



twist drills

The table below shows the sizes of both U.S. and metric straight shank drills up to 1/2 inch in diameter. Other shanks (namely, taper shanks) and larger sizes are usually used only in an industrial setting. If you need information on such drills, the most convenient source is the latest edition of

Eric Oberg, ed.
Machinery's Handbook.



New York: Industrial Press.

In the United States, three different systems for designating twist drill sizes are used:

- fractional inches
- letters (Morse gauge)
- numbers, with higher numbers representing smaller drills.
- millimeters

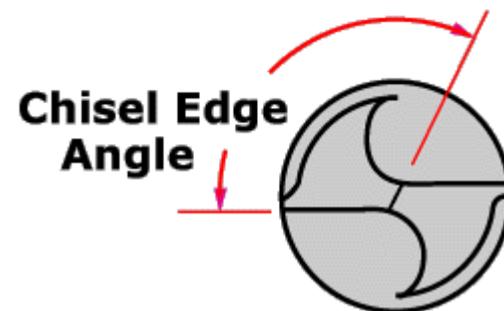
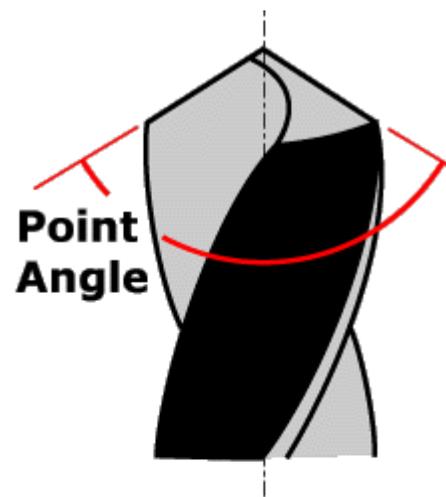
Lengths. The lengths given in the table below are "jobber's lengths." For some purposes they are too short. Very long twist drills, often called "aircraft drills," sometimes "electrician's drill," are available in 6, 12, and even 24-inch lengths.

Points

Ideally the point should be suited to the materials to be drilled. Bits usually come with a 135° split

point, although several proprietary designs are also offered.

Material	Point angle	Chisel angle
aluminum	118°-130°	125°-130°
brass	118°-125°	125°-135°
bronze (hard)	118°	115°-125°
copper	100°-130°	125°-135°
plastic	60°-118°	125°-135°
stainless steel	118°-140°	115°-125°
cast iron	90°-118°	115°-125°
cast steel	118°	125°-235°



Drill size	Lip relief
#80-#61	24°
#60-#41	21°
#40-#31	18°

#30-1/4"	16°
F-11/32"	14°
S-1/2"	12°
33/64" - 3/4"	10°
49/64" up	8°

U.S. Twist Drill Bit Sizes

Size		Diameter		Length inch	Some Uses
U.S.	Metric	inch	mm		
97	0.15	0.0059	0.150	3/4	
96	0.16	0.0063	0.160	3/4	
95	0.17	0.0067	0.170	3/4	
94	0.18	0.0071	0.180	3/4	
93	0.20	0.0075	0.200	3/4	
92	0.20	0.0079	0.200	3/4	
91		0.0083	0.211	3/4	
90	0.22	0.0087	0.221	3/4	
89		0.0091	0.231	3/4	

88		0.0095	0.241	$\frac{3}{4}$	
	0.25	0.0098	0.250	$\frac{3}{4}$	
87		0.0100	0.254	$\frac{3}{4}$	
86		0.0105	0.267	$\frac{3}{4}$	
85	0.28	0.0110	0.280	$\frac{3}{4}$	
84		0.0115	0.292	$\frac{3}{4}$	
	0.30	0.0118	0.300	$\frac{3}{4}$	
83		0.0120	0.305	$\frac{3}{4}$	
82		0.0125	0.138	$\frac{3}{4}$	
	0.32	0.0126	0.320	$\frac{3}{4}$	
81		0.0130	0.330	$\frac{3}{4}$	
80		0.0135	0.343	$\frac{3}{4}$	
	0.35	0.0138	0.350	$\frac{3}{4}$	
79		0.0145	0.368	$\frac{3}{4}$	
	0.38	0.0150	0.380	$\frac{3}{4}$	
1/64		0.0156	0.396	$\frac{3}{4}$	Pilot hole in softwood for #0 wood screw.
	0.40	0.0157	0.400	$\frac{3}{4}$	
78		0.0160	0.406	$\frac{7}{8}$	
	0.42	0.0165	0.420	$\frac{7}{8}$	

	0.45	0.0177	0.450	$\frac{7}{8}$	
77		0.0180	0.457	$\frac{7}{8}$	
	0.48	0.0189	0.480	$\frac{7}{8}$	
	0.50	0.0197	0.500	$\frac{7}{8}$	
76		0.0200	0.508	$\frac{7}{8}$	
75		0.0210	0.533	1	
	0.55	0.0217	0.550	1	
74		0.0225	0.572	1	
	0.60	0.0236	0.600	$1 \frac{1}{8}$	
73		0.0240	0.610	$1 \frac{1}{8}$	
72		0.0250	0.635	$1 \frac{1}{8}$	
	0.65	0.0256	0.650	$1 \frac{1}{4}$	
71		0.0260	0.660	$1 \frac{1}{4}$	Tap for 000-120.
	0.70	0.0276	0.700	$1 \frac{1}{4}$	
70		0.0280	0.711	$1 \frac{1}{4}$	
69		0.0292	0.742	$1 \frac{3}{8}$	
	0.75	0.0295	0.750	$1 \frac{3}{8}$	
68		0.0310	0.787	$1 \frac{3}{8}$	
					Pilot hole in softwood for #1 and #2 wood screw;

1/32		0.0312	0.792	1 $\frac{5}{16}$	pilot hole in hardwood for #0 and #1 wood screw.
	0.80	0.0315	0.800	1 $\frac{5}{16}$	
67		0.0320	0.813	1 $\frac{5}{16}$	
66		0.0330	0.838	1 $\frac{5}{16}$	
	0.85	0.0335	0.850	1 1/2	
65		0.0350	0.889	1 1/2	Close fit clearance hole for #000 screw; tap for 00-90.
	0.90	0.0354	0.899	1 1/2	
64		0.0360	0.914	1 1/2	
63		0.0370	0.940	1 1/2	
	0.95	0.0374	0.950	1 1/2	
62		0.0380	0.965	1 1/2	Free fit clearance hole for #000 screw.
61		0.0390	0.991	1 $\frac{5}{8}$	
	1.00	0.0394	1.00	1 $\frac{5}{8}$	
60		0.0400	1.016	1 $\frac{5}{8}$	
59		0.0410	1.041	1 $\frac{5}{8}$	
	1.05	0.0413	1.050	1 $\frac{5}{8}$	
58		0.0420	1.067	1 $\frac{5}{8}$	
57		0.0430	1.092	1 3/4	

	1.10	0.0433	1.100	1 ³ / ₄	
	1.15	0.0453	1.150	1 ³ / ₄	
56		0.0465	1.181	1 ³ / ₄	
3/64		0.0469	1.191	1 ³ / ₄	Close fit clearance hole for #00 screw; tap for 0-80; pilot hole in softwood for # 3 & #4 wood screw; pilot hole in hardwood for #2 wood screw.
	1.20	0.0472	1.200	1 ⁷ / ₈	
	1.25	0.0492	1.250	1 ⁷ / ₈	
	1.30	0.0512	1.300	1 ⁷ / ₈	
55		0.0520	1.321	1 ⁷ / ₈	Free fit clearance hole for #00 screw.
	1.35	0.0531	1.350	1 ⁷ / ₈	
54		0.0550	1.397	1 ⁷ / ₈	
	1.40	0.0551	1.400	1 ⁷ / ₈	
	1.45	0.0571	1.450	1 ⁷ / ₈	
	1.50	0.0591	1.500	1 ⁷ / ₈	
53		0.0595	1.511	1 ⁷ / ₈	Tap for 1-64, 1-72.
	1.55	0.0610	1.550	1 ⁷ / ₈	
1/16		0.0625	1.588	1 ⁷ / ₈	Clearance hole for #0 wood screw; pilot hole in softwood for #5 wood screw.

	1.60	0.0630	1.600	1 $\frac{7}{8}$	
52		0.0635	1.613	1 $\frac{7}{8}$	Close fit clearance hole for #0 screw; tap for M2.
	1.65	0.0650	1.650	2	
	1.70	0.0669	1.700	2	
51		0.0670	1.702	2	
	1.75	0.0689	1.750	2	
50		0.0700	1.778	2	Free fit clearance hole for #0 screw; tap for 2-56, 2-64.
	1.80	0.0709	1.800	2	
	1.85	0.0728	1.850	2	
49		0.0730	1.854	2	
	1.90	0.0748	1.900	2	
48		0.0760	1.930	2	Close fit clearance hole for #1 screw.
	1.95	0.0768	1.950	2	
$\frac{5}{64}$		0.0781	1.984	2	Clearance hole for #1 wood screw; pilot hole in softwood for #8 & #9 wood screw and in hardwood for #5 & #6 wood screw.
47		0.0785	1.994	2	
	2.00	0.0787	2.000	2	
	2.05	0.0807	2.050	2 $\frac{1}{8}$	

46		0.0810	2.057	$2 \frac{1}{8}$	Close fit clearance hole for M2 screw; free fit clearance hole for #1 screw; tap for M2.5.
45		0.0820	2.083	$2 \frac{1}{8}$	
	2.10	0.0827	2.100	$2 \frac{1}{8}$	
	2.15	0.0846	2.150	$2 \frac{1}{8}$	
44		0.0860	2.184	$2 \frac{1}{8}$	Free fit clearance hole for M2 screw; tap for 4-36.
	2.20	0.0866	2.200	$2 \frac{1}{4}$	
	2.25	0.0886	2.250	$2 \frac{1}{4}$	
43		0.0890	2.261	$2 \frac{1}{4}$	Close fit clearance hole for #2 screw; tap for 4-40.
	2.30	0.0906	2.300	$2 \frac{1}{4}$	
	2.35	0.0925	2.350	$2 \frac{1}{4}$	
42		0.0935	2.375	$2 \frac{1}{4}$	Tap for 4-48.
3/32		0.0938	2.383	$2 \frac{1}{4}$	Clearance hole for #2 wood screw; pilot hole in softwood for #10 & #12 wood screw; pilot hole in hardwood for #7 & #8 wood screw.
	2.40	0.0945	2.400	$2 \frac{3}{8}$	
41		0.0960	2.438	$2 \frac{3}{8}$	Free fit clearance hole for #2 screw.
	2.45	0.0965	2.450	$2 \frac{3}{8}$	
40		0.0980	2.489	$2 \frac{3}{8}$	Tap for M3.
	2.50	0.0984	2.500	$2 \frac{3}{8}$	

39		0.0995	2.527	$2 \frac{3}{8}$	
38		0.1015	2.578	$2\frac{1}{2}$	Tap for 5-40.
	2.60	0.1024	2.600	$2\frac{1}{2}$	
37		0.1040	2.642	$2\frac{1}{2}$	Tap for 5-44.
	2.70	0.1063	2.700	$2\frac{1}{2}$	
36		0.1065	2.705	$2\frac{1}{2}$	Close fit clearance hole for M2.5 screw; tap for 6-32.
7/64		0.1094	2.779	$2 \frac{5}{8}$	Clearance hole for #3 & #4 wood screw; pilot hole in softwood for #12 & #14 wood screw; pilot hole for #9 & #10 wood screw in hardwood.
35		0.1100	2.794	$2 \frac{5}{8}$	
	2.80	0.1102	2.800	$2 \frac{5}{8}$	
34		0.1110	2.819	$2 \frac{5}{8}$	
33		0.1130	2.870	$2 \frac{5}{8}$	Tap for 6-40.
	2.90	0.1142	2.900	$2\frac{3}{4}$	
32		0.1160	2.946	$2\frac{3}{4}$	Close fit clearance hole for #4 screw.
	3.00	0.1181	3.000	$2\frac{1}{4}$	
31		0.1200	3.048	$2\frac{3}{4}$	Close fit clearance hole for M3 screw; free fit clearance hole for M2.5 screw.
	3.10	0.1220	3.100	$2 \frac{3}{4}$	
$\frac{1}{8}$		0.1250	3.0175	$2 \frac{3}{4}$	clearance hole for #5 wood screw; Pilot hole in hardwood

					for #11 & #12 wood screw
	3.20	0.1260	3.200	2 ³ / ₄	
30		0.1285	3.264	2 ³ / ₄	Close fit clearance hole for #5 screw; free fit clearance hole for #4 screw
	3.30	0.1299	3.300	2 ⁷ / ₈	
	3.40	0.1339	3.400	2 ⁷ / ₈	
29		0.1360	3.454	2 ⁷ / ₈	Tap for M4, 8-32, 8-36 screws.
	3.50	0.1378	3.500	2 ⁷ / ₈	
28		0.1405	3.569	2 ⁷ / ₈	
9/64		0.1406	3.571	2 ⁷ / ₈	Free fit clearance hole for M3 screw; clearance hole for #6 wood screw; pilot hole in softwood for #16 & #18 wood screw; Pilot hole in hardwood for #14 wood screw.
	3.60	0.1417	3.600	3	
27		0.1440	3.658	3	Close fit clearance hole for #6 screw; free fit clearance hole for #5 screw.
	3.70	0.1457	3.700	3	
26		0.1470	3.734	3	
25		0.1495	3.797	3	Free fit clearance hole for #6 screw; tap for 10-24 screw.
	3.80	0.1496	3.800	3	

24		0.1520	3.861	3 $\frac{1}{8}$	
	3.90	0.1535	3.900	3 $\frac{1}{8}$	
23		0.1540	3.912	3 $\frac{1}{8}$	
5/32		0.1562	3.967	3 $\frac{1}{8}$	Clearance hole for #7 wood screw; pilot hole in hardwood for #16 wood screw
22		0.1570	3.988	3 $\frac{1}{8}$	
	4.00	0.1575	4.000	3 $\frac{1}{4}$	
21		0.1590	4.039	3 $\frac{1}{4}$	Tap for 10-32 screw.
20		0.1610	4.089	3 $\frac{1}{4}$	
	4.10	0.1614	4.100	3 $\frac{1}{4}$	
	4.20	0.1654	4.200	3 $\frac{1}{4}$	
19		0.1660	4.216	3 $\frac{1}{4}$	
	4.30	0.1693	4.300	3 $\frac{1}{4}$	
18		0.1695	4.305	3 $\frac{1}{4}$	Close fit clearance hole for M4, #8 screws; tap for M5.
11/64		0.1719	4.366	3 $\frac{1}{4}$	Clearance hole for #8 wood screw; pilot hole in softwood for #20 wood screw.
17		0.1730	4.394	3 $\frac{3}{8}$	
	4.40	0.1732	4.400	3 $\frac{3}{8}$	
16		0.1770	4.496	3 $\frac{3}{8}$	

	4.50	0.1772	4.500	3 $\frac{1}{16}$	
15		0.1800	4.572	3 $\frac{1}{8}$	
	4.60	0.1811	4.600	3 $\frac{1}{8}$	
14		0.1820	4.623	3 $\frac{1}{8}$	Tap for 12-24 screw.
13	4.70	0.1850	4.700	3 $\frac{1}{2}$	
3/16		0.1875	4.762	3 $\frac{1}{2}$	Clearance hole for #9 & #10 wood screw; pilot hole in hardwood for #18 wood screw; pilot hole in softwood for #24 wood screw.
12	4.80	0.1890	4.800	3 $\frac{1}{2}$	
11		0.1910	4.851	3 $\frac{1}{2}$	
	4.90	0.1929	4.900	3 $\frac{5}{16}$	
10		0.1935	4.915	3 $\frac{5}{16}$	
9		0.1960	4.978	3 $\frac{5}{16}$	Close fit clearance hole for #10 screw.
	5.00	0.1969	5.000	3 $\frac{5}{16}$	
8		0.1990	5.054	3 $\frac{5}{16}$	
	5.10	0.2008	5.100	3 $\frac{5}{16}$	
7		0.2010	5.105	3 $\frac{5}{16}$	Free fit clearance hole for #10 screw; tap for ¼-20 screw.
13/64		0.2031	5.159	3 $\frac{5}{16}$	
6		0.2040	5.182	3 $\frac{3}{4}$	Tap for M6.

	5.20	0.2047	5.200	3 ¾	
5		0.2055	5.220	3 ¾	
	5.30	0.2087	5.300	3 ¾	
4		0.2090	5.309	3 ¾	Close fit clearance hole for M5 screw.
	5.40	0.2126	5.400	3 ¾	
3		0.2130	5.410	3 ¾	Tap for ¼-28.
	5.50	0.2165	5.500	3 ¾	
7/32		0.2188	5.558	3 ¾	Clearance hole for #12 wood screw: pilot hole in hardwood for #24 wood screw.
	5.60	0.2205	5.600	3 ⅞	
2		0.2210	5.613	3 ⅞	
	5.70	0.2244	5.700	3 ⅞	
1		0.2280	5.791	3 ⅞	Free fit clearance hole for M5 screw
	5.80	0.2283	5.800	3 ⅞	
	5.90	0.2323	5.600	3 ⅞	
A		0.2340	5.944	3 ⅞	
15/64		0.2344	5.954	3 ⅞	
	6.00	0.2362	6.000	4	
B		0.2380	6.045	4	

	6.10	0.2402	6.100	4	
C		0.2420	6.147	4	
	6.20	0.2441	6.200	4	
D		0.2460	6.248	4	
	6.30	0.2480	6.300	4	
E, ¼		0.2500	6.350	4	Close fit clearance hole for M6 screw; clearance hole for #14 wood screw.
	6.40	0.2520	6.400	4 $\frac{1}{8}$	
	6.50	0.2559	6.500	4 $\frac{1}{8}$	
F		0.2570	6.528	4 $\frac{1}{8}$	Close fit clearance hole for ¼" screw; tap for 5/16-18 screw.
	6.60	0.2598	6.600	4 $\frac{1}{8}$	
G		0.2610	6.629	4 $\frac{1}{8}$	Free fit clearance hole for M6 screw.
	6.70	0.2638	6.700	4 $\frac{1}{8}$	
17/64		0.2656	6.746	4 $\frac{1}{8}$	Clearance hole for #16 wood screw.
H		0.2660	6.756	4 $\frac{1}{8}$	Free fit clearance hole for ¼" screw.
	6.80	0.2677	6.800	4 $\frac{1}{8}$	
	6.90	0.2717	6.900	4 $\frac{1}{8}$	
I		0.2720	6.909	4 $\frac{1}{8}$	Tap for 5/16-20 & M8 screws.

	7.00	0.2756	7.000	4 $\frac{1}{8}$	
J		0.2770	7.036	4 $\frac{1}{8}$	
	7.10	0.2795	7.100	4 $\frac{1}{4}$	
K		0.2810	7.137	4 $\frac{1}{4}$	
9/32		0.2812	7.142	4 $\frac{1}{4}$	
	7.20	0.2835	7.200	4 $\frac{1}{4}$	
	7.30	0.2874	7.300	4 $\frac{1}{4}$	
L		0.2900	7.366	4 $\frac{1}{4}$	
	7.40	0.2913	7.400	4 $\frac{3}{8}$	
M		0.2950	7.493	4 $\frac{3}{8}$	
	7.50	0.2953	7.500	4 $\frac{3}{8}$	
19/64		0.2969	7.541	4 $\frac{3}{8}$	Clearance hole for #18 wood screw.
	7.60	0.2992	7.600	4 $\frac{3}{8}$	
N		0.3020	7.671	4 $\frac{3}{8}$	
	7.70	0.3031	7.700	4 $\frac{1}{2}$	
	7.80	0.3071	7.800	4 $\frac{1}{2}$	
	7.90	0.3110	7.900	4 $\frac{1}{2}$	
5/16		0.3125	7.938	4 $\frac{1}{2}$	Tap for $\frac{3}{8}$ -16 screw.

	8.00	0.3150	8.000	4½	
O		0.3160	8.026	4½	
	8.10	0.3189	8.100	4 $\frac{5}{8}$	
	8.20	0.3228	8.200	4 $\frac{5}{8}$	
P		0.3230	8.204	4 $\frac{5}{8}$	Close fit clearance hole for 5/16" , M8 screws.
	8.30	0.3268	8.300	4 $\frac{5}{8}$	
21/64		0.3281	8.334	4 $\frac{5}{8}$	Clearance hole for #20 wood screw.
	8.40	0.3307	8.400	4¾	
Q		0.3320	8.433	4¾	Free fit clearance hole for 5/16", M8 screws; tap for $\frac{3}{8}$ -24 screw.
	8.50	0.3346	8.500	4¾	
	8.60	0.3386	8.600	4¾	
R		0.3390	8.611	4¾	
	8.70	0.3425	8.700	4¾	
11/32		0.3438	8.733	4¾	Tap for M10.
	8.80	0.3465	8.800	4 $\frac{7}{8}$	
S		0.3480	8.839	4 $\frac{7}{8}$	
	8.90	0.3504	8.900	4 $\frac{7}{8}$	
	9.00	0.3543	9.000	4 $\frac{7}{8}$	

T		0.3580	9.093	4 $\frac{7}{8}$	
	9.10	0.3583	9.100	4 $\frac{7}{8}$	
23/64		0.3594	9.129	4 $\frac{7}{8}$	
	9.20	0.3622	9.200	5	
	9.30	0.3661	9.300	5	
U		0.3680	9.347	5	
	9.40	0.3701	9.400	5	
	9.50	0.3740	9.500	5	
$\frac{3}{8}$		0.3750	9.525	5	Clearance hole for #24 wood screw.
V		0.3770	9.576	5	
	9.60	0.3780	9.600	5 $\frac{1}{8}$	
	9.70	0.3819	9.700	5 $\frac{1}{8}$	
	9.80	0.3858	9.800	5 $\frac{1}{8}$	
W		0.3860	9.804	5 $\frac{1}{8}$	Close fit clearance hole for $\frac{3}{8}$ " screw.
	9.90	0.3898	9.900	5 $\frac{1}{8}$	
25/64		0.3906	9.921	5 $\frac{1}{8}$	
	10.00	0.3937	10.00	5 $\frac{1}{8}$	
X		0.3970	10.084	5 $\frac{1}{8}$	Free fit clearance hole for $\frac{3}{8}$ " screw.

	10.20	0.4016	10.200	5¼	
Y		0.4040	10.262	5¼	
13/32		0.4062	10.317	5¼	Close fit clearance hole for M10 screw.
Z		0.4130	10.490	5¼	Tap for M12 screw.
	10.50	0.4134	10.500	5¼	
27/64		0.4219	10.716	5 $\frac{3}{8}$	Free fit clearance hole for M10 screw; tap for ½-13 screw.
	10.80	0.4252	10.800	5½	
	11.00	0.4331	11.000	5½	
7/16		0.4375	11.112	5½	
	11.20	0.4409	11.200	5 $\frac{5}{8}$	
	11.50	0.4528	11.500	5 $\frac{5}{8}$	
29/64		0.4531	11.509	5 $\frac{5}{8}$	Tap for ½-20 screw.
	11.80	0.4646	11.800	5¾	
15/32		0.4688	11.908	5¾	
	12.00	0.4724	12.000	5 $\frac{7}{8}$	
	12.20	0.4803	12.200	5 $\frac{7}{8}$	
31/64		0.4844	12.304	5 $\frac{7}{8}$	Close fit clearance hole for M12 screw.
	12.50	0.4921	12.500	6	

1/2		0.500	12.700	6	Free fit clearance hole for M12 screw.
-----	--	-------	--------	---	--

ANSI standard B94.11M-1979.

[home](#)



[tools index](#)



[your comments](#)



[about](#)



[help](#)



[privacy](#)
[terms of use](#)

Copyright © 1999 Sizes, Inc. All rights reserved.
Last revised: 16 August 2004.