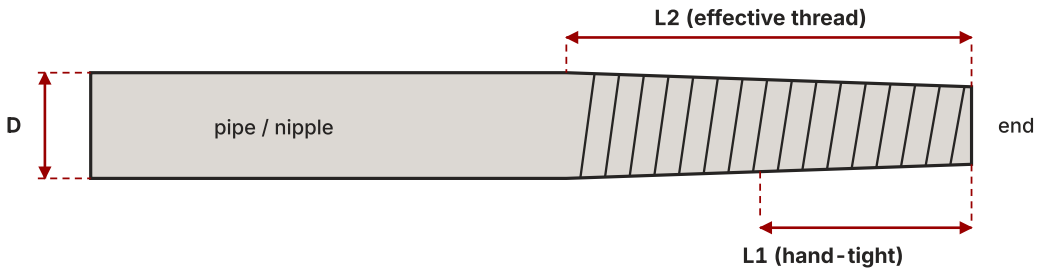
Pipe Thread Sizes (NPT)

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NPT taper pipe threads 1/8″ to 6″: threads per inch, pipe OD, hand-tight engagement and thread length, tap drills, pipe and nipple walls, close nipple lengths.

An **NPT** thread (American National Standard Taper Pipe Thread, ASME B1.20.1) is the thread on pipe, nipples and threaded pipe fittings. It tapers 1 in 16 on the diameter (3/4″ per foot), so the male end wedges into the female as it is tightened. A pipe size is a name, not a measurement: **a 1/2″ pipe is 0.840″ across the outside**, and standard and extra heavy pipe of one size share that outside diameter — the heavier wall is on the inside. The thread is called out by size and threads per inch, as 1/2-14 NPT.



The letters match the table columns. L1 and L2 are measured from the end of the pipe. Not to scale.

NPT pipe thread sizes — ASME B1.20.1 (inches)

PIPE SIZE	THREADS PER INCH	PIPE OD (D)
1/8″	27	0.405″
1/4″	18	0.540″
3/8″	18	0.675″
1/2″	14	0.840″
3/4″	14	1.050″
1″	11½	1.315″
1-1/4″	11½	1.660″
1-1/2″	11½	1.900″
2″	11½	2.375″
2-1/2″	8	2.875″
3″	8	3.500″
3-1/2″	8	4.000″
4″	8	4.500″
5″	8	5.563″
6″	8	6.625″

D = outside diameter of the pipe, basic, inches — the size to measure on a male thread. A dash: our sources differ — give us a call.

Thread engagement — hand-tight and effective thread length

PIPE SIZE	HAND-TIGHT L1	EFFECTIVE THREAD L2
1/8″	0.1615″	0.2639″
1/4″	0.2278″	0.4018″
3/8″	0.240″	0.4078″
1/2″	0.320″	0.5337″
3/4″	0.339″	0.5457″
1″	0.400″	0.6828″
1-1/4″	0.420″	0.7068″
1-1/2″	0.420″	0.7235″
2″	0.436″	0.7565″
2-1/2″	0.682″	1.1375″

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PIPE SIZE	HAND-TIGHT L1	EFFECTIVE THREAD L2
3″	0.766″	1.2000″
3-1/2″	0.821″	1.2500″
4″	0.844″	1.3000″
5″	0.937″	1.4063″
6″	0.958″	1.5125″

Basic lengths, inches, from the end of the pipe (ASME B1.20.1). L1 = how far the threads engage screwed together by hand; L2 = the length of full-form thread on the male end.

Tap drills for NPT pipe taps

THREAD	TAP DRILL
1/8-27 NPT	—
1/4-18 NPT	7/16″
3/8-18 NPT	37/64″
1/2-14 NPT	23/32″
3/4-14 NPT	59/64″
1-11½ NPT	1-5/32″
1-1/4-11½ NPT	1-1/2″
1-1/2-11½ NPT	1-47/64″
2-11½ NPT	2-7/32″
2-1/2-8 NPT	2-5/8″
3-8 NPT	3-1/4″
3-1/2-8 NPT	—
4-8 NPT	4-1/4″
5-8 NPT	—
6-8 NPT	—

Drill size for tapping without a taper pipe reamer. A dash: our sources differ (1/8″: letter R or Q) or only one lists it — give us a call. Drill decimals: drill size chart.

Pipe and nipple wall thickness — standard and extra heavy

PIPE SIZE	OD	STANDARD (SCH 40)	EXTRA HEAVY (SCH 80)
1/8″	0.405″	0.068″	0.095″
1/4″	0.540″	0.088″	0.119″
3/8″	0.675″	0.091″	0.126″
1/2″	0.840″	0.109″	0.147″
3/4″	1.050″	0.113″	0.154″
1″	1.315″	0.133″	0.179″
1-1/4″	1.660″	0.140″	0.191″
1-1/2″	1.900″	0.145″	0.200″
2″	2.375″	0.154″	0.218″
2-1/2″	2.875″	0.203″	0.276″
3″	3.500″	0.216″	0.300″
3-1/2″	4.000″	0.226″	0.318″
4″	4.500″	0.237″	0.337″
5″	5.563″	0.258″	0.375″
6″	6.625″	0.280″	0.432″

Nominal wall, inches, steel and stainless pipe (ASME B36.10 / B36.19). Brass pipe walls differ and aren't on this chart.

Close nipple lengths — steel pipe nipples

PIPE SIZE	CLOSE NIPPLE LENGTH

PIPE SIZE	CLOSE NIPPLE LENGTH
1/8″	3/4″
1/4″	7/8″
3/8″	1″
1/2″	1-1/8″
3/4″	1-3/8″
1″	1-1/2″
1-1/4″	1-5/8″
1-1/2″	1-3/4″
2″	2″
2-1/2″	2-1/2″
3″	2-5/8″
3-1/2″	—
4″	2-7/8″
5″	—
6″	—

Nominal overall length, inches, per the Smith-Cooper and Anvil steel nipple charts. A dash: only one of our sources lists it — give us a call.

Good to know

NPT seals with a sealant. The taper makes the joint tight, but an NPT joint is made pressure-tight with a thread sealant — pipe dope or PTFE tape on the male thread. Screw it in by hand, then make it up with a wrench.

Size a thread by its outside diameter. Measure across the outside of a male thread (or a pipe end) and find the OD in the table; the pipe size and threads per inch are on the same row. Several sizes share a thread count, so the OD is what tells them apart.

Quick answers

What is the outside diameter of 1/2 inch pipe?
A 1/2″ pipe or NPT male thread is **0.840″** across the outside; 2″ pipe is 2.375″. The pipe size is a name, not a measurement.

How many threads per inch on 3/4 NPT?
14 threads per inch (3/4-14 NPT, ASME B1.20.1). 1/2″ is also 14; 1″ through 2″ are 11½.

What size drill for a 1/2 NPT tap?
A **23/32″** drill, per our pipe thread chart (drilled hole, no taper reamer).

How long is a 1/2 inch close nipple?
About **1-1/8″** (steel close nipple, per the Smith-Cooper and Anvil nipple charts) — threaded its whole length.

How far does a 1/2 NPT thread go in hand tight?
Hand-tight engagement L1 is **0.320″**; the effective thread length L2 is 0.5337″ (ASME B1.20.1). The joint is then made up with a wrench.

What is the wall thickness of 1 inch Schedule 40 and Schedule 80 pipe?
Standard (Schedule 40): **0.133″**. Extra heavy (Schedule 80): **0.179″**. The OD is the same (1.315″); the heavier wall is on the inside.

Reference values drawn from the governing standards. For critical applications, confirm against the standard and the manufacturer's published data. Technical information disclaimer →