



Speeds & Feeds

Product Table: Miniature End Mills - Corner Radius - Extra Long Length
Characteristics: 4 Flutes
Series: 240xx

Product Notes:

Posted values reflect tools with a reach equal to 5x Diameter. For tools with a greater reach multiple, use the table below to adjust Chip Load and Depths of Cut.

| Reach Multiple | Slotting | | | Roughing | | | Finishing | | |
|----------------|-----------|---------------------|--------------------|-----------|---------------------|--------------------|-----------|---------------------|--------------------|
| | Chip Load | Radial Depth of Cut | Axial Depth of Cut | Chip Load | Radial Depth of Cut | Axial Depth of Cut | Chip Load | Radial Depth of Cut | Axial Depth of Cut |
| 5x | 100% | 100% | 100% | 75% | 100% | 100% | 100% | 100% | 100% |
| 8x | 75% | 100% | 90% | 75% | 92% | 86% | 83% | 100% | 100% |
| 12x | 60% | 100% | 75% | 60% | 75% | 71% | 75% | 67% | 100% |
| 15x | 50% | 100% | 75% | 50% | 50% | 71% | 67% | 53% | 100% |
| 20x | 40% | 100% | 50% | 40% | 42% | 57% | 58% | 33% | 100% |
| 25x | 30% | 100% | 50% | 30% | 42% | 57% | 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 appropriate safety equipment in the vicinity of use.

| MATERIAL | SFM | Hardness: ≤ 28 Rc (≤ 271 HBn) | | | | | | | | | | Depth of Cut | |
|---|------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------|------------|
| | | Chip Load (IPT) By Cutter Diameter | | | | | | | | | | Radial | Axial |
| | | .125 | .187 | .250 | .312 | .375 | .500 | .625 | .750 | 1.000 | | | |
| ALUMINUM ALLOYS Casting (2xx, 5xx, 7xx, 8xx) Wrought (1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx) Casting - 3%-5% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx) Casting - 5%-8% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx) Casting - 8%-12% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx) Casting - 12%-16% Si (3xx, A3xx, C3xx, 4xx, A4xx, B4xx) Wrought - 5%-8% Si (4xxx) Wrought - 8%-12% Si (4xxx) | 750 | Slotting | .00110 | .00165 | .00220 | .00275 | .00330 | .00440 | .00550 | .00660 | .00880 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00138 | .00206 | .00275 | .00343 | .00413 | .00550 | .00688 | .00825 | .01100 | .60 x Dia | .35 x Dia |
| | 1000 | Finishing | .00174 | .00260 | .00348 | .00434 | .00521 | .00695 | .00869 | .01043 | .01390 | .15 x Dia | 1.50 x Dia |
| | 750 | Slotting | .00099 | .00148 | .00198 | .00247 | .00297 | .00396 | .00495 | .00594 | .00792 | 1.00 x Dia | .20 x Dia |
| | 700 | Roughing | .00124 | .00185 | .00248 | .00309 | .00371 | .00495 | .00619 | .00743 | .00990 | .60 x Dia | .35 x Dia |
| | 650 | Finishing | .00156 | .00234 | .00313 | .00390 | .00469 | .00626 | .00782 | .00939 | .01251 | .15 x Dia | 1.50 x Dia |
| MAGNESIUM ALLOYS ZINC ALLOYS | 1500 | Slotting | .00110 | .00165 | .00220 | .00275 | .00330 | .00440 | .00550 | .00660 | .00880 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00138 | .00206 | .00275 | .00343 | .00413 | .00550 | .00688 | .00825 | .01100 | .60 x Dia | .35 x Dia |
| | 800 | Finishing | .00174 | .00260 | .00348 | .00434 | .00521 | .00695 | .00869 | .01043 | .01390 | .15 x Dia | 1.50 x Dia |
| COPPER ALLOYS High Coppers - 90%+ (C1xxx) Brass (Copper Zinc alloys, C2xxx, C3xxx, C4xxx, C66400-C69800) Phosphor Bronzes (Copper Tin alloys, C5xxx) Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200) Silicon Bronzes (Copper Silicon alloys, C64700-C66100) Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxx) Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95900, C97300-C97800, C99400-C99700) | 225 | Slotting | .00088 | .00132 | .00176 | .00220 | .00264 | .00352 | .00440 | .00528 | .00704 | 1.00 x Dia | .20 x Dia |
| | 500 | Roughing | .00110 | .00165 | .00220 | .00275 | .00330 | .00440 | .00550 | .00660 | .00880 | .60 x Dia | .35 x Dia |
| | 225 | Finishing | .00139 | .00208 | .00278 | .00347 | .00417 | .00556 | .00695 | .00834 | .01112 | .15 x Dia | 1.50 x Dia |
| | 500 | Roughing | .00110 | .00165 | .00220 | .00275 | .00330 | .00440 | .00550 | .00660 | .00880 | .60 x Dia | .35 x Dia |
| | 500 | Finishing | .00139 | .00208 | .00278 | .00347 | .00417 | .00556 | .00695 | .00834 | .01112 | .15 x Dia | 1.50 x Dia |
| | 225 | Finishing | .00139 | .00208 | .00278 | .00347 | .00417 | .00556 | .00695 | .00834 | .01112 | .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 |
| | | .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 1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx | 600 | Slotting | .00038 | .00057 | .00076 | .00094 | .00113 | .00151 | .00189 | .00227 | .00302 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00043 | .00064 | .00085 | .00106 | .00128 | .00170 | .00213 | .00255 | .00340 | .60 x Dia | .35 x Dia |
| | | Finishing | .00054 | .00081 | .00109 | .00136 | .00163 | .00217 | .00272 | .00326 | .00435 | .15 x Dia | 1.50 x Dia |
| | 200 | Slotting | .00035 | .00052 | .00069 | .00086 | .00104 | .00138 | .00173 | .00207 | .00276 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00039 | .00058 | .00078 | .00097 | .00117 | .00156 | .00194 | .00233 | .00311 | .60 x Dia | .35 x Dia |
| | | Finishing | .00050 | .00074 | .00099 | .00124 | .00149 | .00199 | .00248 | .00298 | .00397 | .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 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 | 450 | Slotting | .00038 | .00057 | .00076 | .00094 | .00113 | .00151 | .00189 | .00227 | .00302 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00043 | .00064 | .00085 | .00106 | .00128 | .00170 | .00213 | .00255 | .00340 | .60 x Dia | .35 x Dia |
| | | Finishing | .00054 | .00081 | .00109 | .00136 | .00163 | .00217 | .00272 | .00326 | .00435 | .15 x Dia | 1.50 x Dia |
| | 200 | Slotting | .00035 | .00052 | .00069 | .00086 | .00104 | .00138 | .00173 | .00207 | .00276 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00039 | .00058 | .00078 | .00097 | .00117 | .00156 | .00194 | .00233 | .00311 | .60 x Dia | .35 x Dia |
| | | Finishing | .00050 | .00074 | .00099 | .00124 | .00149 | .00199 | .00248 | .00298 | .00397 | .15 x Dia | 1.50 x Dia |
| TOOL STEELS A, L, O, P, W series D, H, M, T, S series | 150 | Slotting | .00022 | .00032 | .00043 | .00054 | .00065 | .00086 | .00108 | .00130 | .00173 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00024 | .00036 | .00049 | .00061 | .00073 | .00097 | .00122 | .00146 | .00194 | .60 x Dia | .35 x Dia |
| | | Finishing | .00031 | .00046 | .00062 | .00078 | .00093 | .00124 | .00155 | .00186 | .00248 | .15 x Dia | 1.50 x Dia |
| | 200 | Slotting | .00035 | .00052 | .00069 | .00086 | .00104 | .00138 | .00173 | .00207 | .00276 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00039 | .00058 | .00078 | .00097 | .00117 | .00156 | .00194 | .00233 | .00311 | .60 x Dia | .35 x Dia |
| | | Finishing | .00050 | .00074 | .00099 | .00124 | .00149 | .00199 | .00248 | .00298 | .00397 | .15 x Dia | 1.50 x Dia |
| TITANIUM ALLOYS HIGH TEMP ALLOYS Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy | 150 | Slotting | .00022 | .00032 | .00043 | .00054 | .00065 | .00086 | .00108 | .00130 | .00173 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00024 | .00036 | .00049 | .00061 | .00073 | .00097 | .00122 | .00146 | .00194 | .60 x Dia | .35 x Dia |
| | | Finishing | .00031 | .00046 | .00062 | .00078 | .00093 | .00124 | .00155 | .00186 | .00248 | .15 x Dia | 1.50 x Dia |
| | 70 | Slotting | .00011 | .00016 | .00022 | .00027 | .00032 | .00043 | .00054 | .00065 | .00086 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00012 | .00018 | .00024 | .00030 | .00036 | .00049 | .00061 | .00073 | .00097 | .60 x Dia | .35 x Dia |
| | | Finishing | .00016 | .00023 | .00031 | .00039 | .00047 | .00063 | .00078 | .00094 | .00125 | .15 x Dia | 1.50 x Dia |

| MATERIAL | SFM | Hardness: 38-45 Rc (353-421 HBn) | | | | | | | | | | Depth of Cut | |
|--|-----|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------|------------|
| | | Chip Load (IPT) By Cutter Diameter | | | | | | | | | | Radial | Axial |
| | | .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 1030 - 1095, 1140 - 1151, 13xx, 15xx, 2xxx, 3xxx, 4xxx & 4Lxx, 5xxx & 5Lxx, 50xxx & 50Lxx, 51xxx & 51Lxx, 52xxx & 52Lxx, 6xxx, 8xxx, 9xxx | 600 | Slotting | .00038 | .00057 | .00076 | .00094 | .00113 | .00151 | .00189 | .00227 | .00302 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00043 | .00064 | .00085 | .00106 | .00128 | .00170 | .00213 | .00255 | .00340 | .60 x Dia | .35 x Dia |
| | | Finishing | .00054 | .00081 | .00109 | .00136 | .00163 | .00217 | .00272 | .00326 | .00435 | .15 x Dia | 1.50 x Dia |
| | 200 | Slotting | .00035 | .00052 | .00069 | .00086 | .00104 | .00138 | .00173 | .00207 | .00276 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00039 | .00058 | .00078 | .00097 | .00117 | .00156 | .00194 | .00233 | .00311 | .60 x Dia | .35 x Dia |
| | | Finishing | .00050 | .00074 | .00099 | .00124 | .00149 | .00199 | .00248 | .00298 | .00397 | .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 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 | 450 | Slotting | .00038 | .00057 | .00076 | .00094 | .00113 | .00151 | .00189 | .00227 | .00302 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00043 | .00064 | .00085 | .00106 | .00128 | .00170 | .00213 | .00255 | .00340 | .60 x Dia | .35 x Dia |
| | | Finishing | .00054 | .00081 | .00109 | .00136 | .00163 | .00217 | .00272 | .00326 | .00435 | .15 x Dia | 1.50 x Dia |
| | 200 | Slotting | .00035 | .00052 | .00069 | .00086 | .00104 | .00138 | .00173 | .00207 | .00276 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00039 | .00058 | .00078 | .00097 | .00117 | .00156 | .00194 | .00233 | .00311 | .60 x Dia | .35 x Dia |
| | | Finishing | .00050 | .00074 | .00099 | .00124 | .00149 | .00199 | .00248 | .00298 | .00397 | .15 x Dia | 1.50 x Dia |
| TOOL STEELS A, L, O, P, W series D, H, M, T, S series | 150 | Slotting | .00022 | .00032 | .00043 | .00054 | .00065 | .00086 | .00108 | .00130 | .00173 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00024 | .00036 | .00049 | .00061 | .00073 | .00097 | .00122 | .00146 | .00194 | .60 x Dia | .35 x Dia |
| | | Finishing | .00031 | .00046 | .00062 | .00078 | .00093 | .00124 | .00155 | .00186 | .00248 | .15 x Dia | 1.50 x Dia |
| | 200 | Slotting | .00035 | .00052 | .00069 | .00086 | .00104 | .00138 | .00173 | .00207 | .00276 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00039 | .00058 | .00078 | .00097 | .00117 | .00156 | .00194 | .00233 | .00311 | .60 x Dia | .35 x Dia |
| | | Finishing | .00050 | .00074 | .00099 | .00124 | .00149 | .00199 | .00248 | .00298 | .00397 | .15 x Dia | 1.50 x Dia |
| TITANIUM ALLOYS HIGH TEMP ALLOYS Inconel, Hastelloy, Waspalloy, Monel, Nimonic, Haynes, Discoloy, Incoloy | 150 | Slotting | .00022 | .00032 | .00043 | .00054 | .00065 | .00086 | .00108 | .00130 | .00173 | 1.00 x Dia | .20 x Dia |
| | | Roughing | .00024 | .00036 | .00049 | .00061 | .00073 | .00097 | .00122 | .00146 | .00194 | .60 x Dia | .35 x Dia |
| | | Finishing | .00031 | .00046 | .00062 | .00078 | .00093 | .00124 | .00155 | .00186 | .00248 | .15 x Dia | 1.50 x Dia |
| | 70 | Slotting | .00011 | .00016 | .00022 | .00027 | .00032 | .00043 | .00054 | .00065 | .00086 | | |