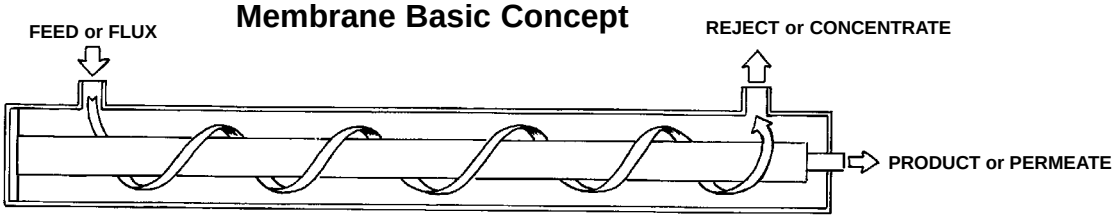
MEMBRANE SYSTEMS

RGF can provide pre-engineered and custom Reverse Osmosis, Nanofiltration, Ultrafiltration & Molecular Separation Systems consisting of pre-treatment, automation, membrane cleaning, and process control. Before a system can be approved for purchase, a lab sample must be analyzed and bench tested by RGF. “No two waste streams are ever alike”.

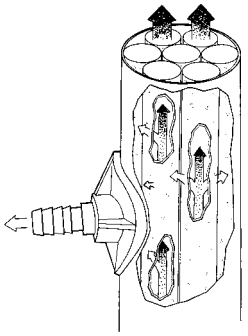
Membrane System	Reverse Osmosis	Nanofiltration	Ultrafiltration	Molecular Separation
Micron Rating	0.0001	0.001	0.01	0.1 / 0.5 / 1.0
Molecular Weight	0	100	10,000	500,000
Operating Pressure (psi)	400 - 1000	200 - 600	20 - 100	10 - 60
Application	Ultrapure Water Desalting Dissolved Solids Removal	Desalting Dissolved Solids Removal	Concentration Oils & Petroleum Hydrocarbons Removal Suspended Solids Removal	Suspended Solids Removal while Sustaining Dissolved Cleaning Agents

Membrane Basic Concept

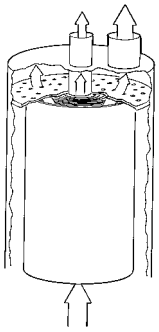


Molecular Separation and Ultrafiltration Membranes

The primary role of the ultrafiltration membrane is to allow the passage of water and low molecular weight solutes, but retain macromolecules whose size is larger than the pore size of the membrane. The ultrafiltration membrane enables concentration, purification, and fractionation of macromolecules in solution to be carried out at temperatures close to ambient temperature and without a phase change or addition of solvents. Ultrafiltration utilizes permeable membranes to separate macromolecules and suspended solids from solution on the basis of size, separation compounds with molecular weights from 8,000 to 500,000. The application of high pressure to the feed side of the membranes enables the passage of water through the membrane. This makes the larger sized (suspended solids) compounds to concentrate on the high pressure side, while the concentration of smaller sized compounds (dissolved solids) remain the same on both sides of the membrane.



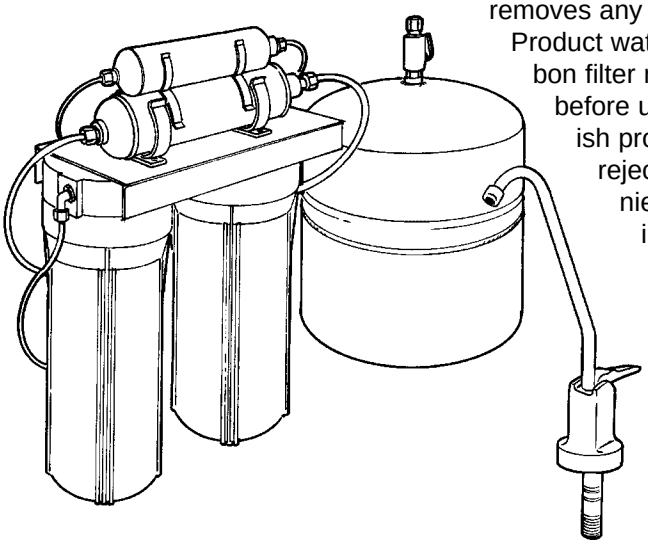
Nanofiltration and Reverse Osmosis Membranes



Reverse Osmosis is a separation technique involving the passage of water molecules through a semipermeable membrane due to the application of pressure and involves no change in either phase or temperature. Thus, the membrane has the quality of allowing the passage of water while preventing the passage of up to 99% of the dissolved solids and virtually all the suspended solids. Reverse osmosis follows the wellknown phenomenon of osmosis. Osmosis is the flow of water from an area of low concentration to an area of high concentration of dissolved solids. Osmotic pressure is a property particular to the solution and is independent of the membrane.

In reverse osmosis, an external pressure (pump pressure) is exerted on the concentrated solution in the tube, forcing fresh water back through the membrane, leaving dissolved particles behind. An example of reverse osmosis occurs when we drink sea water rather than fresh water. Our small intestines are semipermeable membranes which have a low concentration when we drink fresh water. Osmosis allows water to flow freely from our intestines to our bloodstream, from low concentration to high concentration, to hydrate our bodies.

Residential Reverse Osmosis Water Filtration System



Designed to efficiently remove contaminants from city or well water supplies for drinking and cooking uses. A spirally wound membrane which removes salts, chemicals, and minerals from city or well water supplies. A carbon pre-filter removes any free chlorine, a one micron pre-filter removes large solids. Product water is stored in a two gallon pressurized bladder tank. A post carbon filter removes remaining trace contaminants from the product water before use. A differential pressure switch activates the system to replenish product water in the storage tank when the supply runs low. The reject from the membrane is rejected to a drain. The system conveniently mounts under most kitchen sinks to feed ice makers, drinking water spigots, and includes a sink dispenser.

- *R/O Membrane:* spiral wound membrane
- *Storage Capacity:* 2 gallon storage capacity
- *Process Rate:* 10 gallons per day
- *Size:* Filters - 13” L x 15” H x 6” W
  Storage Tank - 12” Dia x 15” H
- *Inlet and Outlet Piping:* 3/8” dia. hose fitting

Item #	*Description*	*Daily Capacity*	*Ship Wt.*
OP-019	Residential Reverse Osmosis	10 g.p.d.	41 lbs.