

GARR TOOL General Purpose Drilling Guide (Bright Finish)

| | ISO Material | HRC | M/Min. (by Series) | | | |
|--|--|-------------------------|--------------------|--------------------|--------------------|--------------------|
| | | | 1100 | 1200, 1205, 1520 | 1500, 1510 | 1600 |
| S | COBALT BASE ALLOYS | | | | | |
| | Haynes 25/188, Stellite 21, Cobalt Chrome | < 40 > 40 | - - | 14 - 21 10 - 18 | 14 - 21 10 - 18 | 10 - 17 6 - 14 |
| | NICKEL BASE ALLOYS | | | | | |
| | Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel | < 40 > 40 | - - | 14 - 21 10 - 18 | 14 - 21 10 - 18 | 10 - 17 6 - 14 |
| | IRON BASE ALLOYS | | | | | |
| | A286, Discaloy, Haynes 556, Carpenter 22, Greek Ascology | < 40 > 40 | - - | 14 - 21 10 - 18 | 14 - 21 10 - 18 | 10 - 17 6 - 14 |
| | TITANIUM ALLOYS | | | | | |
| | Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si | | - | 18 - 27 | 18 - 27 | 14 - 23 |
| | 5553 / Beta Titanium | | - | 14 - 20 | 14 - 20 | 10 - 15 |
| | M | STAINLESS STEELS | | | | |
| 13/8, 15/5, 17-4, pH Types | | < 40 > 40 | - - | 15 - 25 10 - 18 | 15 - 25 10 - 18 | 10 - 20 6 - 14 |
| 300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic | | < 40 > 40 | - - | 14 - 23 10 - 17 | 14 - 23 10 - 17 | 10 - 18 6 - 12 |
| 400 Series - 403, 405, 420, 455 | | < 40 > 40 | - - | 18 - 27 12 - 20 | 18 - 27 12 - 20 | 14 - 23 8 - 15 |
| HIGH STRENGTH TOOL STEELS | | | | | | |
| A2, D2, P20, H13, S7, O1 | < 40 > 40 | - - | 25 - 40 18 - 34 | 25 - 40 18 - 34 | 20 - 34 14 - 27 | |
| Thompson Shaft, Armor Plate (Class 1) | > 50 | - | - | 14 - 25 | 10 - 20 | |
| P | MEDIUM ALLOY TOOL STEELS | | | | | |
| | 4140, 4340, 52100, 6150, 8620 | < 40 > 40 | - - | 30 - 43 21 - 37 | 30 - 43 21 - 37 | 20 - 37 17 - 30 |
| | CARBON STEELS | | | | | |
| | 1000's - 1018, 1020, 12L14 | < 40 | - | 37 - 52 | 37 - 52 | 32 - 45 |
| K | CAST MATERIAL | | | | | |
| | Ductile Iron | | 21 - 43 | 37 - 52 | 37 - 52 | 32 - 45 |
| | Gray Iron | | 21 - 50 | 37 - 58 | 37 - 58 | 32 - 52 |
| N | NON-FERROUS | | | | | |
| | Aluminum (6061, 7075) | | - | 60 - 90 | - | 50 - 75 |
| | Magnesium | | - | 37 - 65 | - | 25 - 50 |
| | Copper | | - | 30 - 50 | - | 18 - 38 |
| | Brass, Bronze | | - | 37 - 65 | - | 25 - 50 |
| O | COMPOSITE (non-ISO) | | | | | |
| | Glass Epoxy, Fiberglass, Plastics, Graphite, G10 | | 43 | 30 - 70 | 32 - 70 | - |

NOTE - ABOVE ARE STARTING PARAMETERS ONLY. HIGHER RESULTS MAY BE ACHIEVED WITH OPTIMUM CONDITIONS.

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| | ISO Material | HRC | CHIPLOAD PER TOOTH (Fz) | | | | |
|--|---|-------------|-------------------------|-------------|--------------|---------------|---------------|
| | | | 2.0 - 3.0mm | 3.0 - 6.0mm | 6.0 - 10.0mm | 10.0 - 13.0mm | 13.0 - 16.0mm |
| S | COBALT BASE ALLOYS | | | | | | |
| | Haynes 25/188, Stellite 21, Cobalt Chrome | < 40 | .008 - .020 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .081 |
| | | > 40 | .005 - .015 | .010 - .023 | .020 - .038 | .030 - .056 | .043 - .076 |
| | NICKEL BASE ALLOYS | | | | | | |
| | Inconel-625/718, Waspaloy, Invar, Rene, Hastelloy, Monel | < 40 | .008 - .020 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .081 |
| | | > 40 | .005 - .015 | .010 - .023 | .020 - .038 | .030 - .056 | .043 - .076 |
| | IRON BASE ALLOYS | | | | | | |
| | A286, Discaloy, Haynes 556, Carpenter 22, Greek Ascology | < 40 | .008 - .020 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .081 |
| | | > 40 | .005 - .015 | .010 - .023 | .020 - .038 | .030 - .056 | .043 - .076 |
| | TITANIUM ALLOYS | | | | | | |
| Commercially Pure, 6Al-4V, Astm 1/2/3, 6Al-25N-4Zr-2Mo-Si | | .010 - .023 | .020 - .036 | .030 - .051 | .041 - .069 | .053 - .084 | |
| 5553 / Beta Titanium | | .008 - .018 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .076 | |
| M | STAINLESS STEELS | | | | | | |
| | 13/8, 15/5, 17-4, pH Types | < 40 | .010 - .023 | .018 - .033 | .028 - .048 | .038 - .066 | .051 - .081 |
| | | > 40 | .008 - .018 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .076 |
| | 300 Series, 304L, Nitronic 50, Duplex, Super-Austenitic | < 40 | .010 - .023 | .018 - .033 | .028 - .048 | .038 - .066 | .051 - .081 |
| | | > 40 | .008 - .018 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .076 |
| | 400 Series - 403, 405, 420, 455 | < 40 | .010 - .023 | .018 - .033 | .028 - .048 | .038 - .066 | .051 - .081 |
| | > 40 | .008 - .018 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .076 | |
| P | HIGH STRENGTH TOOL STEELS | | | | | | |
| | A2, D2, P20, H13, S7, O1 | < 40 | .010 - .023 | .018 - .033 | .028 - .048 | .038 - .066 | .051 - .081 |
| | | > 40 | .008 - .018 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .076 |
| | Thompson Shaft, Armor Plate (Class 1) | > 50 | .005 - .015 | .013 - .023 | .023 - .038 | .033 - .056 | .046 - .071 |
| | MEDIUM ALLOY TOOL STEELS | | | | | | |
| | 4140, 4340, 52100, 6150, 8620 | < 40 | .010 - .023 | .018 - .033 | .028 - .048 | .038 - .066 | .051 - .081 |
| | > 40 | .008 - .018 | .015 - .028 | .025 - .043 | .036 - .061 | .048 - .076 | |
| CARBON STEELS | | | | | | | |
| 1000's - 1018, 1020, 12L14 | < 40 | .013 - .025 | .020 - .036 | .030 - .051 | .041 - .069 | .053 - .084 | |
| K | CAST MATERIAL | | | | | | |
| | Ductile Iron | | .013 - .025 | .020 - .036 | .030 - .051 | .041 - .069 | .053 - .084 |
| | Gray Iron | | .013 - .025 | .020 - .036 | .030 - .051 | .041 - .069 | .053 - .084 |
| N | NON-FERROUS | | | | | | |
| | Aluminum (6061, 7075) | | .015 - .028 | .023 - .038 | .033 - .053 | .043 - .071 | .056 - .086 |
| | Magnesium | | .013 - .025 | .023 - .036 | .033 - .051 | .043 - .069 | .056 - .084 |
| | Copper | | .010 - .020 | .020 - .030 | .030 - .046 | .041 - .064 | .053 - .079 |
| | Brass, Bronze | | .013 - .023 | .023 - .033 | .033 - .048 | .043 - .066 | .056 - .081 |
| O | COMPOSITE (non-ISO) | | | | | | |
| | Glass Epoxy, Fiberglass, Plastics, Graphite, G10 | | .008 - .020 | .018 - .030 | .028 - .046 | .038 - .064 | .051 - .079 |

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