Flanges.

A flange is a method of connecting pipes, valves, pumps and other equipment to form a piping system. It also provides easy access for cleaning, inspection or modification. Flanges are usually welded or screwed. Flanged joints are made by bolting together two flanges with a gasket between them to provide a seal.

Types of flanges

The most used flange types in petro and chemical industry are:

- Welding neck flange
- Slip on flange
- Socket weld flange
- Lap joint flange
- Threaded flange
- Blind flange

All types except the lap joint flange are provided with a raised flange face.

Special flanges

Except the most used standard flanges, there are still a number of special flanges such as:

- Orifice flanges
- Long welding neck flanges
- Weldoflange / nipoflange
- Expander flange
- Reducing flange

Materials for flanges

Pipe flanges are manufactured in all the different materials like stainless steel, cast iron, aluminium, brass, bronze, plastic etc. But the most used material is forged carbon steel and have machined surfaces.

In addition, flanges, like fittings and pipes, for specific purposes sometimes internally equipped with layers of materials of a completely different quality as the flanges themselves, which are "lined flanges".

The material of a flange, is basically set during the choice of the pipe, in most cases, a flange is of the same material as the pipe.

All flanges, discussed on this website fall under the asme en astm standards, unless otherwise indicated. Asme b16.5 describes dimensions, dimensional tolerances etc. And astm the different material qualities.

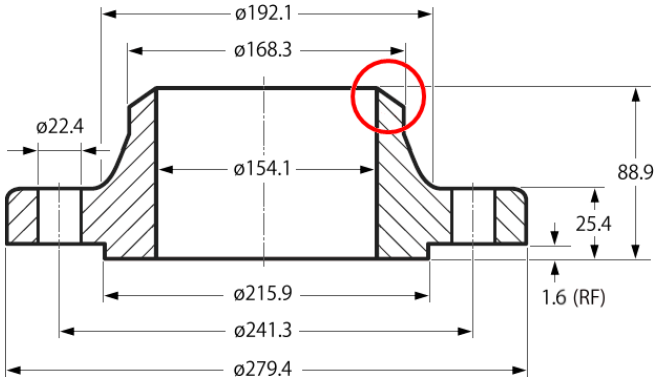
Dimensions of flanges

Each flange according to asme b16.5 has a number of standard dimensions. If a draftsman in japan or a work preparer in canada or a pipefitter in australia is speaking about a welding neck flange nps 6, class 150, schedule 40 asme b16.5, then it goes over the flange which in the image here below is shown.

If the flange is ordered, the supplier want to know the material quality. For example astm a105 is a forged carbon steel flange, while a182 is a forged stainless steel flange.

So, in a correct order to a supplier two standards must be specified:

Welding neck flange nps 6, class 150, schedule 40, asme b16.5 / astm a105



The flange above has 8 bolt holes, and a welding bevel of 37.5 degrees (red circle). All given dimensions are in millimeters. The raised face (rf) does not need to be specified, because according to asme b16.5, each flange is standard delivered with a raised face. Only a different design (ring type joint (rtj), flat face (ff) etc.), should be specified.

Bolted flange connections

A bolted flange connection is a complex combination of many factors (flange, bolts, gaskets, process, temperature, pressure, medium). All these various elements are interrelated and depend upon one another to achieve a successful result.

The reliability of the flanged joint depends critically upon competent control of the joint making process.

Typical bolted flange connection