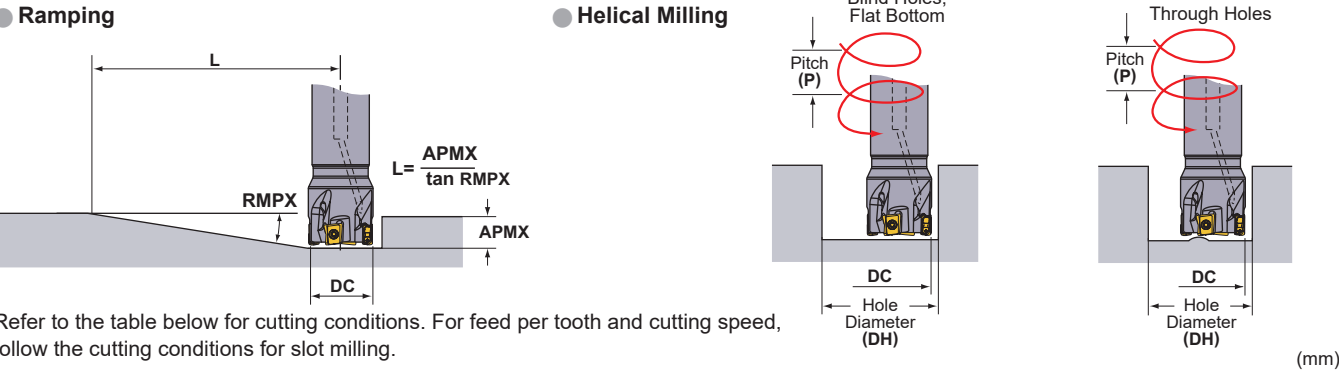
Cutting Edge Diameter DC	RE	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		Maximum Ramping Angle RMPX	Minimum Distance L*	Maximum Hole Diameter DH max.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum Pitch P max.	Minimum Hole Diameter DH min.	Maximum 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



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

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).

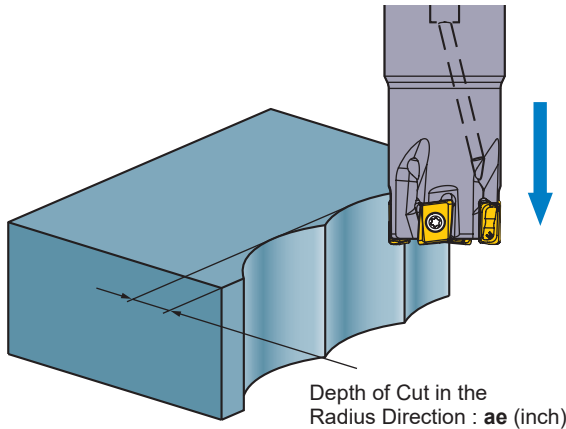
VPX200

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.

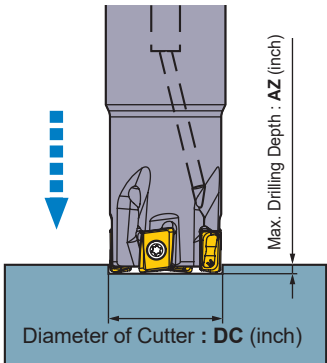
● Plunging



(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).

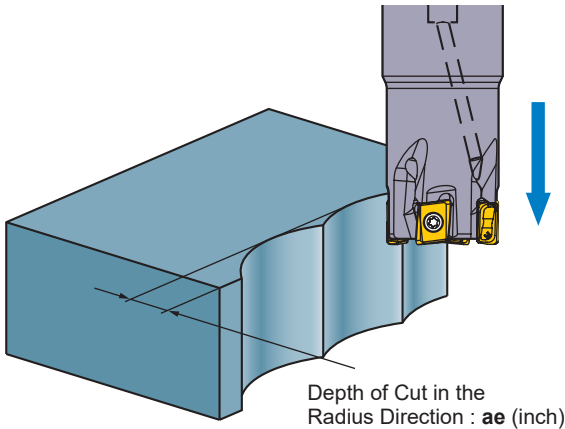
VPX300

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.

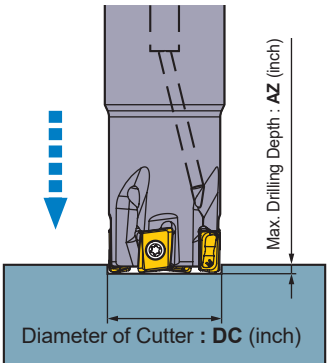
● Plunging



(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

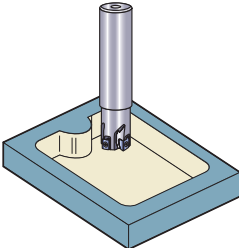
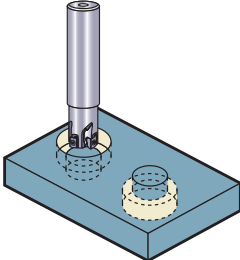
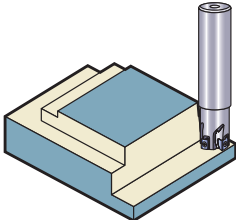


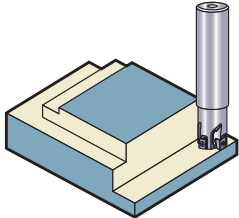
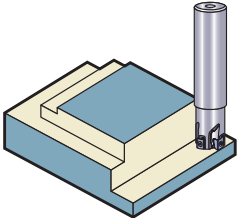
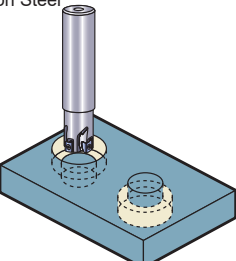
(inch)	
DC	AZ max.
1.000	.022
1.125	.022
1.250	.022
1.375	.022
1.500	.022
2.000	.022
2.500	.022
3.000	.022

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).

Multi-Functional Cutter for High Efficiency Machining

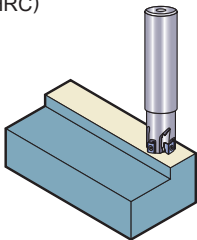
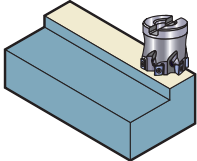
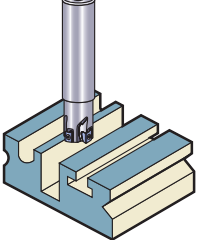
Application Examples

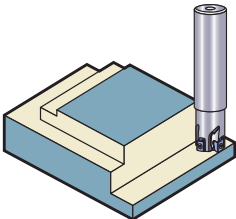
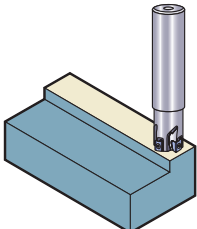
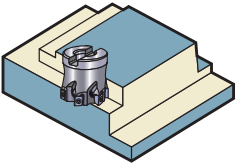
Holder		VPX200R2503SA25S	VPX200R1602SA16S	VPX200R1602SA16S
Insert (Grade)		LOGU0904080PNER-M(MP6120)	LOGU0904080PNER-M(MP6130)	LOGU0904080PNER-M(MP7130)
Workpiece		AISI 1045 	JIS SS400 	JIS SS400+Stainless Steel 
Component		Chucked Parts	Machined Parts	Machined Parts
Cutting Conditions	Cutting Speed vc (SFM)	490	280	655
	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.



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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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B250A-US-2025.7