

# Recommended Cutting Conditions

## Cutting Speed

(inch)

Workpiece Material	Insert			Cutting Width $a_e$				
	Grade Priority		Chip Breaker	$\leq .25DC$		DC (Slot)		
	1st	2nd		Cutting Speed $v_c$ (SFM)				
<b>P</b> Mild Steels	MP6120	VP15TF	M H	590(460–720)		490(360–590)	395(330–460)	
	MP6130	VP20RT	M H	525(395–655)		425(330–525)	330(260–395)	
	Carbon Steels Alloy Steels, Alloy Tool Steels	MP6120	VP15TF	M H	490(330–655)		395(295–490)	330(260–395)
		MP6130	VP20RT	M H	425(295–560)		295(230–360)	260(195–330)
	Pre-hardened Steels	MP6120	VP15TF	M H	395(260–525)		330(230–425)	295(165–395)
		MP6130	VP20RT	M H	330(230–425)		295(195–395)	230(165–330)
<b>M</b> Stainless Steels	MP7130		M	490(395–590)		395(330–460)	330(260–395)	
<b>K</b> Gray Cast Irons	MC5020		H	655(490–820)		590(490–690)		
	VP15TF		M H	590(395–785)		490(330–655)	330(195–460)	
Ductile Cast Irons	VP15TF		M H	525(395–655)		460(330–590)	260(195–330)	
<b>N</b> Aluminum Alloys	TF15	MP9120	GM M	1310(655–2625)		1310(655–2625)	1310(655–2625)	
<b>S</b> Titanium Alloys	MP9130		M	130(100–195)			130(100–195)	
	MP9120		M	165(130–230)			165(130–230)	
Heat Resistant Alloys	MP9120	VP15TF	M H	130(100–195)			130(100–195)	
	MP9130	VP20RT	M H	100(65–130)			100(65–130)	

## Depth of Cut / Feed per Tooth

(inch)

Workpiece Material	Properties	Cutting Width $a_e$	DC						
			$\phi 20$		$\phi 25$		$\phi 32-\phi 50$		
			Depth of Cut $a_p$	Feed per Tooth $f_z$ (IPT)	Depth of Cut $a_p$	Feed per Tooth $f_z$ (IPT)	Depth of Cut $a_p$	Feed per Tooth $f_z$ (IPT)	
<b>P</b> Mild Steels	$\leq 180HB$	$\leq .25DC$	$\leq 1.102$	.006	$\leq 1.457$	.007	$\leq 2.165$	.008	
		0.25-0.75DC	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007	
		DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003	
	Carbon Steels Alloy Steels	180–280HB	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007
			0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006
			DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003
	Alloy Tool Steels	$\leq 350HB$ (Annealing)	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007
			0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006
			DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003
	Pre-hardened Steels	35–45HRC	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007
			0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006
			DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003
<b>M</b> Ferritic and Martensitic Stainless Steels	–	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007	
		0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006	
		DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003	
	Duplex Stainless Steels	$\leq 280HB$	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007
			0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006
			DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003
Precipitation Hardening Stainless Steels	$<450HB$	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007	
		0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006	
		DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003	
<b>K</b> Gray Cast Irons	Tensile Strength $\leq 350MPa$	$\leq .25DC$	$\leq 1.102$	.006	$\leq 1.457$	.007	$\leq 2.165$	.008	
		0.25-0.75DC	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007	
		DC (Slot)	$\leq .709$	.004	$\leq .709$	.004	$\leq .709$	.004	
Ductile Cast Irons	Tensile Strength $\leq 800MPa$	$\leq .25DC$	$\leq 1.102$	.005	$\leq 1.457$	.006	$\leq 2.165$	.007	
		0.25-0.75DC	$\leq 1.102$	.004	$\leq 1.457$	.005	$\leq 2.165$	.006	
		DC (Slot)	$\leq .709$	.003	$\leq .709$	.003	$\leq .709$	.003	
<b>N</b> Aluminum Alloys		$\leq .25DC$	$\leq 1.102$	.006	$\leq 1.457$	.007	$\leq 2.165$	.008	
		0.25-0.75DC			$\leq .354$	.007	$\leq .354$	.008	
		DC (Slot)			$\leq .354$	.007	$\leq .354$	.008	
<b>S</b> Titanium Alloys	$\leq 350HB$	$\leq .25DC$	$\leq 1.102$	.004	$\leq 1.457$	.004	$\leq 2.165$	.004	
		0.25-0.75DC							
		DC (Slot)	$\leq .709$	.002	$\leq .709$	.002	$\leq .709$	.002	
Heat Resistant Alloys	–	$\leq .25DC$	$\leq 1.102$	.003	$\leq 1.457$	.003	$\leq 2.165$	.003	
		0.25-0.75DC							
		DC (Slot)	$\leq .709$	.002	$\leq .709$	.002	$\leq .709$	.002	

Note 1) The above cutting conditions are determined based on high rigidity machine and workpiece materials, where no vibration occurred. Please adjust processing conditions if the vibration is generated.