



DECIMAL EQUIVALENTS

Drill Size	Decimal Inches	Drill Size	Decimal Inches	Drill Size	Decimal Inches	Drill Size	Decimal Inches
0.05 mm	0.0020	2.80 mm	0.1102	M	0.2950	41/64 in	0.6406
0.10 mm	0.0039	#34	0.1110	7.50 mm	0.2953	16.30 mm	0.6417
#97 • 0.15 mm	0.0059	2.85 mm	0.1122	19/64 in	0.2969	16.40 mm	0.6457
#96	0.0063	#33	0.1130	7.60 mm	0.2992	16.50 mm	0.6496
#95	0.0067	2.90 mm	0.1142	N	0.3020	16.60 mm	0.6535
#94	0.0071	#32	0.1160	7.70 mm	0.3031	21/32 in	0.6563
#93	0.0075	2.95 mm	0.1161	7.80 mm	0.3071	16.70 mm	0.6575
#92 • 0.20 mm	0.0079	3.00 mm	0.1181	7.90 mm	0.3110	16.80 mm	0.6614
#91	0.0083	#31	0.1200	5/16 in	0.3125	16.90 mm	0.6654
#90	0.0087	3.05 mm	0.1201	8.00 mm	0.3150	17.00 mm	0.6693
#89	0.0091	3.10 mm	0.1220	O	0.3160	43/64 in	0.6719
#88	0.0095	3.15 mm	0.1240	8.10 mm	0.3189	17.10 mm	0.6732
0.25 mm	0.0098	1/8 in	0.1250	8.20 mm	0.3228	17.20 mm	0.6772
#87	0.0100	3.20 mm	0.1260	P	0.3230	17.30 mm	0.6811
#86	0.0105	3.25 mm	0.1280	8.30 mm	0.3268	17.40 mm	0.6850
#85	0.0110	#30	0.1285	21/64 in	0.3281	11/16 in	0.6875
#84	0.0115	3.30 mm	0.1299	8.40 mm	0.3307	17.50 mm	0.6890
0.30 mm	0.0118	3.35 mm	0.1319	Q	0.3320	17.60 mm	0.6929
#83	0.0120	3.40 mm	0.1339	8.50 mm	0.3346	17.70 mm	0.6969
#82	0.0125	3.45 mm	0.1358	8.60 mm	0.3386	17.80 mm	0.7008
#81	0.0130	#29	0.1360	R	0.3390	45/64 in	0.7031
#80	0.0135	3.50 mm	0.1378	8.70 mm	0.3425	17.90 mm	0.7047
0.35 mm	0.0138	3.55 mm	0.1398	11/32 in	0.3438	18.00 mm	0.7087
#79	0.0145	#28	0.1405	8.80 mm	0.3465	18.10 mm	0.7126
1/64 in	0.0156	9/64 in	0.1406	S	0.3480	18.20 mm	0.7165
0.40 mm	0.0157	3.60 mm	0.1417	8.90 mm	0.3504	23/32 in	0.7188
#78	0.0160	3.65 mm	0.1437	9.00 mm	0.3543	18.30 mm	0.7205
0.45 mm	0.0177	#27	0.1440	T	0.3580	18.40 mm	0.7244
#77	0.0180	3.70 mm	0.1457	9.10 mm	0.3583	18.50 mm	0.7283
0.50 mm	0.0197	#26	0.1470	23/64 in	0.3594	18.60 mm	0.7323
#76	0.0200	3.75 mm	0.1476	9.20 mm	0.3622	47/64 in	0.7344
#75	0.0210	#25	0.1495	9.30 mm	0.3661	18.70 mm	0.7362
0.55 mm	0.0217	3.80 mm	0.1496	U	0.3680	18.80 mm	0.7402
#74	0.0225	3.85 mm	0.1516	9.40 mm	0.3701	18.90 mm	0.7441
0.60 mm	0.0236	#24	0.1520	9.50 mm	0.3740	19.00 mm	0.7480
#73	0.0240	3.90 mm	0.1535	3/8 in	0.3750	3/4 in	0.7500
#72	0.0250	#23	0.1540	V	0.3770	19.10 mm	0.7520
0.65 mm	0.0256	3.95 mm	0.1555	9.60 mm	0.3780	19.20 mm	0.7559
#71	0.0260	5/32 in	0.1563	9.70 mm	0.3819	19.30 mm	0.7598
0.70 mm	0.0276	#22	0.1570	9.80 mm	0.3858	19.40 mm	0.7638
#70	0.0280	4.00 mm	0.1575	W	0.3860	49/64 in	0.7656
#69	0.0292	#21	0.1590	9.90 mm	0.3898	19.50 mm	0.7677
0.75 mm	0.0295	4.05 mm	0.1594	25/64 in	0.3906	19.60 mm	0.7717
#68	0.0310	#20	0.1610	10.00 mm	0.3937	19.70 mm	0.7756
1/32 in	0.0313	4.10 mm	0.1614	X	0.3970	19.80 mm	0.7795
0.80 mm	0.0315	4.15 mm	0.1634	10.10 mm	0.3976	25/32 in	0.7813
#67	0.0320	4.20 mm	0.1654	10.20 mm	0.4016	19.90 mm	0.7835
#66	0.0330	#19	0.1660	Y	0.4040	20.00 mm	0.7874
0.85 mm	0.0335	4.25 mm	0.1673	10.30 mm	0.4055	20.10 mm	0.7913
#65	0.0350	4.30 mm	0.1693	13/32 in	0.4063	20.20 mm	0.7953
0.90 mm	0.0354	#18	0.1695	10.40 mm	0.4094	51/64 in	0.7969
#64	0.0360	4.35 mm	0.1713	Z	0.4130	20.30 mm	0.7992
#63	0.0370	11/64 in	0.1719	10.50 mm	0.4134	20.40 mm	0.8031
0.95 mm	0.0374	#17	0.1730	10.60 mm	0.4173	20.50 mm	0.8071
#62	0.0380	4.40 mm	0.1732	10.70 mm	0.4213	20.60 mm	0.8110
#61	0.0390	4.45 mm	0.1752	27/64 in	0.4219	13/16 in	0.8125
1.00 mm	0.0394	#16	0.1770	10.80 mm	0.4252	20.70 mm	0.8150
#60	0.0400	4.50 mm	0.1772	10.90 mm	0.4291	20.80 mm	0.8189
#59	0.0410	4.55 mm	0.1791	11.00 mm	0.4331	20.90 mm	0.8228
1.05 mm	0.0413	#15	0.1800	11.10 mm	0.4370	21.00 mm	0.8268
#58	0.0420	4.60 mm	0.1811	7/16 in	0.4375	53/64 in	0.8281
#57	0.0430	#14	0.1820	11.20 mm	0.4409	21.10 mm	0.8307
1.10 mm	0.0433	4.65 mm	0.1831	11.30 mm	0.4449	21.20 mm	0.8346
1.15 mm	0.0453	#13 • 4.70 mm	0.1850	11.40 mm	0.4488	21.30 mm	0.8386
#56	0.0465	4.75 mm	0.1870	11.50 mm	0.4528	21.40 mm	0.8425
3/64 in	0.0469	3/16 in	0.1875	29/64 in	0.4531	27/32 in	0.8438
1.20 mm	0.0472	#12 • 4.80 mm	0.1890	11.60 mm	0.4567	21.50 mm	0.8465
1.25 mm	0.0492	4.85 mm	0.1909	11.70 mm	0.4606	21.60 mm	0.8504
1.30 mm	0.0512	#11	0.1910	11.80 mm	0.4646	21.70 mm	0.8543
#55	0.0520	4.90 mm	0.1929	11.90 mm	0.4685	21.80 mm	0.8583
1.35 mm	0.0531	#10	0.1935	15/32 in	0.4688	55/64 in	0.8594
#54	0.0550	4.95 mm	0.1949	12.00 mm	0.4724	21.90 mm	0.8622
1.40 mm	0.0551	#9	0.1960	12.10 mm	0.4764	22.00 mm	0.8661
1.45 mm	0.0571	5.00 mm	0.1969	12.20 mm	0.4803	22.10 mm	0.8701
1.50 mm	0.0591	#8	0.1990	12.30 mm	0.4843	22.20 mm	0.8740
#53	0.0595	5.10 mm	0.2008	31/64 in	0.4844	7/8 in	0.8750
1.55 mm	0.0610	#7	0.2010	12.40 mm	0.4882	22.30 mm	0.8780
1/16 in	0.0625	13/64 in	0.2031	12.50 mm	0.4921	22.40 mm	0.8819
1.60 mm	0.0630	#6	0.2040	12.60 mm	0.4961	22.50 mm	0.8858
#52	0.0635	5.20 mm	0.2047	1/2 in • 12.70 mm	0.5000	22.60 mm	0.8898
1.65 mm	0.0650	#5	0.2055	12.80 mm	0.5039	57/64 in	0.8906
1.70 mm	0.0669	5.30 mm	0.2087	12.90 mm	0.5079	22.70 mm	0.8937
#51	0.0670	#4	0.2090	13.00 mm	0.5118	22.80 mm	0.8976
1.75 mm	0.0689	5.40 mm	0.2126	33/64 in	0.5156	22.90 mm	0.9016
#50	0.0700	#3	0.2130	13.10 mm	0.5157	23.00 mm	0.9055
1.80 mm	0.0709	5.50 mm	0.2165	13.20 mm	0.5197	29/32 in	0.9063
1.85 mm	0.0728	7/32 in	0.2188	13.30 mm	0.5236	23.10 mm	0.9094
#49	0.0730	5.60 mm	0.2205	13.40 mm	0.5276	23.20 mm	0.9134
1.90 mm	0.0748	#2	0.2210	17/32 in	0.5313	23.30 mm	0.9173
#48	0.0760	5.70 mm	0.2244	13.50 mm	0.5315	23.40 mm	0.9213
1.95 mm	0.0768	#1	0.2280	13.60 mm	0.5354	59/64 in	0.9219
5/64 in	0.0781	5.80 mm	0.2283	13.70 mm	0.5394	23.50 mm	0.9252
#47	0.0785	5.90 mm	0.2323	13.80 mm	0.5433	23.60 mm	0.9291
2.00 mm	0.0787	A	0.2340	35/64 in	0.5469	23.70 mm	0.9331
2.05 mm	0.0807	15/64 in	0.2344	13.90 mm	0.5472	23.80 mm	0.9370
#46	0.0810	6.00 mm	0.2362	14.00 mm	0.5512	15/16 in	0.9375
#45	0.0820	B	0.2380	14.10 mm	0.5551	23.90 mm	0.9409
2.10 mm	0.0827	6.10 mm	0.2402	14.20 mm	0.5591	24.00 mm	0.9449
2.15 mm	0.0846	C	0.2420	9/16 in	0.5625	24.10 mm	0.9488
#44	0.0860	6.20 mm	0.2441	14.30 mm	0.5630	24.20 mm	0.9528
2.20 mm	0.0866	D	0.2460	14.40 mm	0.5669	61/64 in	0.9531
2.25 mm	0.0886	6.30 mm	0.2480	14.50 mm	0.5709	24.30 mm	0.9567
#43	0.0890	1/4 in • E	0.2500	14.60 mm	0.5748	24.40 mm	0.9606
2.30 mm	0.0906	6.40 mm	0.2520	37/64 in	0.5781	24.50 mm	0.9646
2.35 mm	0.0925	6.50 mm	0.2559	14.70 mm	0.5787	24.60 mm	0.9685
#42	0.0935	F	0.2570	14.80 mm	0.5827	31/32 in	0.9688
3/32 in	0.0938	6.60 mm	0.2598	14.90 mm	0.5866	24.70 mm	0.9724
2.40 mm	0.0945	G	0.2610	15.00 mm	0.5906	24.80 mm	0.9764
#41	0.0960	6.70 mm	0.2638	19/32 in	0.5938	24.90 mm	0.9803
2.45 mm	0.0965	17/64 in	0.2656	15.10 mm	0.5945	25.00 mm	0.9843
#40	0.0980	H	0.2660	15.20 mm	0.5984	63/64 in	0.9844
2.50 mm	0.0984	6.80 mm	0.2677	15.30 mm	0.6024	25.10 mm	0.9882
#39	0.0995	6.90 mm	0.2717	15.40 mm	0.6063	25.20 mm	0.9921
2.55 mm	0.1004	I	0.2720	39/64 in	0.6094	25.30 mm	0.9961
#38	0.1015	7.00 mm	0.2756	15.50 mm	0.6102	1 in • 25.40 mm	1.0000
2.60 mm	0.1024	J	0.2770	15.60 mm	0.6142		
#37	0.1040	7.10 mm	0.2795	15.70 mm	0.6181		
2.65 mm	0.1043	K	0.2810	15.80 mm	0.6220		
2.70 mm	0.1063	9/32 in	0.2813	5/8 in	0.6250		
#36	0.1065	7.20 mm	0.2835	15.90 mm	0.6260		
2.75 mm	0.1083	7.30 mm	0.2874	16.00 mm	0.6299		
7/64 in	0.1094	L	0.2900	16.10 mm	0.6339		
#35	0.1100	7.40 mm	0.2913	16.20 mm	0.6378		

GUHRING

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TAP DRILL SIZES

TAP SIZE	CUT TAPS – Target Theor. % of Thread			FORM TAPS – Target Theor. % of Thread		
	55% ← Approx.	65% ← Approx.	75% ← Approx.	55% ← Approx.	65% ← Approx.	75% ← Approx.
0 - 80	1.30 mm	1.25 mm	1.20 mm	1.40 mm	1.38 mm	1.36 mm
M1.6 x 0.35	1.35 mm	1.30 mm	1.25 mm	1.47 mm	1.44 mm	1.42 mm
M1.8 x 0.35	1.55 mm	1.50 mm	1.45 mm	1.67 mm	1.64 mm	1.62 mm
1-64	1/16 in	#53	1.45 mm	#51	1.68 mm	1.65 mm
1-72	1.60 mm	1.55 mm	#53	1.72 mm	1.70 mm	1.67 mm
M2 x 0.40	#51	1.65 mm	1.60 mm	#49	1.82 mm	1.79 mm
2-56	#49	1.80 mm	1.73 mm	2.01 mm	5/64 in	1.95 mm
2-64	1.87 mm	#49	1.80 mm	2.03 mm	2.00 mm	5/64 in
M2.2 x 0.45	#49	1.80 mm	1.75 mm	2.03 mm	2.00 mm	1.97 mm
M2.5 x 0.45	#44	2.10 mm	#46	2.33 mm	2.30 mm	2.27 mm
3-48	2.12 mm	#46	2.00 mm	2.32 mm	2.27 mm	2.24 mm
3-56	#44	2.13 mm	#46	2.34 mm	2.30 mm	2.28 mm
4-40	3/32 in	2.30 mm	2.20 mm	2.60 mm	2.55 mm	2.52 mm
4-48	2.45 mm	3/32 in	2.32 mm	#37	2.60 mm	#38
M3 x 0.50	#37	#38	2.50 mm	2.80 mm	7/64 in	2.75 mm
M3 x 0.35	2.75 mm	2.70 mm	2.65 mm	#33	2.85 mm	#34
5-40	#36	#37	#39	2.93 mm	2.88 mm	2.85 mm
5-44	2.75 mm	2.70 mm	2.60 mm	2.95 mm	2.92 mm	#33
M3.5 x 0.60	#31	3.00 mm	2.90 mm	3.27 mm	3.23 mm	3.20 mm
M3.5 x 0.35	3.25 mm	3.20 mm	3.15 mm	3.37 mm	3.35 mm	3.32 mm
6-32	#32	#34	#36	3.20 mm	3.15 mm	3.10 mm
6-40	#31	#32	#33	#30	3.22 mm	1/8 in
M4 x 0.70	3.50 mm	3.40 mm	3.30 mm	#26	3.70 mm	3.65 mm
M4 x 0.50	3.65 mm	9/64 in	3.50 mm	#25	3.77 mm	3.77 mm
8-32	3.60 mm	3.50 mm	3.40 mm	#24	#25	3.75 mm
8-36	#27	9/64 in	#29	3.90 mm	#24	#25
M4.5 x 0.75	5/32 in	#24	#25	#19	4.15 mm	4.10 mm
M4.5 x 0.50	4.15 mm	4.06 mm	4.00 mm	#18	4.27 mm	4.25 mm
10-24	#21	#23	#25	4.42 mm	11/64 in	4.27 mm
10-32	4.25 mm	4.15 mm	#21	4.52 mm	4.45 mm	4.40 mm
M5 x 0.80	4.40 mm	4.30 mm	4.20 mm	#13	4.65 mm	4.60 mm
M5 x 0.50	#14	#15	#16	#12	3/16 in	4.75 mm
12-24	#13	4.60 mm	4.45 mm	5.06 mm	5.00 mm	4.95 mm
12-28	#12	#13	4.60 mm	5.15 mm	5.06 mm	5.00 mm
M6 x 1.00	5.25 mm	13/64 in	5.00 mm	#2	7/32 in	5.50 mm
M6 x 0.75	5.45 mm	5.35 mm	5.25 mm	5.70 mm	5.65 mm	#2
1/4-20	#3	#5	#7	5.85 mm	#1	5.70 mm
1/4-28	5.70 mm	7/32 in	5.45 mm	6.00 mm	15/64 in	5.90 mm
M7 x 1.00	LTR D	LTR C	6.00 mm	LTR G	LTR F	6.50 mm
M7 x 0.75	6.40 mm	1/4 in	LTR D	6.70 mm	6.65 mm	6.60 mm
5/16-18	LTR I	17/64 in	LTR F	7.40 mm	7.30 mm	7.20 mm
5/16-24	9/32 in	LTR J	LTR I	19/64 in	7.45 mm	7.40 mm
M8 x 1.25	7.10 mm	LTR I	LTR H	19/64 in	7.45 mm	LTR L
M8 x 1.00	7.25 mm	9/32 in	7.00 mm	7.60 mm	19/64 in	7.50 mm
3/8-16	8.40 mm	LTR P	5/16 in	8.90 mm	8.80 mm	11/32 in
3/8-24	11/32 in	LTR R	8.50 mm	23/64 in	9.05 mm	9.00 mm
M10 x 1.50	8.90 mm	11/32 in	8.50 mm	9.40 mm	9.30 mm	9.20 mm
M10 x 1.25	9.10 mm	8.90 mm	11/32 in	3/8 in	9.45 mm	LTR U
M10 x 1.00	9.25 mm	23/64 in	9.00 mm	9.60 mm	9.55 mm	9.50 mm
7/16-14	LTR W	LTR V	LTR U	10.40 mm	10.30 mm	10.20 mm
7/16-20	10.20 mm	10.00 mm	9.95 mm	10.60 mm	10.50 mm	LTR Z
M12 x 1.75	27/64 in	10.50 mm	10.30 mm	11.30 mm	11.20 mm	7/16 in
M12 x 1.50	10.90 mm	27/64 in	10.50 mm	11.40 mm	11.30 mm	11.20 mm
M12 x 1.00	11.25 mm	7/16 in	11.00 mm	11.60 mm	11.55 mm	11.50 mm
1/2-13	11.30 mm	11.00 mm	27/64 in	15/32 in	11.80 mm	11.70 mm
1/2-20	11.80 mm	11.60 mm	11.40 mm	12.20 mm	12.10 mm	12.05 mm
M14 x 2.00	12.50 mm	31/64 in	12.00 mm	13.20 mm	33/64 in	13.00 mm
M14 x 1.50	12.90 mm	1/2 in	12.50 mm	13.40 mm	13.30 mm	13.20 mm
9/16-12	1/2 in	12.50 mm	12.20 mm	17/32 in	13.30 mm	13.20 mm
9/16-18	13.25 mm	33/64 in	12.90 mm	13.75 mm	13.65 mm	13.55 mm
5/8-11	14.20 mm	13.90 mm	13.60 mm	15.00 mm	14.80 mm	37/64 in
5/8-18	14.80 mm	37/64 in	14.50 mm	15.30 mm	15.25 mm	15.15 mm
M16 x 2.00	14.50 mm	9/16 in	14.00 mm	15.25 mm	15.10 mm	15.00 mm
M16 x 1.50	14.90 mm	14.70 mm	14.50 mm	15.40 mm	15.30 mm	15.20 mm
M18 x 2.50	16.20 mm	5/8 in	15.50 mm	43/64 in	16.90 mm	16.75 mm
M18 x 1.50	16.90 mm	21/32 in	16.50 mm	17.40 mm	17.30 mm	17.25 mm
3/4-10	17.20 mm	16.90 mm	16.50 mm	18.10 mm	45/64 in	17.70 mm
3/4-16	17.90 mm	17.70 mm	17.50 mm	18.40 mm	18.30 mm	23/32 in
M20 x 2.50	18.20 mm	45/64 in	17.50 mm	3/4 in	18.90 mm	47/64 in
M20 x 1.50	18.90 mm	18.75 mm	18.50 mm	49/64 in	19.30 mm	19.25 mm
M22 x 2.50	51/64 in	25/32 in	19.50 mm	53/64 in	20.90 mm	20.75 mm
M22 x 1.50	20.90 mm	20.75 mm	20.50 mm	27/32 in	21.30 mm	21.25 mm
7/8-9	51/64 in	25/32 in	19.50 mm	21.10 mm	21.00 mm	20.75 mm
7/8-14	20.90 mm	13/16 in	20.40 mm	21.50 mm	27/32 in	21.30 mm
M24 x 3.00	55/64 in	27/32 in	53/64 in	22.80 mm	57/64 in	22.50 mm
M24 x 2.00	22.50 mm	7/8 in	22.00 mm	23.25 mm	23.10 mm	23.00 mm
1-8	29/32 in	57/64 in	22.25 mm	61/64 in	24.00 mm	23.75 mm
1-12	15/16 in	23.60 mm	23.30 mm	31/32 in	24.40 mm	24.25 mm

IMPORTANT: Actual % of Thread will be lower than Theoretical % of Thread due to drilling operation runout. Carbide drills will cut closer to size and therefore will deliver a higher % of Thread. Conversely, runout will be higher with HSS drills, and Actual % of Thread will be lower.

KEY EQUATIONS

UNC/UNF Taps

Example 1/4 - 20
1/4 or 0.2500 in = BD (Basic Major Dia.)
20 = Threads Per Inch (TPI)

Calculating Drill Size for Specific % of Thread

CUT TAPS = $BD - \frac{(\text{Desired \% of Thread} \times 0.01299)}{\text{TPI}}$
Drill Size in

FORM TAPS = $BD - \frac{(\text{Desired \% of Thread} \times 0.0068)}{\text{TPI}}$
Drill Size in

Speed/Feed

RPM = $\frac{\text{SFM}}{\text{Dia. in}} \times 3.82$ IPR = $\frac{1}{\text{TPI}}$

M/MF Taps

Example M8 x 1.00
8.00 mm = BD (Basic Major Dia.)
1.00 mm = Pitch

Calculating Drill Size for Specific % of Thread

CUT TAPS = $BD - \frac{(\text{Desired \% of Thread} \times \text{Pitch})}{76.98}$
Drill Size mm

FORM TAPS = $BD - \frac{(\text{Desired \% of Thread} \times \text{Pitch})}{147.06}$
Drill Size mm

Speed/Feed

RPM = $\frac{\text{SFM}}{\text{Dia. mm}} \times 97.028$ IPR = $\text{Pitch mm} \times 0.0394$

Drills

SFM = $0.26 \times \text{RPM} \times \text{Dia. in}$

RPM = $\frac{\text{SFM}}{\text{Dia. in}} \times 3.82$

IPM = IPR x RPM

IPR = $\frac{\text{IPM}}{\text{RPM}}$

Cut Time sec = $\frac{\text{Hole Depth in}}{\text{IPM}} \times 60$

End Mills

SFM = $0.26 \times \text{RPM} \times \text{Dia. in}$

RPM = $\frac{\text{SFM}}{\text{Dia. in}} \times 3.82$

IPM = No. of Teeth x IPT x RPM

IPT = $\frac{\text{IPM}}{\text{RPM} \times \text{No. of Teeth}}$

Q = Depth of Cut in x Width of Cut in

Cut Time sec = $\frac{\text{Milling Length}}{\text{IPM}} \times 60$

Common Conversions

Inch = $\frac{\text{mm}}{25.4}$ PSI = Bar x 14.7 Torque = NM x 0.7376

SFM = m/min. x 3.28 Gal = $\frac{\text{Liter}}{3.79}$ HP = KW x 1.34

IPR = $\frac{\text{mm/rev.}}{25.4}$

GUHRING

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