FEEDS & SPEEDS FOR DRILLING - 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. Top chart is for general purpose drilling. Bottom chart is for drilling with coolant.

RPM=SFPM*3.82/DRILL DIAMETER

RPM = Rotations Per Minute
SFPM = Surface Feet Per Minute
Drill Diameter = Diameter of the drill in inches

CLASS OF MATERIALS	MATERIAL	BRINELL	SPEED IN SFPM	HOLE DIAMETER YOU ARE DRILLING IN INCHES FEED RATE (INCHES PER REVOLUTION)								
			GENERAL PURPOSE	⅛	¼	⅜	½	⅝	¾	1	1¼	1½
NON-FERROUS (SOFT)	ALUMINUM ALLOY - WROUGHT	30-150 (500kg)	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	110-240	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 STEELSt	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	–	–	–	–	–	–	–	–	–	–

CLASS OF MATERIALS	MATERIAL	BRINELL	SPEED IN SFPM	HOLE DIAMETER YOU ARE DRILLING IN INCHES FEED RATE (INCHES PER REVOLUTION)								
			COOLANT FED	⅛	¼	⅜	½	⅝	¾	1	1¼	1½
NON-FERROUS (SOFT)	ALUMINUM ALLOY - WROUGHT	30-150 (500kg)	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	110-240	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	.06	–	–
HIGH TEMP. ALLOYS	HIGH TEMP ALLOYS NICKEL & IRON BASE ALLOY	140-300	60-115	–	-	-	-	-	-	-	–	–
	STAINLESS STEEL - 300 SERIES	135-375	70-105	–	-	-	-	-	-	-	–	–
	STAINLESS STEEL - PH SERIES	150-440	65-100	–	-	-	-	-	-	-	–	–
	TITANIUM ALLOY	110-380	65-100	–	-	-	-	-	-	-	–	–