



Speeds & Feeds

**Product Table:** Diamond End Mills for Non-Ferrous Materials - PCD Diamond - Square  
**Characteristics:** 4 Flutes  
**Series:** 9141xx

| MATERIAL  | SFM         | Chip Load (IPT) By Cutter Diameter |        |        |        |        |        |        |        |        |        |        | Depth of Cut |        |           |           |
|---|-------------|------------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------------|--------|-----------|-----------|
|   |             | .062                               | .078   | .093   | .125   | .187   | .250   | .312   | .375   | .500   | .625   | .750   | 1.000        | Radial | Axial     |           |
| <b>ALUMINUM ALLOYS</b><br>0% - 5% Silicon (2xx, 3xx, 4xx, 5xx, 7xx, 8xx, A3xx, A4xx, B4xx, C3xx, 1xxx, 2xxx, 3xxx, 5xxx, 6xxx, 7xxx, 8xxx)  | 1500 - 3000 | Roughing                           | .00050 | .00063 | .00076 | .00102 | .00152 | .00203 | .00254 | .00305 | .00406 | .00508 | .00610       | .00813 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00060 | .00076 | .00091 | .00122 | .00182 | .00244 | .00304 | .00366 | .00488 | .00610 | .00732       | .00975 | .15 x Dia | 1.5 x Dia |
| 5%-8% Silicon (3xx, A3xx, C3xx, 4xx, A4xx, B4xx, 4xxx)  | 1500 - 3000 | Roughing                           | .00045 | .00057 | .00068 | .00091 | .00137 | .00183 | .00228 | .00274 | .00366 | .00457 | .00549       | .00732 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00054 | .00068 | .00082 | .00110 | .00164 | .00219 | .00274 | .00329 | .00439 | .00549 | .00658       | .00878 | .15 x Dia | 1.5 x Dia |
| 8%-12% Silicon (3xx, A3xx, C3xx, 4xx, A4xx, B4xx, 4xxx)   | 1100 - 2200 | Roughing                           | .00038 | .00048 | .00057 | .00076 | .00114 | .00152 | .00190 | .00229 | .00305 | .00381 | .00457       | .00610 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00045 | .00057 | .00068 | .00091 | .00137 | .00183 | .00228 | .00274 | .00366 | .00457 | .00549       | .00732 | .15 x Dia | 1.5 x Dia |
| 12%-16% Silicon (3xx, A3xx, C3xx, 4xx, A4xx, B4xx)  | 750 - 1500  | Roughing                           | .00030 | .00038 | .00045 | .00061 | .00091 | .00122 | .00152 | .00183 | .00244 | .00305 | .00366       | .00488 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00036 | .00046 | .00054 | .00073 | .00109 | .00146 | .00183 | .00219 | .00293 | .00366 | .00439       | .00585 | .15 x Dia | 1.5 x Dia |
| <b>MAGNESIUM ALLOYS</b>   | 1500 - 3000 | Roughing                           | .00050 | .00063 | .00076 | .00102 | .00152 | .00203 | .00254 | .00305 | .00406 | .00508 | .00610       | .00813 | .60 x Dia | .35 x Dia |
| <b>ZINC ALLOYS</b>  |             | Finishing                          | .00060 | .00076 | .00091 | .00122 | .00182 | .00244 | .00304 | .00366 | .00488 | .00610 | .00732       | .00975 | .15 x Dia | 1.5 x Dia |
| <b>COPPER ALLOYS</b><br>High Coppers - 90%+ (C1xxxx)<br>Phosphor Bronzes (Copper Tin alloys, C5xxxx)<br>Copper Nickels, Nickel Silvers (Copper Nickel alloys, C7xxxx)   | 500 - 1000  | Roughing                           | .00040 | .00051 | .00060 | .00081 | .00122 | .00163 | .00203 | .00244 | .00325 | .00406 | .00488       | .00650 | .60 x Dia | .35 x Dia |
| Brass (Copper Zinc alloys, C2xxxx, C3xxxx, C4xxxx, C66400-C69800)<br>Aluminum Bronzes (Copper Aluminum alloys, C60600-C64200)<br>Silicon Bronzes (Copper Silicon alloys, C64700-C66100)<br>Cast Copper Alloys (C83300-C86200, C86400-C87900, C92200-C95800, C97300-C97800, C99400-C99700) | 1100 - 2200 | Finishing                          | .00048 | .00061 | .00073 | .00098 | .00146 | .00195 | .00243 | .00293 | .00390 | .00488 | .00585       | .00780 | .15 x Dia | 1.5 x Dia |
| <b>PLASTICS</b><br>Unfilled   | 750 - 1500  | Roughing                           | .00053 | .00067 | .00079 | .00107 | .00160 | .00213 | .00266 | .00320 | .00427 | .00533 | .00640       | .00853 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00063 | .00080 | .00095 | .00128 | .00192 | .00256 | .00320 | .00384 | .00512 | .00640 | .00768       | .01024 | .15 x Dia | 1.5 x Dia |
| 5% - 20% Filled or Fiber Reinforced   | 550 - 1100  | Roughing                           | .00048 | .00060 | .00072 | .00097 | .00144 | .00193 | .00241 | .00290 | .00386 | .00483 | .00579       | .00772 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00057 | .00072 | .00086 | .00116 | .00173 | .00232 | .00289 | .00347 | .00463 | .00579 | .00695       | .00927 | .15 x Dia | 1.5 x Dia |
| 21% - 40% Filled or Fiber Reinforced  | 400 - 750   | Roughing                           | .00043 | .00054 | .00064 | .00086 | .00129 | .00173 | .00216 | .00259 | .00345 | .00432 | .00518       | .00691 | .60 x Dia | .35 x Dia |
|   |             | Finishing                          | .00051 | .00065 | .00077 | .00104 | .00155 | .00207 | .00259 | .00311 | .00415 | .00518 | .00622       | .00829 | .15 x Dia | 1.5 x Dia |
| <b>GRAPHITE</b><br>POCO 3   | 600 - 1200  | Roughing                           | .00058 | .00073 | .00087 | .00117 | .00175 | .00234 | .00292 | .00351 | .00467 | .00584 | .00701       | .00935 | .80 x Dia | .45 x Dia |
|   |             | Finishing                          | .00070 | .00087 | .00104 | .00140 | .00210 | .00280 | .00350 | .00421 | .00561 | .00701 | .00841       | .01122 | .20 x Dia | 1.5 x Dia |
| <b>GREEN CARBIDE &amp; GREEN CERAMICS</b>   | 100 - 750   | Roughing                           | .00053 | .00067 | .00079 | .00107 | .00160 | .00213 | .00266 | .00320 | .00427 | .00533 | .00640       | .00853 | .80 x Dia | .45 x Dia |
|   |             | Finishing                          | .00063 | .00080 | .00095 | .00128 | .00192 | .00256 | .00320 | .00384 | .00512 | .00640 | .00768       | .01024 | .20 x Dia | 1.5 x Dia |

**Product Notes:**

To optimize machining, keep the following in mind:

Since the melting point varies greatly from plastic to plastic, the speed used should be closely supervised

Fiber Reinforced Plastics can be challenging as they encompass multiple variations. Please consider the following:

- An additional reduction in RPM may be necessary to avoid excessive fraying, splitting and tear out of fibers.
- There may be high density areas or "hard spots" (especially in random/whisker reinforcement) in which speeds & feeds should be reduced.
- Aramid fibers are more ductile and less abrasive than glass and carbon fibers allowing increased Chip Loads in these materials.
- When machining woven/cloth layered materials, use an oscillating program to help avoid heavy, localized wear on the cutter.

**General Notes:**

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions. In cases where starting parameters are not given, traditional carbide speeds & feeds may be substituted (diamond is not suited for ferrous materials or materials with low machinability).

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.