

THREAD TYPES

THERE ARE 2 TYPES OF PIPE THREAD - PARALLEL AND TAPERED.

1. Parallel pipe threading is normally used, when sealing is not on the threading.
2. Tapered pipe threading is normally used, when sealing is on the threading.

THERE ARE 2 SYSTEMS OF PIPE THREADING - BRITISH (WHITWORTH 55°) AND AMERICAN (NP 60°)

1. Whitworth, besides having a flank angle of 55°, has 4 standard pitches - 28, 19, 14 and 11 TPI
2. NP, besides having a flank angle of 60°, has 5 standard pitches - 27, 18, 14, 11. and 8 TPI

The first important thing to notice is the fact that the diameter (d/D) of a pipe thread is not the actual diameter.

The given diameter is based on the pipe's inner diameter, since it is the pipe's inner diameter (the bore) that is crucial. For example the actual diameter of a 1" Whitworth pipe thread is not 1 x 25,4 = 25,4mm – but **33,25mm** and a 1" NPT pipe thread is not 1 x 25,4 = 25,4mm – but **33,40mm**. Therefore you should always check the relevant norm for the correct measurements.

Since Whitworth pipe threading is simpler than NP (and way more used in Europe) we'll take this thread system first.

WHITWORTH (PARALLEL) PIPE THREAD REF. ISO 228-1

(BSPP = British Standard Pipe Parallel)

This threading has the following standard designations (abbreviations): **G, BSP**

The internal thread has only one tolerance class, but the external thread has two - **A** and **B**. The internal thread's pitch diameter tolerance is the same as **A** in the external thread, and tolerance **B** is exactly the double of **A**.

In the ISO 228-1 standard the correct designations for a 1." pipe thread is as follows: Internal thread **ISO 228-G 1½** and external thread **ISO 228-G 1½ A** or **ISO 228-G 1½ B** depending on the chosen tolerance.

The pitch diameter tolerance of an external thread is always lower than nominal and for an internal thread higher than nominal. In theory both (external and internal) could have exactly the same pitch diameter measurement – ie. nominal.

WHITWORTH (TAPERED) PIPE THREAD REF. ISO 7-1

(BSPT = British Standard Pipe Tapered)

This threading has the following standard designations (abbreviations): **R, Rc, Rp, BSPT**

An internal thread may be either parallel or tapered. For example with a 1." pipe thread:

An internal and parallel pipe thread is designated **ISO 7 - Rp 1½**

An internal and tapered pipe thread is designated **ISO 7 - Rc 1½**

An external thread is always tapered and is designated **ISO 7 - R 1½**

The pitch diameter tolerance of a tapered thread is roughly equal to the **B** tolerance of a parallel pipe thread.

For more information you might look up the ISO 7-1 norm.

AMERICAN (NP) PIPE THREAD

There are considerably more types of American pipe thread types, than there are Whitworth. Hence only little general information can be given about these. It is recommended that the relevant standard is used when specifying, producing and/or controlling.

Used abbreviations in the designation of American pipe thread types:

| | |
|---|--------------------|
| N | N ational Standard |
| P | P ipe |
| T | T apered |
| C | C oupling |
| S | S traight |
| M | M echanical |
| L | L ocknut |
| H | H ose Coupling |
| R | R ailing Fitting |
| F | F ine |

Some thread designations (abbreviations) for American parallel pipe threading: **NPSI, NPSM, NPSL, NPSH, NPSF, NPSI**

Some thread designations (abbreviations) for American tapered pipe threading: **NPT, NPTR, NPTF**

Nominal diameters versus inch thread sizes

| Ø | Dim |
|-----|--------|
| 16 | 3/8" |
| 20 | 1/2" |
| 25 | 3/4" |
| 32 | 1" |
| 40 | 1 1/4" |
| 50 | 1 1/2" |
| 63 | 2" |
| 75 | 2 1/2" |
| 90 | 3" |
| 110 | 4" |