

## Butt Weld fitting: Reducer

Reducers be applied, to change from pipe diameter in one direction. Standard there are 2 possibilities, the concentric reducer, is usually used in vertical pipe lines, and the eccentric reducer that is used in horizontal pipe lines.



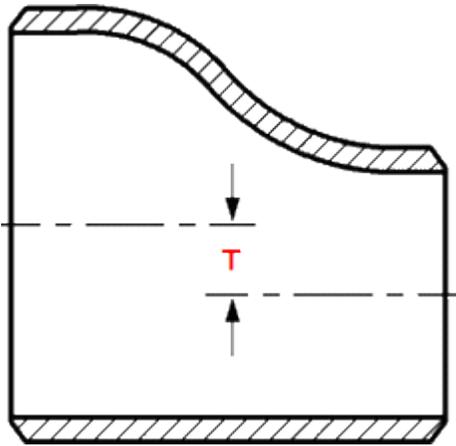
Concentric space space space space space space Eccentric

## TF and BF

On an isometric view, in a horizontal line, with a eccentric reducer must be declared, or the flat side at the bottom or top must be assembled. Perhaps, you have ever seen on a drawing, the abbreviation "TF" or "BF". This stands for respective "top flat" and "bottom flat"

For example:

1. Bottom flat eccentric reducer are often be used in pipe racks to keep the pipeline at the same elevation, after a pipe size change. When a concentric or a flat on top eccentric reducer in a pipe rack will be used, the support detail, probably change.
2. Top flat eccentric reducer are often be used in pump suction lines to avoid accumulation of gas pockets. Eccentric reducers can avoid small "dead spots" that exist behind concentric reducers.



Some draughtsmen also specify the size difference  $T$  between the center lines. As an eccentric reducer in a vertical line is used, it may also be important, which side should be oriented to the north, south, east or west.

## Length of reducers

The length of a Reducer is very short in relation to the diameter, so in some dimensions the transition from one to another diameter is very abruptly. For example, a reducer NPS 6 - NPS 2½ has a length of 140 mm. On this short distance a pipeline will be reduced from 168.3 mm O.D. to 73 mm O.D. During the design phase of a new pipe system, a piping designer certainly must think about it.

An alternative for a smoother flow would be to apply multiple reducers like:

- NPS 6 - NPS 5 (L=140 mm)
- NPS 5 - NPS 4 (L=127 mm)
- NPS 4 - NPS 3½ (L=102 mm)
- NPS 3½ - NPS 3 (L=102 mm)
- NPS 3 - NPS 2½ (L=102 mm)

So, now the distance is approximately 573 mm if the NPS 6 pipe is reduced to NPS 2½, and a smoother flow is guaranteed. In practice this example will probably never occur, I hope, I'm sure, there are better designers like me.

## Buttweld fitting: CAP

Basically a cap will be applied, to shut down the end of a pipe. The Cap, as it is shown in the image below, is available for all pipe dimensions, and is sometimes also used for other purposes.

The large variations of caps, are the so-called ellipsoidal or dished heads. There are used to close pipes of large diameters, and are similar to those used for constructing vessels.

Often you can see on a vessel drawing the name "Klörperboden" ASME F and D, and it is a German name for a special head. F and D stands as an abbreviation for flanged and dished, and this form is also known as torispherical head defined.



"Korbbogenboden", is also an german indication that you can find on a vessel drawing. This head is similar to the ellipsoidal head.

## Buttweld fitting: Stub End

A Stub End always will be used with a Lap Joint flange, as a backing flange; both are shown on the image below.

This flange connections are applied, in low-pressure and non critical applications, and is a cheap method of flanging.

In a stainless steel pipe system, for example, a carbon steel flange can be applied, because they are not come in contact with the product in the pipe.

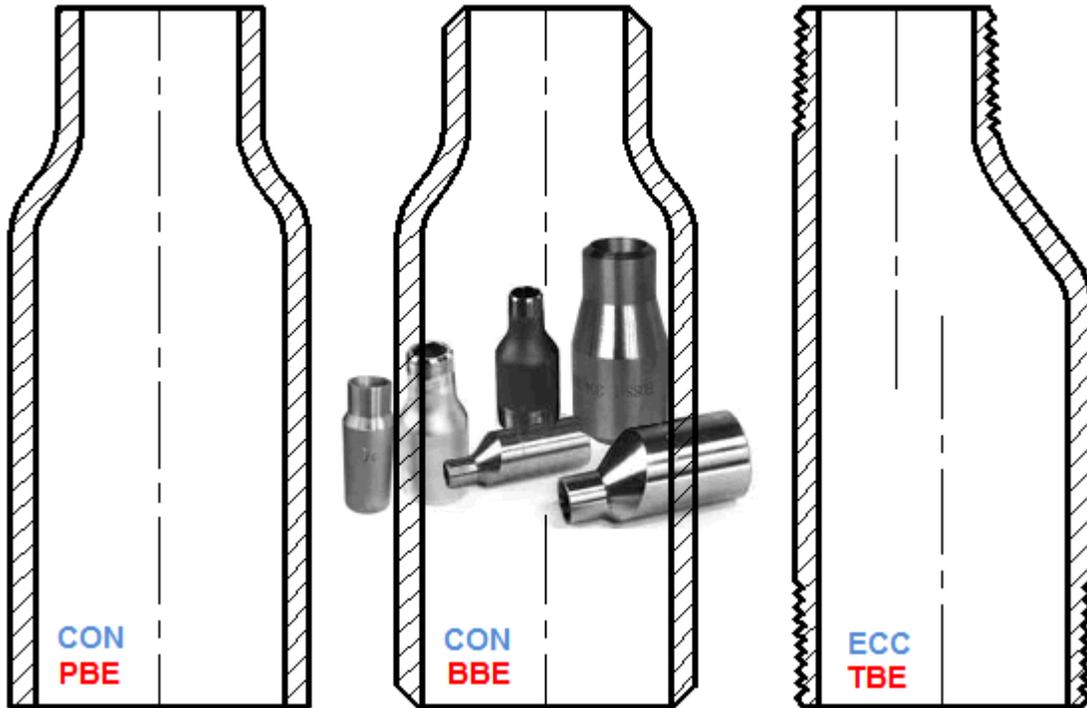


Stub Ends are available in almost all pipe diameters. Dimensions and dimensional tolerances are defined in the ASME B.16.9 standard. Light-weight corrosion resistant Stub Ends (fittings) are defined in MSS SP43.

## Fitting: Swage Nipples

Swage nipples are often used in small diameter pipe systems, and are similar to butt weld reducers. They are concentric and eccentric available, with various ends. The most common types are:

- PBE = Plain Both Ends
- BBE = Beveled Both Ends
- TBE = Treaded Both Ends



Size range NPS 1/8 - NPS 8. Manufactured from A106 Grade B seamless pipe or cold drawn bar which is heat treated in accordance with ASTM A234. Choice of raw material dependant upon size and reduction. Available wall thickness: standard (STD), extra strong (XS), schedule 160, or double extra strong (XXS).