

HCCM

SPEEDS AND FEEDS

Combination Chamfer / End Mills - 4 Flute - High Performance

HCCM													
Material Guide		Hardness	SFM	Inches Per Tooth (IPT)									
				1/8		3/16		1/4		3/8		1/2	
				Rgh	Chf	Rgh	Chf	Rgh	Chf	Rgh	Chf	Rgh	Chf
CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB	455	.0012	.0010	.0018	.0020	.0024	.0030	.0036	.0050	.0047	.0060
		75 - 98 HRB	445	.0009	.0007	.0013	.0015	.0018	.0022	.0026	.0035	.0034	.0045
		21 - 36 HRC	400	.0006	.0005	.0009	.0010	.0011	.0015	.0017	.0025	.0022	.0030
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	390	.0008	.0006	.0011	.0012	.0015	.0020	.0023	.0030	.0030	.0040
		21 - 36 HRC	340	.0006	.0005	.0009	.0010	.0012	.0015	.0017	.0025	.0022	.0028
		36 - 50 HRC	260	.0005	.0003	.0007	.0007	.0010	.0010	.0015	.0018	.0019	.0020
		> 50 HRC	155	.0004	.0003	.0006	.0005	.0008	.0008	.0012	.0012	.0015	.0015
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB	340	.0008	.0005	.0011	.0010	.0015	.0018	.0023	.0028	.0030	.0035
		21 - 36 HRC	250	.0006	.0005	.0009	.0010	.0012	.0015	.0018	.0025	.0024	.0028
		36 - 50 HRC	145	.0005	.0003	.0007	.0007	.0010	.0010	.0014	.0018	.0019	.0020
		> 50 HRC	85	.0004	.0002	.0006	.0005	.0008	.0007	.0012	.0012	.0015	.0015
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	290	.0010	.0006	.0015	.0012	.0020	.0020	.0030	.0030	.0039	.0040
		75 - 98 HRB	255	.0007	.0005	.0010	.0014	.0014	.0018	.0021	.0028	.0027	.0035
		21 - 36 HRC	175	.0006	.0004	.0009	.0009	.0012	.0012	.0018	.0022	.0024	.0028
		36 - 50 HRC	150	.0006	.0004	.0008	.0008	.0011	.0012	.0016	.0020	.0021	.0025
		> 50 HRC	55	.0004	.0003	.0005	.0005	.0007	.0008	.0010	.0012	.0013	.0015
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB	265	.0008	.0005	.0011	.0009	.0015	.0015	.0022	.0022	.0029	.0028
		21 - 36 HRC	225	.0007	.0005	.0010	.0009	.0014	.0012	.0020	.0022	.0026	.0028
		36 - 50 HRC	180	.0006	.0004	.0008	.0007	.0011	.0011	.0016	.0018	.0021	.0020
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB	300	.0008	.0004	.0011	.0009	.0016	.0012	.0023	.0022	.0030	.0025
		21 - 36 HRC	280	.0007	.0006	.0010	.0012	.0013	.0018	.0020	.0028	.0026	.0035
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	200	.0006	.0005	.0008	.0009	.0011	.0012	.0017	.0022	.0022	.0028
		36 - 50 HRC	145	.0005	.0003	.0007	.0007	.0010	.0010	.0014	.0018	.0019	.0020
GRAY CAST IRON	SAE J431, ASTM A48	75 - 98 HRB	410	.0013	.0012	.0019	.0022	.0025	.0035	.0037	.0055	.0048	.0070
		21 - 36 HRC	370	.0007	.0008	.0010	.0015	.0013	.0025	.0020	.0040	.0026	.0050
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	345	.0008	.0007	.0012	.0012	.0016	.0020	.0023	.0035	.0031	.0040
		21 - 36 HRC	335	.0007	.0005	.0010	.0010	.0014	.0015	.0020	.0025	.0026	.0030
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB	310	.0008	.0007	.0012	.0015	.0016	.0020	.0024	.0035	.0032	.0040
		21 - 36 HRC	260	.0006	.0005	.0008	.0010	.0011	.0015	.0016	.0025	.0021	.0030
		36 - 50 HRC	135	.0004	.0003	.0005	.0005	.0007	.0008	.0010	.0012	.0013	.0015
PURE NICKEL	Nickel 200, Nickel 201	< 75 HRB	285	.0011	.0008	.0016	.0015	.0021	.0022	.0031	.0040	.0041	.0045
		75 - 98 HRB	250	.0009	.0007	.0013	.0015	.0018	.0022	.0026	.0035	.0034	.0045
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	80	.0005	.0005	.0008	.0009	.0011	.0012	.0016	.0022	.0021	.0028
		21 - 36 HRC	75	.0005	.0004	.0008	.0008	.0010	.0012	.0015	.0020	.0020	.0025
		36 - 50 HRC	70	.0005	.0004	.0007	.0007	.0009	.0011	.0013	.0018	.0017	.0022
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	300	.0015	.0009	.0022	.0020	.0029	.0028	.0043	.0045	.0057	.0055
		75 - 98 HRB	275	.0012	.0005	.0018	.0011	.0024	.0015	.0036	.0028	.0047	.0030
		21 - 36 HRC	250	.0009	.0006	.0014	.0010	.0018	.0018	.0027	.0028	.0036	.0035
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	180	.0007	.0005	.0011	.0009	.0014	.0012	.0021	.0022	.0028	.0028
		36 - 50 HRC	160	.0007	.0004	.0010	.0008	.0013	.0012	.0020	.0020	.0026	.0022
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	210	.0006	.0003	.0009	.0006	.0012	.0009	.0018	.0015	.0024	.0018
		21 - 36 HRC	170	.0006	.0004	.0009	.0009	.0012	.0012	.0017	.0028	.0023	.0028
			65	.0004	.0003	.0006	.0007	.0008	.0010	.0012	.0018	.0016	.0020

Milling Process	Hardness	ADOC	RDOC
Rgh (Traditional Roughing)	< 35 HRC	Up to Max LOC	30%-40% Diameter
	≥ 35 HRC	Up to Max LOC	25%-35% Diameter
Chf (Chamfering)	N/A	3 Passes	