Drill and Tap Chart

Unified coarse (UNC) tap drills, #1 to 1-1/2 inch

Tap drill is the major diameter minus 0.01299 × percent thread ÷ threads per inch, then the nearest standard drill. * means published charts split between two neighboring drills.

Thread size	Threads per inch	Major dia. (in)	Tap drill	Drill dia. (in)	Thread at that drill	Close-fit clearance drill	Free-fit clearance drill
#1	64	0.0730	#53	0.0595	67%	48 (0.0760)	46 (0.0810)
#2	56	0.0860	#50	0.0700	69%	43 (0.0890)	41 (0.0960)
#3	48	0.0990	#47	0.0785	76%	37 (0.1040)	35 (0.1100)
#4	40	0.1120	#43	0.0890	71%	32 (0.1160)	30 (0.1285)
#5	40	0.1250	#38	0.1015	72%	30 (0.1285)	29 (0.1360)
#6	32	0.1380	#36	0.1065	78%	27 (0.1440)	25 (0.1495)
#8	32	0.1640	#29	0.1360	69%	18 (0.1695)	16 (0.1770)
#10	24	0.1900	#25	0.1495	75%	9 (0.1960)	7 (0.2010)
#12	24	0.2160	#16 *	0.1770	72%	2 (0.2210)	1 (0.2280)
1/4	20	0.2500	#7	0.2010	75%	F (0.2570)	H (0.2660)
5/16	18	0.3125	F	0.2570	77%	P (0.3230)	Q (0.3320)
3/8	16	0.3750	5/16	0.3125	77%	W (0.3860)	X (0.3970)
7/16	14	0.4375	U	0.3680	75%	29/64 (0.4531)	15/32 (0.4688)
1/2	13	0.5000	27/64	0.4219	78%	33/64 (0.5156)	17/32 (0.5312)
9/16	12	0.5625	31/64	0.4844	72%	37/64 (0.5781)	19/32 (0.5938)
5/8	11	0.6250	17/32	0.5312	79%	41/64 (0.6406)	21/32 (0.6562)
3/4	10	0.7500	21/32	0.6562	72%	49/64 (0.7656)	25/32 (0.7812)
7/8	9	0.8750	49/64	0.7656	76%	57/64 (0.8906)	29/32 (0.9062)
1	8	1.0000	7/8	0.8750	77%	1-1/64 (1.0156)	1-1/32 (1.0312)
1-1/8	7	1.1250	63/64	0.9844	76%	—	—
1-1/4	7	1.2500	1-7/64	1.1094	76%	—	—
1-3/8	6	1.3750	1-7/32	1.2188	72%	—	—
1-1/2	6	1.5000	1-11/32	1.3438	72%	—	—

Unified fine (UNF) tap drills, #0 to 1-1/2 inch

Thread size	Threads per inch	Major dia. (in)	Tap drill	Drill dia. (in)	Thread at that drill	Close-fit clearance drill	Free-fit clearance drill
#0	80	0.0600	3/64	0.0469	81%	52 (0.0635)	50 (0.0700)
#1	72	0.0730	#53	0.0595	75%	48 (0.0760)	46 (0.0810)
#2	64	0.0860	#50	0.0700	79%	43 (0.0890)	41 (0.0960)
#3	56	0.0990	#45	0.0820	73%	37 (0.1040)	35 (0.1100)
#4	48	0.1120	#42	0.0935	68%	32 (0.1160)	30 (0.1285)
#5	44	0.1250	#37	0.1040	71%	30 (0.1285)	29 (0.1360)
#6	40	0.1380	#33	0.1130	77%	27 (0.1440)	25 (0.1495)
#8	36	0.1640	#29	0.1360	78%	18 (0.1695)	16 (0.1770)
#10	32	0.1900	#21	0.1590	76%	9 (0.1960)	7 (0.2010)
#12	28	0.2160	#14 *	0.1820	73%	2 (0.2210)	1 (0.2280)
1/4	28	0.2500	#3	0.2130	80%	F (0.2570)	H (0.2660)
5/16	24	0.3125	I	0.2720	75%	P (0.3230)	Q (0.3320)
3/8	24	0.3750	Q	0.3320	79%	W (0.3860)	X (0.3970)
7/16	20	0.4375	25/64	0.3906	72%	29/64 (0.4531)	15/32 (0.4688)
1/2	20	0.5000	29/64	0.4531	72%	33/64 (0.5156)	17/32 (0.5312)
9/16	18	0.5625	33/64	0.5156	65%	37/64 (0.5781)	19/32 (0.5938)
5/8	18	0.6250	37/64	0.5781	65%	41/64 (0.6406)	21/32 (0.6562)
3/4	16	0.7500	11/16	0.6875	77%	49/64 (0.7656)	25/32 (0.7812)
7/8	14	0.8750	13/16	0.8125	67%	57/64 (0.8906)	29/32 (0.9062)
1	12	1.0000	59/64	0.9219	72%	1-1/64 (1.0156)	1-1/32 (1.0312)
1-1/8	12	1.1250	1-3/64	1.0469	72%	—	—
1-1/4	12	1.2500	1-11/64	1.1719	72%	—	—
1-3/8	12	1.3750	1-19/64	1.2969	72%	—	—
1-1/2	12	1.5000	1-27/64	1.4219	72%	—	—

Metric coarse tap drills, M1 to M30

Tap drill is the major diameter minus 1.299 × pitch × percent thread.

Thread	Pitch (mm)	Major dia. (mm)	Tap drill (mm)	Thread at that drill	Close clearance (mm)	Medium clearance (mm)	Free clearance (mm)
M1	0.25	1	0.75	77%	—	—	—
M1.1	0.25	1.1	0.85	77%	—	—	—
M1.2	0.25	1.2	0.95	77%	—	—	—
M1.4	0.3	1.4	1.1	77%	—	—	—
M7	1	7	6	77%	—	—	—
M8	1.25	8	6.8	74%	8.4	9	10
M9	1.25	9	7.8	74%	—	—	—
M10	1.5	10	8.5	77%	10.5	11	12

Thread	Pitch (mm)	Major dia. (mm)	Tap drill (mm)	Thread at that drill	Close clearance (mm)	Medium clearance (mm)	Free clearance (mm)
M1.6	0.35	1.6	1.25	77%	1.7	1.8	2
M1.8	0.35	1.8	1.45	77%	—	—	—
M2	0.4	2	1.6	77%	2.2	2.4	2.6
M2.2	0.45	2.2	1.75	77%	—	—	—
M2.5	0.45	2.5	2.05	77%	2.7	2.9	3.1
M3	0.5	3	2.5	77%	3.2	3.4	3.6
M3.5	0.6	3.5	2.9	77%	—	—	—
M4	0.7	4	3.3	77%	4.3	4.5	4.8
M4.5	0.75	4.5	3.7	82%	—	—	—
M5	0.8	5	4.2	77%	5.3	5.5	5.8
M6	1	6	5	77%	6.4	6.6	7

Thread	Pitch (mm)	Major dia. (mm)	Tap drill (mm)	Thread at that drill	Close clearance (mm)	Medium clearance (mm)	Free clearance (mm)
M11	1.5	11	9.5	77%	—	—	—
M12	1.75	12	10.2	79%	13	13.5	14.5
M14	2	14	12	77%	15	15.5	16.5
M16	2	16	14	77%	17	17.5	18.5
M18	2.5	18	15.5	77%	19	20	21
M20	2.5	20	17.5	77%	21	22	24
M22	2.5	22	19.5	77%	23	24	26
M24	3	24	21	77%	25	26	28
M27	3	27	24	77%	28	30	32
M30	3.5	30	26.5	77%	31	33	35

Metric fine tap drills

Only the fine pitches listed by at least two sources.

Thread	Pitch (mm)	Major dia. (mm)	Tap drill (mm)	Thread at that drill	Close clearance (mm)	Medium clearance (mm)	Free clearance (mm)
M4×0.5	0.5	4	3.5	77%	4.3	4.5	4.8
M5×0.5	0.5	5	4.5	77%	5.3	5.5	5.8
M6×0.75	0.75	6	5.25	77%	6.4	6.6	7
M8×1	1	8	7	77%	8.4	9	10
M8×0.75	0.75	8	7.25	77%	8.4	9	10
M10×1.25	1.25	10	8.8	74%	10.5	11	12
M10×1	1	10	9	77%	10.5	11	12
M10×0.75	0.75	10	9.25	77%	10.5	11	12
M12×1.5	1.5	12	10.5	77%	13	13.5	14.5
M12×1.25	1.25	12	10.8	74%	13	13.5	14.5
M12×1	1	12	11	77%	13	13.5	14.5

Thread	Pitch (mm)	Major dia. (mm)	Tap drill (mm)	Thread at that drill	Close clearance (mm)	Medium clearance (mm)	Free clearance (mm)
M14×1.5	1.5	14	12.5	77%	15	15.5	16.5
M14×1.25	1.25	14	12.8	74%	15	15.5	16.5
M16×1.5	1.5	16	14.5	77%	17	17.5	18.5
M18×1.5	1.5	18	16.5	77%	19	20	21
M20×2	2	20	18	77%	21	22	24
M20×1.5	1.5	20	18.5	77%	21	22	24
M22×1.5	1.5	22	20.5	77%	23	24	26
M24×2	2	24	22	77%	25	26	28
M24×1.5	1.5	24	22.5	77%	25	26	28
M27×2	2	27	25	77%	28	30	32
M30×2	2	30	28	77%	31	33	35

NPT pipe thread tap drills

Tapered pipe threads. The tap drill leaves stock for the taper reamer or tap to finish. Where charts disagree we show the most-cited value first and list the others.

NPT size	Threads per inch	Pipe OD (in)	Tap drill	Other values published
1/16	27	0.3125	C	D (Theoretical Machinist); 1/4 (Eagle Fittings)
1/8	27	0.4050	Q	21/64 (Engineering ToolBox); R (Newman Tools); 21/64 (Eagle Fittings)
1/4	18	0.5400	7/16	27/64 (Engineering ToolBox)
3/8	18	0.6750	9/16	37/64 (Newman Tools)
1/2	14	0.8400	45/64	11/16 (Engineering ToolBox); 23/32 (Newman Tools); 11/16 (Eagle Fittings)
3/4	14	1.0500	29/32	59/64 (Newman Tools); 7/8 (Eagle Fittings)
1	11.5	1.3150	1-9/64	1-1/8 (Engineering ToolBox); 1-5/32 (Newman Tools); 1-3/32 (Eagle Fittings)
1-1/4	11.5	1.6600	1-31/64	1-15/32 (Engineering ToolBox); 1-1/2 (Newman Tools); 1-13/32 (Eagle Fittings)
1-1/2	11.5	1.9000	1-23/32	1-47/64 (Theoretical Machinist, Newman Tools); 1-5/8 (Eagle Fittings)
2	11.5	2.3750	2-7/32	2-13/64 (Theoretical Machinist); 2-3/16 (Engineering ToolBox); 2-1/32 (Eagle Fittings)
2-1/2	8	2.8750	2-5/8	2-9/16 (Engineering ToolBox); 2-1/2 (Eagle Fittings)
3	8	3.5000	3-1/4	3-3/16 (Engineering ToolBox); 3-1/16 (Eagle Fittings)
4	8	4.5000	4-1/4	4-3/16 (Engineering ToolBox); 4-1/16 (Eagle Fittings)

Disclaimer. Reference values for information only. Check the manufacturer's data for your part. Charts & Specs is an independent reference site. It is not affiliated with any manufacturer, standards body or code organization, and it uses brand and standard names only to identify what a value applies to.