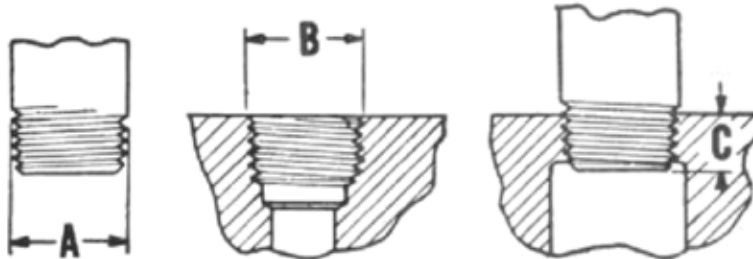


# Finding the Correct Pipe Thread Size

## National Pipe Threads (NPT)

Pipe sizes do refer to physical dimensions, but the plumbing industry standard for the sizes of pipe is not always as straight-forward as measuring the pipe. **Measuring the pipe will oftentimes mislead you into choosing the wrong pipe, so do take care.** The "pipe thread size" as shown in column 3 of the table below is measured and based on the inside of the pipe. But, to actually determine the size of a pipe, the outside diameter of each pipe or fitting must be measured and compared to the table for size identification. For example, a 3/4" NPT pipe thread has an outside diameter of 1.050 inches. Each thread size has a defined number of threads per inch (TPI). The 3/4" NPT pipe thread has 14 threads per inch. Both the TPI (threads per inch) and OD (outside diameter) of the thread are required for positive identification of thread size because several sizes have the same TPI.



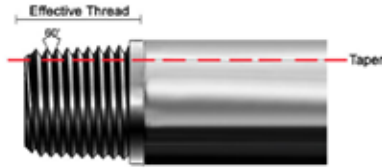
**Male threads:** Measure the outside diameter of the large portion of the thread at "A"; Find figure nearest this dimension in column 1 or 2 of chart. The dimension in column 3 will be your nominal pipe thread size.

**Female Threads:** Measure top diameter of thread at "B"; Find figure nearest this dimension in column 1 or 2 of chart. The dimension in column 3 will be your nominal pipe thread size.

Col 1 (Dimension A)	Col 2 (Dimension A)	Col 3 (Dimension B)	Col 4 (Dimension C)	Col 5	Col 6
OD Fraction Inch (quick reference only)	OD Actual (inches)	Pipe Thread Size	Normal engagement for tight joint	Threads per Inch	Circumference (inches)
5/16	0.3125	1/16	0.2611	27	0.9817
13/32	0.405	1/8	0.2639	27	1.272
35/64	0.540	1/4	0.4018	18	1.696
43/64	0.675	3/8	0.4078	18	2.121
27/32	0.840	1/2	0.5337	14	2.639
1-3/64	1.050	3/4	0.5457	14	3.299
1-5/16	1.315	1	0.6828	11-1/2	4.131
1-21/32	1.660	1-1/4	0.7068	11-1/2	5.215
1-29/32	1.900	1-1/2	0.7235	11-1/2	5.969
2-3/8	2.375	2	0.7565	11-1/2	7.461
2-7/8	2.875	2-1/2	1.1375	8	9.032
3-1/2	3.5	3	1.2000	8	10.995
4	4.0	3-1/2	1.2500	8	12.566
4-1/2	4.5	4	1.3000	8	14.137
5-5/8	5.563	5	1.4063	8	17.476
6-5/8	6.625	6	1.5125	8	20.812
8-5/8	8.625	8	1.7125	8	27.095
10-3/4	10.75	10	1.9250	8	33.771
12-3/4	12.75	12	2.1250	8	40.054



All pipe thread types used in plumbing are specified by the American National Standard for pipe as accredited by the American National Standards Institute (ANSI).



NPT sample (tapered threads)

National Pipe Threads (NPT) have tapered threads. These are the most common threads used for general purposes. NPT threads are designed with a 60 degree thread angle, and are used for joining and sealing pipe to fittings in low pressure air or liquids and also mechanical applications. The tapered thread is 3/4" over one foot of length. Tapered threads are deeper at the end of the pipe and are increasingly shallower the further they are from the end of the pipe. The taper on the pipe only allows the pipe to screw inside the fitting until it is forced to stop because of the taper. The distance the pipe can be screwed into the fitting is specified by the ANSI standard. After tightening with a wrench the threads may have slight spaces between the pipe and fitting which could cause a leak so a pipe sealant must be used to ensure any gaps are filled.

The Dry-seal thread (NPTF) also have tapered threads. NPTF threads are used when the application is such that pipe sealing compounds may fail due to higher heat or pressure than normal NPT threads can withstand. The threads are designed to seal mechanically by slightly, but sufficiently, crushing the threads when tightened with a wrench. This allows for joining the pipe and fitting without sealants.

The NPT and NPTF threads can be interchanged if sealants such as [PTFE](#) tape or suitable [pipe joint compounds](#) are used. **None of the other thread standards are fully interchangeable (GHT, NST, BSPT, NPSI, etc.)** Female NPT threads can be designated as "FPT" or "FIP" and male NPT threads can be designated as "MPT" or "MIP".

National Standard Free-Fitting Straight Mechanical Pipe Threads (NPSM) have straight threads which are only used for joining. A washer or gasket is needed to seal this type of threaded connection.

There are also three less common thread types used in the plumbing industry. The [Garden Hose Thread](#) (GHT) and the [Fire Hose Thread](#) (NST) have coarse threads. The seal is made with a gasket or washer and are used mainly for attaching (joining) hoses to valves quickly, without the use of a wrench. The British Standard Taper Pipe Thread (BSPT) has a 55 degree thread angle (NPT are 60 degree) and is used internationally as a standard thread for joining steel pipes.

Definition of pipe thread acronyms	
NPT	National Pipe Thread (tapered)
FPT	Female Pipe Thread (interchangeable with NPT)
FIP	Female Iron Pipe (interchangeable with NPT)
MPT	Male Pipe Thread (interchangeable with NPT)
MIP	Male Iron Pipe (interchangeable with NPT)
IPS	Iron pipe size (interchangeable with NPT)
PTF	SAE short taper pipe thread
NPTF	National Pipe Thread Fuel (American National taper pipe thread for dryseal pressure-tight joints)
NPSM	National Pipe Straight Mechanical (American National straight pipe thread for mechanical joints)
NPSI	American National straight intermediate pipe thread
GHT	Garden Hose thread
NST	National Standard Thread (Fire Hose thread)
BSPT	British Standard taper pipe thread (metric dimensions)

