Identifying Threads

JME ELLSWORTH
A John M. Ellsworth Company

IT IS IMPORTANT TO IDENTIFY THE THREADS REQUIRED BEFORE ORDERING COUPLINGS.

Identifying threads can sometimes be the most difficult and frustrating part of coupling selection. However, without the right combination of threads, you may not provide a functional or safe connection.

The diameters, threads per inch (TPI) and thread pitch, etc. are necessary to completely identify a thread. Ring, Plug and GO/NOGO 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. Dixon offers 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:

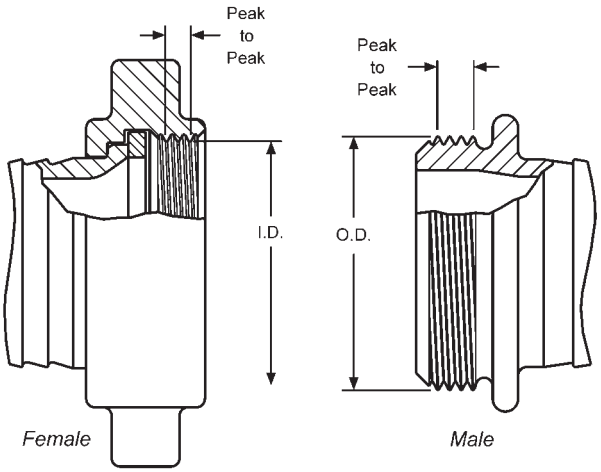
1) Determine the number of threads per inch by measuring the distance from peak of thread to peak of thread across the largest number of whole threads. Then divide the number of threads by the measurement (This will provide the TPI).
2) Check to see if the thread is straight or tapered.

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.

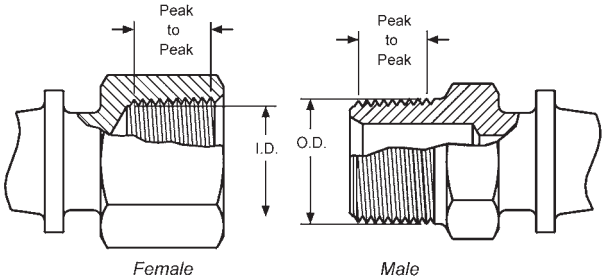
b) Tapered Threads
Measure the "Outside Diameter of the Male" (ODM) at the large end and the small end, or the "Inside Diameter of the Female" (IDF) at the large end and the small end, from peak of thread to peak of thread. Then measure the Outside Diameter (OD) of the unthreaded pipe.

Once the application and these two pieces of information have been determined, the thread can generally be determined. When in doubt, contact the factory.

Straight Thread



Tapered Thread



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Thread Information

Abbreviation	System Name	Compatibility	Seal Method
BSPP	British Standard Pipe Parallel	Male BSPP with Female BSPP Female BSPP with Male BSPP Female BSPP with Male BSPTr	Washer Washer Washer
BSPTr	British Standard Pipe Taper	Male BSPTr with Female BSPTr Male BSPTr with Female BSPP Female BSPTr with Male BSPTr *Female BSPTr not compatible with Male BSPP*	Thread Washer Thread
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) 1"Female NH (NST) with 1" Male NH (NST) 1" Thread is used on both ¾" hose and 1" hose. *Not compatible with other systems*	Washer Washer
GHT	Garden Hose Thread	Male GHT with Female GHT Female GHT with Male GHT Thread is same for all size hose *Not compatible with other systems*	Washer Washer
IPS	Iron Pipe Straight Thread	Generic Name for Straight Pipe Thread See NPSH for compatibility	Washer
IPT	Iron Pipe Thread	Generic Name for All Pipe Thread *More information required*	
NH or NST	American Standard Fire Hose Coupling Thread (National Hose thread also known as National Standard Thread)	Male NH (NST) with Female NH (NST) Female NH (NST) with Male NH (NST) *Not compatible with other systems* Thread pitch and diameters of fire threads may vary according to local and municipal regulations.	Washer Washer
NPT	American Standard Taper Pipe Thread (National Pipe Tapered)	Male NPT with Female NPT Male NPT with Female NPTF Male NPT with Female NPSM Male NPT with Female NPSH Female NPT with Male NPT Female NPT with Male NPTF Female NPT not compatible with Male NPSM or Male NPSH	Thread Thread Washer Washer Thread Thread
NPTF	American Standard Taper Pipe Fuel Dryseal Thread (National Pipe Tapered Fine)	Male NPTF with Female NPTF Male NPTF with Female NPT Male NPTF with Female NPSM Male NPTF with Female NPSH Female NPTF with Male NPTF Female NPTF with Male NPT *Female NPTF with Male NPSM or NPSH* *Note: NPTF with NPTF threads do not require sealant for the initial use. After that, sealant is required.*	Thread Thread Washer Washer Thread Thread Not Compatible
NPSH	American Standard Straight Pipe for Hose Couplings (National Pipe Straight Hose)	Male NPSH with Female NPSH Female NPSH with Male NPSH Female NPSH with Male NPT Female NPSH with Male NPTF Female NPSH with Male NPSM	Washer Washer Washer Washer Washer
NPSM	American Standard Straight Mechanical Joints (National Pipe Straight Mechanical)	Male NPSM with Female NPSM Male NPSM with Female NPSH Female NPSM with Male NPSM Female NPSM with Male NPT Female NPSM with Male NPTF	Seal can be either mechanical or washer. Mating fittings must be of same type.
SIPT	Straight Iron Pipe Thread	Generic name for Straight Pipe Thread	Washer
TIPT	Tapered Iron Pipe Thread	Generic name for Tapered Pipe Thread	Thread

Thread Dimensions

Nominal Dimensions of Standard Threads

ODM -- Outside Diameter of the Male IDF -- Inside Diameter of the Female TPI -- Threads Per Inch

Size	Pipe OD	Tapered Threads		Straight Threads											
		NPT	*BSPTr*	*NPSH*			*NPSM*			*NST (NH)*			*BSPP*		
		TPI	TPI	TPI	ODM *(max)*	IDF *(min)*	TPI	ODM *(max)*	IDF *(min)*	TPI	ODM *(max)*	IDF *(min)*	TPI	ODM *(max)*	IDF *(min)*
1/8"	.405	27	28				27	0.397	0.358					0.383	0.337
1/4"	.540	18	19				18	0.526	0.468					0.516	0.450
3/8"	.675	18	19				18	0.662	0.603					0.656	0.588
1/2"	.840	14	14	14	0.8248	0.7395	14	0.823	0.747					0.825	0.733
3/4"	1.050	14	14	14	1.0353	0.9500	14	1.034	0.958	8	1.375	1.2246		1.041	0.950
1"	1.315	11.5	11	11.5	1.2951	1.1921	11.5	1.293	1.201	8	1.375	1.2246	11	1.309	1.193
1-1/4"	1.660	11.5	11	11.5	1.6399	1.5369	11.5	1.638	1.546				11	1.650	1.534
1-1/2"	1.900	11.5	11	11.5	1.8788	1.7758	11.5	1.877	1.785	9	1.990	1.8577		1.882	1.766
2"	2.375	11.5	11	11.5	2.3528	2.2498	11.5	2.351	2.259				11	2.347	2.231
2-1/2"	2.875	8	11	8	2.8434	2.6930	8	2.841	2.708	7.5	3.068	2.9104	11	2.960	2.844
3"	3.500	8	11				8	3.467	3.334	6	3.623	3.5306	11	3.460	3.344
4"	4.500	8	11				8	4.466	4.333	4	5.010	4.7111		4.450	4.334
4-1/2"										4	5.760	5.4611	11		
5"	5.563	8	11				8	5.528	5.395	4	6.260	5.9602	11	5.450	5.359
6"	6.625	8	11				8	6.585	6.452	4	7.025	6.7252		6.450	6.359
8"	8.625	8													
10"	10.750	8													
12"	12.750	8													

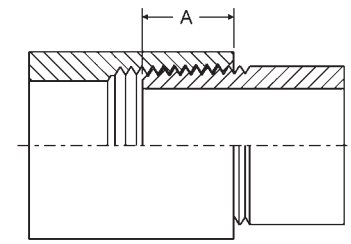
GHT (3/4") -- 1.0625 ODM, 11-1/2 TPI

Note: Female NPT (Tapered Pipe) thread is not available on hose swivel nuts.

Normal Engagement Length of NPT Thread

* Dimensions given do not allow for variations in tapping or threading.

Thread Size	Dimension A
1/8"	1/4"
1/4"	3/8"
3/8"	3/8"
1/2"	1/2"
3/4"	9/16"
1"	11/16"
1-1/4"	11/16"
1-1/2"	11/16"
2"	3/4"
2-1/2"	15/16"
3"	1"
4"	1-1/8"
5"	1-1/4"
6"	1-5/16"
8"	1-7/16"
10"	1-5/8"
12"	1-3/4"



Thread chart

National Standard NH*			Straight Iron Pipe NPSH		New York Corporation NYCT		Pacific Coast PCT		New York Fire Dept. NYFT		Chemical Hose CHT * NH		Underwriter's Play Pipe PPS		Garden Hose GHT *		Chicago Fire Dept. (NEW) *		Chicago Hose	
Size	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI	ODM	TPI
¾"	1.375	8	1.0353 *	14	--	--	1.0625	11	--	--	1.375	8	--	--	1.0625	11½	--	--	1.081	11½
1"	1.375	8	1.2951 *	11½	--	--	1.3125	11½	1.660	8	1.370	8	--	--	1.0625	11½	--	--	1.2951	11½
1¼"	1.6718	9	1.6399 *	11½	--	--	1.860	11	--	--	--	--	--	--	--	--	--	--	1.705	11½
1½"	1.990	9	1.8788 *	11½	2.093	11	2.100	11	2.100	8	--	--	2.1875	12	--	--	1.933	11½	1.946	11½
2"	2.5156	8	2.3528 *	11½	2.547	11	2.550	10	--	--	--	--	--	--	--	--	--	--	2.522	8
2½"	3.0686	7½	2.841 *	8	3.000	8	3.035	7½	3.030	8	--	--	--	--	--	--	2.990	7½	3.043	7
3"	3.6239	6	3.470	8	--	--	--	--	3.630	8	--	--	--	--	--	--	--	--	--	--
3½"	4.2439	6	3.970	8	--	--	--	--	4.070	8	--	--	--	--	--	--	--	--	--	--
4"	5.0109	4	4.470	8	--	--	5.000	4	4.610	8	--	--	--	--	--	--	--	--	--	--
4½"	5.7609	4	4.970	8	--	--	--	--	5.800	4	--	--	--	--	--	--	--	--	--	--
5"	6.260	4	5.530	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
6"	7.025	4	6.590	8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

* National Form Thread. Abbreviation for tapered iron pipe thread is TIPT or NPT (National Pipe Tapered).
ODM = Outside Diameter of Male

Canadian Standard 2½" Hose Threads

Size	Description	ODM	TPI
2½"	AMA - Alberta Mutal Aid	2.990	8 *
2½"	BCT - British Columbia - Vancouver	3	8 *
2½"	CSA - Canadian Standards Association - Ontario	3.125	5 *
2½"	QST - Provice of Quebec Standard	3.031	7
2½"	Western Canada Fire Underwriters Association - Winnipeg, Saskatoon	3.250	6
2½"	Nova Scotia - Male .010 flat x female, Sharp V	3.230	5

* Truncated
ODM = Outside Diameter of Male