



### Introduction

A pressure vessel is a container designed to hold gases or liquids at a pressure substantially different from the ambient pressure. It is the law that vessels over a certain size and pressure (15 PSIG) be built to code. In the US, that code is the ASME Boiler and Pressure Vessel Code (BPVC). These vessels also require an authorized inspector to sign off on every new vessel constructed. Each vessel has a nameplate with pertinent information about the vessel such as maximum allowable working pressure, maximum temperature, minimum design metal temperature, manufacturer details, the date, its registration number (through the National Board), and ASME's official stamp for pressure vessels (U-stamp), making the vessel traceable and officially an ASME Code Vessel.

### Pressure vessel shapes

Pressure vessels can theoretically be almost any shape, but shapes made of sections of spheres, cylinders, and cones are usually employed. A common design is a cylinder with end caps called heads.



Propane  
pressure  
vessel



Water  
heaters



Aerosol spray  
can

### Safety features

Many pressure vessel standards, including the ASME Boiler and Pressure Vessel Code require pressure vessel designs to leak before burst.

### Safety valves

A safety valve is a one type of valve that automatically actuates when the pressure of inlet side of the valve increases to a predetermined pressure, to open the valve disc and discharge the fluid (steam or gas) ; and when the pressure decreases to the prescribed value, to close the valve disc again.

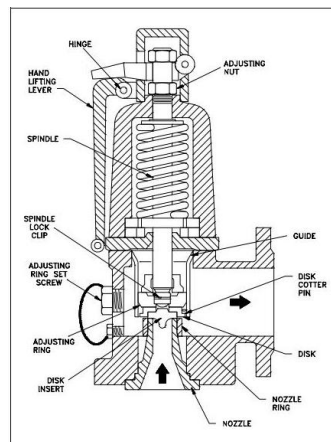


Figure 29 Safety Valve

### Types of protection

- **Thermal protection:** For liquid-packed vessels, thermal relief valves are generally characterized by the relatively small size of the valve necessary to provide protection from excess pressure caused by thermal expansion.
- **Flow protection:** Characterized by safety valves that are considerably larger than those mounted for thermal protection. They are generally sized for use in situations where significant quantities of gas or high volumes of liquid must be quickly discharged in order to protect the integrity of the vessel or pipeline.