

Oil and Gas Separators

Separator is a pressure vessel used for separating well fluids (oil, gas, and water) from oil and gas wells into gaseous and liquid components.

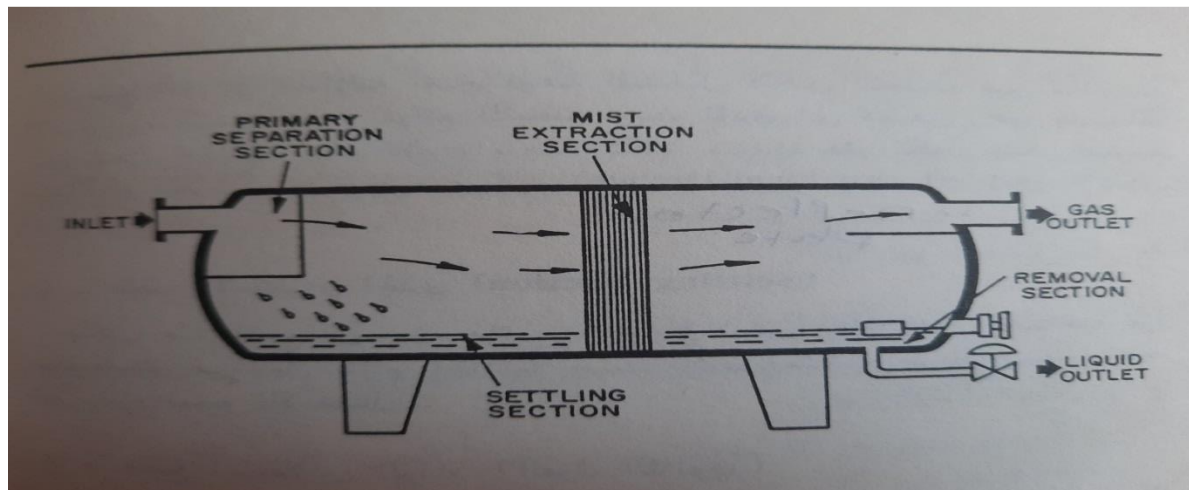
Functions of separators

- 1-Primary separation of liquids and gas phases
- 2-Enhancement of primary separation by removal of oil droplets from gas with aid of mist extractor (Vane and Knitted wire mesh pad types)
- 3-Improving of separation process by removing of gas bubbles from oil by different methods such as settling, agitation, heating, and centrifugal force.
- 4-Separation of water from oil in three phase separation by use chemical and gravity separation.
- 5-Drainage and preventing mixing of the separated fluids .

Components of Separator

The major components of oil and Gas separator are:

- 1-Primary separation section which is either to be deflector plate or centrifugal device placed at the inlet vent of the entering well fluid.
- 2-Settling section (gravity separation section) which is designed to separate liquid droplets of diameter 100 micrometer or larger.
- 3-Mist extractor which is designed to remove small liquid particles (10 micron and larger) from the gas stream. Vane and Knitted wire mesh pad are the most common mist extractor types. The following factors are considered when designing mist extractor:
 - A-Size or diameter of particles.
 - B-Configuration of separating vessel.
 - C-Turbulence of flow in the vessel.
 - D-Properties of flowing fluids into the vessel.
- 4-Back pressure valve on the gas outlet to maintain steady pressure in the vessel
- 5-Pressure relief devices.



Types of Separators:

There are three types of oil and gas separator which are:

1-Vertical Separator

Size: 10-12 in diameter and 4 to 5 ft seam to seam up to 10-12 in diameter and 15-25 ft seam to seam.

Characteristics:

A-used for low to medium gas oil ratio(GOR) of separating hydrocarbon

B-Small space for installation

C-Liquid level control not as critical

D-Has greater liquid surge capacity

E-Easier to clean from solid materials such as sand.

2-Horizontal separator

Size: 10-12 in diameter and 4 to 5 ft seam to seam up to 15-16 in in diameter and 60-70 ft seam to seam.

Characteristics:

A-Cheaper than vertical separator

B-Successfully used in handling foaming crude oil.

C-More economical and efficient for separating due to large interface of liquid –gas compared with vertical separator of same size.

D-Used for high GOR and foaming crude oil

Types of Horizontal Separator.

1-Mono tube separator: Have one cylindrical shell

2- Dual tube separator: Have two cylindrical parallel shells.

3-Spherical separator

Size: 24-30 in up to 66 to 72 in in diameter.

Characteristics:

A-Cheaper than either horizontal and vertical types

B-More compact than other types

C-Better clean out