MECHANICAL · CHEAT SHEET

Drill bit *size chart*.

All four drill bit systems on one chart — **fractional inch** (1/64–1″), **number gauge** (#1–80), **letter gauge** (A–Z), and **metric** (mm). Sorted by diameter, with closest cross-matches.

The chart

FILTER: Type to narrow down — e.g. 'mm', '1/4', '#10'... All | Fractional | Number | Letter | Metric

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
0.3 mm	METRIC	0.0118	0.300	#80 (+0.043 mm)
#80	NUMBER	0.0135	0.343	0.3 mm (-0.043 mm)
#79	NUMBER	0.0145	0.368	1/64 (+0.029 mm)
1/64	FRACTIONAL	0.0156	0.397	0.4 mm (+0.003 mm)
0.4 mm	METRIC	0.0157	0.400	1/64 (-0.003 mm)
#78	NUMBER	0.0160	0.406	0.4 mm (-0.006 mm)
#77	NUMBER	0.0180	0.457	0.5 mm (+0.043 mm)
0.5 mm	METRIC	0.0197	0.500	#76 (+0.008 mm)
#76	NUMBER	0.0200	0.508	0.5 mm (-0.008 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
#75	NUMBER	0.0210	0.533	0.5 mm (-0.033 mm)
#74	NUMBER	0.0225	0.571	0.6 mm (+0.029 mm)
0.6 mm	METRIC	0.0236	0.600	#73 (+0.010 mm)
#73	NUMBER	0.0240	0.610	0.6 mm (-0.010 mm)
#72	NUMBER	0.0250	0.635	0.6 mm (-0.035 mm)
#71	NUMBER	0.0260	0.660	0.7 mm (+0.040 mm)
0.7 mm	METRIC	0.0276	0.700	#70 (+0.011 mm)
#70	NUMBER	0.0280	0.711	0.7 mm (-0.011 mm)
#69	NUMBER	0.0292	0.742	0.7 mm (-0.042 mm)
#68	NUMBER	0.0310	0.787	1/32 (+0.006 mm)
1/32	FRACTIONAL	0.0313	0.794	0.8 mm (+0.006 mm)
0.8 mm	METRIC	0.0315	0.800	1/32 (-0.006 mm)
#67	NUMBER	0.0320	0.813	0.8 mm (-0.013 mm)
#66	NUMBER	0.0330	0.838	0.8 mm (-0.038 mm)
#65	NUMBER	0.0350	0.889	0.9 mm (+0.011 mm)
0.9 mm	METRIC	0.0354	0.900	#65 (-0.011 mm)
#64	NUMBER	0.0360	0.914	0.9 mm (-0.014 mm)
#63	NUMBER	0.0370	0.940	0.9 mm (-0.040 mm)
#62	NUMBER	0.0380	0.965	1 mm (+0.035 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
#61	NUMBER	0.0390	0.991	1 mm (+0.009 mm)
1 mm	METRIC	0.0394	1.000	#61 (-0.009 mm)
#60	NUMBER	0.0400	1.016	1 mm (-0.016 mm)
#59	NUMBER	0.0410	1.041	1 mm (-0.041 mm)
#58	NUMBER	0.0420	1.067	1.1 mm (+0.033 mm)
#57	NUMBER	0.0430	1.092	1.1 mm (+0.008 mm)
1.1 mm	METRIC	0.0433	1.100	#57 (-0.008 mm)
#56	NUMBER	0.0465	1.181	3/64 (+0.010 mm)
3/64	FRACTIONAL	0.0469	1.191	1.2 mm (+0.009 mm)
1.2 mm	METRIC	0.0472	1.200	3/64 (-0.009 mm)
1.3 mm	METRIC	0.0512	1.300	#55 (+0.021 mm)
#55	NUMBER	0.0520	1.321	1.3 mm (-0.021 mm)
#54	NUMBER	0.0550	1.397	1.4 mm (+0.003 mm)
1.4 mm	METRIC	0.0551	1.400	#54 (-0.003 mm)
1.5 mm	METRIC	0.0591	1.500	#53 (+0.011 mm)
#53	NUMBER	0.0595	1.511	1.5 mm (-0.011 mm)
1/16	FRACTIONAL	0.0625	1.587	1.6 mm (+0.013 mm)
1.6 mm	METRIC	0.0630	1.600	1/16 (-0.013 mm)
#52	NUMBER	0.0635	1.613	1.6 mm (-0.013 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
1.7 mm	METRIC	0.0669	1.700	#51 (+0.002 mm)
#51	NUMBER	0.0670	1.702	1.7 mm (-0.002 mm)
#50	NUMBER	0.0700	1.778	1.8 mm (+0.022 mm)
1.8 mm	METRIC	0.0709	1.800	#50 (-0.022 mm)
#49	NUMBER	0.0730	1.854	1.9 mm (+0.046 mm)
1.9 mm	METRIC	0.0748	1.900	#48 (+0.030 mm)
#48	NUMBER	0.0760	1.930	1.9 mm (-0.030 mm)
5/64	FRACTIONAL	0.0781	1.984	#47 (+0.010 mm)
#47	NUMBER	0.0785	1.994	2 mm (+0.006 mm)
2 mm	METRIC	0.0787	2.000	#47 (-0.006 mm)
#46	NUMBER	0.0810	2.057	2.1 mm (+0.043 mm)
#45	NUMBER	0.0820	2.083	2.1 mm (+0.017 mm)
2.1 mm	METRIC	0.0827	2.100	#45 (-0.017 mm)
#44	NUMBER	0.0860	2.184	2.2 mm (+0.016 mm)
2.2 mm	METRIC	0.0866	2.200	#44 (-0.016 mm)
#43	NUMBER	0.0890	2.261	2.3 mm (+0.039 mm)
2.3 mm	METRIC	0.0906	2.300	#43 (-0.039 mm)
#42	NUMBER	0.0935	2.375	3/32 (+0.006 mm)
3/32	FRACTIONAL	0.0938	2.381	#42 (-0.006 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
2.4 mm	METRIC	0.0945	2.400	3/32 (-0.019 mm)
#41	NUMBER	0.0960	2.438	2.4 mm (-0.038 mm)
#40	NUMBER	0.0980	2.489	2.5 mm (+0.011 mm)
2.5 mm	METRIC	0.0984	2.500	#40 (-0.011 mm)
#39	NUMBER	0.0995	2.527	2.5 mm (-0.027 mm)
#38	NUMBER	0.1015	2.578	2.6 mm (+0.022 mm)
2.6 mm	METRIC	0.1024	2.600	#38 (-0.022 mm)
#37	NUMBER	0.1040	2.642	2.6 mm (-0.042 mm)
2.7 mm	METRIC	0.1063	2.700	#36 (+0.005 mm)
#36	NUMBER	0.1065	2.705	2.7 mm (-0.005 mm)
7/64	FRACTIONAL	0.1094	2.778	#35 (+0.016 mm)
#35	NUMBER	0.1100	2.794	2.8 mm (+0.006 mm)
2.8 mm	METRIC	0.1102	2.800	#35 (-0.006 mm)
#34	NUMBER	0.1110	2.819	2.8 mm (-0.019 mm)
#33	NUMBER	0.1130	2.870	2.9 mm (+0.030 mm)
2.9 mm	METRIC	0.1142	2.900	#33 (-0.030 mm)
#32	NUMBER	0.1160	2.946	2.9 mm (-0.046 mm)
3 mm	METRIC	0.1181	3.000	#31 (+0.048 mm)
#31	NUMBER	0.1200	3.048	3 mm (-0.048 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
3.1 mm	METRIC	0.1220	3.100	#31 (-0.052 mm)
1/8	FRACTIONAL	0.1250	3.175	3.2 mm (+0.025 mm)
3.2 mm	METRIC	0.1260	3.200	1/8 (-0.025 mm)
#30	NUMBER	0.1285	3.264	3.3 mm (+0.036 mm)
3.3 mm	METRIC	0.1299	3.300	#30 (-0.036 mm)
3.4 mm	METRIC	0.1339	3.400	#29 (+0.054 mm)
#29	NUMBER	0.1360	3.454	3.5 mm (+0.046 mm)
3.5 mm	METRIC	0.1378	3.500	#29 (-0.046 mm)
#28	NUMBER	0.1405	3.569	9/64 (+0.003 mm)
9/64	FRACTIONAL	0.1406	3.572	#28 (-0.003 mm)
3.6 mm	METRIC	0.1417	3.600	9/64 (-0.028 mm)
#27	NUMBER	0.1440	3.658	3.7 mm (+0.042 mm)
3.7 mm	METRIC	0.1457	3.700	#26 (+0.034 mm)
#26	NUMBER	0.1470	3.734	3.7 mm (-0.034 mm)
#25	NUMBER	0.1495	3.797	3.8 mm (+0.003 mm)
3.8 mm	METRIC	0.1496	3.800	#25 (-0.003 mm)
#24	NUMBER	0.1520	3.861	3.9 mm (+0.039 mm)
3.9 mm	METRIC	0.1535	3.900	#23 (+0.012 mm)
#23	NUMBER	0.1540	3.912	3.9 mm (-0.012 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
5/32	FRACTIONAL	0.1563	3.969	#22 (+0.019 mm)
#22	NUMBER	0.1570	3.988	4 mm (+0.012 mm)
4 mm	METRIC	0.1575	4.000	#22 (-0.012 mm)
#21	NUMBER	0.1590	4.039	4 mm (-0.039 mm)
#20	NUMBER	0.1610	4.089	4.1 mm (+0.011 mm)
4.1 mm	METRIC	0.1614	4.100	#20 (-0.011 mm)
4.2 mm	METRIC	0.1654	4.200	#19 (+0.016 mm)
#19	NUMBER	0.1660	4.216	4.2 mm (-0.016 mm)
4.3 mm	METRIC	0.1693	4.300	#18 (+0.005 mm)
#18	NUMBER	0.1695	4.305	4.3 mm (-0.005 mm)
11/64	FRACTIONAL	0.1719	4.366	#17 (+0.029 mm)
#17	NUMBER	0.1730	4.394	4.4 mm (+0.006 mm)
4.4 mm	METRIC	0.1732	4.400	#17 (-0.006 mm)
#16	NUMBER	0.1770	4.496	4.5 mm (+0.004 mm)
4.5 mm	METRIC	0.1772	4.500	#16 (-0.004 mm)
#15	NUMBER	0.1800	4.572	4.6 mm (+0.028 mm)
4.6 mm	METRIC	0.1811	4.600	#14 (+0.023 mm)
#14	NUMBER	0.1820	4.623	4.6 mm (-0.023 mm)
#13	NUMBER	0.1850	4.699	4.7 mm (+0.001 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
4.7 mm	METRIC	0.1850	4.700	#13 (-0.001 mm)
3/16	FRACTIONAL	0.1875	4.762	4.8 mm (+0.037 mm)
4.8 mm	METRIC	0.1890	4.800	#12 (+0.001 mm)
#12	NUMBER	0.1890	4.801	4.8 mm (-0.001 mm)
#11	NUMBER	0.1910	4.851	4.9 mm (+0.049 mm)
4.9 mm	METRIC	0.1929	4.900	#10 (+0.015 mm)
#10	NUMBER	0.1935	4.915	4.9 mm (-0.015 mm)
#9	NUMBER	0.1960	4.978	5 mm (+0.022 mm)
5 mm	METRIC	0.1969	5.000	#9 (-0.022 mm)
#8	NUMBER	0.1990	5.055	5.1 mm (+0.045 mm)
5.1 mm	METRIC	0.2008	5.100	#7 (+0.005 mm)
#7	NUMBER	0.2010	5.105	5.1 mm (-0.005 mm)
13/64	FRACTIONAL	0.2031	5.159	#6 (+0.022 mm)
#6	NUMBER	0.2040	5.182	5.2 mm (+0.018 mm)
5.2 mm	METRIC	0.2047	5.200	#6 (-0.018 mm)
#5	NUMBER	0.2055	5.220	5.2 mm (-0.020 mm)
5.3 mm	METRIC	0.2087	5.300	#4 (+0.009 mm)
#4	NUMBER	0.2090	5.309	5.3 mm (-0.009 mm)
5.4 mm	METRIC	0.2126	5.400	#3 (+0.010 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
#3	NUMBER	0.2130	5.410	5.4 mm (-0.010 mm)
5.5 mm	METRIC	0.2165	5.500	7/32 (+0.056 mm)
7/32	FRACTIONAL	0.2188	5.556	5.6 mm (+0.044 mm)
5.6 mm	METRIC	0.2205	5.600	#2 (+0.013 mm)
#2	NUMBER	0.2210	5.613	5.6 mm (-0.013 mm)
5.7 mm	METRIC	0.2244	5.700	#2 (-0.087 mm)
#1	NUMBER	0.2280	5.791	5.8 mm (+0.009 mm)
5.8 mm	METRIC	0.2283	5.800	#1 (-0.009 mm)
5.9 mm	METRIC	0.2323	5.900	A (+0.044 mm)
A	LETTER	0.2340	5.944	15/64 (+0.010 mm)
15/64	FRACTIONAL	0.2344	5.953	A (-0.010 mm)
6 mm	METRIC	0.2362	6.000	B (+0.045 mm)
B	LETTER	0.2380	6.045	6 mm (-0.045 mm)
C	LETTER	0.2420	6.147	6.2 mm (+0.053 mm)
6.2 mm	METRIC	0.2441	6.200	D (+0.048 mm)
D	LETTER	0.2460	6.248	6.2 mm (-0.048 mm)
E	LETTER	0.2500	6.350	1/4 (+0.000 mm)
1/4	FRACTIONAL	0.2500	6.350	E (+0.000 mm)
6.4 mm	METRIC	0.2520	6.400	E (-0.050 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
6.5 mm	METRIC	0.2559	6.500	F (+0.028 mm)
F	LETTER	0.2570	6.528	6.5 mm (-0.028 mm)
6.6 mm	METRIC	0.2598	6.600	G (+0.029 mm)
G	LETTER	0.2610	6.629	6.6 mm (-0.029 mm)
17/64	FRACTIONAL	0.2656	6.747	H (+0.010 mm)
H	LETTER	0.2660	6.756	17/64 (-0.010 mm)
6.8 mm	METRIC	0.2677	6.800	H (-0.044 mm)
I	LETTER	0.2720	6.909	7 mm (+0.091 mm)
7 mm	METRIC	0.2756	7.000	J (+0.036 mm)
J	LETTER	0.2770	7.036	7 mm (-0.036 mm)
K	LETTER	0.2810	7.137	9/32 (+0.006 mm)
9/32	FRACTIONAL	0.2813	7.144	K (-0.006 mm)
7.2 mm	METRIC	0.2835	7.200	9/32 (-0.056 mm)
L	LETTER	0.2900	7.366	7.5 mm (+0.134 mm)
M	LETTER	0.2950	7.493	7.5 mm (+0.007 mm)
7.5 mm	METRIC	0.2953	7.500	M (-0.007 mm)
19/64	FRACTIONAL	0.2969	7.541	7.5 mm (-0.041 mm)
N	LETTER	0.3020	7.671	7.8 mm (+0.129 mm)
7.8 mm	METRIC	0.3071	7.800	N (-0.129 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
5/16	FRACTIONAL	0.3125	7.938	8 mm (+0.062 mm)
8 mm	METRIC	0.3150	8.000	O (+0.026 mm)
O	LETTER	0.3160	8.026	8 mm (-0.026 mm)
8.2 mm	METRIC	0.3228	8.200	P (+0.004 mm)
P	LETTER	0.3230	8.204	8.2 mm (-0.004 mm)
21/64	FRACTIONAL	0.3281	8.334	Q (+0.098 mm)
Q	LETTER	0.3320	8.433	8.5 mm (+0.067 mm)
8.5 mm	METRIC	0.3346	8.500	Q (-0.067 mm)
R	LETTER	0.3390	8.611	8.5 mm (-0.111 mm)
11/32	FRACTIONAL	0.3438	8.731	8.8 mm (+0.069 mm)
8.8 mm	METRIC	0.3465	8.800	S (+0.039 mm)
S	LETTER	0.3480	8.839	8.8 mm (-0.039 mm)
9 mm	METRIC	0.3543	9.000	T (+0.093 mm)
T	LETTER	0.3580	9.093	23/64 (+0.035 mm)
23/64	FRACTIONAL	0.3594	9.128	T (-0.035 mm)
9.2 mm	METRIC	0.3622	9.200	23/64 (-0.072 mm)
U	LETTER	0.3680	9.347	9.2 mm (-0.147 mm)
9.5 mm	METRIC	0.3740	9.500	3/8 (+0.025 mm)
3/8	FRACTIONAL	0.3750	9.525	9.5 mm (-0.025 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
V	LETTER	0.3770	9.576	3/8 (-0.051 mm)
9.8 mm	METRIC	0.3858	9.800	W (+0.004 mm)
W	LETTER	0.3860	9.804	9.8 mm (-0.004 mm)
25/64	FRACTIONAL	0.3906	9.922	10 mm (+0.078 mm)
10 mm	METRIC	0.3937	10.000	25/64 (-0.078 mm)
X	LETTER	0.3970	10.084	10 mm (-0.084 mm)
Y	LETTER	0.4040	10.262	13/32 (+0.057 mm)
13/32	FRACTIONAL	0.4063	10.319	Y (-0.057 mm)
Z	LETTER	0.4130	10.490	10.5 mm (+0.010 mm)
10.5 mm	METRIC	0.4134	10.500	Z (-0.010 mm)
27/64	FRACTIONAL	0.4219	10.716	10.5 mm (-0.216 mm)
11 mm	METRIC	0.4331	11.000	7/16 (+0.112 mm)
7/16	FRACTIONAL	0.4375	11.112	11 mm (-0.112 mm)
11.5 mm	METRIC	0.4528	11.500	29/64 (+0.009 mm)
29/64	FRACTIONAL	0.4531	11.509	11.5 mm (-0.009 mm)
15/32	FRACTIONAL	0.4688	11.906	12 mm (+0.094 mm)
12 mm	METRIC	0.4724	12.000	15/32 (-0.094 mm)
31/64	FRACTIONAL	0.4844	12.303	12.5 mm (+0.197 mm)
12.5 mm	METRIC	0.4921	12.500	31/64 (-0.197 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
1/2	FRACTIONAL	0.5000	12.700	12.5 mm (-0.200 mm)
13 mm	METRIC	0.5118	13.000	33/64 (+0.097 mm)
33/64	FRACTIONAL	0.5156	13.097	13 mm (-0.097 mm)
17/32	FRACTIONAL	0.5313	13.494	13.5 mm (+0.006 mm)
13.5 mm	METRIC	0.5315	13.500	17/32 (-0.006 mm)
35/64	FRACTIONAL	0.5469	13.891	14 mm (+0.109 mm)
14 mm	METRIC	0.5512	14.000	35/64 (-0.109 mm)
9/16	FRACTIONAL	0.5625	14.287	14.5 mm (+0.212 mm)
14.5 mm	METRIC	0.5709	14.500	37/64 (+0.184 mm)
37/64	FRACTIONAL	0.5781	14.684	14.5 mm (-0.184 mm)
15 mm	METRIC	0.5906	15.000	19/32 (+0.081 mm)
19/32	FRACTIONAL	0.5938	15.081	15 mm (-0.081 mm)
39/64	FRACTIONAL	0.6094	15.478	15.5 mm (+0.022 mm)
15.5 mm	METRIC	0.6102	15.500	39/64 (-0.022 mm)
5/8	FRACTIONAL	0.6250	15.875	16 mm (+0.125 mm)
16 mm	METRIC	0.6299	16.000	5/8 (-0.125 mm)
41/64	FRACTIONAL	0.6406	16.272	16.5 mm (+0.228 mm)
16.5 mm	METRIC	0.6496	16.500	21/32 (+0.169 mm)
21/32	FRACTIONAL	0.6563	16.669	16.5 mm (-0.169 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
17 mm	METRIC	0.6693	17.000	43/64 (+0.066 mm)
43/64	FRACTIONAL	0.6719	17.066	17 mm (-0.066 mm)
11/16	FRACTIONAL	0.6875	17.462	17.5 mm (+0.037 mm)
17.5 mm	METRIC	0.6890	17.500	11/16 (-0.037 mm)
45/64	FRACTIONAL	0.7031	17.859	18 mm (+0.141 mm)
18 mm	METRIC	0.7087	18.000	45/64 (-0.141 mm)
23/32	FRACTIONAL	0.7188	18.256	18.5 mm (+0.244 mm)
18.5 mm	METRIC	0.7283	18.500	47/64 (+0.153 mm)
47/64	FRACTIONAL	0.7344	18.653	18.5 mm (-0.153 mm)
19 mm	METRIC	0.7480	19.000	3/4 (+0.050 mm)
3/4	FRACTIONAL	0.7500	19.050	19 mm (-0.050 mm)
49/64	FRACTIONAL	0.7656	19.447	19.5 mm (+0.053 mm)
19.5 mm	METRIC	0.7677	19.500	49/64 (-0.053 mm)
25/32	FRACTIONAL	0.7813	19.844	20 mm (+0.156 mm)
20 mm	METRIC	0.7874	20.000	25/32 (-0.156 mm)
51/64	FRACTIONAL	0.7969	20.241	20 mm (-0.241 mm)
13/16	FRACTIONAL	0.8125	20.637	21 mm (+0.363 mm)
21 mm	METRIC	0.8268	21.000	53/64 (+0.034 mm)
53/64	FRACTIONAL	0.8281	21.034	21 mm (-0.034 mm)

SIZE	SYSTEM	DECIMAL (IN)	MM	CLOSEST OTHER
27/32	FRACTIONAL	0.8438	21.431	21 mm (-0.431 mm)
55/64	FRACTIONAL	0.8594	21.828	22 mm (+0.172 mm)
22 mm	METRIC	0.8661	22.000	55/64 (-0.172 mm)
7/8	FRACTIONAL	0.8750	22.225	22 mm (-0.225 mm)
57/64	FRACTIONAL	0.8906	22.622	23 mm (+0.378 mm)
23 mm	METRIC	0.9055	23.000	29/32 (+0.019 mm)
29/32	FRACTIONAL	0.9063	23.019	23 mm (-0.019 mm)
59/64	FRACTIONAL	0.9219	23.416	23 mm (-0.416 mm)
15/16	FRACTIONAL	0.9375	23.813	24 mm (+0.188 mm)
24 mm	METRIC	0.9449	24.000	15/16 (-0.188 mm)
61/64	FRACTIONAL	0.9531	24.209	24 mm (-0.209 mm)
31/32	FRACTIONAL	0.9688	24.606	25 mm (+0.394 mm)
25 mm	METRIC	0.9843	25.000	63/64 (+0.003 mm)
63/64	FRACTIONAL	0.9844	25.003	25 mm (-0.003 mm)
1/1	FRACTIONAL	1.0000	25.400	25 mm (-0.400 mm)

About the systems. Number drills (#1–#80) and letter drills (A–Z) are US industrial sizes — they fill the gaps between fractional sizes and are common in machining. Fractional drills (1/64″ steps) are the household standard. Metric drills are the international standard outside the US and Canada. Most drill index sets include all four systems together.

Common applications

USE CASE	TYPICAL DRILL	NOTE
Pilot for #6 wood screw	3/32″	In softwood. Hardwood: tap drill #36.
Pilot for #8 wood screw	1/8″	In softwood. Hardwood: #29.
Pilot for #10 wood screw	9/64″	In softwood. Hardwood: #25.
Tap drill for 1/4″–20 UNC	#7 (0.201″)	75% thread engagement.
Tap drill for 5/16″–18 UNC	F (0.257″)	75% thread engagement.
Tap drill for 3/8″–16 UNC	5/16″	75% thread engagement.
Tap drill for M4 × 0.7	3.3 mm	75% thread engagement.
Tap drill for M6 × 1.0	5.0 mm	75% thread engagement.
Clearance for 1/4″ bolt	17/64″	Loose fit, standard.
Drywall anchor #6/#8	5/16″ or 3/8″	Check anchor packaging.

Common pitfalls

- **Number drills count *down* as they get bigger.** #80 is the smallest, #1 is the largest. Just like AWG — and trips up everyone the first time.
- **Letter drills start where number drills end.** A (0.234″) is bigger than #1 (0.228″). Useful when you've outgrown the number set but haven't reached a clean fraction.

- **"Close enough" isn't always.** A 6 mm and a 15/64″ drill are 0.0094″ apart — fine for most through-holes, but a tight fit for a press-fit pin won't tolerate the difference.
- **Metric and US fractional don't line up.** 1/4″ ≈ 6.35 mm, not 6 mm. If a metric spec says 6 mm and you only have inch drills, the closest size is 15/64″ (5.95 mm) or 1/4″ (6.35 mm) — pick based on whether you want clearance or interference.
- **Drill bit diameter ≠ hole size.** A real-world hole is typically 0.001″–0.005″ larger than the bit due to runout and bit flexing. Critical for precision work.

Common questions

What size drill bit is 1/4 inch in metric?

1/4 inch = 6.35 mm. The closest standard metric drill is 6.5 mm (slightly larger) or 6 mm (slightly smaller). For tapping, a 6 mm hole is too tight for a 1/4-20 tap; 6.5 mm gives clearance. For clearance holes, 6.5 mm is the safer choice.

What's the difference between letter and number drills?

Number drills run from #1 (0.228") to #80 (0.0135") — getting smaller as the number increases. Letter drills run from A (0.234") to Z (0.413") — getting larger as the letter advances. They were standardized to fill gaps in the fractional series. Use number drills for small holes, letter drills for mid-sized holes.

Why is the tap drill different from the bolt diameter?

A tap drill leaves enough material for the thread crests to form. For a 1/4-20 UNC, the tap drill is #7 (0.201") — about 75% of the bolt's nominal 1/4" (0.25") diameter. Using a 1/4" drill would leave no thread; the bolt would just spin. The 75%-thread engagement is a strength/ease-of-tapping compromise.

What's a 'pilot hole' and when do I need one?

A pilot hole is a small initial hole drilled to guide a larger drill or fastener. For wood screws, the pilot prevents splitting and reduces driving torque; for metal, it lets the cutting edge of a large drill engage properly. Rule of thumb: pilot diameter ≈ 70% of the major diameter for self-tapping screws, smaller for wood.

How do I drill through hardened steel without breaking bits?

First, verify it's actually hardened — many 'hard' steels can be drilled with standard HSS bits and good technique. For true hardened steel (Rockwell 50+), you need cobalt M42 or carbide-tipped bits, slow speed (200-400 RPM), heavy pressure, and constant cooling. Hardened steel work-hardens further if you let the bit rub instead of cut; let it bite.

Sources

- **Number drills (#1–80):** ANSI B94.11M — Twist Drills.
- **Letter drills (A–Z):** ANSI B94.11M.
- **Fractional drills:** ANSI B94.11M, in 1/64″ increments.
- **Metric drills:** ISO 235 — Parallel shank twist drills.
- **Tap drill values:** Machinery's Handbook, 31st ed., for 75% thread engagement.

Disclaimer. Pilot, tap, and clearance hole sizes vary with material and intended fit. For precision or production work, always verify against your specific application.