M527 Application Guide – Speed & Feed (inch)

ISO Code	Work Material	Type of Cut	Axial DOC	Radial DOC	No. of Flutes	Speed (SFM)	Feed (Inch per Tooth) 3/8	1/2	5/8	3/4	1
K	Cast Iron Gray	Slotting	.5 x D	1 x D	7	300	.0013	.0018	.0022	.0027	.0035
		Peripheral - Rough	1.25 x D	.3 x D	7	375	.0018	.0023	.0029	.0035	.0047
		Finish	2 x D	.015 x D	7	450	.0018	.0024	.0030	.0036	.0048
	Cast Iron	Slotting	.5 x D	1 x D	7	275	.0011	.0014	.0018	.0021	.0029
		Peripheral - Rough	1.25 x D	.3 x D	7	350	.0015	.0019	.0024	.0029	.0039
		Peripheral - HEM*	3 x D	.05 x D	7	390	.0043	.0057	.0071	.0085	.0114
		Finish	2 x D	.015 x D	7	350	.0015	.0020	.0025	.0030	.0040
P	Low Carbon Steels ≤ 38 Rc 1018, 1020, 12L14, 5120, 8620	Slotting	.5 x D	1 x D	7	325	.0015	.0020	.0025	.0030	.0040
		Peripheral - Rough	1.25 x D	.3 x D	7	400	.0020	.0027	.0034	.0041	.0055
		Peripheral - HEM*	3 x D	.05 x D	7	450	.0066	.0088	.0109	.0131	.0175
		Finish	2 x D	.015 x D	7	400	.0021	.0028	.0035	.0042	.0056
	Medium Carbon Steels ≤ 48 HRC 1045, 4140, 4340, 5140	Slotting	.5 x D	1 x D	7	300	.0014	.0018	.0023	.0027	.0037
		Peripheral - Rough	1.25 x D	.3 x D	7	375	.0019	.0025	.0031	.0037	.0050
		Peripheral - HEM*	3 x D	.05 x D	7	415	.0064	.0086	.0107	.0129	.0172
		Finish	2 x D	.015 x D	7	375	.0019	.0025	.0032	.0038	.0051
	Tool and Die Steels ≤ 48 Rc A2, D2, O1, S7, P20, H13	Slotting	.5 x D	1 x D	7	275	.0012	.0015	.0019	.0023	.0031
		Peripheral - Rough	1.25 x D	.3 x D	7	350	.0016	.0021	.0026	.0032	.0042
		Peripheral - HEM*	3 x D	.05 x D	7	390	.0055	.0074	.0092	.0110	.0147
		Finish	2 x D	.015 x D	7	350	.0016	.0021	.0027	.0032	.0043
M	Martensitic & Ferritic Stainless Steels 410, 416, 440	Slotting	.5 x D	1 x D	7	300	.0014	.0018	.0023	.0027	.0037
		Peripheral - Rough	1.25 x D	.3 x D	7	375	.0019	.0025	.0031	.0037	.0050
		Peripheral - HEM*	3 x D	.05 x D	7	415	.0064	.0086	.0107	.0129	.0172
		Finish	2 x D	.015 x D	7	375	.0019	.0025	.0032	.0038	.0051
	Austenitic Stainless Steels, FeNi Alloys 303, 304, 316, Invar, Kovar	Slotting	.5 x D	1 x D	7	275	.0013	.0017	.0021	.0026	.0034
		Peripheral - Rough	1.25 x D	.3 x D	7	350	.0018	.0023	.0029	.0035	.0047
		Peripheral - HEM*	3 x D	.05 x D	7	390	.0063	.0083	.0104	.0125	.0167
		Finish	2 x D	.015 x D	7	350	.0018	.0024	.0030	.0036	.0048
	Precipitation Hardening Stainless Steels 17-4, 15-5	Slotting	.5 x D	1 x D	7	250	.0011	.0014	.0018	.0021	.0029
		Peripheral - Rough	1.25 x D	.3 x D	7	325	.0015	.0019	.0024	.0029	.0039
		Peripheral - HEM*	3 x D	.05 x D	7	360	.0050	.0067	.0083	.0100	.0133
		Finish	1.5 x D	.015 x D	7	325	.0015	.0020	.0025	.0030	.0040
S	Titanium Alloys 6Al-4V, 6-2-4	Slotting	.5 x D	1 x D	7	250	.0010	.0013	.0016	.0020	.0026
		Peripheral - Rough	1 x D	.3 x D	7	300	.0013	.0018	.0022	.0027	.0036
		Peripheral - HEM*	3 x D	.05 x D	7	330	.0047	.0063	.0079	.0095	.0126
		Finish	1.5 x D	.015 x D	7	300	.0014	.0018	.0023	.0027	.0036
	Difficult-to-Machine Titanium Alloys 10-2-3 Precipitation Hardening Stainless Steel M 13-8	Slotting	.25 x D	1 x D	7	200	.0007	.0010	.0012	.0015	.0019
		Peripheral - Rough	1 x D	.25 x D	7	250	.0011	.0014	.0018	.0021	.0028
		Peripheral - HEM*	3 x D	.05 x D	7	275	.0037	.0049	.0061	.0073	.0098
		Finish	1.5 x D	.01 x D	7	250	.0012	.0016	.0021	.0025	.0033

D = Tool Diameter *HEM = High-efficiency machining (chip thinning calculations have already been applied to HEM parameters shown).

≈ Approximately Equals < Less Than
≤ Less Than or Equal To > Greater Than
≥ Greater Than or Equal To = Equals
× Multiply

Common Machining Formulas

$$RPM = \frac{SFM \times 3.82}{D}$$

$$SFM = RPM \times D \times .262$$

$$IPM = RPM \times IPT \times Z$$

$$MRR = RDOC \times ADOC \times IPM$$

$$RPM = \frac{M/min \times 318.3}{D}$$

$$M/min = RPM \times D \times .00314$$

$$MMPM = RPM \times MMPT \times Z$$

$$MRR = RDOC \times ADOC \times MMPM$$