Deep hole drilling
on conventional machine tools

1. operation - pilot hole
   - workpiece
   - coolant cycle

2. operation - deep hole drilling
   - workpiece
   - chip box
   - bushing
   - spindle unit
   - coolant cycle

Deep hole drilling machines

Material group | Hardness | SFM | Feed Rate - IPR
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Common structural steels ≤100 Bhn | 360 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
>100-260 Bhn | 360 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
Free-cutting steels | 24-30 Rc | 395 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
Unalloyed heat-treatable steels ≤16 Rc | 360 | 0.003 | 0.004 | 0.006 | 0.009 | 0.010 | 0.012 | 0.012
>16-24 Rc | 360 | 0.003 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020
Alloyed heat-treatable steels | 24-30 Rc | 360 | 0.003 | 0.005 | 0.008 | 0.011 | 0.012 | 0.016 | 0.016
>24-30 Rc | 360 | 0.003 | 0.005 | 0.008 | 0.011 | 0.012 | 0.016 | 0.016
Unalloyed case hardened steels ≤10 Rc | 230 | 0.003 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
>10-24 Rc | 230 | 0.003 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
Nitriding steels ≤24-30 Rc | 330 | 0.02 | 0.02 | 0.005 | 0.007 | 0.008 | 0.008 | 0.010
>24-30 Rc | 330 | 0.02 | 0.02 | 0.005 | 0.007 | 0.008 | 0.008 | 0.010
Tool steels ≤24-30 Rc | 260 | 0.02 | 0.02 | 0.005 | 0.007 | 0.008 | 0.008 | 0.010
>24-30 Rc | 260 | 0.02 | 0.02 | 0.005 | 0.007 | 0.008 | 0.008 | 0.010
High speed steels ≤14-20 Rc | 165 | 0.009 | 0.011 | 0.005 | 0.007 | 0.009 | 0.010 | 0.010
Spring steels ≤330 Bhn | 165 | 0.002 | 0.003 | 0.005 | 0.007 | 0.009 | 0.010 | 0.010
Stainless steels, sulphured austenitic martensitic | ≤24-30 Rc | 330 | 0.002 | 0.003 | 0.005 | 0.007 | 0.008 | 0.008 | 0.010
>24-30 Rc | 330 | 0.002 | 0.003 | 0.005 | 0.007 | 0.008 | 0.008 | 0.010
Hardenable steels ≤46-50 Rc | 165 | 0.002 | 0.003 | 0.004 | 0.006 | 0.008 | 0.010 | 0.010
>46-60 Rc | 165 | 0.002 | 0.003 | 0.004 | 0.006 | 0.008 | 0.010 | 0.010
Special alloys ≤26 Rc | 100 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
Cast iron ≤300 Bhn | 330 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
Spheroidal graphite iron and malleable cast iron ≤300 Bhn | 330 | 0.004 | 0.006 | 0.010 | 0.014 | 0.016 | 0.020 | 0.020
Chilled cast iron ≤350 Bhn | • | • | • | • | • | • | • | •
Ti and Ti-alloys ≤24-30 Rc | • | • | • | • | • | • | • | •
Al and Al-alloys ≤24-30 Rc | • | • | • | • | • | • | • | •
Al wrought alloys ≤150 Bhn | • | • | • | • | • | • | • | •
Al cast alloys ≤10 % Si >10 % Si | ≤200 Bhn | • | • | • | • | • | • | • | •
Magnesium alloys ≤150 Bhn | • | • | • | • | • | • | • | •
Mild steel, short-chipping ≤300 Bhn | ≤200 Bhn | • | • | • | • | • | • | • | •
Mild steel, long-chipping ≤300 Bhn | ≤200 Bhn | • | • | • | • | • | • | • | •
Duroplastics –
Thermoplastics –
Reinforced plastics - Kevlar –
Reinforced plastics - GFK / CFK –

Note: Pilot holes (depth >1xD) are recommended when using RT100T drills. Use a series 5514 or similar drill to drill a minimum of 1xD deep. Then enter the pilot hole with the RT100T drill at approx 300 rev/min and 500 mm/min speed, start high coolant pressure and increase RPM. Drill to hole depth without pecking.

Using These Tables. The Speeds & Feeds listed below are conservative recommendations for initial setup. In actual use, depending on the machining environment and workpiece material, significantly higher speeds and feeds may be achievable. Using the below as a starting point, cutting speed/feed can be gradually adjusted upwards until the optimum settings per application are found. Questions? Contact us by telephone at (800) 776-6170.

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