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reverse osmosis sea water desalination systems

epRO/s



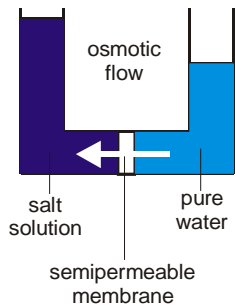
up to 545 m³/day



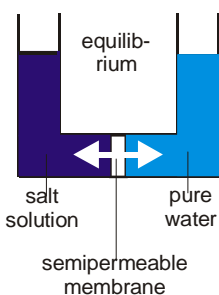
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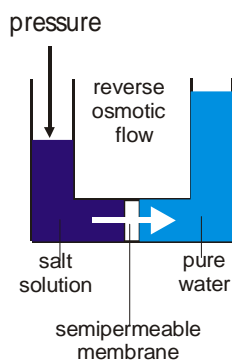
The RO Process



While ordinary liquid filters use screens to separate suspended particles from a water stream, Reverse Osmosis (RO) is a membrane separation process where a semipermeable membrane acts as a molecular filter to separate up to 99% of dissolved solids, bacteria, particles, and organics larger than 300 molecular weight.

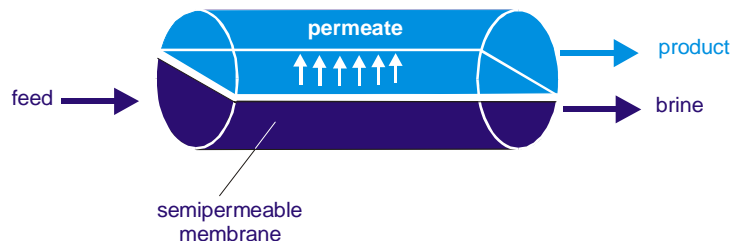


In nature, salt and pure solutions separated by a semipermeable membrane will try to reach equilibrium: equal concentration of material at both sides of the membrane. The only way to achieve equilibrium is to allow pure water to pass through the semipermeable membrane to dilute the salt solution. This phase of "attempting to reach equilibrium" is called the osmosis process. The osmosis process continues until the pressure in the salt solution side is built up to a certain value then the flow stops. This pressure is called "osmotic pressure".



The osmosis process is reversible. By applying osmotic pressure on the salt solution side, water can pass through the semipermeable membrane to the pure water side, leaving salts behind. This is called reverse osmosis (RO) process. The RO process is widely used in water desalination.

In practice, the RO devices are cross-flow filtration where the feed stream is split into permeate (pure) and brine (concentrate) streams. The cross-flow configuration allows for continuous duty process as the concentrate sweeps away the membrane's rejected salts and discharges them to the brine stream.

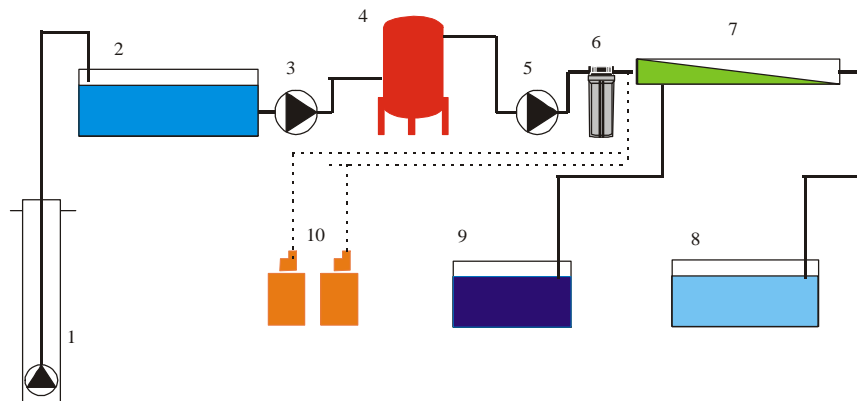
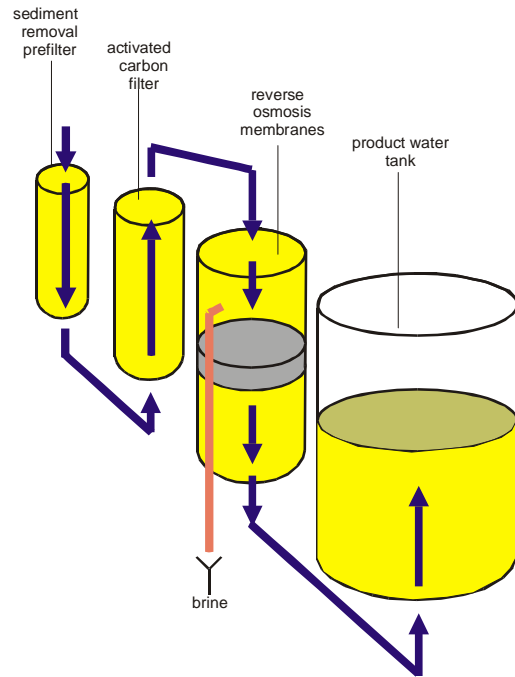


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The RO System

In a typical RO system, pre-filter removes suspended solids: dirt, sand, and rust. The Following activated carbon filter removes dissolved gases like chlorine, sulphur dioxide, hydrocarbons, odor and taste reagents . The RO membranes separate the dissolved solids: mineral salts & heavy metals. Microorganisms: bacteria, viruses and pathogens are also separated. The RO membranes clean water at molecular level.



- | | |
|------------------------------|-------------------------------|
| 1 deep well pump | 6 sediment removal filter |
| 2 raw water tank | 7 reverse osmopsis membranes |
| 3 filter feed/backwash pump | 8 product water tank |
| 4 multimedia pressure filter | 9 brine holding tank |
| 5 high pressure pump | 10 chemical injection systems |



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epROs-Range 1 from 27.3 to 81.8 m³/day

Technical Data

model	production		power rating kw	dimensions l x w x h mm	weight Kg
	m ³ /day	GPH			
epRO 30s	27.3	17	15	3600x1200x1500	900
epRO 40s	38.2	30	15	3600x1200x1500	1100
epRO 60s	54.5	42	25	3600x1200x1500	1150
epRO 80s	81.8	92	40	4200x1200x1500	1500

Based on feed water: TDS of 45,000 mg/l / temperature of 25 °C / SDI<5 / Turbidity<1

Based on electric power supply of 220v/ 1ph / 50hz.

Approximate skid dimensions

Dry weight.

Standard Equipment

Fiberglass pressure vessels.
 5-micron sediment prefilter.
 Low/high feed pressure alarm.
 Automatic feed water shut-off valve.
 Corrosion resistant high pressure pump.
 Thin film composite spiral wound membrane.
 Pressure gauges at all streams.
 Pemeate & brine flowmeters.
 Stainless steel high pressure pipes.
 Cleaning in situ.
 Manual membrane flushing.
 Powder electrostatic coated steel frame.
 50 hz / 220-380v electrics.
 NEMA 12 electric control panel.
 Sediment prefilter differential pressure gauges.

Optional Equipment

Stainless steel high pressure pump.
 Energy recovery system.
 Automatic flushing.
 Ultraviolet disinfection.
 Chemical dosing.
 Media filters for special treatment.
 TDS, pH, ORP, temperature & turbidity instruments.
 PLC control.
 All streams flowmeters.
 Special enclosures.
 60hz / 230-460v electrics.



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