

## Recommended Cutting Conditions

### Dry Cutting

(inch)

Work Material	Hardness	Grade	Breaker	vc (SFM)	fz (IPT)	ap	ae	
P	Mild Steel	≤ 180HB	MP6120	M	820 (655–985)	.012 (.008–.016)	≤.197	≤0.8DC
			VP15TF	MP	820 (655–985)	.012 (.008–.016)	≤.197	≤0.8DC
			MP6130	M	720 (560–885)	.016 (.012–.020)	≤.197	≤0.8DC
	Carbon Steel, Alloy Steel	180–280HB	MP6120	M	720 (560–885)	.012 (.008–.016)	≤.197	≤0.8DC
			VP15TF	MP	720 (560–885)	.012 (.008–.016)	≤.197	≤0.8DC
			MP6130	M	620 (460–785)	.016 (.012–.020)	≤.197	≤0.8DC
	Carbon Steel, Alloy Steel	280–350HB	MP6120	M	460 (330–590)	.012 (.008–.016)	≤.197	≤0.8DC
			VP15TF	MP	460 (330–590)	.012 (.008–.016)	≤.197	≤0.8DC
			MP6130	M	360 (230–490)	.016 (.012–.020)	≤.197	≤0.8DC
	Alloy Tool Steel	≤350HB (annealing)	MP6120	M	460 (330–590)	.006 (.004–.008)	≤.118	≤0.8DC
			VP15TF	MP	460 (330–590)	.006 (.004–.008)	≤.118	≤0.8DC
			MP6130	M	360 (230–490)	.010 (.008–.012)	≤.118	≤0.8DC
Pre-hardened Steel	35–45HRC	MP6120	M	460 (330–590)	.006 (.004–.008)	≤.118	≤0.8DC	
		VP15TF	MP	460 (330–590)	.006 (.004–.008)	≤.197	≤0.8DC	
		MP6130	M	360 (230–490)	.010 (.008–.012)	≤.118	≤0.8DC	
M	Austenitic Stainless Steel	≤200HB	MP7030	MM	655 (490–820)	.008 (.004–.012)	≤.197	≤0.8DC
	Austenitic Stainless Steel	> 200HB	MP7030	MM	490 (330–655)	.008 (.004–.012)	≤.197	≤0.8DC
	Two-phase Stainless Steel	≤280HB	MP7030	MM	460 (330–590)	.006 (.002–.010)	≤.197	≤0.8DC
	Ferritic and Martensitic Stainless Steel	≤200HB	MP7030	MM	655 (490–820)	.008 (.004–.012)	≤.197	≤0.8DC
	Ferritic and Martensitic Stainless Steel	> 200HB	MP7030	MM	490 (330–655)	.008 (.004–.012)	≤.197	≤0.8DC
	Precipitation Hardening Stainless Steel	< 450HB	MP7030	MM	425 (330–525)	.006 (.002–.010)	≤.197	≤0.8DC
K	Gray Cast Iron	Tensile Strength ≤350MPa	MC5020	MK, HK	720 (490–985)	.012 (.008–.016)	≤.197	≤0.8DC
			VP15TF, VP20RT	MK, HK	590 (425–755)	.012 (.008–.016)	≤.197	≤0.8DC
			VP15TF	MP	590 (425–755)	.012 (.008–.016)	≤.197	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	MC5020	MK, HK	655 (490–820)	.008 (.004–.012)	≤.197	≤0.8DC
			VP15TF, VP20RT	MK, HK	560 (395–720)	.008 (.004–.012)	≤.197	≤0.8DC
			VP15TF	MP	560 (395–720)	.008 (.004–.012)	≤.197	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	MC5020	MK, HK	560 (490–655)	.008 (.004–.012)	≤.197	≤0.8DC
			VP15TF, VP20RT	MK, HK	460 (330–590)	.008 (.004–.012)	≤.197	≤0.8DC
			VP15TF	MP	460 (330–590)	.008 (.004–.012)	≤.197	≤0.8DC
H	Hardened Steel	40–55HRC	VP15TF	MP	260 (195–330)	.006 (.004–.008)	≤.118	≤0.8DC

(Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)

(Note2) Recommended wet cutting with internal coolant for titanium alloy and heat resistant alloy,

(Note3) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

## Wet Cutting

(inch)

	Work Material	Hardness	Breaker	Grade	vc (SFM)	fz (IPT)	ap	ae
<b>M</b>	Austenitic Stainless Steel	≤200HB	<b>MP7030</b>	<b>MM</b>	410 (330—490)	.006 (.004—.008)	≤.197	≤0.8DC
	Austenitic Stainless Steel	> 200HB	<b>MP7030</b>	<b>MM</b>	330 (245—410)	.006 (.004—.008)	≤.197	≤0.8DC
	Two-phase Stainless Steel	≤280HB	<b>MP7030</b>	<b>MM</b>	260 (195—330)	.004 (.002—.006)	≤.197	≤0.8DC
	Ferritic and Martensitic Stainless Steel	≤200HB	<b>MP7030</b>	<b>MM</b>	410 (330—490)	.006 (.004—.008)	≤.197	≤0.8DC
	Ferritic and Martensitic Stainless Steel	> 200HB	<b>MP7030</b>	<b>MM</b>	330 (245—410)	.006 (.004—.008)	≤.197	≤0.8DC
	Precipitation Hardening Stainless Steel	< 450HB	<b>MP7030</b>	<b>MM</b>	230 (165—295)	.004 (.002—.006)	≤.197	≤0.8DC
<b>S</b>	Titanium Alloy	—	<b>MP7030</b>	<b>MM</b>	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC
		—	<b>MP9120</b>	<b>L</b>	195 (165—230)	.004 (.002—.006)	≤.118	≤0.6DC
		—	<b>MP9130</b>	<b>L</b>	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC
	Heat Resistant Alloy	—	<b>MP7030</b>	<b>MM</b>	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC
		—	<b>MP9120</b>	<b>L</b>	195 (165—230)	.004 (.002—.006)	≤.118	≤0.6DC
		—	<b>MP9130</b>	<b>L</b>	130 (65—165)	.006 (.004—.008)	≤.118	≤0.6DC

(Note1) Recommended wet cutting for good surface finishing of stainless steel. (Tool life is short compared to wet cutting.)

(Note2) Recommended wet cutting with internal coolant for titanium alloy and heat resistant alloy.

(Note3) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

## Cutting Conditions with Wiper Insert

(inch)

	Work Material	Hardness	Main Insert	Grade	Wiper Insert	Grade	vc (SFM)	fz (IPT)	ap	ae
<b>P</b>	Mild Steel	≤180HB	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	820 (655—985)	.012 (.008—.016)	≤.0197	≤0.8DC
			<b>MP6120</b>	<b>M</b>	<b>MP6120</b>	<b>M</b>	820 (655—985)	.012 (.008—.016)	≤.0197	≤0.8DC
	Carbon Steel, Alloy Steel	180—280HB	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	720 (560—885)	.012 (.008—.016)	≤.0197	≤0.8DC
			<b>MP6120</b>	<b>M</b>	<b>MP6120</b>	<b>M</b>	720 (560—885)	.012 (.008—.016)	≤.0197	≤0.8DC
	Carbon Steel, Alloy Steel	280—350HB	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	460 (330—590)	.012 (.008—.016)	≤.0197	≤0.8DC
			<b>MP6120</b>	<b>M</b>	<b>MP6120</b>	<b>M</b>	460 (330—590)	.012 (.008—.016)	≤.0197	≤0.8DC
<b>K</b>	Gray Cast Iron	Tensile Strength ≤350MPa	<b>MC5020</b>	<b>MK, HK</b>	<b>MC5020</b>	<b>WK</b>	1050 (820—1310)	.012 (.008—.016)	≤.0197	≤0.8DC
			<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	720 (490—985)	.012 (.008—.016)	≤.0197	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤450MPa	<b>MC5020</b>	<b>MK, HK</b>	<b>MC5020</b>	<b>WK</b>	820 (655—985)	.008 (.004—.012)	≤.0197	≤0.8DC
			<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	655 (490—820)	.008 (.004—.012)	≤.0197	≤0.8DC
	Ductile Cast Iron	Tensile Strength ≤800MPa	<b>MC5020</b>	<b>MK, HK</b>	<b>MC5020</b>	<b>WK</b>	720 (655—820)	.008 (.004—.012)	≤.0197	≤0.8DC
			<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	560 (490—655)	.008 (.004—.012)	≤.0197	≤0.8DC
<b>S</b>	Heat Resistant Alloy	—	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	130 (65—165)	.006 (.004—.008)	≤.0197	≤0.8DC
<b>H</b>	Hardened Steel	40—55HRC	<b>VP15TF</b>	<b>MP</b>	<b>VP15TF</b>	<b>WP</b>	260 (195—330)	.006 (.004—.008)	≤.0197	≤0.8DC

(Note 1) When clamp rigidity is low and tool overhang is long, we recommended to reduce the cutting speed and the feed rate by 30%.

(Note 2) Use WP geometry insert in combination with MP or M geometry inserts, and use WK geometry insert in combination with MK or HK geometry inserts