

High Speed Steel and Cobalt Endmills Speeds & Feeds

Material	Grades	SFM		Feed by Endmill Diameter (IPT)							
		SFM	SFM	1/8	1/4	3/8	1/2	5/8	3/4	1	
		Uncoated	AITIN	(.1250)	(.2500)	(.3750)	(.5000)	(.0625)	(.7500)	(1.000)	
P - Steels											
High Strength Tool Steel	A2, D2, P20, H11, H13, S2, 01	50-75	75-90	.0010	.0015	.0020	.0025	.0030	.0040	.0060	
Low Carbon	A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012 5015, 9310	150-200	175-250	.0010	.0015	.0020	.0025	.0030	.0040	.0060	
Medium Carbon	1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100	75-100	100-125	.0010	.0015	.0020	.0025	.0030	.0040	.0060	
M - Stainless Steels											
Austenitic	301-304L, 310, 316L, 321, 347	115-150	120-170	.0010	.0015	.0020	.0025	.0030	.0035	.0040	
Martensitic	403, 410, 416, 420, 430, 431, 440	20-50	30-60	.0010	.0015	.0020	.0025	.0030	.0035	.0040	
Precipitation Hardening	12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO	90-110	100-120	.0010	.0015	.0020	.0025	.0030	.0035	.0040	
K - Cast Irons											
Ductile	A536, J434, 60-40-18	75-100	90-120	.0010	.0020	.0030	.0035	.0040	.0045	.0050	
Gray	A48, A436, A319, Class 20, G4000	90-130	100-150	.0010	.0020	.0030	.0040	.0050	.0060	.0080	
Malleable	A220, A602, J158	100-150	115-170	.0010	.0020	.0030	.0040	.0050	.0060	.0080	
N - Non-Ferrous											
Aluminum Alloys		600-800	800-1000	.0010	.0020	.0030	.0040	.0050	.0060	.0080	
Aluminum High Silicon		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
Brass/Bronze	Aluminum Bronze, Low Silicon Bronze	300-400	400-500	.0010	.0020	.0030	.0035	.0040	.0045	.0050	
Composites	G-10, Fiberglass, Graphite, Graphite Epoxy, Plastics	800-1000	950-1200	.0010	.0020	.0030	.0035	.0040	.0045	.0050	
Copper		150-250	200-300	.0010	.0020	.0030	.0040	.0050	.0060	.0080	
Magnesium		150-250	200-300	.0010	.0020	.0030	.0040	.0050	.0060	.0080	
Titanium	Commercially Pure, 6Al-4V ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si Ti-8Al-1Mo, Ti-8Al-4Mo	70-100	80-120	.0010	.0015	.0020	.0025	.0030	.0040	.0060	
S - High Temp Alloys											
Cobalt Base	Stellite, HS-21, Haynes 25/188, X40, L605	25-35	30-40	.0005	.0007	.0010	.0010	.0012	.0015	.0020	
Iron Base	Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3	30-40	35-45	.0005	.0007	.0010	.0010	.0012	.0015	.0020	
Nickel Base	Inconel 625/718, Inco 700, 713C, 718 Monel 400-401, 404, K401, Rene, Rene 41 & 95 Hastelloy, Waspoly Udimet 500 & 700	20-30	25-35	.0005	.0007	.0010	.0010	.0012	.0015	.0020	

NOTE: Speeds and Feeds listed are estimated and will vary by application.
 These General Purpose tools can be found on pages 181-183.