Recommended Cutting Conditions

■ Dry Cutting

Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥	Width of Cut **ae** .8DC≥	Width of Cut **ae** DC(Slot)
					Cutting Speed **vc** (SFM)		
P	Mild Steels	Hardness ≤180HB	●	MP6120	785(655–920)	720(590–850)	655(525–785)
			◐	MP6130	755(620–885)	690(560–820)	620(490–755)
			✻	MP6130,VP15TF	690(560–820)	620(490–755)	560(425–690)
	Carbon Steels Alloy Steels	Hardness 180–280HB	●	MP6120	690(560–820)	620(490–755)	560(425–690)
			◐	MP6130	655(525–785)	590(460–720)	525(395–655)
			✻	MP6130,VP15TF	590(460–720)	525(395–655)	460(330–590)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280–350HB ≤350HB (Annealing)	●	MP6120	655(525–785)	590(460–720)	525(395–655)
			◐	MP6130	620(490–755)	560(425–690)	490(360–620)
			✻	MP6130,VP15TF	560(425–690)	490(360–620)	425(295–560)
	Pre-hardened Steels	Hardness 35–45HRC	●	MP6120	460(395–525)	–	–
			◐	MP6130	395(330–460)	–	–
			✻	MP6130,VP15TF	360(295–425)	–	–
M	Austenitic Stainless Steels	Hardness ≤200HB	●	MP7130	590(525–655)	525(460–590)	–
			◐	MP7130,VP15TF	560(490–620)	490(425–560)	–
			✻	MP7130,VP15TF	490(425–560)	425(360–490)	–
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	560(490–620)	490(425–560)	–
			◐	MP7130,VP15TF	525(460–590)	460(395–525)	–
			✻	MP7130,VP15TF	460(395–525)	395(330–460)	–
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	●	MP7130	590(525–655)	525(460–590)	–
			◐	MP7130,VP15TF	560(490–620)	490(425–560)	–
			✻	MP7130,VP15TF	490(425–560)	425(360–490)	–
	Duplex Stainless Steels	Hardness ≤280HB	●	MP7130	525(460–590)	460(395–525)	–
			◐	MP7130,VP15TF	490(425–560)	425(360–490)	–
			✻	MP7130,VP15TF	425(360–490)	360(295–425)	–
	Precipitation Hardening Stainless Steels	Hardness <450HB	●	MP7130	460(395–525)	–	–
			◐	MP7130,VP15TF	425(360–490)	–	–
			✻	MP7130,VP15TF	360(295–425)	–	–
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	MC5020	820(690–950)	755(620–885)	690(560–820)
			◐	MC5020	785(655–920)	720(590–850)	655(525–785)
			◐	VP15TF	785(655–920)	720(590–850)	–
			✻	MC5020,VP15TF	720(590–850)	655(525–785)	590(460–720)
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	MC5020	720(590–525)	655(525–785)	590(460–720)
			◐	MC5020	690(560–820)	620(490–755)	560(425–690)
			◐	VP15TF	690(560–820)	620(490–755)	–
			✻	MC5020,VP15TF	620(490–755)	560(425–690)	490(360–620)
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	MC5020	590(460–720)	525(395–655)	460(330–590)
			◐	MC5020	560(425–690)	490(360–620)	425(295–560)
			◐	VP15TF	560(425–690)	490(360–620)	–
			✻	MC5020,VP15TF	490(360–620)	425(295–560)	360(230–490)
H	Hardened Steels	Hardness 40–55HRC	●	VP15TF	165(100–230)	–	–
			◐	VP15TF	165(100–230)	–	–

Note 1) The recommended cutting speed has been calculated for a depth of cut .079 inch. Please reduce the cutting speed by an appropriate amount corresponding to the increase in cutting depth.

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

■ Wet Cutting
Cutting Speed

(inch)

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥	Width of Cut **ae** .8DC≥	Width of Cut **ae** DC(Slot)
					Cutting Speed **vc** (SFM)		
P	Mild Steels	Hardness ≤180HB	●	MP6120	490(460—525)	425(395—460)	395(360—425)
			◐	MP6130	460(425—490)	395(360—425)	360(330—395)
			✲	MP6130,VP15TF	395(360—425)	330(295—360)	295(260—330)
	Carbon Steels Alloy Steels	Hardness 180—280HB	●	MP6120	490(460—525)	425(395—460)	395(360—425)
			◐	MP6130	460(425—490)	395(360—425)	360(330—395)
			✲	MP6130,VP15TF	395(360—425)	330(295—360)	295(260—330)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280—350HB ≤350HB (Annealing)	●	MP6120	460(425—490)	395(360—425)	360(330—395)
			◐	MP6130	425(395—460)	360(330—395)	330(295—360)
			✲	MP6130,VP15TF	360(330—395)	295(260—330)	260(230—295)
	Pre-hardened Steels	Hardness 35—45HRC	●	MP6120	360(330—395)	—	—
			◐	MP6130	330(295—360)	—	—
			✲	MP6130,VP15TF	260(230—295)	—	—
M	Austenitic Stainless Steels	Hardness ≤200HB	●	MP7130	425(395—460)	360(330—395)	—
			◐	MP7130,VP15TF	395(360—425)	330(295—360)	—
			✲	MP7130,VP15TF	330(295—360)	260(230—295)	—
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	425(395—460)	360(330—395)	—
			◐	MP7130,VP15TF	395(360—425)	330(295—360)	—
			✲	MP7130,VP15TF	330(295—360)	260(230—295)	—
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	●	MP7130	425(395—460)	360(330—395)	—
			◐	MP7130,VP15TF	395(360—425)	330(295—360)	—
			✲	MP7130,VP15TF	330(295—360)	260(230—295)	—
	Duplex Stainless Steels	Hardness ≤280HB	●	MP7130	395(360—425)	330(295—360)	—
			◐	MP7130,VP15TF	360(330—395)	295(260—330)	—
			✲	MP7130,VP15TF	295(260—330)	230(195—260)	—
	Precipitation Hardening Stainless Steels	Hardness <450HB	●	MP7130	395(360—425)	—	—
			◐	MP7130,VP15TF	360(330—395)	—	—
			✲	MP7130,VP15TF	295(260—330)	—	—
K	Gray Cast Irons	Tensile Strength ≤350MPa	●	MC5020	560(490—620)	490(425—560)	425(360—490)
			◐	MC5020	525(460—590)	460(395—525)	395(330—460)
			◐	VP15TF	525(460—590)	460(395—525)	—
			✲	MC5020,VP15TF	460(395—525)	395(330—460)	330(260—395)
	Ductile Cast Irons	Tensile Strength ≤450MPa	●	MC5020	560(490—620)	490(425—560)	425(360—490)
			◐	MC5020	525(460—590)	460(395—525)	395(330—460)
			◐	VP15TF	525(460—590)	460(395—525)	—
			✲	MC5020,VP15TF	460(395—525)	395(330—460)	330(260—395)
	Ductile Cast Irons	Tensile Strength ≤800MPa	●	MC5020	525(490—560)	460(425—490)	395(360—425)
			◐	MC5020	490(460—525)	425(395—460)	360(330—395)
			◐	VP15TF	490(460—525)	425(395—460)	—
			✲	MC5020,VP15TF	425(395—460)	360(330—395)	295(260—330)
N	Aluminum Alloys	Content Si<5%	●	TF15	1640(985—2950)	1640(985—2950)	1640(985—2950)
			◐	TF15	1640(985—2950)	1640(985—2950)	1640(985—2950)
			✲	TF15	1310(655—2625)	1310(655—2625)	1310(655—2625)
S	Titanium Alloys	—	●	MP9120	260(195—330)	—	—
			◐	MP9120	230(165—295)	—	—
			✲	MP9130	195(130—260)	—	—
	Heat Resistant Alloys	—	●	MP9120	195(165—230)	—	—
			◐	MP9120	165(100—195)	—	—
			✲	MP9130	130(65—130)	—	—
H	Hardened Steels	Hardness 40—55HRC	●	VP15TF	165(100—230)	—	—
			◐	VP15TF	165(100—230)	—	—

Note 1) Refer to the above table and set up cutting conditions according to cutting applications.

Recommended Cutting Conditions

Depth of Cut / Feed per Tooth

	Workpiece Material	Properties	Cutting Conditions	Grade	Width of Cut **ae** .5DC≥ Breaker	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)
P	Mild Steels	Hardness ≤180HB	●	MP6120	L,M	≤.157	.005(.004–.006)
			●	MP6130	L,M	≤.157	.005(.004–.006)
			●		M,R	≤.157	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.157	.005(.004–.006)
	Carbon Steels Alloy Steels	Hardness 180–280HB	●	MP6120	L,M	≤.157	.005(.004–.006)
			●	MP6130	L,M	≤.157	.005(.004–.006)
			●		M,R	≤.157	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.157	.005(.004–.006)
	Carbon Steels Alloy Steels Alloy Tool Steels	Hardness 280–350HB ≤350HB (Annealing)	●	MP6120	L,M	≤.118	.005(.004–.006)
			●	MP6130	L,M	≤.118	.005(.004–.006)
			●		M,R	≤.118	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.118	.005(.004–.006)
	Pre-hardened Steels	Hardness 35–45HRC	●	MP6120	L,M	≤.079	.005(.004–.006)
			●	MP6130	L,M	≤.079	.005(.004–.006)
			●		M,R	≤.079	.006(.004–.008)
			✱	MP6130,VP15TF	M,R	≤.079	.005(.004–.006)
M	Austenitic Stainless Steels	Hardness ≤200HB	● ●	MP7130	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M	≤.157	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.157	.005(.004–.006)
	Austenitic Stainless Steels	Hardness >200HB	●	MP7130	L,M	≤.157	.005(.004–.006)
			●	MP7130	L,M	≤.118	.005(.004–.006)
			●	VP15TF	M	≤.118	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.118	.005(.004–.006)
	Ferritic and Martensitic Stainless Steels	Hardness ≤200HB	● ●	MP7130	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M	≤.157	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.118	.005(.004–.006)
	Duplex Stainless Steels	Hardness ≤280HB	● ●	MP7130	L,M	≤.118	.005(.004–.006)
			● ●	MP7130	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M	≤.118	.006(.004–.008)
			●	VP15TF	M	≤.157	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.118	.005(.004–.006)
			✱	MP7130,VP15TF	M	≤.157	.005(.004–.006)
	Precipitation Hardening Stainless Steels	Hardness <450HB	●	MP7130	L,M	≤.079	.005(.004–.006)
			●	MP7130	L,M	≤.079	.005(.004–.006)
			●	VP15TF	M	≤.079	.006(.004–.008)
			✱	MP7130,VP15TF	M	≤.079	.005(.004–.006)
K	Gray Cast Irons	Tensile Strength ≤350MPa	● ●	MC5020	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M,R	≤.157	.006(.004–.008)
			✱	MC5020,VP15TF	M,R	≤.157	.005(.004–.006)
	Ductile Cast Irons	Tensile Strength ≤800MPa	● ●	MC5020	L,M	≤.157	.005(.004–.006)
			●	VP15TF	M,R	≤.157	.006(.004–.008)
			✱	MC5020,VP15TF	M,R	≤.157	.005(.004–.006)
N	Aluminum Alloys	Content Si<5%	● ● ✱	TF15	L	≤.157	.005(.004–.006)
S	Titanium Alloys	–	● ●	MP9120	L,M	≤.079	.004(.002–.005)
			✱	MP9130	L,M	≤.079	.004(.002–.005)
	Heat Resistant Alloys	–	● ●	MP9120	L,M	≤.079	.004(.002–.005)
			✱	MP9130	L,M	≤.079	.004(.002–.005)
H	Hardened Steels	Hardness 40–55HRC	●	VP15TF	M	≤.079	.002(.002–.004)
			●	VP15TF	M,R	≤.079	.002(.002–.004)

Note 1) Refer to the above table and set up cutting conditions according to cutting applications.

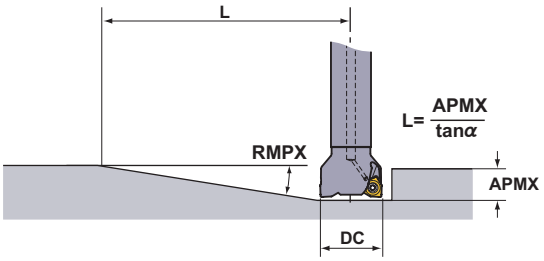
Cutting Conditions (Guide) :
● : Stable Cutting ◐ : General Cutting ✥ : Unstable Cutting

(inch)

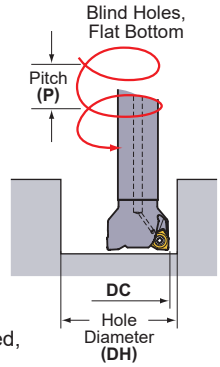
Width of Cut **ae**						Cutting Mode
.8DC≥			DC(Slot)			
Breaker	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	Breaker	Depth of Cut **ap**	Feed per Tooth **fz** (IPT)	
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
M,R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M,R	≤.118	.005(.004–.006)	M	≤.079	.005(.004–.006)	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
M,R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M,R	≤.118	.005(.004–.006)	M	≤.079	.005(.004–.006)	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.118	.005(.004–.006)	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
M,R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M,R	≤.118	.005(.004–.006)	M	≤.079	.005(.004–.006)	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
L,M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
L,M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
L,M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
L,M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M	≤.118	.005(.004–.006)	–	–	–	Dry, Wet
L,M	≤.118	.005(.004–.006)	–	–	–	Dry
L,M	≤.118	.005(.004–.006)	–	–	–	Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry
M	≤.118	.006(.004–.008)	–	–	–	Wet
M	≤.118	.006(.004–.008)	–	–	–	Dry
M	≤.118	.005(.004–.006)	–	–	–	Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
M,R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M,R	≤.118	.005(.004–.006)	M,R	≤.079	.005(.004–.006)	Dry, Wet
L,M	≤.118	.005(.004–.006)	L,M	≤.079	.005(.004–.006)	Dry, Wet
M,R	≤.118	.006(.004–.008)	–	–	–	Dry, Wet
M,R	≤.118	.005(.004–.006)	M,R	≤.079	.005(.004–.006)	Dry, Wet
L	≤.118	.005(.004–.006)	L	≤.079	.005(.004–.006)	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Wet
–	–	–	–	–	–	Dry, Wet
–	–	–	–	–	–	Dry, Wet

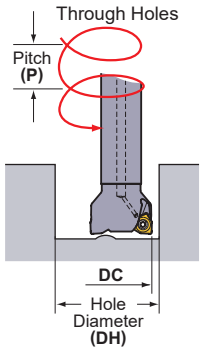
Ramping / Helical Milling

● Ramping



● Helical Milling





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

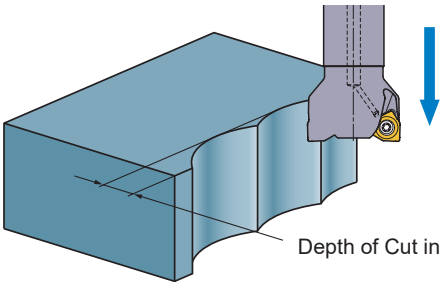
(inch)

DC		RE	APMX	Ramping		Helical Milling (Blind Hole, Flat Bottom)				Helical Milling (Through Hole)	
inch	mm			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.**
1.969	50	.016	.315	.40°	46.260	3.878	.042	3.748	.039	3.248	.028
1.969	50	.031	.315	.40°	46.260	3.846	.041	3.748	.039	3.248	.028
2.000	—	.016	.315	.40°	46.260	3.929	.042	3.811	.040	3.295	.028
2.000	—	.031	.315	.40°	46.260	3.898	.042	3.811	.040	3.295	.028
2.480	63	.016	.315	.26°	71.142	4.902	.035	4.772	.033	4.276	.024
2.480	63	.031	.315	.26°	71.142	4.870	.034	4.772	.033	4.276	.024
2.500	—	.016	.315	.26°	71.142	4.929	.035	4.811	.033	4.299	.026
2.500	—	.031	.315	.26°	71.142	4.898	.034	4.811	.033	4.299	.026
3.000	—	.016	.315	.16°	115.591	5.929	.026	5.811	.025	5.299	.020
3.000	—	.031	.315	.16°	115.591	5.898	.026	5.811	.025	5.299	.020
3.150	80	.016	.315	.16°	115.591	6.240	.027	6.110	.026	5.614	.020
3.150	80	.031	.315	.16°	115.591	6.209	.027	6.114	.026	5.614	.020

*Shows the distance until a maximum depth of cut of .315” is achieved at the maximum ramping angle L (= .315”/tan α).
Note 1) When ramping and helical milling, it is recommended to reduce the feed per tooth.
Note 2) When ramping and helical milling, long continuous chips may be scattered so please be careful.

<Helical Milling>
To obtain a flat bottom surface when helical millimg, it requires to remove “the uncut part” in the center of the workpiece material at a final pass.
When helical milling, make sure that the depth of cut per helical pass doesn’t exceed the maximum depth of cut (**APMX**).

● Plunging



Depth of Cut in the Radius Direction : **ae** = .315 inch

Recommended Cutting Conditions

■ WWX200/400 Cutting Speed
Dry Cutting

(inch)

	Workpiece Material	Properties	Cutting Conditions	MV1020 Width of Cut **ae** 0.5DC≥	MV1020 0.8DC≥	MV1020 DC(Slot)	MV1030 Width of Cut **ae** 0.5DC≥	MV1030 0.8DC≥	MV1030 DC(Slot)
				Cutting Speed **vc** (SFM)			Cutting Speed **vc** (SFM)		
P	Mild Steel	Hardness ≤180HB	●	985(820–1150)	920(755–1080)	820(655–985)	755(620–885)	690(560–820)	620(490–755)
			◐	950(785–1115)	850(690–1050)	785(620–950)	755(620–885)	690(560–820)	620(490–755)
	Carbon Steel Alloy Steel	Hardness 180–350HB	●	850(690–1015)	785(620–920)	690(525–850)	655(525–785)	590(460–720)	525(395–655)
			◐	820(655–985)	755(590–885)	655(490–820)	655(525–785)	590(460–720)	525(395–655)
M	Stainless Steel	–	●	–	–	–	590(525–655)	525(460–590)	–
			◐	–	–	–	560(490–620)	490(425–560)	–
K	Ductile Cast Iron	Tensile Strength ≤450MPa	●	785(655–1015)	720(560–920)	655(490–850)	690(560–820)	620(490–755)	560(425–690)
			◐	755(620–985)	690(525–885)	620(460–820)	690(560–820)	620(490–755)	560(425–690)
		Tensile Strength ≤800MPa	●	690(525–920)	620(460–820)	525(395–690)	560(425–690)	490(360–620)	425(295–560)
			◐	655(490–885)	590(425–785)	490(360–655)	560(425–690)	490(360–620)	425(295–560)

■ WWX200/400 Cutting Speed
Wet Cutting

(inch)

	Workpiece Material	Properties	Cutting Conditions	MV1020 Width of Cut **ae** 0.5DC≥	MV1020 0.8DC≥	MV1020 DC(Slot)	MV1030 Width of Cut **ae** 0.5DC≥	MV1030 0.8DC≥	MV1030 DC(Slot)
				Cutting Speed **vc** (SFM)			Cutting Speed **vc** (SFM)		
P	Mild Steel	Hardness ≤180HB	●	720(690–755)	620(590–690)	590(525–620)	460(425–490)	395(360–425)	360(330–395)
			◐	690(655–720)	590(560–655)	560(490–590)	460(425–490)	395(360–425)	360(330–395)
	Carbon Steel Alloy Steel	Hardness 180–350HB	●	655(620–690)	560(525–620)	525(490–560)	460(425–490)	395(360–425)	360(330–395)
			◐	620(590–655)	525(490–590)	490(460–525)	460(425–490)	395(360–425)	360(330–395)
K	Ductile Cast Iron	Tensile Strength ≤450MPa	●	655(590–785)	590(490–720)	490(425–655)	525(460–590)	460(395–525)	395(330–460)
			◐	620(560–755)	560(460–690)	460(395–620)	525(460–590)	460(395–525)	395(330–460)
		Tensile Strength ≤800MPa	●	590(560–690)	525(490–620)	460(395–525)	490(460–525)	425(395–460)	360(330–395)
			◐	560(525–655)	490(460–590)	395(360–490)	490(460–525)	425(395–460)	360(330–395)

Note 1) The recommended cutting speed has been calculated for a depth of cut 2mm. Please reduce the cutting speed by an appropriate amount corresponding to the increase in cutting depth.

Recommended Cutting Conditions

■ WWX400 Depth of Cut / Feed per Tooth
Dry and Wet Cutting

(inch)

Workpiece Material		Properties	Cutting Conditions	Width of Cut **ae**								
				0.5DC≥			0.8DC≥			DC(Slot)		
				Breaker	Depth of Cut **ap**	Feed **fz** (IPT)	Breaker	Depth of Cut **ap**	Feed **fz** (IPT)	Breaker	Depth of Cut **ap**	Feed **fz** (IPT)
P	Mild Steel	Hardness ≤180HB	● ●	L–M	≤.157	.005(.004–.006)	L–M	≤.118	.005(.004–.006)	L–M	≤.079	.005(.004–.006)
			●	M–R	≤.157	.006(.004–.008)	M–R	≤.118	.006(.004–.008)	–	–	–
	Carbon Steel Alloy Steel	Hardness 180–350HB	● ●	L–M	≤.157	.005(.004–.006)	L–M	≤.118	.005(.004–.006)	L–M	≤.079	.005(.004–.006)
			●	M–R	≤.157	.006(.004–.008)	M–R	≤.118	.006(.004–.008)	–	–	–
M	Stainless Steel	–	● ●	L–M	≤.079	.005(.004–.006)	L–M	≤.079	.005(.004–.006)	–	–	–
K	Ductile Cast Iron	Tensile Strength ≤450MPa	● ●	L–M	≤.157	.005(.004–.006)	L–M	≤.118	.005(.004–.006)	L–M	≤.079	.005(.004–.006)
			●	M–R	≤.157	.006(.004–.008)	M–R	≤.118	.006(.004–.008)	–	–	–
		Tensile Strength ≤800MPa	● ●	L–M	≤.157	.005(.004–.006)	L–M	≤.118	.005(.004–.006)	L–M	≤.079	.005(.004–.006)
			●	M–R	≤.157	.006(.004–.008)	M–R	≤.118	.006(.004–.008)	–	–	–

Note 1) Refer to the above table and set up cutting conditions according to cutting applications.