



Speeds & Feeds

Product Table: Miniature End Mills - Square - Long Reach, Standard Flute - Metric
Characteristics: 8x Reach Multiple, 3x Length of Cut Multiple, 4 Flutes
Series: 6776xx

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.

		Hardness: ≤ 28 Rc (≤ 271 HBn)																					
MATERIAL	SMM	Chip Load (MMPT) by Dia						Depth of Cut						Depth of Cut									
		0.50			0.75			1.20		Radial		Axial		1.50		2.00		Chip Load (MMPT) by Cutter Dia		Radial		Axial	
		0.50	0.75	1.20	1.50	2.00	3.00	5.00	6.00	9.50	12.00	1.50	2.00	3.00	5.00	6.00	9.50	12.00	1.50	2.00	3.00	5.00	6.00
ALUMINUM ALLOYS	230	Slotting	.0034	.0052	.0083	1 x Dia	.07 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	1 x Dia	.18 x Dia						
		Roughing	.0043	.0065	.0103	.28 x Dia	.30 x Dia	.0112	.0150	.0187	.0224	.0374	.0449	.0711	.0898	.55 x Dia	.30 x Dia						
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	305	Finishing	.0072	.0108	.0173	.05 x Dia	3 x Dia	.0188	.0250	.0313	.0375	.0626	.0751	.1189	.1502	.10 x Dia	3 x Dia						
		Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	230	Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
		Roughing	.0039	.0058	.0093	.28 x Dia	.30 x Dia	.0101	.0135	.0168	.0202	.0337	.0404	.0640	.0808	.55 x Dia	.30 x Dia						
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	215	Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
		Roughing	.0039	.0058	.0093	.28 x Dia	.30 x Dia	.0101	.0135	.0168	.0202	.0337	.0404	.0640	.0808	.55 x Dia	.30 x Dia						
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	200	Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
		Roughing	.0039	.0058	.0093	.28 x Dia	.30 x Dia	.0101	.0135	.0168	.0202	.0337	.0404	.0640	.0808	.55 x Dia	.30 x Dia						
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	145	Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
		Roughing	.0039	.0058	.0093	.28 x Dia	.30 x Dia	.0101	.0135	.0168	.0202	.0337	.0404	.0640	.0808	.55 x Dia	.30 x Dia						
Wrought - 5%-8% Si (4xxx)	305	Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
		Roughing	.0039	.0058	.0093	.28 x Dia	.30 x Dia	.0101	.0135	.0168	.0202	.0337	.0404	.0640	.0808	.55 x Dia	.30 x Dia						
Wrought - 8%-12% Si (4xxx)	245	Slotting	.0031	.0046	.0074	1 x Dia	.07 x Dia	.0081	.0108	.0135	.0162	.0269	.0323	.0512	.0646	1 x Dia	.18 x Dia						
		Roughing	.0039	.0058	.0093	.28 x Dia	.30 x Dia	.0101	.0135	.0168	.0202	.0337	.0404	.0640	.0808	.55 x Dia	.30 x Dia						
MAGNESIUM ALLOYS	460	Slotting	.0034	.0052	.0083	1 x Dia	.07 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	1 x Dia	.18 x Dia						
		Roughing	.0043	.0065	.0103	.28 x Dia	.30 x Dia	.0112	.0150	.0187	.0224	.0374	.0449	.0711	.0898	.55 x Dia	.30 x Dia						
ZINC ALLOYS	245	Slotting	.0034	.0052	.0083	1 x Dia	.07 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	1 x Dia	.18 x Dia						
		Roughing	.0043	.0065	.0103	.28 x Dia	.30 x Dia	.0112	.0150	.0187	.0224	.0374	.0449	.0711	.0898	.55 x Dia	.30 x Dia						
COPPER ALLOYS	70	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
High Coppers - 90%+ (C1xxx)	150	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C66400-C69800)	70	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
Phosphor Bronzes (Copper Tin alloys, C5xxx)	150	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	150	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	150	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)	70	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						
Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	170	Slotting	.0028	.0041	.0066	1 x Dia	.07 x Dia	.0072	.0096	.0120	.0144	.0239	.0287	.0455	.0574	1 x Dia	.18 x Dia						
		Roughing	.0034	.0052	.0083	.28 x Dia	.30 x Dia	.0090	.0120	.0150	.0180	.0299	.0359	.0568	.0718	.55 x Dia	.30 x Dia						

		Hardness: 29-37 Rc (279-344 HBn)																					
MATERIAL	SMM	Chip Load (MMPT) by Dia						Depth of Cut						Depth of Cut									
		0.50			0.75			1.20		Radial		Axial		1.50		2.00		Chip Load (MMPT) by Cutter Dia		Radial		Axial	
		0.50	0.75	1.20	1.50	2.00	3.00	5.00	6.00	9.50	12.00	1.50	2.00	3.00	5.00	6.00	9.50	12.00	1.50	2.00	3.00	5.00	6.00
CARBON STEELS	180	Slotting	.0012	.0018	.0028	1 x Dia	.07 x Dia	.0031	.0041	.0051	.0062	.0103	.0123	.0195	.0247	1 x Dia	.18 x Dia						
		Roughing	.0013	.0020	.0032	.28 x Dia	.30 x Dia	.0035	.0046	.0058	.0069	.0116	.0139	.0220	.0278	.55 x Dia	.30 x Dia						
		Finishing	.0022	.0034	.0054	.05 x Dia	3 x Dia	.0059	.0078	.0098	.0117	.0196	.0235	.0372	.0469	.10 x Dia	3 x Dia						
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4xLxx, 5xxx & 5xLxx, 50xxx & 50Lxxx, 51xxx & 51Lxxx, 52xxx & 52Lxxx, 6xxx, 8xxx, 9xxx	60	Slotting	.0011	.0016	.0026	1 x Dia	.07 x Dia	.0028	.0038	.0047	.0056	.0094	.0113	.0179	.0226	1 x Dia	.18 x Dia						
		Roughing	.0012	.0018	.0029	.28 x Dia	.30 x Dia	.0032	.0042	.0053	.0063	.0106	.0127	.0201	.0254	.55 x Dia	.30 x Dia						
		Finishing	.0021	.0031	.0049	.05 x Dia	3 x Dia	.0054	.0072	.0089	.0107	.0179	.0215	.0340	.0429	.10 x Dia	3 x Dia						
STAINLESS STEELS	140	Slotting	.0012	.0018	.0028	1 x Dia	.07 x Dia	.0031	.0041	.0051	.0062	.0103	.0123	.0195	.0247	1 x Dia	.18 x Dia						
		Roughing	.0013	.0020	.0032	.28 x Dia	.30 x Dia	.0035	.0046	.0058	.0069	.0116	.0139	.0220	.0278	.55 x Dia	.30 x Dia						
		Finishing	.0022	.0034	.0054	.05 x Dia	3 x Dia	.0059	.0078	.0098	.0117	.0196	.0235	.0372	.0469	.10 x Dia	3 x Dia						
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	60	Slotting	.0011	.0016	.0026	1 x Dia	.07 x Dia	.0028	.0038	.0047	.0056	.0094	.0113	.0179	.0226	1 x Dia	.18 x Dia						
		Roughing	.0012	.0018	.0029	.28 x Dia	.30 x Dia	.0032	.0042	.0053	.0063	.0106	.0127	.0201	.0254	.55 x Dia	.30 x Dia						
		Finishing	.0021	.0031	.0049	.05 x Dia	3 x Dia	.0054	.0072	.0089	.0107	.0179	.0215	.0340	.0429	.10 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	45	Slotting	.0007	.0010	.0016	1 x Dia	.07 x Dia	.0018	.0024	.0029	.0035	.0059	.0071	.0112	.0141	1 x Dia	.18 x Dia						
		Roughing	.0008	.0011	.0018	.28 x Dia	.30 x Dia	.0020	.0026	.0033	.0040	.0066	.0079	.0126	.0159	.55 x Dia	.30 x Dia						
		Finishing	.0013	.0019	.0031	.05 x Dia	3 x Dia	.0034	.0045	.0056	.0067	.0112	.0134	.0212	.0268	.10 x Dia	3 x Dia						
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	45	Slotting	.0007	.0010	.0016	1 x Dia	.07 x Dia	.0018	.0024	.0029	.0035	.0059	.0071	.0112	.0141	1 x Dia	.18 x Dia						
		Roughing	.0008	.0011	.0018	.28 x Dia	.30 x Dia	.0020	.0026	.0033	.0040	.0066	.0079	.0126	.0159	.55 x Dia	.30 x Dia						
		Finishing	.0013	.0019	.0031	.05 x Dia	3 x Dia	.0034	.0045	.0056	.0067	.0112	.0134	.0212	.0268	.10 x Dia	3 x Dia						
TOOL STEELS	60	Slotting	.0011	.0016	.0026	1 x Dia	.07 x Dia	.0028	.0038	.0047	.0056	.0094	.0113	.0179	.0226	1 x Dia	.18 x Dia						
		Roughing	.0012	.0018	.0029	.28 x Dia	.30 x Dia	.0032	.0042	.0053	.0063	.0106	.0127	.0201	.0254	.55 x Dia	.30 x Dia						
		Finishing	.0021	.0031	.0049	.05 x Dia	3 x Dia	.0054	.0072	.0089	.0107	.0179	.0215	.0340	.0429	.10 x Dia	3 x Dia						
A, L, O, P, W series	45	Slotting	.0007	.0010	.0016	1 x Dia	.07 x Dia	.0018	.00														