Jobber Length • Screw Machine Length • Taper Length

Operating Parameters — General Application Cobalt and HSS Drills

Material	Hardness	Speeds (SFM) Drill Finish				Feed Rate (IPR)			
		Bright or Steam Oxide	Straw	TiN	TiCN TiAlN	1/8" 3.17mm	1/4" 6.35mm	3/8" 9.52mm	1/2" 12.70mm
Ferrous									
low carbon steel	85-125 Bhn	90	125	135	–	.0040	.0065	.0080	.0100
medium carbon steel	125-175 Bhn	90	125	135	–	.0040	.0065	.0080	.0100
high carbon steel	175-225 Bhn	90	125	135	–	.0030	.0050	.0065	.0080
alloyed steel	200-300 Bhn	60	80	90	–	.0025	.0040	.0050	.0065
heat-treatable steel and forgings	370-420 Bhn	40	50	60	70	.0025	.0040	.0050	.0065
tool steels	< 24 HRc	60	80	90	110	.0030	.0050	.0065	.0080
	> 24-30 HRc	30	40	45	55	.0025	.0040	.0050	.0065
high-speed steels	14-30 HRc	35	50	55	60	.0025	.0040	.0050	.0065
gray cast iron	240 Bhn	115	160	175	–	.0050	.0080	.0100	.0125
	<300 Bhn	90	125	135	–	.0050	.0080	.0100	.0125
mallable cast iron	<300 Bhn	70	95	105	–	.0050	.0080	.0100	.0125
chilled cast iron	<350 Bhn	25	35	40	–	.0025	.0040	.0050	.0065
stainless steel									
300 series (Austenetic)	120-200 Bhn	60	80	90	100	.0025	.0040	.0050	.0065
400 series (Martensitic)	200-300 Bhn	40	50	60	80	.0025	.0040	.0050	.0065
sulphurized	> 25 HRc	45	65	70	80	.0025	.0040	.0050	.0065
spring steel	400 Bhn	25	35	40	45	.0020	.0030	.0040	.0050
Nonferrous									
aluminum and aluminum alloys	40-100 Bhn	180	–	–	–	.0050	.0080	.0100	.0125
cast aluminum									
< 10% Si	200 Bhn	200	275	–	–	.0050	.0080	.0100	.0125
> 10% Si	200 Bhn	180	225	–	250	.0040	.0065	.0080	.0100
brass, long chipping	190-210 Bhn	150	–	–	–	.0040	.0065	.0080	.0100
bronze, long chipping	150-200 Bhn	90	115	–	130	.0030	.0050	.0065	.0080
copper, low alloy	65-100 Bhn	120	145	–	–	.0040	.0065	.0080	.0100
plastics, duraplastics	N/A	55	75	80	–	.0030	.0050	.0065	.0080

The speeds and feeds listed here are conservative recommendations for initial setup. In actual use, depending on the machine environment and workpiece material, significantly higher speeds and feeds may be achievable. Use these speeds and feeds as a starting point. Cutting conditions can be gradually adjusted until the optimum settings for the application are found. Questions? Contact Technical Support at 800.892.4281.

Drill Definitions

- RPM = revolutions per minute
- SFM = surface feet per minute
- FR = feed rate in inches per minute
- IPR = inches per revolution

Drill Formulas

- RPM = 3.82 x SFM/drill diameter
- SFM = .262 x RPM x drill diameter
- FR = RPM x IPR

Drill and Reamer Blanks

Style 902 • Oversize Reamer Blank Tolerance +.0002/–.0000

FEATURES

ANSI SIZES | HSS SUBSTRATE | GENERAL PURPOSE

APPLICATIONS

ALLOY-TOOL STEEL | NICKEL ALLOYS | CAST IRON | COBALT ALLOYS

Style 902 Bright

Blank Diameter	Width in	Width mm	Height in	Height mm	Order Number
3/64	.0469	1.19	1.750	44.45	C19271
#51	.0670	1.70	2.000	50.80	C19288
1/8	.1250	3.18	2.750	69.85	C19335
5/32	.1562	3.97	3.125	79.38	C19355
3/16	.1875	4.76	3.500	88.90	C19377
7/32	.2188	5.56	3.750	95.25	C19398
1/4,E	.2500	6.35	4.000	101.60	C19416
5/16	.3125	7.94	4.500	114.30	C19449

Style 903 • Undersize Drill Blank Tolerance +.0000/–.0003

FEATURES

ANSI SIZES | HSS SUBSTRATE | GENERAL PURPOSE

APPLICATIONS

ALLOY-TOOL STEEL | NICKEL ALLOYS | CAST IRON | COBALT ALLOYS

Style 903 Bright

Blank Diameter	Width in	Width mm	Height in	Height mm	Order Number
#55	.0520	1.32	1.875	47.63	C19562
1/16	.0625	1.59	1.875	47.63	C19570
3/32	.0938	2.38	2.250	57.15	C19599
1/8	.1250	3.18	2.750	69.85	C19622
3/16	.1875	4.76	3.500	88.90	C19664
1/4,E	.2500	6.35	4.000	101.60	C19703
5/16	.3125	7.94	4.500	114.30	C19736
3/8	.3750	9.53	5.000	127.00	C19766
1/2	.5000	12.70	6.000	152.40	C19795

TECH TIP

Drill and Reamer Blanks

- Ideal for use as drifts of dowel pins, for gauging purposes, and for making punches.
- Also can be used for round tool bits, countersinks, boring, or burring tools.