# Construction and working of cyclone separator

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#### **CYCLONE SEPARATOR**





**Cyclone separator** 

## Prineiple

- > In cyclone separator, the centrifugal force is used to separate solids from fluids.
- The separation depends not only on the particle size but also on density of particles.
- Hence depending on the fluid velocity, the cyclone separator can be used to separate all types of particles or to remove only coarse particles and allow fine particles to be carried through with the fluid.

# Construction

- > It consists of a short vertical, cylindrical vessel with a conical base.
- > In the upper part of the vessel is fitted with a tangential inlet.
- > The outlet (solid outlet) is arranged at the base.
- > Fluid outlet is provided at the centre of the top portion, which extends inwardly into the separator.
- Such an arrangement prevents the air short-circulating directly from the inlet to the outlet of the fluid.

## Working

- > The solids to be separated are suspended in a stream of gas (usually air).
- Such a feed is introduced tangentially at a very high velocity, so that rotary movement takes place within the vessel.
- > The centrifugal force and vortexing throws the solids to the walls.
- As the speed of air diminishes, the particles fall to the conical base and are discharged through the solid outlet.
- > The fluids (air) can escape from the central outlet at the top.

Uses

- > Cyclone separators is used to separate the solids from gases.
- > It is also used for size separation of solids in liquids.
- > It is used for separating the heavy or coarse fraction from fine dust.

### Advantages

- Low capital cost
- Ability to operate at high temperature
- Low maintenance requirements (no moving parts)

## Disadvantages

- Unable to process sticky materials
- High operating cost due to pressure drop

(Vortex-a whirling mass of fluid or air, especially a whirlpool or whirlwind.)

