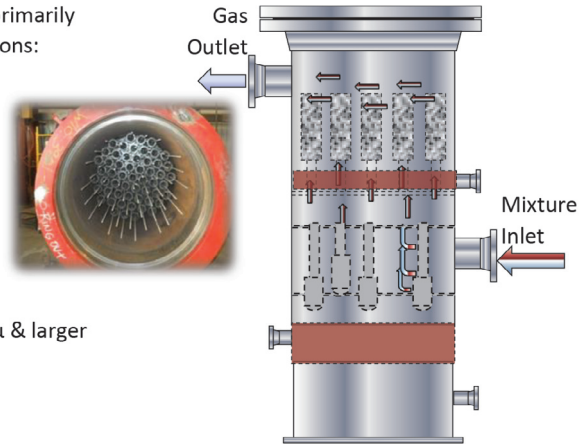


## Reverse-Flow Coalescer

Reverse-Flow Coalescers are used where ultimate efficiency for separating smaller particles is required. These units can be combined with other separation devices to ensure proper efficiency and promote/extend element life. Similar to filter separators, these units are designed for 2-stage separation; however, in the coalescer configuration, finer particle removal & separation is achieved and the flow through the elements is from inside to out. Typically the first stage consists of a basic inlet baffle, multi-cyclone or vanes. The second stage elements coalesce the liquid droplets into larger particles that are gravity separated exiting the elements.

Reverse-Flow Coalescers are primarily used in the following applications:

- Mole Sieve Protection
- Final Discharge Recip Compressor
- Compressor Seal Gas
- Glycol Carry-Over
- Foam & Paraffin
- Performance  
100% of Liquids + Solids 0.3  $\mu$  & larger



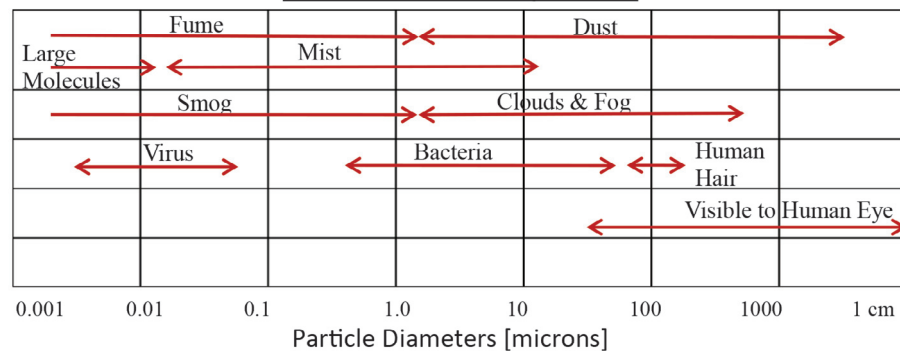
## Separation Process

SPS utilizes mechanical separation in the following common applications:

- Solids from Gas or Liquids
- Liquid from Liquid w/ Gas (3-Phase)
- Liquids from Gas
- Solids & Liquids from Gas

Utilizing SPS's most efficient method of separation, we are able to remove sub-micron particles from the gas stream to 0.3 $\mu$  in size.

## Particle Size Comparison



Schultz Process Services, Inc. (SPS) product line specializes in state of the art mechanical separation technology including:

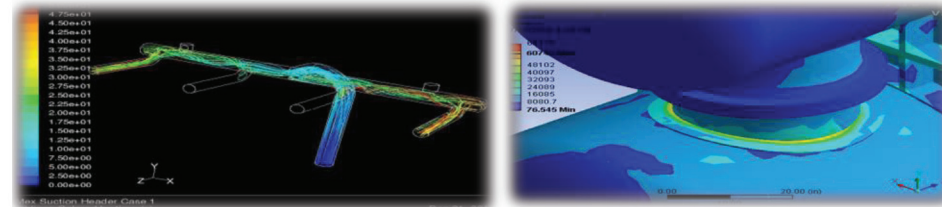
- Vane Separator (Patent Approved)
- Filter Separator
- Multi-Cyclone
- Reverse-Flow Coalescer
- Gas Filter
- Effluent and Particle Testing
- Fabrication
- 3-Phase Separator
- Fuel Gas Skid
- KO Drum
- Sand Trap Separator
- CFD Study
- Retrofit

SPS utilizes 150+ years of combined experience specializing in the separation industry to provide the most efficient & economical solution for your processing needs. We are dedicated to working with clients to achieve their processing requirements and offering alternative solutions on a case-by-case basis. SPS prides itself on service to our customers and has a proven track record of managing projects efficiently while providing quick turn-around proposals as well as deliveries.

*"Service may be our last name, but it's our first priority"*  
- Don Schultz, Founder

## Product Support

SPS is committed to providing high quality products that operate efficiently and effectively. Support is continuously verified through use of the latest technology including FEA, CFD, production prototype testing, both in house and in the field.



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## Gas Conditioning Mechanical Separators



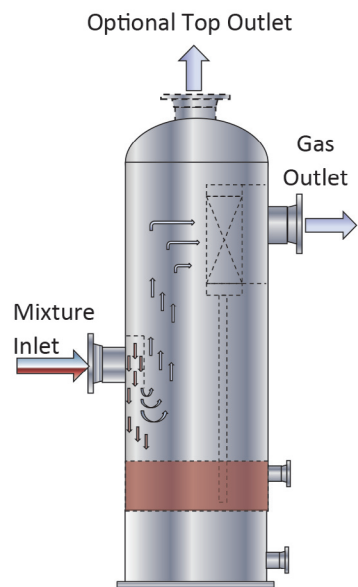
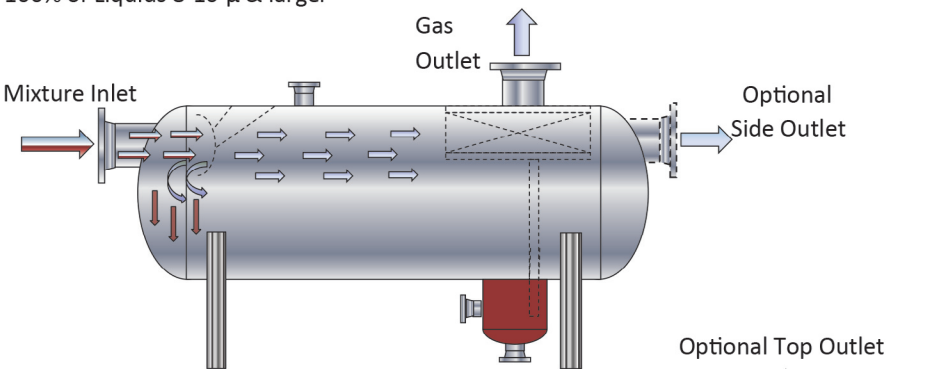
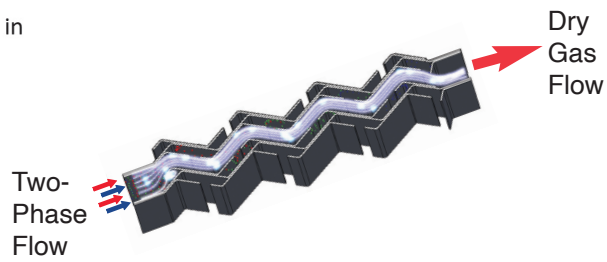
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## Vane-Type Separator

SPS utilizes cutting-edge double-pocket vane technology for optimum performance and design. Our vane technology offers higher capacity using innovative compact designs that allow greater vapor flow with better efficiency. Vane-Type Separators are designed to remove liquid particles from a vapor stream with high efficiency and low pressure drops. The entrained liquid particles are captured and removed through impaction against the vane blades & channeled from the vapor stream. SPS designs Vane-Type separators for Horizontal or Vertical installation.

Gas Separators are primarily used in the following applications:

- Slug Catchers
  - Metering stations
  - Compression Stations
  - Pipelines
  - Chemical Plants
  - Performance
- 100% of Liquids 8-10  $\mu$  & larger

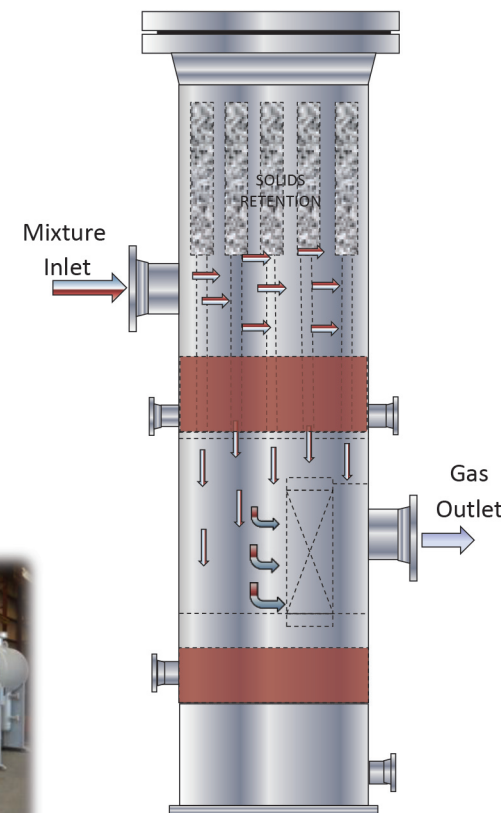
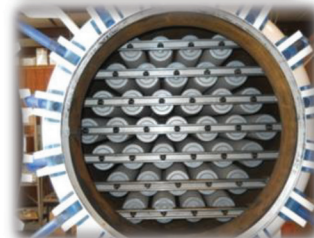


## Filter Separator

Filter Separators are utilized when higher efficiency for separating smaller particles is required. Filters are typically used on suction stages of compressor runs, where solids and other particulate are present. Filter Separators incorporate 2 technologies (Filter Cartridge & Vane Unit); when in unison, these technologies are able to offer 3 $\mu$  removal efficiency. These units are available in either Horizontal or Vertical configuration. SPS has designed a compact vertical model for use with fuel gas applications that requires only one set of instrumentation for liquid level control.

Filter Separators are primarily used in the following applications:

- Fuel Gas Condition for Engines and Turbines
  - Compression Stations
  - Chemical Process
  - Performance
- Liquids: 100% > 3 $\mu$   
99.5% < 3 $\mu$   
Solids: 100% > 3 $\mu$   
100% < 3 $\mu$



## Multi-Cyclone Separator

Multi-Cyclones are designed to remove both free liquids and solids from a vapor stream. The removal efficiency of any centrifugal device is directly related to the radius of curvature; SPS Multi-Cyclone tubes have a fixed radius of curvature to provide the highest degree of separation. Centrifugal separators typically have a higher pressure drop and lower turndown capability with advantages of smaller diameter vessels and no maintenance. SPS Multi-Cyclones are robust and used for difficult applications to remove wax, foam, paraffin, in addition to normal pipeline liquids and solids.

Multi-Cyclones are primarily used in the following applications:

- Slug Catchers
  - Complex Applications
  - Compression Stations
  - Pipelines
  - Foam & Paraffin
  - Performance
- 100% of Liquids 8-10  $\mu$  & larger  
100% of Solids 5-7 $\mu$  & larger



As seen in Fig. A, the solid and liquid particles are removed from the gas current through centrifugal separation. Particulates enter the scroll openings and are forced down the cone in a cyclonic motion, creating a film-type layer of solids and liquids inside the bullet nose shell. The stream continues down into the nose until it reaches the lower mid portion of the cone. Only the lighter phase (vapor stream) can make the turn into the exit tube; the heavier phase contaminates (liquids and solids) are forced down the cone and exit through the bottom outlet.

