

HCM													
Material Guide		Hardness	SFM	Inches per Tooth (IPT)									
				Effective Cutting Diameter (Deff)									
				< .125	≥ .125 < .1875	≥ .1875 < .25	≥ .25 < .3125	≥ .3125 < .375	≥ .375 < .5	≥ .5 < .625	≥ .625 < .75	≥ .75	
WROUGHT ALUMINUM ALLOY	2014, 5052, 6061	< 120 HBS	2200	.0009	.0018	.0028	.0035	.0045	.0055	.0070	.0090	.0110	
	7050, 7075, 7475	≥ 120 HBS	2200	.0006	.0012	.0018	.0022	.0028	.0035	.0045	.0055	.0070	
CAST ALUMINUM ALLOY	319.0, 328.0, 355.0	< 120 HBS	1800	.0012	.0025	.0040	.0050	.0060	.0080	.0100	.0130	.0150	
	360.0, 380.0, 383.0 390.0, 520.0, 535.0	≥ 120 HBS	1600	.0010	.0020	.0030	.0040	.0050	.0060	.0080	.0100	.0120	
COPPER ALLOY	Cu-ETP, CuBe2 CuZn30, CuZn36Pb3 CuZn10, CuSn5	< 75 HRB	600	.0007	.0015	.0022	.0030	.0035	.0045	.0060	.0070	.0090	
		75 - 98 HRB	450	.0007	.0015	.0022	.0028	.0035	.0045	.0055	.0070	.0090	
CARBON STEEL	10XX, 11XX, 12XX 12LXX, ASTM A27 ASTM A36	< 75 HRB	450	.0010	.0020	.0030	.0040	.0050	.0060	.0080	.0100	.0120	
		75 - 98 HRB	450	.0007	.0015	.0020	.0028	.0035	.0040	.0055	.0070	.0080	
		21 - 36 HRC	400	.0005	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0060	
LOW ALLOY STEEL	13XX, 41XX, 43XX 51XX, 86XX, 93XX	75 - 98 HRB	400	.0006	.0012	.0018	.0025	.0030	.0035	.0050	.0060	.0070	
		21 - 36 HRC	350	.0005	.0009	.0015	.0018	.0022	.0028	.0035	.0045	.0055	
		36 - 50 HRC	200	.0003	.0006	.0010	.0012	.0015	.0020	.0025	.0030	.0040	
		> 50 HRC	90	.0002	.0005	.0007	.0010	.0012	.0015	.0020	.0025	.0030	
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	325	.0005	.0011	.0018	.0022	.0028	.0035	.0045	.0055	.0070	
		21 - 36 HRC	250	.0005	.0009	.0015	.0018	.0022	.0028	.0035	.0045	.0055	
		36 - 50 HRC	150	.0003	.0007	.0010	.0012	.0018	.0020	.0028	.0035	.0040	
		> 50 HRC	50	.0002	.0005	.0007	.0010	.0012	.0015	.0020	.0025	.0030	
SPECIALTY STEEL	300M, Invar 36, Kovar Maraging 200 Maraging 250 Maraging 300 Maraging 350	< 75 HRB	350	.0006	.0012	.0020	.0025	.0030	.0040	.0050	.0060	.0080	
		75 - 98 HRB	400	.0005	.0011	.0015	.0020	.0028	.0030	.0040	.0055	.0060	
		21 - 36 HRC	225	.0004	.0009	.0012	.0018	.0022	.0025	.0035	.0045	.0050	
		36 - 50 HRC	140	.0004	.0008	.0012	.0015	.0020	.0022	.0030	.0040	.0045	
		> 50 HRC	45	.0002	.0005	.0007	.0010	.0012	.0015	.0020	.0025	.0030	
AUSTENITIC STAINLESS STEEL	Nitronic 50 Nitronic 60, 301, 303 304, 304L Incoloy 27-7MO, 316 316L, 321, 347	75 - 98 HRB	250	.0004	.0009	.0012	.0018	.0022	.0028	.0035	.0045	.0055	
		21 - 36 HRC	225	.0004	.0009	.0012	.0018	.0022	.0025	.0035	.0045	.0050	
		36 - 50 HRC	175	.0003	.0007	.0010	.0012	.0018	.0020	.0028	.0035	.0040	
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420 440, 430, 446	75 - 98 HRB	325	.0004	.0008	.0012	.0018	.0020	.0025	.0035	.0040	.0050	
		21 - 36 HRC	300	.0005	.0011	.0018	.0022	.0028	.0035	.0045	.0055	.0070	
PH STAINLESS STEEL	15-5, 17-4 Carpenter 450 Carpenter 465	21 - 36 HRC	225	.0004	.0009	.0012	.0018	.0022	.0028	.0035	.0045	.0055	
		36 - 50 HRC	120	.0003	.0007	.0010	.0012	.0018	.0020	.0028	.0035	.0040	
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	450	.0011	.0022	.0035	.0045	.0055	.0070	.0090	.0110	.0130	
		21 - 36 HRC	400	.0008	.0015	.0022	.0030	.0040	.0045	.0060	.0080	.0090	
MALLEABLE CAST IRON	ASTM A47, ASTM A220 ASTM A602	75 - 98 HRB	350	.0007	.0012	.0020	.0028	.0035	.0040	.0055	.0070	.0080	
		21 - 36 HRC	300	.0005	.0009	.0015	.0020	.0022	.0028	.0040	.0045	.0055	
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	325	.0007	.0012	.0020	.0028	.0035	.0040	.0055	.0070	.0080	
		21 - 36 HRC	275	.0005	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0060	
		36 - 50 HRC	160	.0002	.0005	.0007	.0010	.0012	.0015	.0020	.0025	.0030	
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	450	.0008	.0015	.0022	.0030	.0040	.0045	.0060	.0080	.0090	
		75 - 98 HRB	450	.0007	.0015	.0020	.0028	.0035	.0040	.0055	.0070	.0080	
NICKEL ALLOY	Hastelloy C-22 Inconel 625, Waspaloy René 41, Inconel 718 Incoloy 20	75 - 98 HRB	175	.0004	.0009	.0012	.0018	.0022	.0028	.0035	.0045	.0055	
		21 - 36 HRC	150	.0004	.0008	.0012	.0015	.0020	.0025	.0030	.0040	.0050	
		36 - 50 HRC	80	.0004	.0007	.0011	.0015	.0018	.0020	.0028	.0035	.0040	
PURE TITANIUM	Ti Grade 1, Ti Grade 2 Ti Grade 3, Ti Grade 4 Ti Grade 7, Ti Grade 12	< 75 HRB	350	.0009	.0018	.0028	.0035	.0045	.0055	.0070	.0090	.0110	
		75 - 98 HRB	400	.0005	.0010	.0015	.0020	.0025	.0030	.0040	.0050	.0060	
		21 - 36 HRC	350	.0005	.0011	.0015	.0022	.0028	.0030	.0045	.0055	.0060	
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	21 - 36 HRC	200	.0004	.0009	.0012	.0018	.0022	.0028	.0035	.0045	.0055	
		36 - 50 HRC	140	.0004	.0007	.0010	.0015	.0018	.0022	.0030	.0035	.0045	
COBALT ALLOY	ASTM F562, ASTM F90 ASTM F75, ASTM F799	75 - 98 HRB	225	.0003	.0006	.0008	.0010	.0015	.0018	.0022	.0028	.0035	
		21 - 36 HRC	150	.0004	.0008	.0012	.0018	.0020	.0025	.0035	.0040	.0050	
		36 - 50 HRC	80	.0003	.0006	.0010	.0012	.0015	.0020	.0025	.0030	.0040	

NOTES:

Speed (SFM) and feed (IPT) numbers shown in the table above are considered to be average values. Use a tolerance of ± 25% as needed.

Hardness Scales: HBS = Brinell (500-kgf steel ball)

HRB = Rockwell B

HRC = Rockwell C