



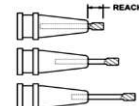
Speeds & Feeds

Product Table: End Mills - Square - Reduced Shank
 Characteristics: 2 Flutes
 Series: 9078xx

Product Notes:

Reduced shank end mills can be chucked at a variety of reach lengths. Posted values reflect a 3x reach length (ex. a 1/8 diameter mill chucked at a 3/8 reach). When chucking at longer reach lengths, use the table below for Chip Load and Depth of Cut adjustment multipliers.

Reach Multiple	Slotting			Roughing			Finishing		
	Chip Load	Depth of Cut Radial	Depth of Cut Axial	Chip Load	Depth of Cut Radial	Depth of Cut Axial	Chip Load	Depth of Cut Radial	Depth of Cut Axial
3x	100%	100%	100%	100%	100%	100%	100%	100%	100%
5x	83%	100%	57%	83%	92%	78%	86%	100%	100%
8x	63%	100%	51%	63%	85%	67%	71%	67%	100%
12x	50%	100%	43%	50%	69%	56%	64%	67%	100%
15x	42%	100%	43%	42%	46%	56%	57%	53%	100%
18x	38%	100%	34%	38%	46%	44%	54%	40%	100%
20x	33%	100%	29%	33%	38%	44%	50%	33%	100%



General Notes:

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

MATERIAL	SFM	Hardness: ≤ 28 Rc (≤ 271 HBn)											Depth of Cut					
		Chip Load (IPT) By Cutter Diameter											Radial	Axial				
		.062	.078	.093	.125	.187	.250	.312	.375	.500	.625	.750			1.000			
ALUMINUM ALLOYS																		
Casting (2xx, 5xx, 7xx, 8xx)	750	Slotting	.00070	.00088	.00104	.00140	.00210	.00281	.00350	.00421	.00561	.00701	.00842	.01122	1.00 x Dia	.35 x Dia		
		Roughing	.00087	.00109	.00130	.00175	.00262	.00351	.00438	.00526	.00701	.00877	.01052	.01403	.65 x Dia	.45 x Dia		
Wrought (10xx, 20xx, 30xx, 50xx, 60xx, 70xx, 80xx)	1000	Finishing	.00128	.00161	.00192	.00259	.00387	.00517	.00645	.00776	.01034	.01293	.01551	.02068	.15 x Dia	1.50 x Dia		
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	750	Slotting	.00063	.00079	.00094	.00126	.00189	.00252	.00315	.00379	.00505	.00631	.00757	.01010	1.00 x Dia	.35 x Dia		
Casting - 8%-9% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	700	Slotting	.00078	.00098	.00117	.00158	.00236	.00316	.00394	.00473	.00631	.00789	.00947	.01262	.65 x Dia	.45 x Dia		
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	650	Roughing	.00078	.00098	.00117	.00158	.00236	.00316	.00394	.00473	.00631	.00789	.00947	.01262	.65 x Dia	.45 x Dia		
Wrought - 5%-8% Si (4xxx)	1000	Finishing	.00115	.00145	.00173	.00233	.00348	.00465	.00581	.00698	.00931	.01163	.01396	.01861	.15 x Dia	1.50 x Dia		
Wrought - 8%-12% Si (4xxx)	800	Finishing	.00115	.00145	.00173	.00233	.00348	.00465	.00581	.00698	.00931	.01163	.01396	.01861	.15 x Dia	1.50 x Dia		
MAGNESIUM ALLOYS																		
	1500	Slotting	.00070	.00088	.00104	.00140	.00210	.00281	.00350	.00421	.00561	.00701	.00842	.01122	1.00 x Dia	.35 x Dia		
		Roughing	.00087	.00109	.00130	.00175	.00262	.00351	.00438	.00526	.00701	.00877	.01052	.01403	.65 x Dia	.45 x Dia		
ZINC ALLOYS																		
	800	Finishing	.00128	.00161	.00192	.00259	.00387	.00517	.00645	.00776	.01034	.01293	.01551	.02068	.15 x Dia	1.50 x Dia		
COPPER ALLOYS																		
High Coppers - 90%+ (C1xxx)	225	Slotting	.00056	.00070	.00083	.00112	.00168	.00224	.00280	.00337	.00449	.00561	.00673	.00898	1.00 x Dia	.35 x Dia		
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C6400-C6900)	500	Slotting	.00056	.00070	.00083	.00112	.00168	.00224	.00280	.00337	.00449	.00561	.00673	.00898	1.00 x Dia	.35 x Dia		
Phosphor Bronzes (Copper Tin alloys, C5xxx)	225	Slotting	.00056	.00070	.00083	.00112	.00168	.00224	.00280	.00337	.00449	.00561	.00673	.00898	1.00 x Dia	.35 x Dia		
Aluminum Bronzes (Copper Aluminum alloys, C6000-C6400)	500	Roughing	.00070	.00088	.00104	.00140	.00210	.00281	.00350	.00421	.00561	.00701	.00842	.01122	.65 x Dia	.45 x Dia		
Silicon Bronzes (Copper Silicon alloys, C6400-C6800)	500	Roughing	.00070	.00088	.00104	.00140	.00210	.00281	.00350	.00421	.00561	.00701	.00842	.01122	.65 x Dia	.45 x Dia		
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)	225	Slotting	.00056	.00070	.00083	.00112	.00168	.00224	.00280	.00337	.00449	.00561	.00673	.00898	1.00 x Dia	.35 x Dia		
Cast Copper Alloys (C8300-C8620, C8640-C8790, C9200-C9580, C97300-C97800, C99400-C99700)	550	Finishing	.00103	.00129	.00154	.00207	.00309	.00414	.00620	.00827	.01034	.01241	.01655	.02141	.15 x Dia	1.50 x Dia		

MATERIAL	SFM	Hardness: 29-37 Rc (279-344 HBn)											Depth of Cut					
		Chip Load (IPT) By Cutter Diameter											Radial	Axial				
		.062	.078	.093	.125	.187	.250	.312	.375	.500	.625	.750			1.000			
CARBON STEELS																		
Free-Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	600	Slotting	.00024	.00030	.00036	.00048	.00072	.00096	.00120	.00145	.00193	.00241	.00289	.00386	1.00 x Dia	.35 x Dia		
		Roughing	.00027	.00034	.00040	.00054	.00081	.00108	.00135	.00163	.00217	.00271	.00325	.00434	.65 x Dia	.45 x Dia		
		Finishing	.00040	.00050	.00060	.00081	.00121	.00162	.00202	.00242	.00323	.00404	.00485	.00647	.15 x Dia	1.50 x Dia		
1030 - 1095, 1140 - 1151, 13xx, 15xx, 20xx, 30xx, 40xx & 4Lxx, 50xx & 5Lxx, 50xx & 50Lxx, 51xx & 51Lxx, 52xx & 52Lxx, 60xx, 80xx, 90xx	200	Slotting	.00025	.00027	.00033	.00044	.00066	.00088	.00110	.00132	.00176	.00220	.00264	.00353	1.00 x Dia	.35 x Dia		
		Roughing	.00025	.00031	.00037	.00050	.00074	.00099	.00124	.00149	.00198	.00248	.00297	.00397	.65 x Dia	.45 x Dia		
		Finishing	.00037	.00046	.00055	.00074	.00111	.00148	.00184	.00222	.00296	.00369	.00443	.00591	.15 x Dia	1.50 x Dia		
STAINLESS STEELS																		
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	450	Slotting	.00024	.00030	.00036	.00048	.00072	.00096	.00120	.00145	.00193	.00241	.00289	.00386	1.00 x Dia	.35 x Dia		
		Roughing	.00027	.00034	.00040	.00054	.00081	.00108	.00135	.00163	.00217	.00271	.00325	.00434	.65 x Dia	.45 x Dia		
		Finishing	.00040	.00050	.00060	.00081	.00121	.00162	.00202	.00242	.00323	.00404	.00485	.00647	.15 x Dia	1.50 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	Slotting	.00022	.00027	.00033	.00044	.00066	.00088	.00110	.00132	.00176	.00220	.00264	.00353	1.00 x Dia	.35 x Dia		
		Roughing	.00025	.00031	.00037	.00050	.00074	.00099	.00124	.00149	.00198	.00248	.00297	.00397	.65 x Dia	.45 x Dia		
		Finishing	.00037	.00046	.00055	.00074	.00111	.00148	.00184	.00222	.00296	.00369	.00443	.00591	.15 x Dia	1.50 x Dia		
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	150	Slotting	.00014	.00017	.00020	.00028	.00041	.00055	.00069	.00083	.00110	.00138	.00165	.00220	1.00 x Dia	.35 x Dia		
		Roughing	.00015	.00019	.00023	.00031	.00046	.00062	.00077	.00093	.00124	.00155	.00186	.00248	.65 x Dia	.45 x Dia		
		Finishing	.00023	.00029	.00034	.00046	.00069	.00092	.00115	.00139	.00185	.00231	.00277	.00369	.15 x Dia	1.50 x Dia		
TOOL STEELS																		
A, L, O, P, W series	200	Slotting	.00022	.00027	.00033	.00044	.00066	.00088	.00110	.00132	.00176	.00220	.00264	.00353	1.00 x Dia	.35 x Dia		
		Roughing	.00025	.00031	.00037	.00050	.00074	.00099	.00124	.00149	.00198	.00248	.00297	.00397	.65 x Dia	.45 x Dia		
		Finishing	.00037	.00046	.00055	.00074	.00111	.00148	.00184	.00222	.00296	.00369	.00443	.00591	.15 x Dia	1.50 x Dia		
D, H, M, T, S series	150	Slotting	.00014	.00017	.00020	.00028	.00041	.00055	.00069	.00083	.00110	.00138	.00165	.00220	1.00 x Dia	.35 x Dia		
		Roughing	.00015	.00019	.00023	.00031	.00046	.00062	.00077	.00093	.00124	.00155	.00186	.00248	.65 x Dia	.45 x Dia		
		Finishing	.00023	.00029	.00034	.00046	.00069	.00092	.00115	.00139	.00185	.00231	.00277	.00369	.15 x Dia	1.50 x Dia		
TITANIUM ALLOYS																		
	150	Slotting	.00014	.00017	.00020	.00028	.00041	.00055	.00069	.00083	.00110	.00138	.00165	.00220	1.00 x Dia	.35 x Dia		
		Roughing	.00015	.00019	.00023	.00031	.00046	.00062	.00077	.00093	.00124	.00155	.00186	.00248	.65 x Dia	.45 x Dia		
		Finishing	.00023	.00029	.00034	.00046	.00069	.00092	.00115	.00139	.00185	.00231	.00277	.00369	.15 x Dia	1.50 x Dia		
HIGH TEMP ALLOYS																		
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discalloy, Incoloy	70	Slotting	.00014	.00017	.00020	.00028	.00041	.00055	.00069	.00083	.00110	.00138	.00165	.00220	1.00 x Dia	.35 x Dia		
		Roughing	.00015	.00019	.00023	.00031	.00046	.00062	.00077	.00093	.00124	.00155	.00186	.00248	.65 x Dia	.45 x Dia		
		Finishing	.00023	.00029	.00034	.00046	.00069	.00092	.00115	.00139	.00185	.00231	.00277	.00369	.15 x Dia	1.50 x Dia</		