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| **Cutting Speeds for Commonly Used Materials** | | | | | | | |
|  | **Tool Material** | | | | | | |
| **Work Material** | **High-Speed Steel** | **Uncoated Carbide** | **Coated Carbide** | **Cermet** | **Ceramic** | **CBN** | **Diamond** |
| ***Aluminum***  Low Silicon  High Silicon | 300 – 800 | 700 – 1400 |  |  |  |  | 1000 - 5000 |
|  |  |  |  |  |  | 500 - 2500 |
| ***Bronze*** | 65 – 130 | 500 – 700 |  |  |  |  |  |
| ***Gray Cast Iron*** | 50 – 80 | 250 – 450 | 350 – 500 | 400 – 1000 | 700 – 2000 | 700 – 1500 |  |
| ***Chilled Cast Iron*** |  |  |  |  | 250 – 600 | 250 - 500 |  |
| ***Low-Carbon Steel*** | 60 – 100 | 250 – 350 | 500 – 900 | 500 – 1300 | 1000 – 2500 |  |  |
| ***Alloy Steel*** | 40 – 70 |  | 350 – 600 | 300 – 1000 | 500 – 1500 | 250 - 600 |  |
| ***Tool Steel*** | 40 – 70 |  | 250 – 500 |  | 500 – 1200 | 150 – 300 |  |
| ***Stainless Steel***  200 & 300 Series  400 & 500 Series | 30 – 80 | 100 – 250 | 400 – 650 |  | 300 – 1100 |  |  |
|  |  | 250 – 350 |  | 400 - 1200 |  |  |
| ***Non-metallics*** |  | 400 – 600 |  |  |  |  | 400 - 2000 |
| ***Super-alloys*** |  | 70 – 100 | 90 – 150 |  | 500 – 1000 | 300 – 800 |  |

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| **Drilling Speed Table** | |
| **Material** | **Cutting Speed/ SFPM** |
| ***Low-Carbon Steel*** | 60 – 100 |
| ***Aluminum Alloys*** | 100 – 300 |
| ***Cast Iron*** | 60 – 200 |
| ***Alloy Steel*** | 40 – 90 |
| ***Brass and Bronze*** | 50 - 200 |
|  | |
| **Drilling Feed Table** | |
| **Drill Size Dia.** | **IPR** |
| **Under** (1/8) | 0.001 to 0.002 |
| (1/8) **to** (1/4) | 0.002 to 0.004 |
| (1/4) **to** (1/2) | 0.004 to 0.007 |
| (1/2) **to 1”** | 0.007 to 0.015 |
| **Over 1”** | 0.015 |

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| **Feed for High-Speed Steel End Mills (Feed per Tooth in Inches)** | | | | | | | | |
| **Cutter Diameter** | **Aluminum** | **Brass** | **Bronze** | **Cast Iron** | **Low-Carbon Steel** | **High-Carbon Steel** | **Medium-Alloy Steel** | **Stainless Steel** |
| (1/8) | 0.002 | 0.001 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 | 0.0005 |
| (1/4) | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 | 0.001 | 0.0005 | 0.001 |
| (3/8) | 0.003 | 0.003 | 0.002 | 0.002 | 0.002 | 0.002 | 0.001 | 0.002 |
| (1/2) | 0.005 | 0.002 | 0.003 | 0.0025 | 0.002 | 0.002 | 0.001 | 0.002 |
| (3/4) | 0.006 | 0.004 | 0.003 | 0.003 | 0.004 | 0.003 | 0.002 | 0.003 |
| **1”** | 0.007 | 0.005 | 0.004 | 0.0035 | 0.005 | 0.003 | 0.003 | 0.004 |
| **1”** (1/2) | 0.008 | 0.005 | 0.005 | 0.004 | 0.006 | 0.004 | 0.003 | 0.004 |
| **2”** | 0.009 | 0.006 | 0.005 | 0.005 | 0.007 | 0.004 | 0.003 | 0.005 |

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| **RPM** = |
| **IPM** = **F** x **N** x **RPM** |
| **IPM** = Feed Rate, Inches Per Minute |
| **F** = Feed per Tooth |
| **N** = Number of Teeth/ Flutes in the cutter |
| **RPM** = Revolutions per Minute |

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| *Other Operations* | **Speed** | **Feed** |
| **Reaming** | (1/3)33% to (1/2)50% of Drill Size | x2 to x3 of Drill (0.0015 to 0.004 in.) |
| **Counterboring** | (1/3)33% of Drill Size | (3/8) in. diameter up to **0.004** in. per revolution  (5/8) in. diameter up to **0.005** in. per revolution  (7/8) in. diameter up to **0.006** in. per revolution  **1** (1/4) in. diameter up to **0.007** in. per revolution  **1** (1/2) in. diameter up to **0.008** in. per revolution |
| **Threading** | (1/4)25% of Turning | See Machinist’s Handbook |

*Threading Information*:

* Pitch = 1/TPI, Single Lead = Pitch
* Depth: External Thread = Pitch x 0.6134
* Depth: Internal Thread = Pitch x 0.541