



# Module 19.3.9 Weld able Pipe Fittings



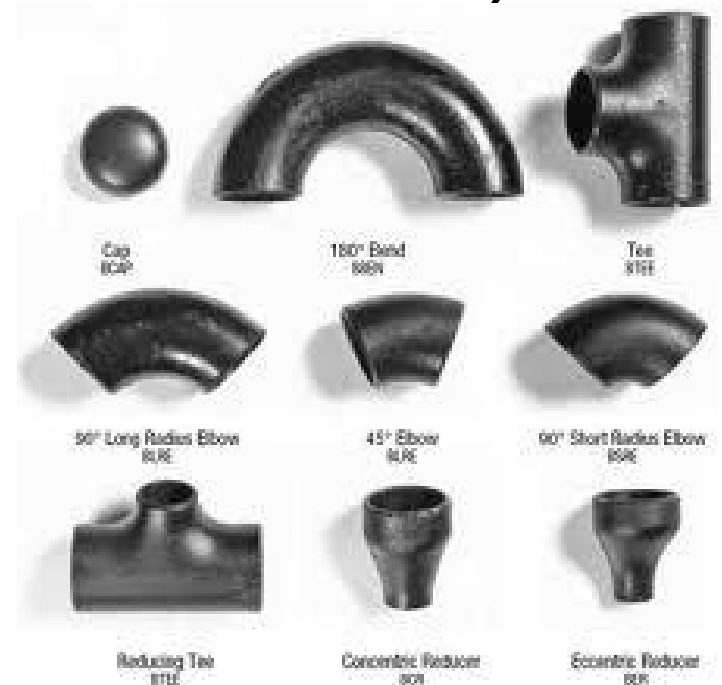


# Pipe Fitting Objectives

- Produce change in geometry
  - Modify flow direction
  - Bring pipes together
  - Alter pipe diameter
  - Terminate pipe

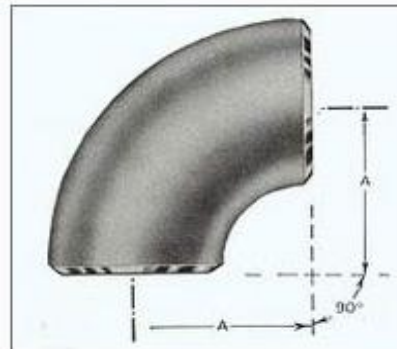
# Parts of pipe fittings

- Elbow and returns
- Tee (Reducing outlet Tee & Cross)
- Reducer (Concentric & Eccentric reducer)
- Traps
- Bellows



# Elbow

- Elbow 45°
- Elbow 90° long radius
- Elbow 90° short radius





# Bends

- These are same as elbow the difference is only the large radius, to reduce the thrust of flowing material.





# Tee

- Are used to make branches at 90° of either same diameter or different diameters.



Standard Tee



Reducing outlet  
Tee

# Cross

- These are four way connectors, used to make multiple branches in a pipe line system. Also available in reducing branches.





# Reducers

- Reducers are used either to reduce the flow or to increase the pressure in a pipe line system and it may be reversed.
- Two types of reducers
  - a. Concentric
  - b. eccentric







# Concentric Reducer



- have an edge that is parallel to the connecting pipe. This results in the two pipes having offset centre lines, unlike concentric reducers. The same fitting can be used in reverse; as an eccentric increaser/expander.
- The gradual accumulation of air in a concentric reducer would result in a large bubble that could eventually cause the pump to stall or cause [cavitation](#) when drawn into the pump.
- Horizontal gas reducers are always eccentric, bottom flat, which allows condensed water or oil to drain at low points.
- Reducers in vertical lines are generally concentric unless the layout dictates otherwise.





# Eccentric Reducer

- is a fitting used in piping systems between two pipes of different diameters. They are used where the diameter of the pipe on the upstream side of the fitting (i.e. where flow is coming from) is larger than the downstream side.
- Horizontal liquid reducers are always eccentric, top flat, which prevents the buildup of air bubbles in the system. Eccentric reducers are used at the suction side of pumps to ensure air does not accumulate in the pipe.



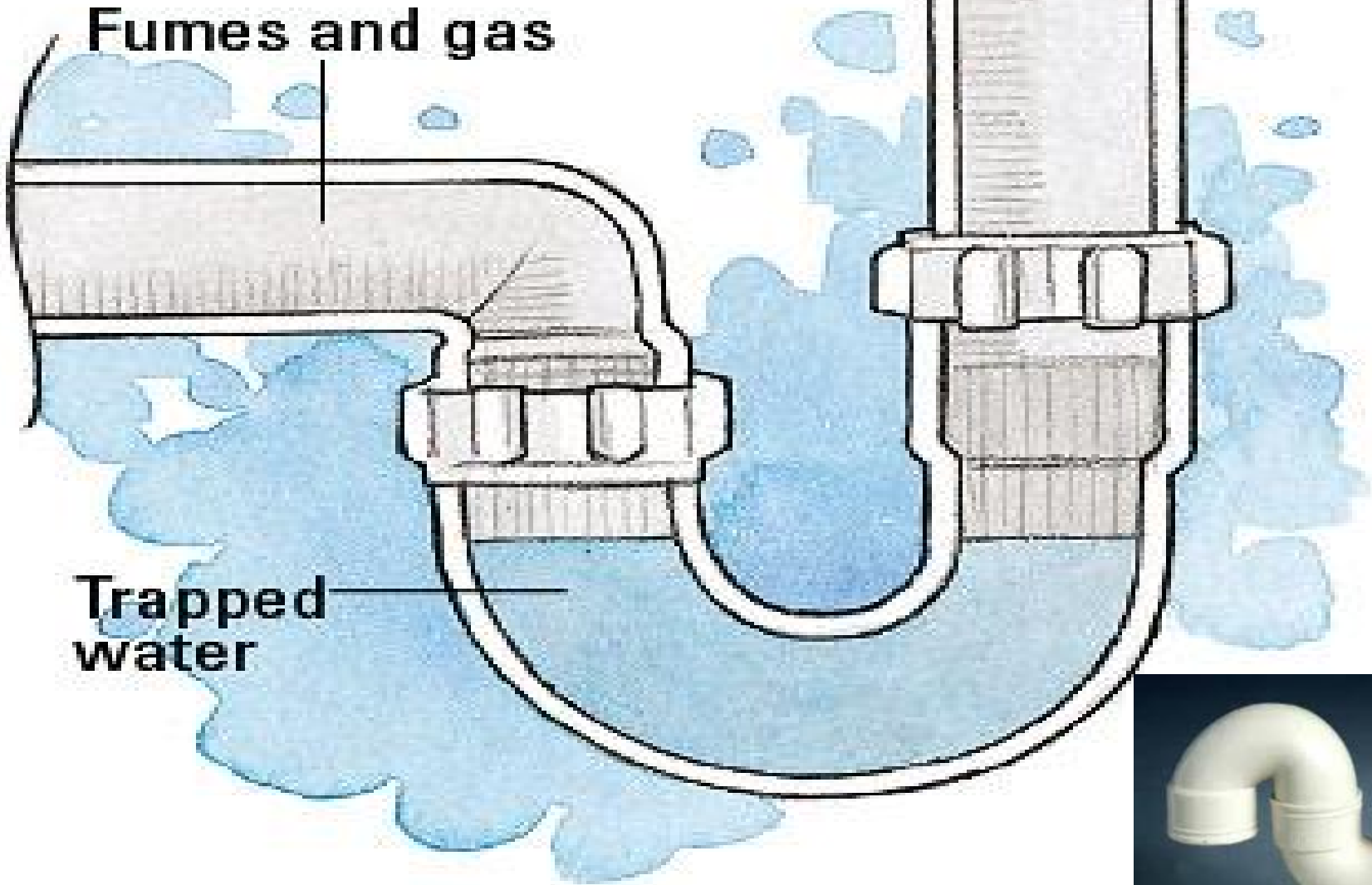


# Traps

- In plumbing, a trap is a U-, S-, or J-shaped pipe located below or within a plumbing fixture. An S-shaped trap is also known as the S-bend known as the U-bend . The new U-bend could not jam, so, unlike the S-bend, it did not need an overflow. The bend is used to prevent sewer gases from entering buildings. In refinery applications, it also prevents hydrocarbons and other dangerous gases from escaping outside through drains.
- Because of its shape, the trap retains a small amount of water after the fixture's use. This water in the trap creates a seal that prevents sewer gas from passing from the drain pipes back into the occupied space of the building. Essentially all plumbing fixtures including sinks, bathtubs, and toilets must be equipped with either an internal or external trap.



# TRAPS





# Bellows

- The pipeline bellow is used to control high pressure liquid flow. A bellow is a expansion joint on a pipe line. The pressure in a pipe line gives rise to forces that may lead to line instability if no sliding points and fixed points are provided. If movements occur in different directions inside a pipeline, these need to be divided by planning anchors at suitable intervals. If stable anchors are not possible, the expansion joints need to be mounted such that the axial movement is diverted and can be received by tied lateral expansion joints.
- An bellows is also fitted in a pipeline which is subject to considerable temperature variations. One type consists of a bellows arrangement which will permit movement in several directions and absorb vibration . The fitting must be selected according to the variation in system temperatures and installed to permit the expansion and contraction required in the system.



# BELLOWS

