

Facet coalescer and separator cartridges are mechanical devices to filter solids and separate two immiscible liquids. The most common uses are the filtration and separation of water from aviation fuel, hydrocarbons, process streams, fuel oil, diesel, and various types of oil.

How They Function

In order to provide efficient coalescing of an aqueous discontinuous phase, the media used in the coalescer cartridge must contain an infinite number of small, continuous, irregular passages of a very small diameter. As the continuous phase passes through the media, the discontinuous phase is broken out by impingement, generally in the form of minute particles. As the particles pass through the entire depth of the media, they commingle or coalesce into discrete droplet size, capable of settling due to gravity.

Because coalescing requires a depth media with small irregular passages, it is also an excellent filter media for removing solids. A coalescer capable of producing water removal will also remove solids as low as 1 micron. If less efficient filtration is desired, the coalescing will also be less efficient.

The function of the separator cartridge in the second-stage (in a two-stage design) is to provide a hydrophobic membrane so the discontinuous phase droplets are repelled if they do not completely settle out by gravity, and to act as a secondary barrier to solids. A cylindrically wrapped separator cartridge is available in a Teflon® coated 200 mesh monel screen to provide hydrophobic separation. Screen cartridges will remove solids down to 50 microns. The pleated paper separator cartridges have been treated to repel water and are capable of removing solids down to 5 microns.

Selection Criteria

In selecting the media for the desired degree of separation, the chemical properties, operating temperature, volume of the discontinuous phase and allowable initial differential pressure must all be considered.

Further, a filter separator housing is durable and can last for many years. In making a selection, it is important to consider future needs. Undersized or marginally sized

housings may not provide the user with the option to update performance by a simple change in coalescer or separator cartridge media. The slightly higher initial investment in a larger housing can be offset by future demands for increased performance.

A two-stage filter separator should be used where the highest degree of water removal is required. A typical application is the removal of water from jet fuel prior to aircraft fueling. Other typical applications include the removal of water from various process streams prior to distribution.

A single-stage filter separator is used where less efficient water and solids removal is required or where the processed fluid is not compatible with the second-stage separator cartridge. Typical applications are the removal of gross water at an intermediate process stage prior to further refinement.

Cost of Filtration Separation

Through many years of experience, it has been found that the most realistic method of determining the true cost of filtration is based on the cost per unit of product processed. There are four factors which make up the true cost of filtration separation:

1. Cost of media (cartridges, etc.)
2. Cost of service parts (gaskets, etc.)
3. Cost of maintenance labor
4. Cost of downtime to service or maintain (value of lost production)

By totaling these factors, filtration costs may be determined for various unit bases such as cost per pound, per gallon, per barrel, per year, etc. While cost of new equipment may vary, the true cost to the user is based on the cost per unit processed.

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Due to our continuing program of improvement, specifications are subject to change without notice.