

BSP & NPT Explained

BSP thread form stands for British Standard Pipe and is common in Australia and the commonwealth countries. It is based on trade size rather than actual diameter which can lead to some confusion when measuring ports.

There are two types of BSP threads;

- Parallel (BSPP) - also known as G or Rp

- Tapered (BSPT) - also known as R or Rc

Both threads have the same pitch, angle (55 degrees) and shape (rounded peaks and valleys).

The below table gives the major and minor diameter for each BSP Trade Thread Size.

Trade Size	Threads per inch	Pitch		Major Diameter		Minor Diameter		Gage Length	
		Inch	mm	Inch	mm	Inch	Mm	Inch	mm
1/8	28	0.0357	0.907	0.383	9.728	0.3372	8.565	0.1563	3.97
1/4	19	0.0526	1.337	0.518	13.157	0.4506	11.445	0.2367	6.012
3/8	19	0.0526	1.337	0.656	16.662	0.5886	14.95	0.25	6.35
1/2	14	0.0714	1.814	0.825	20.955	0.7336	18.633	0.3214	8.164
3/4	14	0.0714	1.814	1.041	26.441	0.9496	24.12	0.375	9.525
1	11	0.0909	2.309	1.309	33.249	1.1926	30.292	0.4091	10.391
1 ¼	11	0.0909	2.309	1.65	41.91	1.5336	38.953	0.5	12.7
1 ½	11	0.0909	2.309	1.882	47.803	1.7656	44.846	0.5	12.7
2	11	0.0909	2.309	2.347	59.614	2.2306	56.657	0.625	15.875
2 ½	11	0.0909	2.309	2.96	75.184	2.8436	72.227	0.6875	17.463
3	11	0.0909	2.309	3.46	87.884	3.3436	84.927	0.8125	20.638
4	11	0.0909	2.309	4.45	113.03	4.3336	110.073		

NPT stands for National Pipe Thread and is an American standard thread. It may also be referred to as MPT, MNPT or NPT (M) for male external threads and FPT, FNPT or NPT(F) for female internal threads. A thread sealant must always be used to achieve a leak free seal (except for NPTF). It is also based on Trade Size rather than actual diameter (similar to BSP in this regard).

Both threads have the same pitch, angle (60 degrees) and shape (flat peaks and valleys).

The below table gives the Threads Per Inch, Pitch and Major Diameter for NPT Threads.

Trade Size	Threads per inch	Pitch		Major Diameter (O.D)	
		Inch	mm	Inch	mm
1/8	27	0.03704	0.94082	0.405	10.29
1/4	18	0.05556	1.41122	0.54	13.72
3/8	18	0.05556	1.41122	0.675	17.15
1/2	14	0.07143	1.81432	0.84	21.34
3/4	14	0.07143	1.81432	1.05	26.67
1	11 ½	0.08696	2.20878	1.315	33.4
1 ¼	11 ½	0.08696	2.20878	1.66	42.16
1 ½	11 ½	0.08696	2.20878	1.9	48.26
2	11 ½	0.08696	2.20878	2.375	60.33
2 ½	8	0.125	3.175	2.875	73.03

BSP vs NPT

NPT threads are common in the United States and a few other countries, BSP threads are widely used in many other countries.

BSPT -British Standard Pipe Taper
BSPP -British Standard Pipe Parallel
NPT -National Pipe Taper
NPS -National Pipe Straight

While the actual specified outside diameters of American National Pipe differ slightly from those of British Standard Pipe, either thread may reliably be cut onto a pipe of its respective trade size. BSPT equivalent is NPT and BSPP's equivalent is NPS.

Never swap threads if it is a high pressure application.

NPT/NPS and BSP threads are not compatible due to the differences in their thread forms, and not just the fact that most sizes have a different pitch. NPT/NPS threads have a 60° angle and have flattened peaks and valleys (Sellers thread form) where as BSP threads have a 55° angle and have rounded peaks and valleys (Whitworth thread form).

However, having said the above, in compressed air situations there is generally no issue with joining 1/2" & 3/4" BSP to NPT as the TPI's are the same and the thread angle does not create any issues. 1/4" & 3/8" need an adapter which we [have here available](#).

NPT and BSP thread pitches (threads per inch) are listed below. To determine pitch, use a thread gauge or count the number of threads that fall into a 1" span.

Trade Size	Pitch (Threads per Inch)	
	NPT/NPS	BSP
1/8	27	28
1/4	18	19
3/8	18	19
1/2	14	14
3/4	14	14
1	11 1/2	11
1 1/4	11 1/2	11
1 1/2	11 1/2	11
2	11 1/2	11