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2025

SWRO Efficient Desalination Solutions

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01 Introduction to SWRO Systems

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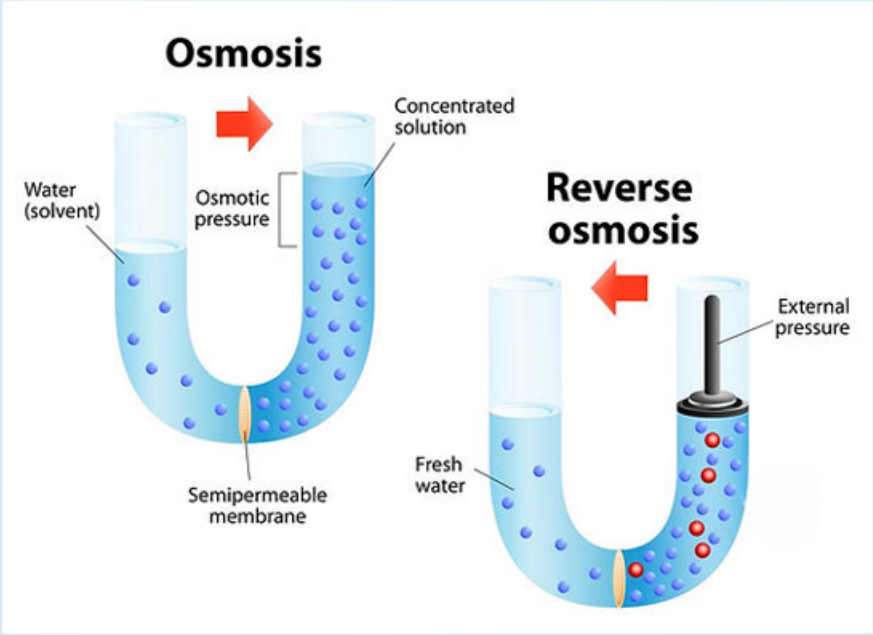
What is SWRO?

SWRO, or Seawater Reverse Osmosis, is a system designed to convert high- salinity seawater into fresh, potable water. It is essential for providing clean water in areas where freshwater sources are scarce.

Benefits of Containerized SWRO

Containerized SWRO systems offer significant advantages. All desalination components are pre- assembled in 1 to 2 containers, which greatly reduces on- site installation workload and time. This makes it highly efficient for both indoor and outdoor use.



02 Working Principle of SWRO

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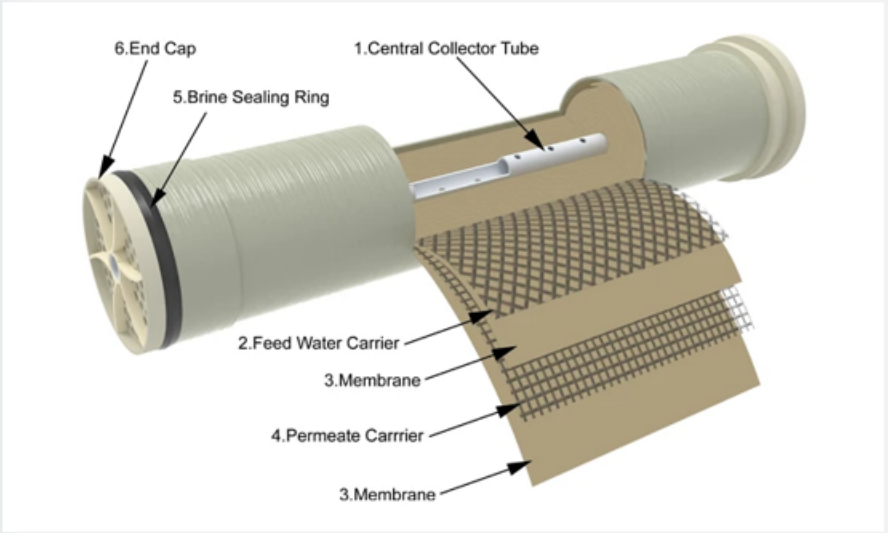
Osmotic Pressure

SWRO operates at higher pressures than brackish water RO due to the greater osmotic pressure of seawater. This high pressure is necessary to overcome the natural osmotic pressure and force water molecules through the semi-permeable membrane.

Membrane Filtration

The core of the SWRO system is the semi-permeable membrane. It allows water molecules to pass through while rejecting dissolved salts other and impurities. This process effectively desalinates seawater, producing fresh water.



03 SWRO Configurations-1

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Excellent Screen

The SWRO system features a Screen 10” color display with touch screen control. This advanced interface allows for easy monitoring and adjustment of system parameters.

PLC and Communication

Equipped with a Siemens smart200 and PLC RS232/NET communication, the system ensures precise control and seamless integration with other systems.

03 SWRO Configurations-2

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High Pressure Pump Inverter

The high- pressure pump configuration includes an inverter, which optimizes energy consumption and enhances system efficiency.

Automatic Water Rinse

The system has an automatic water rinse feature that activates during shutdown. This helps to maintain the cleanliness of the system and prolong the life of the components.

03 SWRO Configurations-3

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In-Situ Chemical Cleaning

An in- situ chemical cleaning system is integrated into the SWRO system. This allows for regular maintenance without the need for disassembly, ensuring consistent performance.

Remote Monitoring

The remote monitoring system enables operators to monitor the SWRO system from a distance. This feature is particularly useful for managing multiple systems or for providing timely maintenance.

04 Applications of SWRO-1

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Construction Sites

SWRO systems are ideal for construction sites where a reliable source of fresh water is needed. They can provide water for drinking, mixing concrete, and other construction- related activities.

Factory Facilities

In industrial settings, SWRO systems ensure a consistent supply of high- quality water. This is crucial for processes that require pure water, such as cooling systems, cleaning, manufacturing and.



04 Applications of SWRO-2

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Hotels and Resorts

Hotels and resorts often require large amounts of fresh water for guest use, landscaping, and pools. SWRO systems can meet these demands efficiently, ensuring a sustainable water supply.

Customized Applications

The modular design of SWRO systems allows for customization to meet specific needs. This flexibility makes it suitable for a wide range of applications, from small- scale operations to large industrial complexes.



05 Technical Specifications-1

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Model Overview

The SWRO system comes in various models, including C50, C120, C250E, C350E, C500E, and C1000E. Each model is designed to meet different freshwater capacities ranging from 50 to 2,000 m3/day.

Container Sizes

The container sizes vary depending on the model. For example, the C50 and C120 models use a 20 ft container, while the larger models like C500E and C1000E use 40 ft or multiple 40 ft containers.

Technical Data	Unit	C50	C120	C250E	C350E	C500E	C1000E
Rated Product Flow 1)	m3 /h	2.3	5.5	11.4	16.4	23	45.5
Rated Recovery Rate 1)	%	35	40	45	45	45	45
Container Size	ft	20	20	40	40	40	40+40
Energy Consumption 3	kWh/M3	5.93	5.21	2.73	2.7	2.64	2.58
Installed Power 4)	kW	18.7	37	50.5	61	86.5	173.5

05 Technical Specifications-2

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Energy Consumption

Energy consumption is a critical factor in the efficiency of SWRO systems. The C50 model consumes 5.93 kWh/M3, while the C1000E model consumes 2.58 kWh/M3. These figures are based on standard seawater conditions.

Recovery Rates

The recovery rate, which is the percentage of freshwater produced from the feedwater, varies from 35% to 45% depending on the model. Higher recovery rates indicate more efficient water production.



05 Technical Specifications-3

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Installed Power

The installed power for the SWRO systems ranges from 18.7 kW for the C50 model to 173.5 kW for the C1000E model. This includes all components such as pumps, energy recovery devices, and lighting.

Customization Options

The SWRO systems offer customization options for voltage and frequency to meet specific requirements. This flexibility ensures that the systems can be adapted to different power supply standards.



06 Project reference

Project Location: Morocco
Equipment: Sea Water mobile Reverse Osmosis Desalination units
Treatment Capacity: 20,000m3/day
Operation date: July 2024

The scope of work includes the following:

- Delivery of a containerized plant of a capacity of 20MLD
- Commissioning and Startup of the Plant
- Provide full scale in class training to operations
- Provide extended training on site to operations
- Continous support during operation of the plant
- Technical expertise as required



06 Project reference

Containerized RO Desalination for Sri Lanka

Owner: largest IPP of Sri Lanka
Total Capacity: 500M3/Day
RO Process Description: MMF+SWRO
Plant Location: Sri Lanka
Application: Power Plant
Date commissioned: 2021

The scope of work includes the following:

- Delivery of a containerized plant of a capacity of 10MLD
- Commissioning and Startup of the Plant
- Provide full scale in class training to operations
- Provide extended training on site to operations
- Continous support during operation of the plant
- Technical expertise as required



06 Project reference

Containerized SWRO project in Oman for Veolia

User: Veolia
Total Capacity: 800M3/Day
RO Process Description: MMF+SWRO
Plant Location: Al Sharqiyah South Governorate, Oman
Application: Desalination Plant
Date commissioned: 2022

The scope of work includes the following:

- Delivery of a containerized plant of a capacity of 12MLD
- Commissioning and Startup of the Plant
- Provide full scale in class training to operations
- Provide extended training on site to operations
- Continous support during operation of the plant
- Technical expertise as required





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Thank You

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