

MATERIAL	SFM	Hardness: ≤ 28 Rc (≤ 271 HBn)															
		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	750	Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
		Roughing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000	Finishing	.00022	.00045	.00068	.03 x Dia	.3 x Dia	.00078	.00098	.00116	.00156	.00234	.00313	.00469	.00626	.06 x Dia	.3 x Dia
		Slotting	.00008	.00016	.00024	1 x Dia	.06 x Dia	.00028	.00035	.00041	.00056	.00083	.00111	.00167	.00223	1 x Dia	.15 x Dia
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	750	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00008	.00016	.00024	1 x Dia	.06 x Dia	.00028	.00035	.00041	.00056	.00083	.00111	.00167	.00223	1 x Dia	.15 x Dia
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	700	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00008	.00016	.00024	1 x Dia	.06 x Dia	.00028	.00035	.00041	.00056	.00083	.00111	.00167	.00223	1 x Dia	.15 x Dia
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	650	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00008	.00016	.00024	1 x Dia	.06 x Dia	.00028	.00035	.00041	.00056	.00083	.00111	.00167	.00223	1 x Dia	.15 x Dia
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	475	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00008	.00016	.00024	1 x Dia	.06 x Dia	.00028	.00035	.00041	.00056	.00083	.00111	.00167	.00223	1 x Dia	.15 x Dia
Wrought - 5%-8% Si (4xxx)	1000	Finishing	.00019	.00040	.00061	.03 x Dia	.3 x Dia	.00070	.00088	.00105	.00141	.00211	.00282	.00422	.00563	.06 x Dia	.3 x Dia
		Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
Wrought - 8%-12% Si (4xxx)	800	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
MAGNESIUM ALLOYS	1500	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
ZINC ALLOYS	800	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
COPPER ALLOYS	225	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00007	.00014	.00021	1 x Dia	.06 x Dia	.00025	.00031	.00037	.00050	.00074	.00099	.00149	.00198	1 x Dia	.15 x Dia
High Coppers - 90%+ (C1xxx)	225	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00007	.00014	.00021	1 x Dia	.06 x Dia	.00025	.00031	.00037	.00050	.00074	.00099	.00149	.00198	1 x Dia	.15 x Dia
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C66400-C66800)	225	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00007	.00014	.00021	1 x Dia	.06 x Dia	.00025	.00031	.00037	.00050	.00074	.00099	.00149	.00198	1 x Dia	.15 x Dia
Phosphor Bronzes (Copper Tin alloys, C5xxx)	225	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00007	.00014	.00021	1 x Dia	.06 x Dia	.00025	.00031	.00037	.00050	.00074	.00099	.00149	.00198	1 x Dia	.15 x Dia
Aluminum Bronzes (Copper Aluminum alloys, C66000-C64200)	500	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00009	.00018	.00027	1 x Dia	.06 x Dia	.00031	.00039	.00046	.00062	.00093	.00124	.00186	.00248	1 x Dia	.15 x Dia
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)	225	Finishing	.00011	.00022	.00033	.15 x Dia	.25 x Dia	.00038	.00048	.00058	.00077	.00116	.00155	.00232	.00309	.30 x Dia	.25 x Dia
		Slotting	.00007	.00014	.00021	1 x Dia	.06 x Dia	.00025	.00031	.00037	.00050	.00074	.00099	.00149	.00198	1 x Dia	.15 x Dia
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	550	Finishing	.00017	.00036	.00054	.03 x Dia	.3 x Dia	.00062	.00078	.00093	.00125	.00187	.00250	.00375	.00501	.06 x Dia	.3 x Dia
		Slotting	.00007	.00014	.00021	1 x Dia	.06 x Dia	.00025	.00031	.00037	.00050	.00074	.00099	.00149	.00198	1 x Dia	.15 x Dia



Speeds & Feeds

Product Table: Miniature End Mills - Square - Long Reach, Standard Flute
Characteristics: 15x Reach Multiple, 2 Flutes
Series: 8291xx, 8292xx

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	SFM	Hardness: 29-37 Rc (279-344 HBn)															
		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	600	Slotting	.00003	.00006	.00009	1 x Dia	.06 x Dia	.00011	.00013	.00016	.00021	.00032	.00043	.00064	.00085	1 x Dia	.15 x Dia
		Roughing	.00003	.00007	.00010	.15 x Dia	.25 x Dia	.00012	.00015	.00018	.00024	.00036	.00048	.00072	.00096	.30 x Dia	.25 x Dia
Free-Machining/Low Carbon steels, 10xx, 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	200	Finishing	.00007	.00014	.00021	.03 x Dia	.3 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.06 x Dia	.3 x Dia
		Slotting	.00003	.00006	.00008	1 x Dia	.06 x Dia	.00010	.00012	.00014	.00019	.00029	.00039	.00058	.00078	1 x Dia	.15 x Dia
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx	200	Roughing	.00003	.00006	.00009	.15 x Dia	.25 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	.30 x Dia	.25 x Dia
		Finishing	.00006	.00013	.00019	.03 x Dia	.3 x Dia	.00022	.00028	.00033	.00045	.00067	.00089	.00134	.00179	.06 x Dia	.3 x Dia
STAINLESS STEELS	450	Slotting	.00003	.00006	.00009	1 x Dia	.06 x Dia	.00011	.00013	.00016	.00021	.00032	.00043	.00064	.00085	1 x Dia	.15 x Dia
		Roughing	.00003	.00007	.00010	.15 x Dia	.25 x Dia	.00012	.00015	.00018	.00024	.00036	.00048	.00072	.00096	.30 x Dia	.25 x Dia
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	200	Finishing	.00007	.00014	.00021	.03 x Dia	.3 x Dia	.00024	.00031	.00036	.00049	.00073	.00098	.00147	.00196	.06 x Dia	.3 x Dia
		Slotting	.00003	.00006	.00008	1 x Dia	.06 x Dia	.00010	.00012	.00014	.00019	.00029	.00039	.00058	.00078	1 x Dia	.15 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	Roughing	.00003	.00006	.00009	.15 x Dia	.25 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	.30 x Dia	.25 x Dia
		Finishing	.00006	.00013	.00019	.03 x Dia	.3 x Dia	.00022	.00028	.00033	.00045	.00067	.00089	.00134	.00179	.06 x Dia	.3 x Dia
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-7, 17-7	150	Slotting	.00002	.00003	.00005	1 x Dia	.06 x Dia	.00006	.00008	.00009	.00012	.00018	.00024	.00036	.00049	1 x Dia	.15 x Dia
		Roughing	.00002	.00004	.00006	.15 x Dia	.25 x Dia	.00007	.00009	.00010	.00014	.00020	.00027	.00041	.00055	.30 x Dia	.25 x Dia
TOOL STEELS	200	Finishing	.00004	.00008	.00012	.03 x Dia	.3 x Dia	.00014	.00017	.00021	.00028	.00042	.00056	.00084	.00112	.06 x Dia	.3 x Dia
		Slotting	.00003	.00006	.00008	1 x Dia	.06 x Dia	.00010	.00012	.00014	.00019	.00029	.00039	.00058	.00078	1 x Dia	.15 x Dia
A, L, O, P, W series	200	Roughing	.00003	.00006	.00009	.15 x Dia	.25 x Dia	.00011	.00014	.00016	.00022	.00033	.00044	.00066	.00087	.30 x Dia	.25 x Dia
		Finishing	.00006	.00013	.00019	.03 x Dia	.3 x Dia	.00022	.00028	.00033	.00045	.00067	.00089	.00134	.00179	.06 x Dia	.3 x Dia
D, H, M, T, S series	150	Slotting	.00002	.00003	.00005	1 x Dia	.06 x Dia	.00006	.00008	.00009	.00012	.00018	.00024	.00036	.00049	1 x Dia	.15 x Dia
		Roughing	.00002	.00004	.00006	.15 x Dia	.25 x Dia	.00007	.00009	.00010	.000						