Material	Hardness	SFM	Chip Load (IPT) by Cutter Diameter									
			.078		.093		.125		.187		.250	
			Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh	Slot	Rgh
Carbon Steel: 10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	< 75 HRB	800	.0017	.0036	.0021	.0043	.0027	.0057	.0040	.0085	.0053	.0113
	75 - 98 HRB	750	.0013	.0024	.0015	.0028	.0020	.0037	.0030	.0055	.0040	.0073
	21 - 36 HRC	700	.0008	.0017	.0010	.0020	.0013	.0025	.0020	.0038	.0027	.0050
Low Alloy Steel: 13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB	600	.0017	.0036	.0021	.0043	.0027	.0057	.0040	.0085	.0053	.0113
	21 - 36 HRC	550	.0017	.0030	.0021	.0036	.0027	.0047	.0040	.0070	.0053	.0093
	36 - 50 HRC	400	.0013	.0020	.0015	.0025	.0020	.0033	.0030	.0050	.0040	.0067
	> 50 HRC	350	.0008	.0013	.0010	.0015	.0013	.0020	.0020	.0030	.0027	.0040
Tool Steel: A2, H13, L6, P20, S7	75 - 98 HRB	550	.0017	.0036	.0021	.0043	.0027	.0057	.0040	.0085	.0053	.0113
	21 - 36 HRC	500	.0017	.0030	.0021	.0036	.0027	.0047	.0040	.0070	.0053	.0093
	36 - 50 HRC	450	.0013	.0020	.0015	.0025	.0020	.0033	.0030	.0050	.0040	.0067
	> 50 HRC	400	.0008	.0013	.0010	.0015	.0013	.0020	.0020	.0030	.0027	.0040
Specialty Steel: 300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	< 75 HRB	450	.0017	.0042	.0021	.0051	.0027	.0067	.0040	.0100	.0053	.0133
	75 - 98 HRB	500	.0017	.0038	.0021	.0045	.0027	.0060	.0040	.0090	.0053	.0120
	21 - 36 HRC	450	.0017	.0030	.0021	.0036	.0027	.0047	.0040	.0070	.0053	.0093
	36 - 50 HRC	400	.0013	.0020	.0015	.0025	.0020	.0033	.0030	.0050	.0040	.0067
	> 50 HRC	350	.0008	.0013	.0010	.0015	.0013	.0020	.0020	.0030	.0027	.0040
Austenitic Stainless Steel: Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321,	75 - 98 HRB	500	.0017	.0033	.0021	.0040	.0027	.0053	.0040	.0080	.0053	.0107
	21 - 36 HRC	450	.0017	.0030	.0021	.0036	.0027	.0047	.0040	.0070	.0053	.0093
	36 - 50 HRC	400	.0016	.0025	.0018	.0030	.0022	.0040	.0033	.0060	.0043	.0080
Martensitic & Ferritic Stainless Steel: 403, 410, 416, 420, 440, 430,	75 - 98 HRB	750	.0017	.0024	.0020	.0028	.0025	.0037	.0038	.0055	.0050	.0073
	21 - 36 HRC	650	.0017	.0033	.0021	.0040	.0027	.0053	.0040	.0080	.0053	.0107
PH Stainless Steel: 15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC	450	.0017	.0024	.0020	.0028	.0025	.0037	.0038	.0055	.0050	.0073
	36 - 50 HRC	400	.0013	.0020	.0015	.0025	.0020	.0033	.0030	.0050	.0040	.0067
Gray Cast Iron: ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	600	.0017	.0037	.0021	.0044	.0027	.0056	.0040	.0084	.0053	.0111
	21 - 36 HRC	550	.0017	.0039	.0021	.0047	.0027	.0063	.0040	.0095	.0053	.0127
Malleable Cast Iron: ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB	550	.0017	.0037	.0021	.0044	.0027	.0056	.0040	.0084	.0053	.0111
	21 - 36 HRC	450	.0040	.0025	.0021	.0030	.0027	.0040	.0040	.0060	.0053	.0080
Nodular (Ductile) Cast Iron: ASTM A536, ASTM 897	75 - 98 HRB	500	.0017	.0037	.0021	.0044	.0027	.0056	.0040	.0084	.0053	.0111
	21 - 36 HRC	450	.0018	.0025	.0021	.0030	.0027	.0040	.0040	.0060	.0053	.0080
	36 - 50 HRC	400	.0008	.0013	.0010	.0015	.0013	.0020	.0020	.0030	.0027	.0040
Pure Nickel: Nickel 200, Nickel 201	< 75 HRB	600	.0017	.0028	.0021	.0034	.0027	.0047	.0040	.0070	.0053	.0094
	75 - 98 HRB	550	.0018	.0027	.0021	.0032	.0027	.0043	.0040	.0065	.0053	.0087
Nickel Alloy: Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB	200	.0017	.0023	.0021	.0028	.0027	.0038	.0040	.0056	.0053	.0075
	21 - 36 HRC	180	.0017	.0019	.0021	.0024	.0027	.0033	.0040	.0049	.0053	.0066
	36 - 50 HRC	150	.0016	.0018	.0018	.0021	.0022	.0028	.0033	.0042	.0043	.0056
Pure Titanium: Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	< 75 HRB	350	.0017	.0028	.0021	.0034	.0027	.0047	.0040	.0070	.0053	.0094
	75 - 98 HRB	400	.0017	.0026	.0021	.0032	.0027	.0042	.0040	.0063	.0053	.0084
	21 - 36 HRC	325	.0017	.0025	.0021	.0030	.0027	.0040	.0040	.0060	.0053	.0080
Titanium Alloy: Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 36 HRC	300	.0017	.0019	.0021	.0024	.0027	.0033	.0040	.0049	.0053	.0066
	36 - 50 HRC	250	.0017	.0014	.0020	.0017	.0025	.0023	.0038	.0035	.0050	.0047
Cobalt Alloy: ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB	225	.0013	.0014	.0015	.0017	.0020	.0023	.0030	.0035	.0040	.0047
	21 - 36 HRC	150	.0017	.0023	.0021	.0028	.0027	.0035	.0040	.0053	.0053	.0070
	36 - 50 HRC	90	.0013	.0014	.0015	.0017	.0020	.0023	.0030	.0035	.0040	.0047

Milling Process	Hardness	Axial Depth of Cut	Radial Depth of Cut
Slotting	< 35 HRC	.03x-.05xDia	1xDia
	≥ 35 HRC	.025x-.04xDia	1xDia
Roughing	< 35 HRC	.03x-.05xDia	≥ .65xDia
	≥ 35 HRC	.0275x-.0425xDia	≥ .65xDia

HARVEY TOOL

Speeds & Feeds

Product Table: High Feed End Mills for High Temp Alloys
Characteristics: 3x, 5x, 8x Reach Multiple
Series: 7098xx, 7100xx, 7119xx, 7120xx, 7121xx, 7122xx, 7123xx, 7124xx

Please note:

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions.

If you require additional information, Harvey Tool has a team of technical experts available to assist you through even the most challenging applications. Please contact us at **800-645-5609** or **Harveytech@harveyperformance.com**.