

General Purpose Carbide Drills Speeds & Feeds

| Material | Grades | SFM | | | | | |
|-----------------------------|--|----------|---------|-------------|-------------|-------------|-------------|
| | | Uncoated | AlTiN | 1/8 | 1/4 | 3/8 | 1/2 |
| | | | | (.1250) | (.2500) | (.3750) | (.5000) |
| P - Steels | | | | | | | |
| High Strength Tool Steel | A2, D2, P20, H11, H13, S2, 01 | 100-175 | 140-210 | .0004-.0015 | .0010-.0020 | .0010-.0025 | .0015-.0030 |
| Low Carbon | A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310 | 100-175 | 140-210 | .0005-.0015 | .0010-.0025 | .0010-.0030 | .0015-.0040 |
| Medium Carbon | 1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100 | 125-175 | 175-245 | .0005-.0015 | .0010-.0025 | .0010-.0030 | .0015-.0040 |
| M - Stainless Steels | | | | | | | |
| Austenitic | 301-304L, 310, 316L, 321, 347 | 100-175 | 140-210 | .0004-.0015 | .0005-.0015 | .0010-.0015 | .0010-.0030 |
| Martensitic | 403, 410, 416, 420, 430, 431, 440 | 100-150 | 140-210 | .0004-.0015 | .0008-.0020 | .0010-.0035 | .0015-.0040 |
| Precipitation Hardening | 12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO | 125-175 | 175-245 | .0004-.0015 | .0008-.0020 | .0010-.0035 | .0015-.0040 |
| K - Cast Irons | | | | | | | |
| Ductile | A536, J434, 60-40-18 | 125-250 | 175-350 | .0010-.0030 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| Gray | A48, A436, A319, Class 20, G4000 | 125-250 | 175-350 | .0010-.0030 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| Malleable | A220, A602, J158 | 125-250 | 175-350 | .0010-.0030 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| N - Non-Ferrous | | | | | | | |
| Aluminum Alloys | 2014, 2024, 6061, 7075 | 150-300 | 210-420 | .0010-.0020 | .0015-.0040 | .0020-.0045 | .0030-.0060 |
| Aluminum High Silicon | A380, A390 | 100-200 | 140-280 | .0008-.0015 | .0010-.0030 | .0015-.0035 | .0020-.0050 |
| Brass/Bronze | Aluminum Bronze, Low Silicon Bronze | 125-300 | 175-420 | .0010-.0020 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| Composites | G-10, Fiberglass, Graphite, Graphite Epoxy, Plastics | 150-300 | 210-420 | .0010-.0020 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| Copper | | 150-300 | 210-420 | .0010-.0020 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| Magnesium | | 200-500 | 280-700 | .0010-.0020 | .0010-.0030 | .0015-.0035 | .0025-.0040 |
| S - High Temp Alloys | | | | | | | |
| Cobalt Base | Stellite, HS-21, Haynes 25/188, X40, L605 | 80-150 | 110-210 | .0004-.0010 | .0005-.0020 | .0010-.0025 | .0010-.0040 |
| Iron Base | Incoloy 800-802, Multimet N-155, Timkin 16-25-6, Carpenter 22-b3 | 150-200 | 210-280 | .0008-.0015 | .0010-.0020 | .0015-.0035 | .0020-.0040 |
| Nickel Base | Inconel 625/718, Inco 700, 713C, 718, Monel 400-401, 404, K401, Rene, Rene 41 & 95 Hastelloy, Waspoloy, Udimet 500 & 700 | 100-150 | 140-210 | .0004-.0015 | .0008-.0015 | .0010-.0025 | .0015-.0040 |
| Titanium | Commercially Pure, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si, Ti-8Al-1Mo, Ti-8Al-4Mo | 150-200 | 210-280 | .0008-.0015 | .0010-.0020 | .0015-.0030 | .0020-.0040 |

NOTES: (1) Speeds and Feeds listed are estimated and will vary by application.
 (2) Reduce Speeds by 20-30% when exceeding 2x length to diameter.

These tools can be found on pages 284-290.