

Ultra filtration

What is Ultra Filtration?

Ultrafiltration

or UF is a pressure driven membrane separation process that separates particulate matter from soluble components in the carrier fluid (such as water). UF membranes typically have pore sizes in the range of 0.01 - 0.10 μm and have a high removal capability for bacteria and most viruses, colloids and silt (SDI). The smaller the nominal pore size, the higher the removal capability. Most materials that are used in UF are polymeric and are naturally hydrophobic. Common polymeric materials used in UF include: Polysulfone (PS), Polyethersulfone (PES), Polypropylene (PP), or Polyvinylidene fluoride (PVDF). Although these materials can be blended with hydrophilic agents, they can reduce the membranes ability to be cleaned with high strength disinfectants such as hypochlorite that impacts removal of bacterial growth. When combined with Reverse Osmosis technology, the Ultra Filtration unit becomes one of the most efficient ways of producing crystal clear fresh water. The concept allows the use of high turbidity (dirty) feed water, removing suspended particles from river water, dam water or any source that may contain high levels of suspended sediment etc, delivering Ultra clean feed water to the reverse Osmosis Plant. Ultra Filtration System - in conjunction with Desalination Plant

The DOW™ Ultrafiltration module utilizes a double-walled hollow fiber (capillary) PVDF membrane which has a very small nominal pore diameter for PVDF material that allows for the removal of all particulate matter, bacteria and most viruses and colloids. Despite the small pore diameter, the membrane has a very high porosity resulting in a flux similar to that of micro-filtration (MF) and can effectively replace MF in most cases.

Systems

designed with DOW™ Ultrafiltration use an outside-in flow configuration which allows for less plugging, higher solids loading, higher flow area and easy cleaning. The primary flow design is dead-end filtration but the module can be operated using a concentrate bleed. Dead-end filtration uses less energy and has a lower operating pressure than the concentrate bleed, therefore reducing operating costs.

Typically,

DOW™ Ultrafiltration is operated at a constant permeate flow. The transmembrane pressure (TMP) will naturally increase over time and the module can be cleaned periodically by back flushing and air scouring to remove the fouling layer. Disinfectants and other cleaning agents can be used to fully remove and prevent performance loss due to biological growth as well as other foulants.

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DOW™ Ultrafiltration Technology

The DOW™

Ultrafiltration double-walled hollow fiber membrane is formed from high grade polymeric chemicals. The virtually defect-free, double-walled fiber membrane is much more robust and less prone to breakage than single-wall hollow fibers but due to the high pore distribution, does not compromise flux. The uniformity of pore size and outside-in flow ensures the DOW™ Ultrafiltration membrane creates the perfect barrier without sacrificing performance.

DOW™ Ultrafiltration Advantages

- Low fouling Hydrophilic Polyvinylidene fluoride (H-PVDF) membrane
- Excellent filtration performance with high flux
- Durable and break resistant double-walled fiber structure
- High chemical resistance and temperature tolerance for effective membrane cleaning
- Very fine nominal pore diameter (0.03 μm)
- High removal efficiency of bacteria and viruses
- Dead-end or concentrate bleed flow capabilities
- Outside-In flow configuration that allows for less plugging and higher solids loading, higher flow area and easier cleaning