



“ The water and energy nexus will be the prevailing issue facing the world in the coming years”

Innovative Water Solutions

Trevi’s FO process is a disruptive technology, which can help meet the world’s rapidly increasing demand for clean water using a small fraction of the energy needed for existing water purification systems.



Mission

Trevi System’s goal is to develop systems that use an innovative and highly energy efficient Forward Osmosis (FO) process, in order to produce clean water from saltwater, brackish water, or industrial wastewater at much lower cost and energy use as compared to existing technologies.



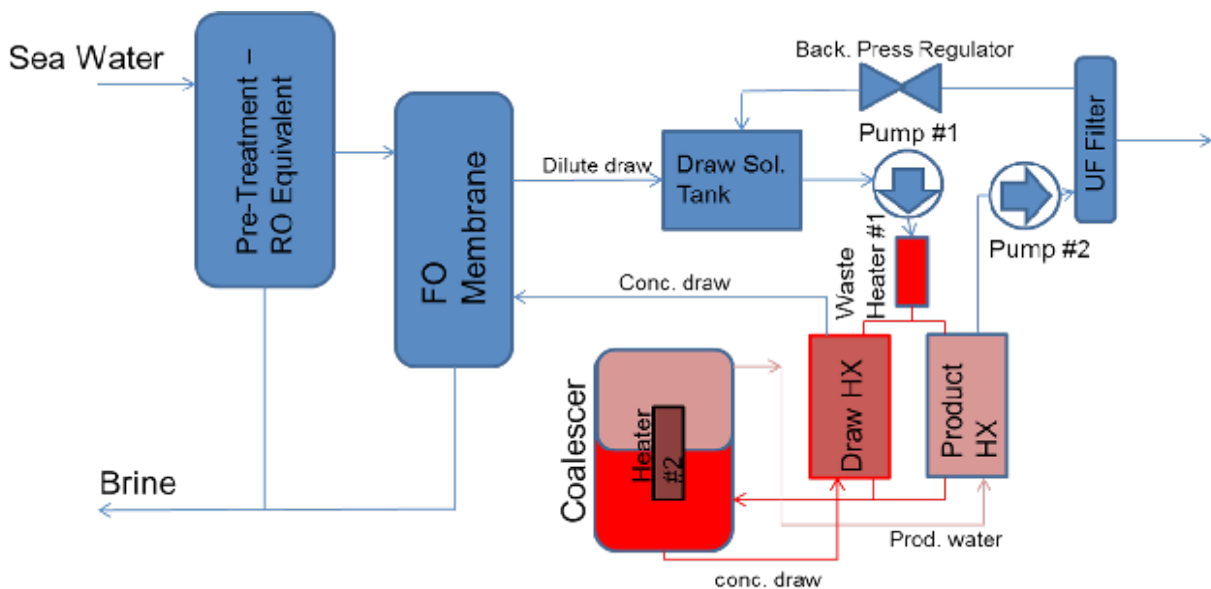
Testing

The system has completed its laboratory trial period, demonstrating energy savings and capital costs. Trevi has now completed field trials at the US Navy NFESC facility in Port Hueneme. These trials validated energy savings, monitored the long term water quality and verified that thermal operating parameters of the FO system remain within acceptable ranges.



Energy Use

Trevi Systems’ low- grade heat enables co-generation, solar thermal or gas fired hot water sources to be readily used. A water cost per cubic meter model (20 year capital depreciation) has been developed showing that using natural gas results in a 30% savings and using a co-gen heat source results in a >50% savings. These numbers are based on a 7c/kWh cost for electricity.



Trevi-100 m³ Pilot Skid

The driving factor for considering implementing a forward osmosis system versus a reverse osmosis system should be the energy savings.

Trevi Systems developed a unique draw chemistry that allows the draw solute to be separated from the recovered water using thermal heat. The traditional RO high pressure pump has been replaced instead with a chemical pump.

The Trevi FO System will perform optimally when used in conjunction with thermal energy sources such as solar ponds or solar concentrating systems because the technology development is focused on a system that is thermally driven rather than electrical. Since the energy consumption is very low, the brine stream generated may be concentrated to either very low or very high recovery rates without a noticeable change in electrical energy consumption, allowing the system to be tailored to the environmental requirements of the area.

Trevi Systems offers 100m³ pilot Forward Osmosis systems for small scale desalination plants, renewable eco-resorts, hydroponics water recycling, water/membrane studies, and industry training. These small scale pilot systems contain all the elements of a full scale pilot plant but are size and cost optimized for smaller volume that may use thermal energy sources.

Membrane development is an active area of research in Forward Osmosis Systems, with Trevi's 100m³/day skid the hydrodynamic impact of various packaging types may be studied as well as the fouling aspects of membranes. These are difficult to study in small scale laboratory clamshell experiments.

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Key Features

- 1) Plate and frame, spiral wound or hollow fiber membranes (consult with Trevi on the latest in membrane availability).
- 2) User supplied membranes may alternatively be used with the skid.
- 3) Allen Bradley/Rockwell control automation with user adjustable controls.
- 4) Thermally driven separation process with optional (external) adjustable electric heater to simulate various thermal sources.
- 5) Optional pre-treatment skid (specify for specific applications).