

Pipe Thread Standard

1 Definition

The diameters, threads per inch (TPI) and thread pitch, etc. are necessary to completely identify a thread. In a shop, specialty gauges are required to accurately gauge or identify threads. In the field, in the absence of these gauges, thread "leaf" gauges can be used to identify the "Threads per Inch" (TPI) and the thread pitch. On threads you have determined to be straight threads, a caliper can be used to measure the "Outside Diameter of the Male" (ODM) or the "Inside Diameter of the Female" (IDF). A caliper can also be used to take measurements of tapered thread diameters. However, these are more difficult to define because of the taper. Fortunately, there are few tapered threads to deal with and these can usually be identified from the nominal ODM and the TPI.

However, identifying the thread may not fully identify what is needed in a mating fitting. The application is the primary **limiting factor on the thread type used**. We offer products with a wide variety of threads used with hose, pipe and hydraulics.

When attempting to choose a fitting, it is always advisable to first identify the thread to which it must connect. This may entail checking with a fitting or equipment manufacturer.

The fire hose thread specifications for some local municipal fire equipment and hydrants may vary according to local specifications. These can generally be most easily identified by contacting the local fire department responsible for the hydrant. The most common thread used on fire equipment is National Standard Thread (NST), also known as National Hose thread (NH).

When it is not possible to identify the thread:

- **1) Determine the number of threads per inch by measuring the distance from peak of thread to peak of thread across the largest number of whole threads. Then divide the number of threads by the measurement. (This will provide the TPI).**

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2) Check to see if the thread is straight or tapered.

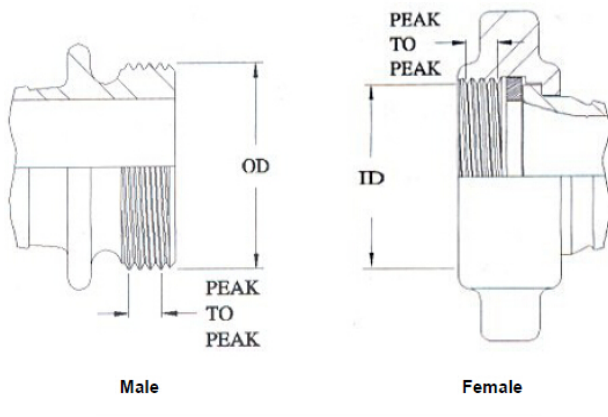
a) Straight Threads

Measure the "Outside Diameter of the Male" (ODM) or the "Inside Diameter of the Female" (IDF), from peak of thread to peak of thread.

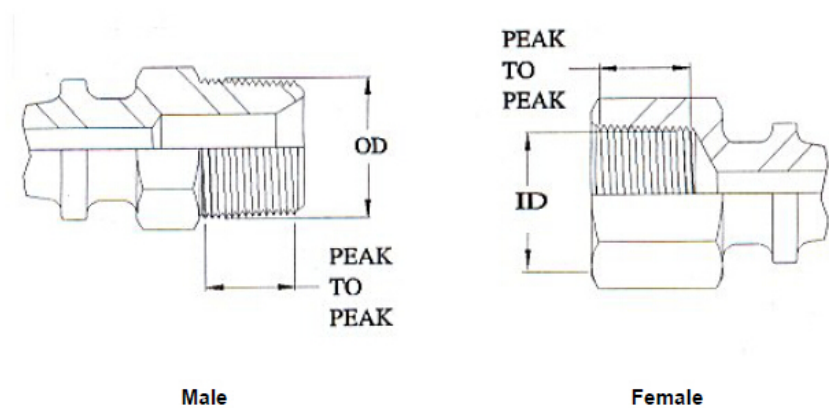
b) Tapered Threads

Measure the "Outside Diameter of the Male" (ODM) at the large end and the small end, or the "Inside Diameter of the Female" (IDF) at the large end and the small end, from peak of thread to peak of thread.

Straight Thread



Tapered Thread



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Abbreviation	System Name	Compatibility	Seal Method
BSPP	British Standard Pipe Parallel	Male BSPP with Female BSPP	Washer
		Female BSPP with Male BSPP	Washer
		Female BSPP with Male BSPT _r	Washer
BSPT_r	British Standard Pipe Taper	Male BSPT _r with Female BSPT _r	Thread
		Male BSPT _r with Female BSPP	Washer
		Female BSPT _r with Male BSPT _r	Thread
		<i>Female BSPT_r not compatible with Male BSPP</i>	
CHT	American Standard Fire Hose Thread (1" National Hose Thread is Chemical Hose Thread, also known as Booster Hose Thread)	1" Male NH (NST) with 1" Female NH (NST)	Washer
		1" Female NH (NST) with 1" Male NH (NST)	Washer
		1" Thread is used on both ¾" hose & 1" hose.	
		<i>Not compatible with other systems</i>	
GHT	Garden Hose Thread	Male GHT with Female GHT	Washer
		Female GHT with Male GHT	Washer
		Thread is the same for all size hose.	
		<i>Not compatible with other systems</i>	
IPS	Iron Pipe Straight Thread	Generic name for Straight Pipe Thread	Washer
		See NPSH for compatibility	
JIC	Joint Industrial Committee	Used with other mating JIC threads	Mechanical

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NPT	American Standard Taper Pipe Thread (National Pipe Thread)	Male NPT with Female NPT	Thread
		Male NPT with Female NPTF	Thread
		Male NPT with Female NPSM	Washer
		Male NPT with Female NPSH	Washer
		Female NPT with Male NPT	Thread
		Female NPT with Male NPTF	Thread
		<i>Female NPT not compatible with Male NPSM or Male NPSH</i>	
NPTF	American Standard Taper Pipe Fuel Dryseal Thread (National Pipe Tapered Fine)	Male NPTF with Female NPTF	Thread
		Male NPTF with Female NPT	Thread
		Male NPTF with Female NPSM	Washer
		Male NPTF with Female NPSH	Washer
		Female NPTF with Male NPTF	Thread
		Female NPTF with Male NPT	Thread
		<i>Female NPTF with Male NPSM or Male NPSH</i>	Not Compatible
		<i>Note: NPTF with NPTF threads do not require sealant for the initial use. After that, sealant is required.</i>	
NPSH	American Standard Straight Pipe for Hose Couplings (National Pipe Straight Hose)	Male NPSH with Female NPSH	Washer
		Female NPSH with Male NPSH	Washer
		Female NPSH with Male NPT	Washer
		Female NPSH with Male NPTF	Washer
		Female NPSH with Male NPSM	Washer
NPSM	American Standard Straight Mechanical Joints (National Pipe Straight Mechanical)	Male NPSM with Female NPSM	Seal can be either mechanical or washer. Mating fittings must be of same type
		Male NPSM with Female NPSH	
		Female NPSM with Male NPSM	
		Female NPSM with Male NPT	
		Female NPSM with Male NPTF	
TIPT	Tapered Iron Pipe Thread	Generic name for Tapered Pipe Thread	Thread

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Thread Dimensions

Nominal Dimensions of Standard Threads

Size	Pipe O. D.	NPT		NPSH		NPSM		
		TPI	TPI	ODM (Max)	IDF (Min)	TPI	ODM (Max)	IDF (Min)
1/8"	.405	27	-	-	-	27	0.397	0.358
1/4"	.504	18	-	-	-	18	0.526	0.468
3/8"	.675	18	-	-	-	18	0.662	0.603
1/2"	.840	14	14	0.8248	0.7395	14	0.823	0.747
3/4"	1.050	14	14	1.0353	0.9500	14	1.034	0.958
1"	1.315	11.5	11.5	1.2951	1.1921	11.5	1.293	1.201
1-1/4"	1.660	11.5	11.5	1.6399	1.5369	11.5	1.638	1.546
1-1/2"	1.900	11.5	11.5	1.8788	1.7758	11.5	1.877	1.785
2"	2.375	11.5	11.5	2.3528	2.2498	11.5	2.351	2.259
2-1/2"	2.875	8	-	-	-	8	2.841	2.708
3"	3.500	8	-	-	-	8	3.467	3.334
4"	4.500	8	-	-	-	8	4.466	4.333
5"	5.563	8	-	-	-	8	5.528	5.395
6"	6.625	8	-	-	-	8	6.585	6.452
8"	8.625	8	-	-	-	-	-	-
10"	10.750	8	-	-	-	-	-	-
12"	12.750	8	-	-	-	-	-	-

ODM = Outside Diameter of Male
 IDF = Inside Diameter of Female
 TPI = Threads per Inch
 GHT (3/4") = 1.0625 ODM, 11-1/2 TPI