



Recommended Cutting Data CDACR - Inch

| Workpiece Material Group | I S O | Hardness | vc - SFM | | | Drill Diameter | | | | | |
|---|-------------|-------------------|----------|----------------|------|----------------|-----------|-----------|-----------|-----------|-----------|
| | | | Min | Starting Value | Max | 1/8 | 3/16 | 1/4 | 5/16 | 3/8 | 1/2 |
| | | | | | | f - IPR | | | | | |
| Aluminum & Aluminum Wrought Alloys | 10 | 60-100 Brinell HB | 390 | 750 | 1480 | .005-.010 | .006-.011 | .007-.014 | .008-.017 | .011-.020 | .013-.022 |
| Cast Aluminum Alloys | 20 | 75-90 Brinell HB | 390 | 720 | 1150 | .006-.009 | .006-.011 | .007-.013 | .009-.015 | .011-.018 | .013-.021 |
| Aluminum Alloys Cast 13-22% Si | 30 | | 330 | 590 | 1310 | .005-.007 | .006-.007 | .006-.010 | .008-.012 | .011-.015 | .013-.017 |
| Copper and Copper Alloys, Brass, Bronze, Copper | 40 | 90-110 Brinell HB | 330 | 430 | 980 | .004-.006 | .005-.007 | .006-.009 | .006-.011 | .007-.013 | .008-.014 |

Definition

This group contains non-ferrous, soft metals with hardness under 130 HB, except for high strength bronzes (>225HB)
 Aluminum (Al) alloys comprising less than 12-13% silicon (Si) represent the largest part
 MMC: Metal Matrix Composite: Al + SiC (20-30%)
 Magnesium based alloys
 Copper, electrolytic copper with 99.95% Cu
 Bronze: Copper with Tin (Sn) (10-14%) and/or aluminum (3-10%)
 Brass: Copper (60-85%) with Zinc (Zn) (40-15%)

Machinability of Aluminum

Long-chipping material
 Relatively easy chip control, if alloyed
 Pure Al is sticky and requires sharp cutting edges and high cutting speeds (Vc), consider Fordlube coating.
 Specific cutting force: 350–700 N/mm²
 Cutting forces, and thus the power required to machine them, are low.
 For Cast Aluminum with Si-content above 13%, consider CERAedge® coating.
 Over eutectic Al with higher Si-content > 12% is very abrasive, consider an engineered custom tool solution with GemX coating or PCD diamond tipped.

Common components

Engine block, cylinder head, transmission housings, casings, aerospace frame components.





Recommended Cutting Data CDACR - Metric

| Workpiece Material Group | I S O | Hardness | vc - m/min | | | Drill Diameter (mm) | | | | | |
|---|-------------|-------------------|------------|----------------|-----|---------------------|-----------|-----------|-----------|-----------|-----------|
| | | | Min | Starting Value | Max | 3.0 | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 |
| | | | | | | f - mm/Rev | | | | | |
| Aluminum & Aluminum Wrought Alloys | 10 | 60-100 Brinell HB | 120 | 230 | 450 | 0.13-0.25 | 0.14-0.29 | 0.17-0.35 | 0.21-0.42 | 0.27-0.50 | 0.33-0.57 |
| Cast Aluminum Alloys | 20 | 75-90 Brinell HB | 120 | 220 | 350 | 0.14-0.23 | 0.15-0.28 | 0.17-0.34 | 0.22-0.39 | 0.29-0.46 | 0.34-0.54 |
| Aluminum Alloys Cast 13-22% Si | 30 | | 100 | 180 | 400 | 0.13-0.18 | 0.14-0.19 | 0.16-0.25 | 0.20-0.30 | 0.28-0.37 | 0.33-0.42 |
| Copper and Copper Alloys, Brass, Bronze, Copper | 40 | 90-110 Brinell HB | 100 | 130 | 300 | 0.10-0.16 | 0.12-0.18 | 0.14-0.24 | 0.16-0.28 | 0.18-0.32 | 0.20-0.36 |

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