HPCM

SPEEDS & FEEDS

Chamfer Mills - Helical Flute

HPCM

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 7050, 7075, 7475	< 120 HBS ≥ 120 HBS	2200 2200	.0009 .0006	.0018 .0012	.0028 .0018	.0035 .0022	.0045 .0030	.0055 .0035	.0070 .0045	.0090 .0060	.0110 .0070
CAST ALUMINUM ALLOY	319.0, 328.0, 355.0 360.0, 380.0, 383.0 390.0, 520.0, 535.0	< 120 HBS ≥ 120 HBS	1800 1600	.0012 .0011	.0028 .0022	.0040 .0030	.0055 .0045	.0070 .0055	.0080 .0060	.0110 .0090	.0130 .0110	.0160 .0130
COPPER ALLOY	Cu-ETP , CuBe2 CuZn30 , CuZn36Pb3 CuZn10 , CuSn5	< 75 HRB 75 - 98 HRB	600 450	.0008 .0007	.0015 .0015	.0022 .0022	.0030 .0030	.0040 .0035	.0045 .0045	.0060 .0060	.0080 .0070	.0090 .0090
CARBON STEEL	10XX, 11XX, 12XX 12LXX, ASTM A27 ASTM A36	< 75 HRB 75 - 98 HRB 21 - 36 HRC	450 450 400	.0010 .0007 .0005	.0020 .0015 .0010	.0030 .0022 .0015	.0040 .0028 .0020	.0050 .0035 .0025	.0060 .0045 .0030	.0080 .0055 .0040	.0100 .0070 .0050	.0120 .0090 .0060
LOW ALLOY STEEL	13XX, 41XX, 43XX 51XX, 86XX, 93XX	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC > 50 HRC	400 350 200 90	.0006 .0005 .0003 .0003	.0012 .0010 .0007 .0005	.0020 .0015 .0010 .0008	.0025 .0020 .0012 .0010	.0030 .0025 .0018 .0012	.0040 .0028 .0020 .0015	.0050 .0040 .0028 .0020	.0060 .0050 .0035 .0025	.0080 .0055 .0040 .0030
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC > 50 HRC	325 250 150 50	.0006 .0005 .0003 .0002	.0010 .0010 .0007 .0005	.0018 .0015 .0010 .0007	.0022 .0020 .0012 .0010	.0028 .0025 .0018 .0012	.0035 .0028 .0020 .0015	.0045 .0040 .0028 .0020	.0055 .0050 .0035 .0025	.0070 .0055 .0040 .0030
SPECIALTY STEEL	300M, Invar 36, Kovar Maraging 200 Maraging 250 Maraging 300 Maraging 350	< 75 HRB 75 - 98 HRB 21 - 36 HRC 36 - 50 HRC > 50 HRC	350 400 225 140 45	.0006 .0005 .0004 .0004 .0003	.0012 .0011 .0009 .0008 .0005	.0020 .0018 .0012 .0012 .0008	.0025 .0022 .0018 .0015 .0010	.0030 .0028 .0022 .0020 .0012	.0040 .0035 .0028 .0025 .0015	.0050 .0045 .0035 .0030 .0020	.0060 .0055 .0045 .0040 .0025	.0080 .0070 .0055 .0050 .0030
AUSTENITIC STAINLESS STEEL	Nitronic 50 Nitronic 60 , 301, 303 304, 304L Incoloy 27-7MO, 316 316L, 321, 347	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	250 225 175	.0005 .0005 .0004	.0009 .0009 .0007	.0015 .0012 .0011	.0018 .0018 .0015	.0022 .0022 .0018	.0028 .0028 .0020	.0035 .0035 .0028	.0045 .0045 .0035	.0055 .0055 .0040
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420 440, 430, 446	75 - 98 HRB 21 - 36 HRC	325 300	.0004 .0006	.0009 .0012	.0012 .0018	.0018 .0022	.0022 .0028	.0025 .0035	.0035 .0045	.0045 .0055	.0050 .0070
PH STAINLESS STEEL	15-5, 17-4 Carpenter 450 Carpenter 465	21 - 36 HRC 36 - 50 HRC	225 120	.0005 .0003	.0009 .0007	.0012 .0010	.0018 .0015	.0022 .0018	.0028 .0020	.0035 .0028	.0045 .0035	.0055 .0040
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB 21 - 36 HRC	450 400	.0012 .0008	.0022 .0015	.0035 .0025	.0045 .0030	.0055 .0040	.0070 .0050	.0090 .0060	.0110 .0080	.0140 .0100
MALLEABLE CAST IRON	ASTM A47, ASTM A220 ASTM A602	75 - 98 HRB 21 - 36 HRC	350 300	.0007 .0005	.0012 .0010	.0020 .0015	.0028 .0020	.0035 .0025	.0040 .0030	.0055 .0040	.0070 .0050	.0080 .0060
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	325 275 160	.0007 .0005 .0003	.0015 .0010 .0005	.0020 .0015 .0008	.0028 .0020 .0010	.0035 .0025 .0012	.0040 .0030 .0015	.0055 .0040 .0020	.0070 .0050 .0025	.0080 .0060 .0030
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB 75 - 98 HRB	450 450	.0008 .0007	.0015 .0015	.0022 .0022	.0030 .0030	.0040 .0035	.0045 .0045	.0060 .0060	.0080 .0070	.0090 .0090
NICKEL ALLOY	Hastelloy C-22 Inconel 625, Waspaloy René 41 , Inconel 718 Incoloy 20	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	175 150 80	.0005 .0004 .0004	.0009 .0008 .0007	.0012 .0012 .0011	.0018 .0018 .0015	.0022 .0020 .0018	.0028 .0025 .0022	.0035 .0035 .0030	.0045 .0040 .0035	.0055 .0050 .0045
PURE TITANIUM	Ti Grade 1, Ti Grade 2 Ti Grade 3, Ti Grade 4 Ti Grade 7, Ti Grade 12	< 75 HRB 75 - 98 HRB 21 - 36 HRC	350 400 350	.0009 .0005 .0006	.0020 .0011 .0010	.0028 .0015 .0018	.0040 .0020 .0022	.0045 .0028 .0028	.0055 .0030 .0035	.0080 .0040 .0045	.0090 .0055 .0055	.0110 .0060 .0070
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V Ti 10V-2Fe-3Al	21 - 36 HRC 36 - 50 HRC	200 140	.0005 .0004	.0009 .0008	.0012 .0012	.0018 .0015	.0022 .0020	.0028 .0022	.0035 .0030	.0045 .0040	.0055 .0045
COBALT ALLOY	ASTM F562 , ASTM F90 ASTM F75, ASTM F799	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	225 150 80	.0003 .0004 .0003	.0006 .0009 .0007	.0009 .0012 .0010	.0012 .0018 .0012	.0015 .0022 .0018	.0018 .0028 .0020	.0022 .0035 .0028	.0030 .0045 .0035	.0035 .0055 .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