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

RECOMMENDED CUTTING CONDITIONS

■ Breaker Selection Table by Workpiece Material Cutting State

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

The following table shows recommended conditions for dry cutting and wet cutting accordingly.

RECOMMENDED CUTTING CONDITIONS

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

Cutting Speed

	Workpiece Material	Characteristics	Cutting Conditions	Grade	ae (mm) ≤0.25DC	ae (mm) 0.25—0.5DC	ae (mm) 0.5—0.75DC	ae (mm) DC(Slot)	Cutting Mode
					vc (m/min)				
P	Mild Steels	Hardness ≤180HB	● ◐	MP6120,VP15TF	140(100—190)	130(90—180)	100(70—120)	100(70—120)	Dry, Wet
			✲	MP6130	140(100—190)	130(90—180)	100(70—120)	100(70—120)	Dry, Wet
	Carbon Steels Alloy Steels	Hardness 180—350HB	● ◐	MP6120,VP15TF	120(90—140)	110(80—130)	100(70—120)	100(70—120)	Dry, Wet
			✲	MP6130	120(90—140)	110(80—130)	100(70—120)	100(70—120)	Dry, Wet
	Pre-hardened Steels	Hardness 180—350HB	● ◐	MP6120,VP15TF	100(80—120)	90(70—110)	80(60—100)	80(60—100)	Dry, Wet
			✲	MP6130	100(80—120)	90(70—110)	80(60—100)	80(60—100)	Dry, Wet
M	Austenitic Stainless Steels	Hardness ≤200HB	● ◐	MP7130,VP15TF	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
			✲	MP7130	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
		Hardness >200HB	● ◐	MP7130,VP15TF	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
			✲	MP7130	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
	Ferritic and Martensitic Stainless Steels	—	● ◐	MP7130,VP15TF	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
			✲	MP7130	120(100—150)	110(90—140)	90(70—120)	90(70—120)	Dry, Wet
	Duplex Stainless Steels	Hardness ≤280HB	● ◐	MP7130,VP15TF	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
			✲	MP7130	100(80—130)	90(70—120)	70(50—100)	70(50—100)	Dry, Wet
	Precipitation-Hardening Stainless Steel	Hardness <450HB	● ◐	MP7130,VP15TF	90(70—120)	80(60—110)	60(40—90)	60(40—90)	Dry, Wet
			✲	MP7130	90(70—120)	80(60—110)	60(40—90)	60(40—90)	Dry, Wet
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ◐	MC5020	180(160—220)	170(150—210)	150(130—190)	150(130—190)	Dry, Wet
			◐ ✲	VP15TF	130(100—150)	120(90—140)	100(80—120)	100(80—120)	Dry, Wet
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ◐	MC5020	160(140—180)	150(130—170)	130(110—150)	130(110—150)	Dry, Wet
			◐ ✲	VP15TF	110(80—140)	100(70—130)	80(60—120)	80(60—120)	Dry, Wet
N	Aluminium Alloys	Content Si<5%	● ◐ ✲	TF15	600(400—1000)	600(400—1000)	600(400—1000)	600(400—1000)	Dry, Wet
S	Titanium Alloys (Ti-6Al-4V etc.)	—	● ◐	MP9120	50(40—70)	50(40—70)	50(40—70)	50(40—70)	Wet
			●	VP15TF	50(40—70)	50(40—70)	50(40—70)	50(40—70)	Wet
			◐ ✲	MP9130	50(40—70)	50(40—70)	50(40—70)	50(40—70)	Wet
	Titanium Alloys (Ti-6Al-5V-5Mo-3Cr etc.)	—	● ◐	MP9120	30(20—40)	30(20—40)	30(20—40)	30(20—40)	Wet
			●	VP15TF	30(20—40)	30(20—40)	30(20—40)	30(20—40)	Wet
			◐ ✲	MP9130	30(20—40)	30(20—40)	30(20—40)	30(20—40)	Wet
	Heat Resistant Alloys	—	● ◐	MP9120	40(30—60)	40(30—60)	40(30—60)	40(30—60)	Wet
			●	VP15TF	40(30—60)	40(30—60)	40(30—60)	40(30—60)	Wet
			◐ ✲	MP9130	40(30—60)	40(30—60)	40(30—60)	40(30—60)	Wet

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

Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 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 bit may become fatigued and break during machining. Please change out the bit periodically.

RECOMMENDED CUTTING CONDITIONS

Depth of Cut / Feed per Tooth

	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø40 ap (mm)	DC (mm) ø40 fz (mm/t)	DC (mm) ø50—ø80 ap (mm)	DC (mm) ø50—ø80 fz (mm/t)
P	Mild Steels	Hardness ≤180HB	≤0.25DC	● ● ✻	≤APMX	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
			0.25—0.5DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤31	0.15(0.10—0.20)
			0.5—0.75DC	● ● ✻	≤21	0.10(0.08—0.12)	≤21	0.13(0.10—0.15)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.10(0.08—0.12)
	Carbon Steels Alloy Steels	Hardness 180—280HB	≤0.25DC	● ● ✻	≤APMX	0.15(0.10—0.20)	≤APMX	0.18(0.10—0.25)
			0.25—0.5DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤31	0.15(0.10—0.20)
			0.5—0.75DC	● ● ✻	≤21	0.10(0.08—0.12)	≤21	0.13(0.10—0.15)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.10(0.08—0.12)
	Carbon Steels Alloy Steels	Hardness 280—350HB	≤0.25DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ● ✻	≤APMX	0.10(0.08—0.12)	≤31	0.13(0.10—0.15)
			0.5—0.75DC	● ● ✻	≤21	0.08(0.06—0.10)	≤21	0.10(0.08—0.12)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
	Pre-hardened Steels	Hardness 35—45HRC	≤0.25DC	● ● ✻	≤APMX	0.13(0.10—0.15)	≤APMX	0.15(0.10—0.20)
			0.25—0.5DC	● ● ✻	≤APMX	0.10(0.08—0.12)	≤31	0.13(0.10—0.15)
			0.5—0.75DC	● ● ✻	≤21	0.08(0.06—0.10)	≤21	0.10(0.08—0.12)
			DC(Slot)	● ● ✻	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
M	Austenitic Stainless Steels	—	≤0.25DC	○ ◔	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				✻	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	○ ◔	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ◔	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				✻	≤21	0.08(0.06—0.10)	≤21	0.08(0.06—0.10)
			DC(Slot)	○ ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	≤0.25DC	○ ◔	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				✻	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	○ ◔	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ◔	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				✻	≤21	0.08(0.06—0.10)	≤21	0.08(0.05—0.10)
			DC(Slot)	○ ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.05—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.05—0.08)
	Duplex Stainless Steels	Hardness ≤280HB	≤0.25DC	○ ◔	≤APMX	0.15(0.10—0.20)	≤APMX	0.15(0.10—0.20)
				✻	≤APMX	0.12(0.08—0.15)	≤APMX	0.12(0.08—0.15)
			0.25—0.5DC	○ ◔	≤APMX	0.12(0.08—0.15)	≤31	0.12(0.08—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ◔	≤21	0.10(0.08—0.12)	≤21	0.10(0.08—0.12)
				✻	≤21	0.08(0.06—0.10)	≤21	0.08(0.06—0.10)
			DC(Slot)	○ ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.06—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)
	Precipitation-Hardening Stainless Steel	Hardness <450HB	≤0.25DC	○ ◔	≤APMX	0.13(0.10—0.15)	≤APMX	0.13(0.10—0.15)
				✻	≤APMX	0.10(0.08—0.12)	≤APMX	0.10(0.08—0.12)
			0.25—0.5DC	○ ◔	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
				✻	≤APMX	0.10(0.08—0.12)	≤31	0.10(0.08—0.12)
			0.5—0.75DC	○ ◔	≤21	0.08(0.06—0.10)	≤21	0.08(0.05—0.10)
				✻	≤21	0.07(0.06—0.08)	≤21	0.07(0.05—0.08)
			DC(Slot)	○ ◔	≤5	0.08(0.06—0.10)	≤5	0.08(0.05—0.10)
				✻	≤5	0.07(0.06—0.08)	≤5	0.07(0.06—0.08)

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

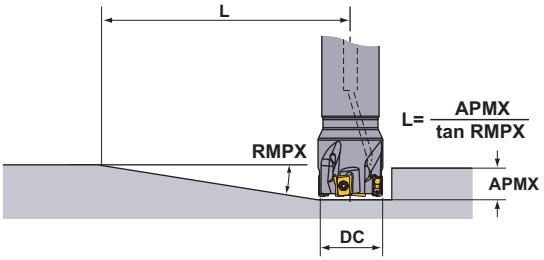
	Workpiece Material	Characteristics	ae (mm)	Cutting Conditions	DC (mm) ø40 ap (mm)	ø40 fz (mm/t)	ø50—ø80 ap (mm)	ø50—ø80 fz (mm/t)
K	Gray Cast Irons	Tensile Strength ≤350MPa	≤0.25DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤APMX	0.18 (0.10—0.25)
				✲	≤APMX	0.12 (0.08—0.15)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤APMX	0.12 (0.08—0.15)	≤31	0.15 (0.10—0.20)
				✲	≤APMX	0.10 (0.08—0.12)	≤31	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤21	0.10 (0.08—0.12)	≤21	0.13 (0.10—0.15)
				✲	≤21	0.08 (0.06—0.10)	≤21	0.10 (0.08—0.12)
			DC(Slot)	● ◐	≤5	0.08 (0.06—0.10)	≤5	0.12 (0.08—0.15)
				✲	≤5	0.07 (0.06—0.08)	≤5	0.08 (0.06—0.10)
	Ductile Cast Irons	—	≤0.25DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤APMX	0.15 (0.10—0.20)
				✲	≤APMX	0.13 (0.10—0.15)	≤APMX	0.13 (0.10—0.15)
			0.25—0.5DC	● ◐	≤APMX	0.13 (0.10—0.15)	≤31	0.13 (0.10—0.15)
				✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐	≤21	0.10 (0.08—0.12)	≤21	0.10 (0.08—0.12)
				✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
				✲	≤5	0.07 (0.06—0.08)	≤5	0.07 (0.06—0.08)
N	Aluminium Alloys	Content Si＜5%	≤0.25DC	● ◐	≤APMX	0.18 (0.10—0.25)	≤APMX	0.18 (0.10—0.25)
				✲	≤APMX	0.15 (0.10—0.20)	≤APMX	0.15 (0.10—0.20)
			0.25—0.5DC	● ◐	≤APMX	0.15 (0.10—0.20)	≤31	0.15 (0.10—0.20)
				✲	≤APMX	0.13 (0.10—0.15)	≤31	0.13 (0.10—0.15)
			0.5—0.75DC	● ◐	≤21	0.11 (0.06—0.15)	≤21	0.12 (0.08—0.15)
				✲	≤21	0.11 (0.06—0.15)	≤21	0.12 (0.08—0.15)
			DC(Slot)	● ◐	≤5	0.11 (0.06—0.15)	≤5	0.12 (0.08—0.15)
				✲	≤5	0.09 (0.06—0.12)	≤5	0.10 (0.08—0.12)
S	Titanium Alloys (Ti-6Al-4V etc.)	—	≤0.25DC	● ◐ ✲	≤APMX	0.12 (0.08—0.15)	≤APMX	0.12 (0.08—0.15)
			0.25—0.5DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
	Titanium Alloys (Ti-5Al-5V-5Mo-3Cr etc.)	—	≤0.25DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)
	Heat Resistant Alloys	—	≤0.25DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤APMX	0.10 (0.08—0.12)
			0.25—0.5DC	● ◐ ✲	≤APMX	0.10 (0.08—0.12)	≤31	0.10 (0.08—0.12)
			0.5—0.75DC	● ◐ ✲	≤21	0.08 (0.06—0.10)	≤21	0.08 (0.06—0.10)
			DC(Slot)	● ◐ ✲	≤5	0.08 (0.06—0.10)	≤5	0.08 (0.06—0.10)

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 machining

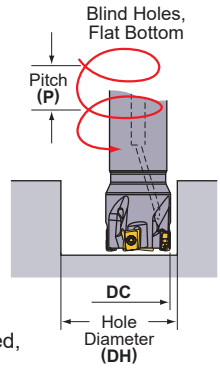
Note 3) A type with fewer teeth is recommended when the depth of cut in the radius direction (ae) is 0.5 DC or more.
Note 4) Wet cutting is recommended, when focusing on the surface finish. (Service life is shorter than for dry cutting.)
Note 5) When using under higher than recommended cutting conditions, or for long periods of time, the bit may become fatigued and break during machining. Please change out the bit periodically.

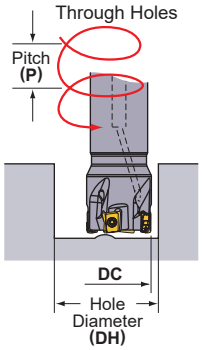
■ Ramping / Helical Milling

● **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 (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	L (mm) *	DH max. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)	DH min. (mm)	P max. (mm)
25	0.2	2.13°	296	49	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	2.13°	296	47.4	2.6	42.7	2.1	36.9	1.4
	1.2	2.13°	296	47	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	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	2.13°	296	43.4	2.2	42.7	2.1	36.9	1.4
	3.2	2.13°	296	43	2.1	42.7	2.1	36.9	1.4
28	0.2	1.77°	356	55	2.6	48.7	2	42.7	1.4
	0.4	1.77°	356	54.6	2.6	48.7	2	42.7	1.4
	0.8	1.77°	356	53.8	2.5	48.7	2	42.7	1.4
	1	1.77°	356	53.4	2.5	48.7	2	42.7	1.4
	1.2	1.77°	356	53	2.4	48.7	2	42.7	1.4
	1.6	1.77°	356	52.2	2.4	48.7	2	42.7	1.4
	2	1.77°	356	51.4	2.3	48.7	2	42.7	1.4
	2.4	1.77°	356	50.6	2.2	48.7	2	42.7	1.4
	3	1.77°	356	49.4	2.1	48.7	2	42.7	1.4
	3.2	1.77°	356	49	2	48.7	2	42.7	1.4
30	0.2	1.61°	392	59	2.6	52.7	2	46.6	1.5
	0.4	1.61°	392	58.6	2.5	52.7	2	46.6	1.5
	0.8	1.61°	392	57.8	2.5	52.7	2	46.6	1.5
	1	1.61°	392	57.4	2.4	52.7	2	46.6	1.5
	1.2	1.61°	392	57	2.4	52.7	2	46.6	1.5
	1.6	1.61°	392	56.2	2.3	52.7	2	46.6	1.5
	2	1.61°	392	55.4	2.2	52.7	2	46.6	1.5
	2.4	1.61°	392	54.6	2.2	52.7	2	46.6	1.5
	3	1.61°	392	53.4	2.1	52.7	2	46.6	1.5
	3.2	1.61°	392	53	2	52.7	2	46.6	1.5
32	0.2	1.47°	429	63	2.5	56.7	2	50.6	1.5
	0.4	1.47°	429	62.6	2.5	56.7	2	50.6	1.5
	0.8	1.47°	429	61.8	2.4	56.7	2	50.6	1.5
	1	1.47°	429	61.4	2.4	56.7	2	50.6	1.5
	1.2	1.47°	429	61	2.3	56.7	2	50.6	1.5
	1.6	1.47°	429	60.2	2.3	56.7	2	50.6	1.5
	2	1.47°	429	59.4	2.2	56.7	2	50.6	1.5
	2.4	1.47°	429	58.6	2.1	56.7	2	50.6	1.5
	3	1.47°	429	57.4	2.1	56.7	2	50.6	1.5
	3.2	1.47°	429	57	2	56.7	2	50.6	1.5

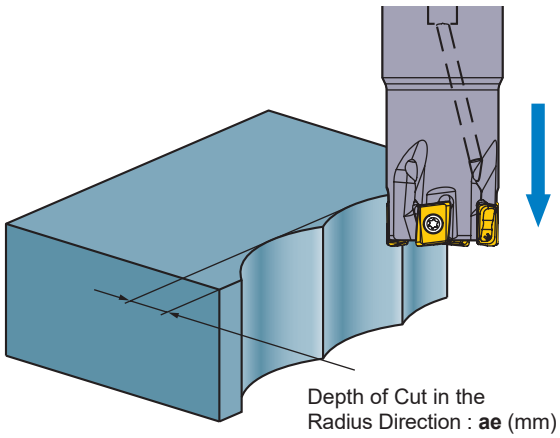
Note 1) When machining a highly ductile workpiece material with the ramping angles in the table above, chips can become long.
* Shows the distance until a maximum depth of cut of 11 mm is achieved at the maximum ramping angle L (= 11/tan RMPX).

DC (mm)	RE (mm)	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
		RMPX	**L** (mm) *	**DH max.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)	**DH min.** (mm)	**P max.** (mm)
35	0.2	1.28°	493	69	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	1.28°	493	67.4	2.3	62.8	1.9	56.6	1.5
	1.2	1.28°	493	67	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	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	1.28°	493	63.4	2	62.8	1.9	56.6	1.5
	3.2	1.28°	493	63	2	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	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	2.1	72.7	1.9	66.5	1.5
	2	1.06°	595	75.2	2	72.7	1.9	66.5	1.5
	2.4	1.06°	595	74.4	2	72.7	1.9	66.5	1.5
	3	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	0.79°	798	97.2	2	92.7	1.8	86.5	1.6
	1.2	0.79°	798	96.8	2	92.7	1.8	86.5	1.6
	1.6	0.79°	798	96	2	92.7	1.8	86.5	1.6
	2	0.79°	798	95.2	2	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	0.79°	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	118.7	1.8	112.5	1.6
	0.4	0.6°	1051	124.4	2	118.7	1.8	112.5	1.6
	0.8	0.6°	1051	123.6	2	118.7	1.8	112.5	1.6
	1	0.6°	1051	123.2	2	118.7	1.8	112.5	1.6
	1.2	0.6°	1051	122.8	2	118.7	1.8	112.5	1.6
	1.6	0.6°	1051	122	1.9	118.7	1.8	112.5	1.6
	2	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	0.6°	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	0.45°	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	1.9	152.7	1.8	146.5	1.6
	2	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	0.45°	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

■ For Plunging and Drilling

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

● Plunging



VPX200

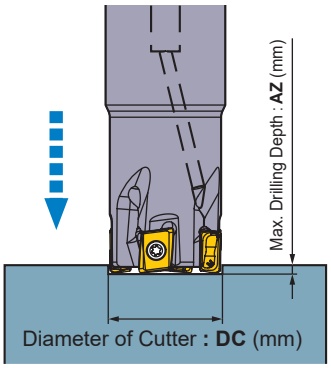
DC (mm)	**ae max.** (mm)
16	3.9
18	3.9
20	3.9
22	4.0
25	4.0
28	4.0
30	4.0
32	4.0
35	4.0
40	4.0
50	4.0
63	4.0

VPX300

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

Note 1) No step feed necessary.

● Drilling



VPX200

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

VPX300

DC (mm)	**AZ max.** (mm)
25	0.55
28	0.55
30	0.55
32	0.55
35	0.55
40	0.55
50	0.55
63	0.55
80	0.55

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