

MATERIAL		Hardness: ≤ 28 Rc (≤ 271 HBn)																
		SFM	Chip Load (IPT) by Dia			Depth of Cut		Chip Load (IPT) by Cutter Dia						Depth of Cut				
			0.015	0.031	0.047	Radial	Axial	0.062	0.078	0.093	0.125	0.187	0.250	0.375	0.500	Radial	Axial	
ALUMINUM ALLOYS		Sloting	.00017	.00035	.00054	1 x Dia	.14 x Dia	.00061	.00077	.00092	.00124	.00185	.00248	.00371	.00495	1 x Dia	.35 x Dia	
Casting (2xx, 5xx, 7xx, 8xx)		750	Roughing	.00017	.00035	.00054	13 x Dia	3 x Dia	.00061	.00077	.00092	.00124	.00185	.00248	.00371	.00495	25 x Dia	3 x Dia
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)		1000	Finishing	.00022	.00045	.00068	.08 x Dia	3 x Dia	.00078	.00098	.00116	.00156	.00234	.00313	.00469	.00626	.15 x Dia	3 x Dia
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		750	Sloting	.00015	.00032	.00048	1 x Dia	.14 x Dia	.00055	.00069	.00083	.00111	.00167	.00223	.00334	.00446	1 x Dia	.35 x Dia
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		700	Roughing	.00015	.00032	.00048	.13 x Dia	3 x Dia	.00055	.00069	.00083	.00111	.00167	.00223	.00334	.00446	25 x Dia	3 x Dia
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		650	Finishing	.00019	.00040	.00061	.08 x Dia	3 x Dia	.00070	.00088	.00105	.00141	.00211	.00282	.00422	.00563	.15 x Dia	3 x Dia
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)		475	Sloting	.00017	.00035	.00054	1 x Dia	.14 x Dia	.00061	.00077	.00092	.00124	.00185	.00248	.00371	.00495	1 x Dia	.35 x Dia
Wrought - 5%-8% Si (4xxx)		1000	Roughing	.00017	.00035	.00054	13 x Dia	3 x Dia	.00061	.00077	.00092	.00124	.00185	.00248	.00371	.00495	25 x Dia	3 x Dia
Wrought - 8%-12% Si (4xxx)		800	Finishing	.00022	.00045	.00068	.08 x Dia	3 x Dia	.00078	.00098	.00116	.00156	.00234	.00313	.00469	.00626	.15 x Dia	3 x Dia
MAGNESIUM ALLOYS		1500	Sloting	.00017	.00035	.00054	1 x Dia	.14 x Dia	.00061	.00077	.00092	.00124	.00185	.00248	.00371	.00495	1 x Dia	.35 x Dia
			Roughing	.00017	.00035	.00054	13 x Dia	3 x Dia	.00061	.00077	.00092	.00124	.00185	.00248	.00371	.00495	25 x Dia	3 x Dia
ZINC ALLOYS		800	Finishing	.00022	.00045	.00068	.08 x Dia	3 x Dia	.00078	.00098	.00116	.00156	.00234	.00313	.00469	.00626	.15 x Dia	3 x Dia
COPPER ALLOYS		225	Sloting	.00014	.00028	.00043	1 x Dia	.14 x Dia	.00049	.00062	.00074	.00099	.00148	.00198	.00297	.00396	1 x Dia	.35 x Dia
High Coppers - 90%+ (C1xxx)		500	Roughing	.00014	.00028	.00043	.13 x Dia	3 x Dia	.00049	.00062	.00074	.00099	.00148	.00198	.00297	.00396	25 x Dia	3 x Dia
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C6400-C69800)		225	Finishing	.00019	.00040	.00061	.08 x Dia	3 x Dia	.00070	.00088	.00105	.00141	.00211	.00282	.00422	.00563	.15 x Dia	3 x Dia
Phosphor Bronzes (Copper Tin alloys, C5xxx)		500	Sloting	.00014	.00028	.00043	1 x Dia	.14 x Dia	.00049	.00062	.00074	.00099	.00148	.00198	.00297	.00396	1 x Dia	.35 x Dia
Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)		500	Roughing	.00014	.00028	.00043	.13 x Dia	3 x Dia	.00049	.00062	.00074	.00099	.00148	.00198	.00297	.00396	25 x Dia	3 x Dia
Silicon Bronzes (Copper Silicon alloys, C64700-C68100)		500	Finishing	.00019	.00040	.00061	.08 x Dia	3 x Dia	.00070	.00088	.00105	.00141	.00211	.00282	.00422	.00563	.15 x Dia	3 x Dia
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)		225	Sloting	.00014	.00028	.00043	1 x Dia	.14 x Dia	.00049	.00062	.00074	.00099	.00148	.00198	.00297	.00396	1 x Dia	.35 x Dia
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)		550	Roughing	.00014	.00028	.00043	.13 x Dia	3 x Dia	.00049	.00062	.00074	.00099	.00148	.00198	.00297	.00396	25 x Dia	3 x Dia
			Finishing	.00019	.00040	.00061	.08 x Dia	3 x Dia	.00070	.00088	.00105	.00141	.00211	.00282	.00422	.00563	.15 x Dia	3 x Dia



Speeds & Feeds

Product Table: Miniature End Mills - Corner Radius - Stub & Standard
Characteristics: 3x, 4x Length of Cut, 3 Flutes
Series: 8317xx, 8318xx, 8319xx, 8320xx, 8321xx, 8426xx, 8483xx, 8534xx, 8541xx, 8577xx, 8672xx, 8709xx

Please note:

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. Chip loads reflect uncoated cutters and may be increased 10%-20% if coated. For ferrous materials with hardness ≤ 28 Rc, chip loads can be increased 10%-20%.

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.

WARNING: Cutting tools may shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment in the vicinity of use.

MATERIAL		Hardness: 29-37 Rc (279-344 HBn)																
		SFM	Chip Load (IPT) by Dia			Depth of Cut		Chip Load (IPT) by Cutter Dia						Depth of Cut				
			0.015	0.031	0.047	Radial	Axial	0.062	0.078	0.093	0.125	0.187	0.250	0.375	0.500	Radial	Axial	
CARBON STEELS		Sloting	.00006	.00012	.00018	1 x Dia	.14 x Dia	.00021	.00027	.00032	.00043	.00064	.00085	.00128	.00170	1 x Dia	.35 x Dia	
Free-Machining/Low Carbon steels, 10xx-1029 & all 10Lxx, 11xx-1139 & all 11Lxx, 12xx-1215 & all 12Lxx		600	Roughing	.00005	.00011	.00017	.13 x Dia	3 x Dia	.00019	.00024	.00028	.00038	.00057	.00077	.00115	.00153	25 x Dia	3 x Dia
			Finishing	.00007	.00014	.00021	.08 x Dia	3 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.15 x Dia	3 x Dia
1030-1095, 1140-1151, 13xx, 15xx, 20xx, 30xx, 40xx & 44Lxx, 50xx & 54Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 60xx, 80xx, 90xx		200	Sloting	.00005	.00011	.00017	1 x Dia	.14 x Dia	.00019	.00024	.00029	.00039	.00058	.00078	.00117	.00156	1 x Dia	.35 x Dia
			Roughing	.00005	.00010	.00015	.13 x Dia	3 x Dia	.00017	.00022	.00026	.00035	.00052	.00070	.00105	.00140	25 x Dia	3 x Dia
			Finishing	.00006	.00013	.00019	.08 x Dia	3 x Dia	.00022	.00028	.00033	.00045	.00067	.00089	.00134	.00179	.15 x Dia	3 x Dia
STAINLESS STEELS		Sloting	.00006	.00012	.00018	1 x Dia	.14 x Dia	.00021	.00027	.00032	.00043	.00064	.00085	.00128	.00170	1 x Dia	.35 x Dia	
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe		450	Roughing	.00005	.00011	.00017	.13 x Dia	3 x Dia	.00019	.00024	.00028	.00038	.00057	.00077	.00115	.00153	25 x Dia	3 x Dia
			Finishing	.00007	.00014	.00021	.08 x Dia	3 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.15 x Dia	3 x Dia
201, 202, 203, 205, 301, 302, 304, 304L, 308, 309, 310, 314, 316, 316L, 317, 321, 329, 330, 347, 348, 385, 403, 405, 409, 410, 413, 420, 429, 430, 434, 436, 442, 446, 501, 502		200	Sloting	.00005	.00011	.00017	1 x Dia	.14 x Dia	.00019	.00024	.00029	.00039	.00058	.00078	.00117	.00156	1 x Dia	.35 x Dia
			Roughing	.00005	.00010	.00015	.13 x Dia	3 x Dia	.00017	.00022	.00026	.00035	.00052	.00070	.00105	.00140	25 x Dia	3 x Dia
			Finishing	.00006	.00013	.00019	.08 x Dia	3 x Dia	.00022	.00028	.00033	.00045	.00067	.00089	.00134	.00179	.15 x Dia	3 x Dia
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7		150	Sloting	.00003	.00007	.00011	1 x Dia	.14 x Dia	.00012	.00015	.00018	.00024	.00036	.00049	.00073	.00097	1 x Dia	.35 x Dia
			Roughing	.00003	.00006	.00009	.13 x Dia	3 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	25 x Dia	3 x Dia
			Finishing	.00004	.00008	.00012	.08 x Dia	3 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.15 x Dia	3 x Dia
TOOL STEELS		Sloting	.00005	.00011	.00017	1 x Dia	.14 x Dia	.00019	.00024	.00029	.00039	.00058	.00078	.00117	.00156	1 x Dia	.35 x Dia	
A, L, O, P, W series		200	Roughing	.00005	.00010	.00015	.13 x Dia	3 x Dia	.00017	.00022	.00026	.00035	.00052	.00070	.00105	.00140	25 x Dia	3 x Dia
			Finishing	.00006	.00013	.00019	.08 x Dia	3 x Dia	.00022	.00028	.00033	.00045	.00067	.00089	.00134	.00179	.15 x Dia	3 x Dia
D, H, M, T, S series		150	Sloting	.00003	.00007	.00011	1 x Dia	.14 x Dia	.00012	.00015	.00018	.00024	.00036	.00049	.00073	.00097	1 x Dia	.35 x Dia
			Roughing	.00003	.00006	.00009	.13 x Dia	3 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	25 x Dia	3 x Dia
			Finishing	.00004	.00008	.00012	.08 x Dia	3 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.15 x Dia	3 x Dia
TITANIUM ALLOYS		Sloting	.00003	.00007	.00011	1 x Dia	.14 x Dia	.00012	.00015	.00018	.00024	.00036	.00049	.00073	.00097	1 x Dia	.35 x Dia	
		150	Roughing	.00003	.00006	.00009	.13 x Dia	3 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	25 x Dia	3 x Dia
			Finishing	.00004	.00008	.00012	.08 x Dia	3 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.15 x Dia	3 x Dia
HIGH TEMP ALLOYS		Sloting	.00003	.00007	.00011	1 x Dia	.14 x Dia	.00012	.00015	.00018	.00024	.00036	.00049	.00073	.00097	1 x Dia	.35 x Dia	
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy		70	Roughing	.00003	.00006	.00009	.13 x Dia	3 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	25 x Dia	3 x Dia
			Finishing	.00004	.00008	.00012	.08 x Dia	3 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.15 x Dia	3 x Dia

MATERIAL		Hardness: 38-45 Rc (353-421 HBn)																
		SFM	Chip Load (IPT) by Dia			Depth of Cut		Chip Load (IPT) by Cutter Dia						Depth of Cut				
			0.015	0.031	0.047	Radial	Axial	0.062	0.078	0.093	0.125	0.187	0.250	0.375	0.500	Radial	Axial	
			Sloting	.00003	.00007	.00011	1 x Dia	.14 x Dia	.00012	.00015	.00018	.00024	.00036	.00049	.00073	.00097	1 x Dia	.35 x Dia
			Roughing	.00002	.00005	.00008	.13 x Dia	3 x Dia	.00009	.00011	.00013	.00017	.00026	.00035	.00052	.00070	25 x Dia	3 x Dia
			Finishing	.00003	.00006	.00010	.08 x Dia	3 x Dia	.00011	.00014	.00017	.00023	.00034	.00045	.00068	.00090	.15 x Dia	3 x Dia
		100	Sloting	.00003	.00006	.00008	1 x Dia	.14 x Dia	.00010	.00012	.00014	.00019	.00029	.				