

GROUP #	MATERIAL GROUP	MATERIAL EXAMPLES	HARDNESS Hb	LOW SFM	HIGH SFM	RECOMMENDED MAX% STEPOVER @ 2x DIA LOC	CT IPT Ø 0.250	CT IPT Ø 0.375	CT IPT Ø 0.500	CT IPT Ø 0.625	CT IPT Ø 0.750	CT IPT 1.000
P4	Tool Steel	A2, P20, S7, H13, L6	<300	450	650	7.00%	0.0020	0.0031	0.0042	0.0055	0.0063	0.0080
P5	Ferritic, Martensitic & PH Stainless Steels	400'S, 15-5, 17-4 CUSTOM 400'S	>300	300	500	7.00%	0.0020	0.0029	0.0041	0.0053	0.0063	0.0080
M3	Duplex Steels (Austenitic & Ferritic)	255, 323, 329, 2202, 2205, 2304	<310	350	500	7.00%	0.0024	0.0037	0.0049	0.0063	0.0074	0.0102
S1	Iron-Based, Heat-Resistant Alloys	A-286, INVAR, Discaloy, INCOLOY 800-802, Nitronic	>200	200	425	7.00%	0.0022	0.0033	0.0046	0.0053	0.0059	0.0069
S3	Nickel-Based, Heat-Resistant Alloys	HAST-C, Rene 41, Waspalloy, Monel, Nimonic, UDIMET, INCO 718	>180	100	225	6.00%	0.0023	0.0036	0.0048	0.0059	0.0067	0.0091
S4	TITANIUM	Ti6AL4V	>270	325	450	8.00%	0.0020	0.0031	0.0042	0.0052	0.0059	0.0076
S4.2	TITANIUM	TITANIUM 10-2-3	<390	175	300	6.00%	0.0023	0.0036	0.0048	0.0059	0.0069	0.0093
H1	Hardened Tool Steels	D2, H13, S7	>360	325	525	4.00%	0.0016	0.0021	0.0025	0.0029	0.0032	0.0036
H2	Hardened Tool Steels	D2, H13, S7	>420	300	400	3.00%	0.0015	0.0019	0.0023	0.0027	0.0032	0.0036
H3	Hardened Tool Steels	D2, H13, S7	>485	225	300	2.00%	0.0014	0.0018	0.0022	0.0026	0.0031	0.0035
H4	Hardened Tool Steels	D2, H13, S7	>560	180	275	1.00%	0.0012	0.0016	0.0021	0.0025	0.0030	0.0034

NOTES:

Speed (SFM) and feed (CT IPT) numbers shown have been calculated based upon chip thinning practices. The CT IPT has been calculated based upon the mid range value between the LOW SFM and HIGH SFM. The values shown also are based upon the Length of Cut (AP) value of 2xØ.

Example: Group S4 being cut with a standard Ø 0.500 endmill with a 1.25" flute length can safely handle a 8% step over or 0.040" stepover (ae) at 1.00" depth of cut. The tool can safely run at 387 SFM and 0.0042" ipt.

Formula: RPM = SFM x 3.82 / Ø of the Tool | RPM = 387 x 3.82 / Ø 0.5 | RPM = 2957
FEEDRATE = RPM x CT IPT x # FLUTES | FEEDRATE = 2957 x 0.0042 x 6 | FEEDRATE = 74.5" ipm

Results: Ti6 Series endmill, 1/2 x 1/2 x 1-1/4 x 3-6F RH w/0.030R can safely run 2957 RPM & 74.5 ipm while cutting 1.00" depth of cut & 0.040" stepover.

We recommend using air blast instead of coolant to cool the tool anytime you are running over 500 SFM
We recommend reducing SFM & IPT by 30-40% when running finishing toolpaths if surface finish is not within quality limits
Chip thinning calculations are included in the chipload. No need to use a chip thinning calculator.

