

# Speeds and Feeds



Workpiece material	Hardness HB	Insert grade	Cutting parameters		
			V(SFM)	f(IPT)	
				SPMT120408	
P Low-carbon steel, Soft steel	≤180	HMP20	900(650-1200)	0.008(0.004-0.012)	
	180-280	HMP20	800(600-1100)	0.006(0.004-0.012)	
	280-350	HMP20	600(500-1100)	0.008(0.004-0.012)	
M Stainless steel	≤270	HMP20	450(300-800)	0.006(0.004-0.012)	
S High-temperature alloy	≤400	HMP20	200(100-300)	0.006(0.004-0.012)	

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Feed Rate, Per Revolution (in/min)
$v_f = f_n \cdot n$

Feed Rate, Per Tooth (in/min)
$v_f = f_z \cdot n \cdot Z$

Feed Per Revolution (in/rev)
$f_n = \frac{v_f}{n}$

Feed Per Tooth (in)
$f_z = \frac{v_f}{n \cdot Z}$

Cutting Speed (ft/min)
$v_c = \frac{\pi \cdot D_{tool} \cdot n}{12}$

Spindle Speed (rev/min)
$n = \frac{v_c \cdot 12}{\pi \cdot D_{tool}}$

Material Removal Rate (in <sup>3</sup> /min)
$MMR = a_p \cdot a_e \cdot v_f$

## Inch

Symbol	Definition	Unit
$v_f$	Feed rate	in/min
$f_n$	Feed per revolution	in/rev
$f_z$	Feed per tooth	in
$v_c$	Cutting speed	ft/min (SFM)
$n$	Spindle speed	rev/min (RPM)
$D_{tool}$	Tool cutting diameter	in
$MMR$	Material removal rate	(in <sup>3</sup> /min)
$a_e$	Radial depth of cut	in
$a_p$	Axial depth of cut	in
$Z$	Number of teeth/flutes	