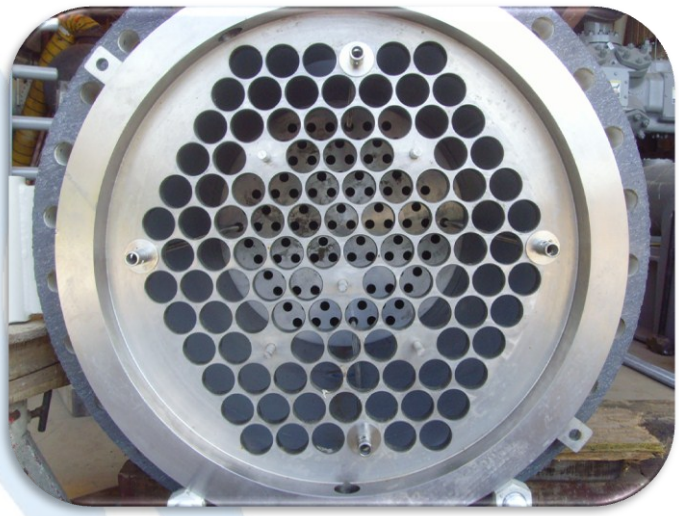
PEERLESS Europe
MAKING ENERGY SAFE, EFFICIENT AND CLEAN

skimovex

Oily Water Separators
Hydrocyclones.

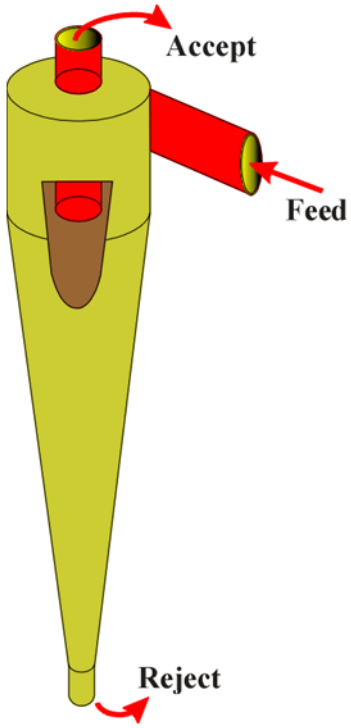
Process

Deoiler Hydrocyclones were developed for the offshore oil industry in the 1980s and rapidly became established as standard equipment used for recovery of oil from Produced Water streams.



The horizontal deoiling hydrocyclone vessel with liners is designed to reduce the oil content of the incoming produced water prior to entering an optional degasser vessel. The horizontal arrangement allows easy access to the liners for inspection, installation and replacement.

Liquid/liquid cyclones – On entering the cyclone tangentially, the fluid begins to spin. This creates a radial force that directs the heavier phase towards the edges of the cyclone and then out of the cyclone underflow owing to differential pressure. The less dense phase is concentrated in the centre of the cyclone before passing out of the cyclone overflow, again due to differential pressure.



Advantages

Deoiler Hydrocyclones offer the following benefits:-

- Compact design, replacing substantially larger equipment.
- No moving parts and minimal maintenance
- Ideal for use where space is minimal
- Efficiencies down to 5mg/l (5ppm) in one pass.

Hydrocyclones are effectively gravity separators that rely on the differential density between the oil droplet and the water to allow separation. The efficiency of the separation is governed by five main factors:

Droplet/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 oil droplets of a certain size for a given set of process parameters. This is the profile of the hydrocyclone. It is thus essential at all times to minimise any possible causes for droplet shear.

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.

Viscosity of the bulk fluid – a lower viscosity will result in easier separation.

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 flowrate in the hydrocyclone and hence a higher pressure drop. Therefore unlike all other gravity separation devices the hydrocyclone performs better with higher flowrates and hence lower residence time.

Distance – the reject from the hydrocyclone comes out in a counter current flow as a reverse spinning vortex. For an oil droplet to be removed it must make its way from the bulk fluid into the central core. The less distance the droplet has to travel to get to this central core the higher the efficiency.

Hydrocylone skid with control system

Peerless can cater for future downturn of production and include blanks inside the vessel to allow for a future change in process conditions. This allow the user to simply remove the blanking plate and replace with a hydrocyclone when new process conditions dictate.

Peerless Europe are able to supply complete skid mounted Hydrocyclone skid package complete with design and supply of all Instrumentation and Controls.

Due to the corrosive nature of some of the fluids the Hydrocyclone can be manufactured from exotic materials such as Super Duplex and Inconel.

Peerless are able to engineer the complete skid package including providing 3D model designs, Stress / STAAD structural analysis and Heat and Mass Balance.