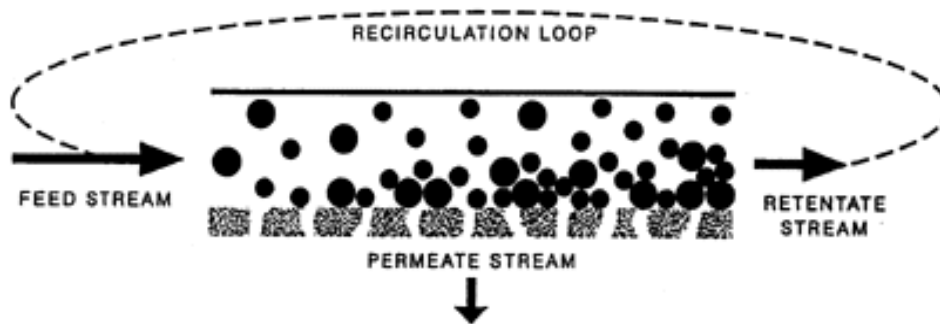


Crossflow Filtration

Sometimes referred to as Tangential Flow Filtration, Crossflow Filtration is used mostly in the sub-micron range, it's most common uses are in the range of Microfiltration, Ultrafiltration Nanofiltration and Reverse Osmosis for the production desalinated water. Crossflow is used most often, in situations that require the filtration of very large volumes of fluid, or the separation of very high concentrations of solids. As the system pore size, or molecular weight cut-off decreases, the operating pressure of the system increases. Microfiltration systems can operate in the 20 – 40 PSI range, while some Ultrafiltration Nanofiltration and Reverse Osmosis systems will require often require pressures of 100 PSI and higher.

The feed stream forms a “Recirculation-loop”, where the feed stream passes across the membrane sheet surface, or more commonly through the center lumen of a membrane tube or layers in spiral-wrap module.



In a typical tubular microfiltration application, a fluid, such as chemically pre-treated wastewater, flows through the tubular modules at high velocity, sufficient to maintain turbulent flow. At typical operating pressures of 20 – 80 psi, the “Permeate Stream” is forced through the pores of the membrane, while suspended particulates remain in the “Retentate Stream”. The turbulent flow over the membrane surface prevents the build-up of particles on the inner surface of the tube, providing high flux and prolonged filter life. This turbulent crossflow performance and large bore tubular design, may eliminate the need for some prefiltration steps and should routinely handle high solids levels.

These types of systems are usually used to process very large volumes of liquids. Typical applications would include:

- Biological or biopharmaceutical processing
- Concentration of fruit juices and extracts
- Food and beverage processing
- Desalination of brackish water or seawater
- Purification of rinse water in electroplating tanks
- Municipal or industrial water and wastewater purification

Cross-flow filtration can concentrate solids and semi-solids very effectively because membrane selection is designed to keep the solids retained on the membrane surface rather than in the filter matrix. Cross-flow filtration can also concentrate solids and semi-solids very effectively because membrane selection (both tubular or spiral-wrap module) are designed to keep the solids following “across” the membrane surface rather than penetrating the filter matrix, while allowing liquid to penetrate the membrane.

Keywords

Crossflow Filtration

Nano Filtration

Membranes

Water, Wastewater & Water Reuse