

FEEDS & SPEEDS CHARTS FOR DRILLS - CARBIDE TIPPED

Feeds & speeds are a starting recommendation only. Factors such as machine, fixture and tooling rigidity, horsepower available, coolant application and others will affect the performance significantly. Please read machine operators instructions and use all safety shields and glasses before performing these operations.



$$\text{RPM} = \text{SFPM} \times 3.82 / \text{DRILL DIAM.} \quad \text{IPM} = \text{IPR} \times \text{RPM}^*$$

| CLASSIFICATION | MATERIAL | BRINELL | SPEED IN SFPM | FEED RATE (INCHES PER REVOLUTION) | | | | | HOLE DIAMETER IN INCHES | | | |
|------------------------|--|------------|------------------------|-----------------------------------|------|------|------|------|-------------------------|------|-------|-------|
| | | | GENERAL PURPOSE (G.P.) | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 |
| NON-FERROUS (SOFT) | ALUMINUM ALLOY - WROUGHT | 30 - 150* | 250-350 | .003 | .005 | .007 | .008 | .010 | .011 | .014 | .017 | .019 |
| | MAGNESIUM ALLOY | 50 - 90* | 300-400 | .003 | .005 | .006 | .007 | .008 | .009 | .013 | .015 | .016 |
| | LEAD ALLOY | 10 - 20* | 350-450 | .003 | .005 | .006 | .007 | .008 | .009 | .013 | .015 | .017 |
| | NON-METAL AND PLASTIC | - | 175-450 | .002 | .004 | .005 | .005 | .006 | .008 | .009 | .010 | .012 |
| | ZINC ALLOY - DIE CAST | 80 - 100 | 300-400 | .003 | .005 | .007 | .009 | .011 | .012 | .014 | .016 | .018 |
| NON-FERROUS (HARD) | ALUMINUM BRONZE | 40 - 175 | 125-190 | .002 | .005 | .007 | .008 | .009 | .010 | .012 | .014 | .016 |
| | BRASS ALLOY - LEADED AND FREE CUTTING | 10 - 100Rb | 225-400 | .003 | .005 | .007 | .008 | .009 | .010 | .012 | .014 | .016 |
| | NICKEL SILVER | 10 - 100Rb | 125-190 | .002 | .005 | .007 | .008 | .009 | .010 | .012 | .014 | .016 |
| | COPPER ALLOY - TOUGH | 40 - 200* | 125-190 | .002 | .005 | .007 | .008 | .009 | .010 | .012 | .014 | .016 |
| CAST IRON | DUCTILE CAST IRON - AUSTENITIC | 120 - 275 | - | - | - | - | - | - | - | - | - | - |
| | DUCTILE CAST IRON - FERRITIC | 140 - 270 | 150-225 | .002 | .004 | .006 | .008 | .010 | .012 | .014 | .016 | .018 |
| | DUCTILE CAST IRON - MARTENSITIC | 270 - 400 | - | - | - | - | - | - | - | - | - | - |
| | GRAY - PEARLITIC | 220 - 320 | 130-225 | .002 | .004 | .006 | .007 | .009 | .010 | .013 | .016 | .018 |
| | GRAY - FERRITIC | 120 - 220 | 125-190 | .002 | .005 | .008 | .009 | .010 | .011 | .012 | .014 | .016 |
| | MALLEABLE CAST IRON - MARTENSITIC | 200 - 320 | 100-150 | .002 | .004 | .006 | .007 | .008 | .010 | .012 | .014 | .016 |
| LOW CARBON STEELS | LOW AND MEDIUM CARBON STEEL - FREE MACHINING | 100 - 250 | 125-175 | .003 | .004 | .008 | .010 | .012 | .014 | .017 | .018 | .019 |
| | LOW AND MEDIUM CARBON STEEL - WROUGHT | 100 - 375 | - | - | - | - | - | - | - | - | - | - |
| MEDIUM STRENGTH STEELS | LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING | 100 - 275 | - | - | - | - | - | - | - | - | - | - |
| | LOW AND MEDIUM CARBON ALLOY STEEL | 85 - 375 | - | - | - | - | - | - | - | - | - | - |
| | STAINLESS STEEL - 400 SERIES | 135 - 325 | - | - | - | - | - | - | - | - | - | - |
| | STAINLESS STEEL - 400 SERIES FREE MACHINING | 135 - 275 | 100-150 | .002 | .004 | .005 | .006 | .007 | .008 | .010 | .012 | .014 |
| HIGH STRENGTH STEELS | HIGH STRENGTH STEEL - WROUGHT & TOOL STEEL | 175 - 400 | - | - | - | - | - | - | - | - | - | - |
| HIGH TEMP. ALLOYS | HIGH TEMP ALLOYS NICKEL & IRON BASE ALLOY | 140 - 300 | - | - | - | - | - | - | - | - | - | - |
| | STAINLESS STEEL - 300 SERIES | 135 - 375 | - | - | - | - | - | - | - | - | - | - |
| | STAINLESS STEEL - PH SERIES | 150 - 440 | - | - | - | - | - | - | - | - | - | - |
| | TITANIUM ALLOY | 110 - 380 | - | - | - | - | - | - | - | - | - | - |

| CLASSIFICATION | MATERIAL | BRINELL | SPEED IN SFPM | FEED RATE (INCHES PER REVOLUTION) | | | | | HOLE DIAMETER IN INCHES | | | |
|------------------------|--|------------|--------------------|-----------------------------------|-------|------|------|------|-------------------------|------|-------|-------|
| | | | COOLANT FED (C.F.) | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 | 1 1/4 | 1 1/2 |
| NON-FERROUS (SOFT) | ALUMINUM ALLOY - WROUGHT | 30 - 150* | 375-550 | - | .004 | .005 | .006 | .006 | .007 | .009 | - | - |
| | MAGNESIUM ALLOY | 50 - 90* | 450-550 | - | .005 | .006 | .007 | .008 | .009 | .013 | - | - |
| | LEAD ALLOY | 10 - 20* | 400-500 | - | .004 | .006 | .007 | .008 | .009 | .013 | - | - |
| | NON-METAL AND PLASTIC | - | - | - | - | - | - | - | - | - | - | - |
| | ZINC ALLOY - DIE CAST | 80 - 100 | 400-500 | - | .004 | .005 | .006 | .008 | .009 | .010 | - | - |
| NON-FERROUS (HARD) | ALUMINUM BRONZE | 40 - 175 | 200-300 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| | BRASS ALLOY - LEADED AND FREE CUTTING | 10 - 100Rb | 300-450 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| | NICKEL SILVER | 10 - 100Rb | 225-300 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| | COPPER ALLOY - TOUGH | 40 - 200* | 225-300 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| CAST IRON | DUCTILE CAST IRON - AUSTENITIC | 120 - 275 | - | - | - | - | - | - | - | - | - | - |
| | DUCTILE CAST IRON - FERRITIC | 140 - 270 | 200-250 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| | DUCTILE CAST IRON - MARTENSITIC | 270 - 400 | 200-250 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| | GRAY - PEARLITIC | 220 - 320 | 225-325 | - | .004 | .006 | .008 | .010 | .012 | .015 | - | - |
| | GRAY - FERRITIC | 120 - 220 | 200-250 | - | .004 | .006 | .008 | .008 | .008 | .010 | - | - |
| | MALLEABLE CAST IRON - MARTENSITIC | 200 - 320 | 200-250 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| LOW CARBON STEELS | LOW AND MEDIUM CARBON STEEL - FREE MACHINING | 100 - 250 | 150-250 | - | .005 | .006 | .008 | .009 | .010 | .012 | - | - |
| | LOW AND MEDIUM CARBON STEEL - WROUGHT | 100 - 375 | - | - | - | - | - | - | - | - | - | - |
| MEDIUM STRENGTH STEELS | LOW AND MEDIUM CARBON ALLOY STEEL - FREE MACHINING | 100 - 275 | 100-220 | - | .005 | .006 | .007 | .008 | .010 | .012 | - | - |
| | LOW AND MEDIUM CARBON ALLOY STEEL | 85 - 375 | 100-150 | - | .005 | .006 | .007 | .008 | .010 | .012 | - | - |
| | STAINLESS STEEL - 400 SERIES | 135 - 325 | 110-150 | - | .004 | .005 | .006 | .007 | .008 | .010 | - | - |
| | STAINLESS STEEL - 400 SERIES FREE MACHINING | 135 - 275 | 125-190 | - | .004 | .005 | .006 | .007 | .007 | .008 | - | - |
| HIGH STRENGTH STEELS | HIGH STRENGTH STEEL - WROUGHT & TOOL STEEL | 175 - 400 | 100-150 | - | .0015 | .002 | .003 | .004 | .005 | .006 | - | - |
| HIGH TEMP. ALLOYS | HIGH TEMP ALLOYS NICKEL & IRON BASE ALLOY | 140 - 300 | - | - | - | - | - | - | - | - | - | - |
| | STAINLESS STEEL - 300 SERIES | 135 - 375 | - | - | - | - | - | - | - | - | - | - |
| | STAINLESS STEEL - PH SERIES | 150 - 440 | - | - | - | - | - | - | - | - | - | - |
| | TITANIUM ALLOY | 110 - 380 | - | - | - | - | - | - | - | - | - | - |

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