

Desanding Hydrocyclones

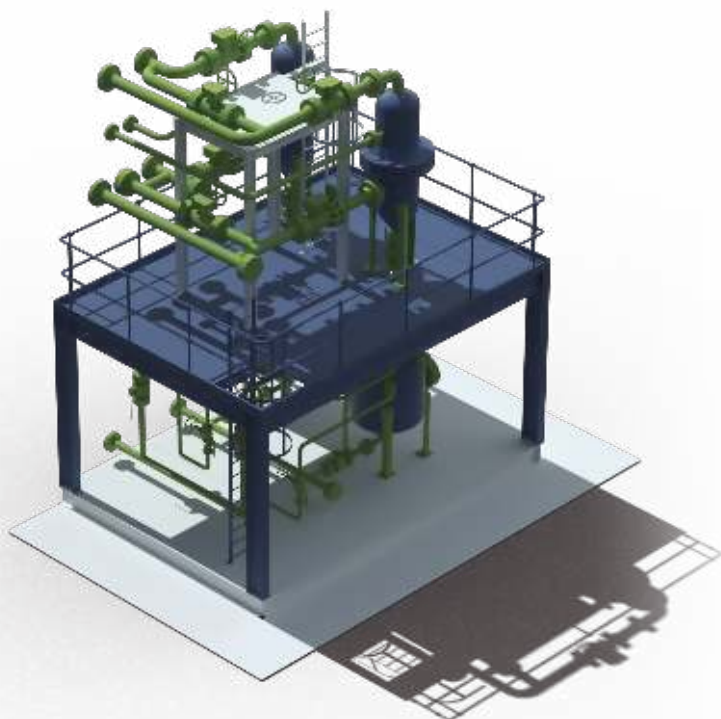
Product Application

- Wellhead solids removal in multi-phase flow.
- Protection of equipment from blockage or erosion.
- Sand cleaning for overboard discharge.
- Polishing of water prior to re-injection.

Product Benefits

Desanding Hydrocyclones offer the following benefits:

- Compact design, replacing substantially larger equipment.
- No moving parts and minimal maintenance
- Ideal for use where space is minimal
- Cyclonic liners are available in a range of alloys from Stainless steel, Alumina Ceramic, Polypropylene, Tungsten Carbide, Reaction Bonded Silicon Carbide



Process Description

Desanding Hydrocyclones are pressure-driven cyclonic separators that utilize a certain pressure drop across the unit to force the separation of the solids from the bulk phase produced water or condensate. The feed stream, containing high amount of solids/ sand, enters the hydrocyclone through a tangential inlet under a pressurized condition. This is where it is forced into a spiral motion by the hydrocyclone's internal profile. The internal conic shape of the liner causes the spinning/ swirling effect to accelerate (which effectively creates) high centrifugal forces, causing the denser solid particles to move to the outer wall of the hydrocyclone liner, while the lighter phase water or condensate is concentrated to the central core of the liner.

Solids continue to spiral down along the outer wall of the hydrocyclone to the bottom exit which is typically collected in an accumulator (could be integrated or a separate unit) for periodic disposal. The "desanded" water in the central core section reverses direction and is forced out through the central vortex towards the top of the Hydrocyclone.

Hydrocyclones are effectively centrifugal separators that rely on the differential density between the solids particle and the water to allow separation.

The efficiency of the separation is governed by four main factors:

1. Solid Particle Size

According to Stokes' Law this is the biggest factor that affects gravity based separation. A hydrocyclone is ultimately a proportional separator. Any single type of hydrocyclone will separate a given percentage of solid particles of a certain size for a given set of process parameters. This is the profile of the hydrocyclone.

2. Differential Density

Two different products will only separate due to gravity (or other forces) if there is a difference in density. The greater this difference the easier it is to separate them.

3. Viscosity of the Bulk Fluid

A lower viscosity of the bulk fluid (water) will result in easier separation.

4. Gravity (or Centrifugal Force)

The hydrocyclone has a tangential inlet. This creates a swirl in the hydrocyclone. The swirl and consequential centrifugal force is increased by the circular velocity of the water. This is caused by a higher flow rate in the hydrocyclone and hence a higher pressure drop. Therefore unlike all other gravity separation devices the hydrocyclone performs better with higher flow rates and hence lower residence time.

Field Trials:

- Small scale trials are simple
- Can provide accurate picture of treat-ability of fluid
- Single liner trials fully scalable
- Suitcase size liner trials

Service and Features:

- Supply of complete skid mounted equipment
- Focus on performance guarantee, available plot space and ease of maintenance
- Trouble shooting and De-bottlenecking of existing plants
- Fast track deliveries
- CFD modelling and application verification
- Installation and Supervision Commissioning

