# Pipe Fitting Standards

With the rapid progress in the global trade, standardization of various products has become essential. It significantly contributes towards increasing international trade and bridging the quality gap between the manufacturers and producers of different nations.

In industrial fitting industry as well, standards play a vital role. The various "Standards" define application, design and construction rules and requirements for various fitting components as flanges, elbows, tees, valves etc. They have a limited scope that is as defined by the standard. On the other hand, the fitting "Codes" define the requirements of design, fabrication, use of materials, tests and inspection of different fittings and fitting systems.

Following are the standards that are popularly followed by companies around the world:

**NPT** (National Pipe Taper)
It is the most common U.S. standard for pipe fittings. NPT fittings are measured on the internal diameter of the fitting. NPT ports and fittings are both tapered (unlike AN threads that are straight)

When threaded together, the NPT design creates a wedging effect, binding the thread in order to seal. The use of a thread sealant is common and required with NPT, as it does not consistently create a positive seal on its own, like an O-Ring configuration. When NPT is sufficiently tight, a number of threads show on the adapter fitting making NPT assemblies bulkier and less clean appearing.

**AN** ("A" for Army,"N" for Navy)
This standard was originally designed for the U.S. Military. AN fittings are measured on the outside diameter of the fittings, in 1/16 inch increments. Thus, an AN 4 fitting would have an external diameter of approximately 4/16", or 1/4", and an AN 6 fitting would have an external diameter of approximately 6/16" or 3/8". In this case, approximation is important as AN external diameter is not a direct fit with an equivalent NPT thread.

**Dash** (-) size
It is used interchangeably with AN fittings and thus a Dash "8" fitting amounts to an AN 8 fitting. A dash (-) size in AN "speak" refers to the I.D. of a standard, thin wall, hard line as the basis to construct a comparable flexible hose that may be used in it's place.

A 1/2" thin wall, hard line that measures 500" on the outside diameter (O.D.), has an inside diameter (I.D.) of 0.440", and a wall thickness of 0.030". An appropriate, flexible replacement line would be -8 AN, with a minimum 0.440" I.D. Depending on line construction, rubber with stainless steel or nylon braid, or Teflon with stainless steel braid, the line's wall thickness and O.D. may vary.

**BSP** (British Standard Pipe)
It is the U.K. standard for pipe fittings. Also called BSPT - British Standard Pipe Taper threads，or BSPP - British Standard Pipe Parallel (Straight) threads. BSPP requires a sealing ring and the BSPT achieves pressure tight joints by the threads alone.

**ANSI** (The American National Standards Institute)
It assigns "schedule numbers" to classify wall thicknesses for different pressure uses. These schedule numbers cover all pipe and fitting with sizes from NPS 1/8 through NPS 36 identified as Standard (STD), Extra Strong (XS) and Double Extra Strong (XXS) and all wall thicknesses by ANSI schedule number.

This selection is only for fittings that mate with pipe conforming to an ANSI schedule number. Many types of fittings do not carry this designation.

**ASTM** International (American Society for Testing and Materials)
It is a scientific and technical organization that develops and publishes voluntary standards on the characteristics of material, products, systems and services. Originally known as the American Society for Testing and Materials (ASTM), it is one of the largest voluntary standards development organizations in the world - a trusted source for technical standards for materials, products, systems, and services.

The standard includes test procedures for determining or verifying characteristics as chemical composition, measuring performance. The standards cover refined materials as steel and basic products as machinery and fabricated equipment. The ASTM standards are published in a set of 67 volumes in 16 sections

Apart from the above mentioned standards, other widely recognized standards for pipe, tube and fittings standards and specifications are:

**ISO** - International Organization for Standardization

**DIN** - Deutsches Institut für Normung)

**JIS**- Japanese Industrial Standards