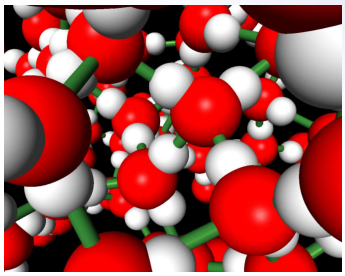
WATERLAND

CEYKA®

THE WATER COMPANY

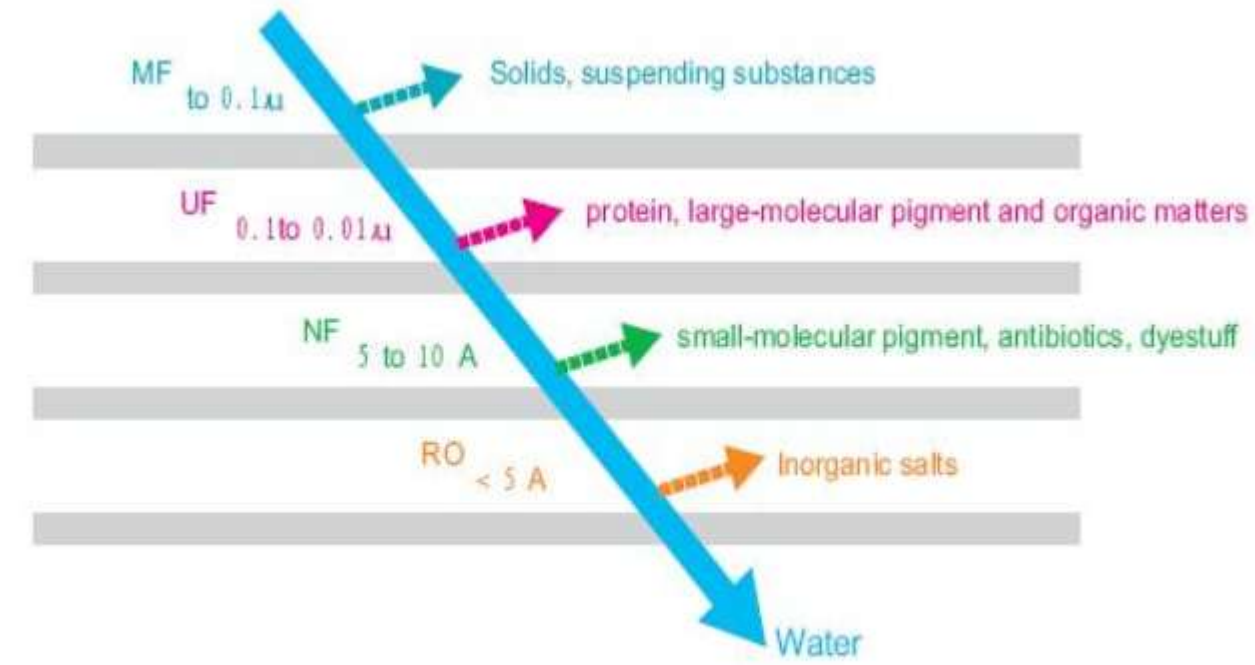
MEMBRANE SYSTEMS



MEMBRANE SEPARATION TECHNOLOGY

Membrane separation involves separating components from liquid, fluid or gaseous streams by means of forcing the stream to flow under pressure over the surface of a membrane. The technology is actually a family of processes that include reverse osmosis, nanofiltration, ultrafiltration and microfiltration. Components smaller than the membrane pore size pass through the membrane while larger components are retained. Components can be selectively separated over a wide range of particle sizes. Examples are bacteria and pyrogen; macromolecular materials, such as starch and protein; and small soluble molecules such as amino acids, sugars and inorganic acids.

Separation technology enables processors to simultaneously concentrate, fractionate, and purify their products. Large volumes can be treated with remarkable energy efficiency since the technology does not require a phase change to facilitate water removal, nor do the processes require a steam source or ancillary equipment such as heat generators, evaporators, or condensers.



Membrane Technologies

Membrane processes separate molecules on the basis of size and molecular weight. The following is a description of reverse osmosis, nanofiltration, ultrafiltration, and microfiltration.

Reverse Osmosis (RO)

RO is the most complex technique in membrane separation. RO membranes concentrate low molecular weight organic materials and salts while allowing water and solvents to pass through. High pressures of about 35-100 bar are required in order to overcome the high osmotic pressures across the membrane. This permits water to flow from the concentrated feed stream to the dilute permeates, a direction that is just the reverse of what would occur naturally during osmosis. RO is widely used for desalinating seawater and reclaiming brackish well water.

Nanofiltration (NF)

NF separates liquid in a region between reverse osmosis (RO) and ultrafiltration (UF). The NF membrane displays excellent rejection of divalent ions while allowing a majority of monovalent ions to pass. Organic molecules in the 200-300 molecular weight ranges are also highly rejected. The unique separation capability of NF provides the opportunity to selectively concentrate either valuable or undesirable substances from a process stream with greater effectiveness, consistency, reliability, and economy. NF applications include demineralization, color removal, and desalting.

Ultrafiltration (UF)

UF is a low-pressure fractionation of selected components by size. Ultrafiltration separates dissolved solutes of .005-.1 microns. This corresponds to a molecular weight cut off (MWCO) of about 1,000 to 300,000. Depending on the molecular weight cut off selected, the membrane will concentrate high molecular weight species while allowing dissolved salts and lower molecular weight materials to pass through. UF membranes are used in numerous industries for concentration, clarification, and diafiltration of large process streams.

Microfiltration (MF)

MF is the most open membrane. MF separates macro materials and suspended solids in the size range of about 0.05-2.0 microns. Typical materials removed by MF are starch, bacteria, fat, molds, yeast, and emulsified oils. MF offers unlimited new process opportunities in the industrial market.

CEYKA

WATERLAND

Typical Application for Our Products





Water Industries

- Drinking water
- Pure water for any industrial process requirement
- Seawater desalination
- Waste water treatment, reclamation

Bio-pharmaceutical Industries

- Filtration & purification for fermentation broth of antibiotics, vitamins, amino acids
- Concentration of pharmaceutical process streams
- Protein separation
- Recovery solvent, acid and alkali
- Recovery and purification of mother liquid

Chemical & Dyestuff Industries

- Desalination, concentration of dyestuffs
- Desalination of optical brighteners
- Dyestuff wastewater treatment, or for recycling

Food Industries

- Separation of whey protein and lactose in cheese Industry
- Concentration and desalination of cheese whey
- Standardization of milk
- Sugar and polysaccharide concentration and purification
- Color removal

Beverage Industries

- Clarification, purification & concentration of Juice
- Clarification, & concentration of tea
- Acid and Alkali recovery from CIP water

Automotive and Appliances

- Filtration of E-Coat
- Lifetime extension of degreasing baths
- Treatment of oil / water emulsions

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