

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	Radial	Axial	
<b>ALUMINUM ALLOYS</b>															
Casting (2xx, 5xx, 7xx, 8xx)	750	Finishing	.00007	.00015	.00023	.05 x Dia	8 x Dia	.00026	.00033	.00039	.00052	.00078	.00104	.10 x Dia	8 x Dia
Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)	1000														
Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	750	Finishing	.00006	.00013	.00020	.05 x Dia	8 x Dia	.00023	.00029	.00035	.00047	.00070	.00094	.10 x Dia	8 x Dia
Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	700														
Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	650	Finishing	.00006	.00013	.00020	.05 x Dia	8 x Dia	.00023	.00029	.00035	.00047	.00070	.00094	.10 x Dia	8 x Dia
Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)	475														
Wrought - 5%-8% Si (4xxx)	1000	Finishing	.00007	.00015	.00023	.05 x Dia	8 x Dia	.00026	.00033	.00039	.00052	.00078	.00104	.10 x Dia	8 x Dia
Wrought - 8%-12% Si (4xxx)	800														
<b>MAGNESIUM ALLOYS</b>	1500	Finishing	.00007	.00015	.00023	.05 x Dia	8 x Dia	.00026	.00033	.00039	.00052	.00078	.00104	.10 x Dia	8 x Dia
<b>ZINC ALLOYS</b>	800	Finishing	.00007	.00015	.00023	.05 x Dia	8 x Dia	.00026	.00033	.00039	.00052	.00078	.00104	.10 x Dia	8 x Dia
<b>COPPER ALLOYS</b>															
High Coppers - 90%+ (C1xxx)	225	Finishing	.00006	.00012	.00018	.05 x Dia	8 x Dia	.00021	.00026	.00031	.00042	.00062	.00083	.10 x Dia	8 x Dia
Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C66400-C69800)	500														
Phosphor Bronzes (Copper Tin alloys, C5xxx)	225	Finishing	.00006	.00012	.00018	.05 x Dia	8 x Dia	.00021	.00026	.00031	.00042	.00062	.00083	.10 x Dia	8 x Dia
Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)	500														
Silicon Bronzes (Copper Silicon alloys, C64700-C66100)	500	Finishing	.00006	.00012	.00018	.05 x Dia	8 x Dia	.00021	.00026	.00031	.00042	.00062	.00083	.10 x Dia	8 x Dia
Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx)	225														
Cast Copper Alloys (C83300-C86200, C85400-C87900, C92200-C95800, C97300-C97800, C99400-C99700)	550	Finishing	.00006	.00012	.00018	.05 x Dia	8 x Dia	.00021	.00026	.00031	.00042	.00062	.00083	.10 x Dia	8 x Dia



Speeds & Feeds

**Product Table:** Miniature End Mills - Ball - Long Flute  
**Characteristics:** 8x Length of Cut, 4 Flutes  
**Series:** 8455xx, 8456xx, and Items #34109, #34110, #34112, #34116

**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](mailto: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	Radial	Axial	
<b>CARBON STEELS</b>															
Free-Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	600	Finishing	.00002	.00005	.00007	.05 x Dia	8 x Dia	.00008	.00010	.00012	.00016	.00024	.00033	.10 x Dia	8 x Dia
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xx, 3xx, 4xx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx	200	Finishing	.00002	.00004	.00006	.05 x Dia	8 x Dia	.00007	.00009	.00011	.00015	.00022	.00030	.10 x Dia	8 x Dia
<b>STAINLESS STEELS</b>															
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	450	Finishing	.00002	.00005	.00007	.05 x Dia	8 x Dia	.00008	.00010	.00012	.00016	.00024	.00033	.10 x Dia	8 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	Finishing	.00002	.00004	.00006	.05 x Dia	8 x Dia	.00007	.00009	.00011	.00015	.00022	.00030	.10 x Dia	8 x Dia
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	150	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia
<b>TOOL STEELS</b>															
A, L, O, P, W series	200	Finishing	.00002	.00004	.00006	.05 x Dia	8 x Dia	.00007	.00009	.00011	.00015	.00022	.00030	.10 x Dia	8 x Dia
D, H, M, T, S series	150	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia
<b>TITANIUM ALLOYS</b>															
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	150	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia
<b>HIGH TEMP ALLOYS</b>															
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	70	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia

MATERIAL	SFM	Hardness: 38-45 Rc (353-421 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	Radial	Axial	
<b>CARBON STEELS</b>															
Free-Machining/Low Carbon steels, 10xx - 1029 & all 10Lxx, 11xx - 1139 & all 11Lxx, 12xx - 1215 & all 12Lxx	600	Finishing	.00002	.00005	.00007	.05 x Dia	8 x Dia	.00008	.00010	.00012	.00016	.00024	.00033	.10 x Dia	8 x Dia
1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xx, 3xx, 4xx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx	200	Finishing	.00002	.00004	.00006	.05 x Dia	8 x Dia	.00007	.00009	.00011	.00015	.00022	.00030	.10 x Dia	8 x Dia
<b>STAINLESS STEELS</b>															
203 EZ, 303 (all types), 416, 416Se, 416 Plus X, 420F, 420FSe, 430F, 430FSe, 440F, 440FSe	450	Finishing	.00002	.00005	.00007	.05 x Dia	8 x Dia	.00008	.00010	.00012	.00016	.00024	.00033	.10 x Dia	8 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	Finishing	.00002	.00004	.00006	.05 x Dia	8 x Dia	.00007	.00009	.00011	.00015	.00022	.00030	.10 x Dia	8 x Dia
414, 431, 440A, 440B, 440C, 13-8, 15-5, 15-7, 17-4, 17-7	150	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia
<b>TOOL STEELS</b>															
A, L, O, P, W series	200	Finishing	.00002	.00004	.00006	.05 x Dia	8 x Dia	.00007	.00009	.00011	.00015	.00022	.00030	.10 x Dia	8 x Dia
D, H, M, T, S series	150	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia
<b>TITANIUM ALLOYS</b>															
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	150	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia
<b>HIGH TEMP ALLOYS</b>															
Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy	70	Finishing	.00001	.00003	.00004	.05 x Dia	8 x Dia	.00005	.00006	.00007	.00009	.00014	.00019	.10 x Dia	8 x Dia