

Reverse Osmosis

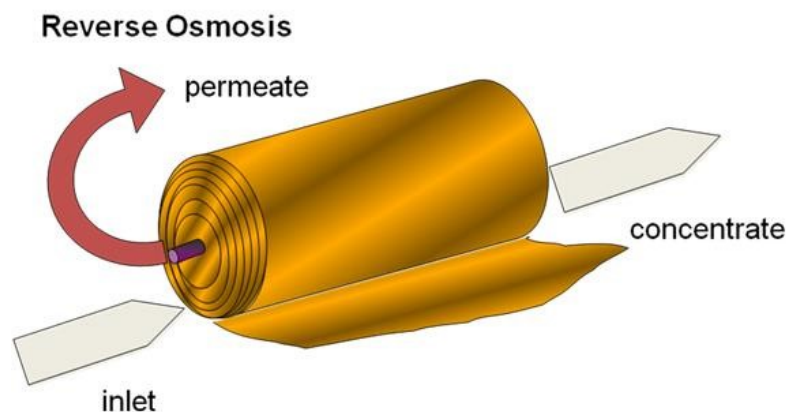
Reverse Osmosis reduces the concentration of dissolved salts by upto 99% whilst also removing, bacteria, pyrogens and yeast cells.

Reverse Osmosis Solutions from Envirogen are used around the world often in combination with other processes, to deliver the quality of water our customers need.



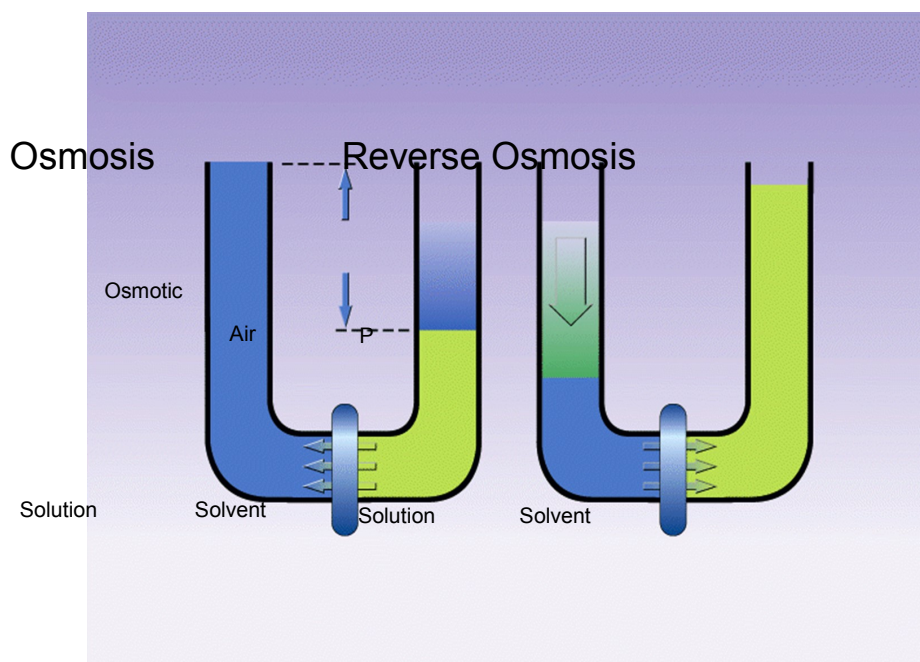
Technology

Reverse osmosis (RO) is a filtration method that removes many types of large molecules and ions from solutions by applying pressure to the solution when it is on one side of a selective membrane. The result is that the solute is retained on the pressurised side of the membrane and the pure solvent is allowed to pass to the other side. To be “selective,” this membrane should not allow large molecules or ions through the pores (holes), but should allow smaller components of the solution (such as the solvent) to pass freely.



The process is similar to membrane filtration. However, there are key differences between reverse osmosis and filtration. The predominant removal mechanism in membrane filtration is straining, or size exclusion, so the process can theoretically achieve perfect exclusion of particles regardless of operational parameters such as influent pressure and concentration. Reverse osmosis, however, involves a diffusive mechanism so that separation efficiency is dependent on solute concentration, pressure, and water flux rate.

Reverse osmosis is most commonly known for its use in drinking water purification from seawater, removing the salt and other substances from the water molecules. This is the reverse of the normal osmosis process, in which the solvent naturally moves from an area of low solute concentration, through a membrane, to an area of high solute concentration. The movement of a pure solvent to equalize solute concentrations on each side of a membrane generates a pressure and this is the “osmotic pressure.” Applying an external pressure to reverse the natural flow of pure solvent, thus, is reverse osmosis.



Things To Consider

- RO can act as an ultra-filter removing particles such as some micro organisms that may be too large to pass through the pores of the membrane.
- It is not a new process and is simple in design.
- Permeate production rate is normally 70% - 75% of the feed flow.
- Waste water is 25% - 30% of feed flow.
- The purity of the permeate depends on the quality of the feed water and the efficiency of any pre treatment required.
- Water quality is measured on the outlet by a conductivity monitor. This instrument can be linked to a dump valve to ensure out of spec water is diverted to drain.

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