

RO  
MEMBRANES

SPECTRUM  
PURE

# Contents

<b>WHY CHOOSE SPECTRUM PURE .....</b>	<b>4</b>
<b>WHAT IS REVERSE OSMOSIS.....</b>	<b>6</b>
<b>HOW REVERSE OSMOSIS WORKS.....</b>	<b>7</b>
<b>RO MEMBRANE GUIDE.....</b>	<b>8</b>
<b>MEMBRANE CROSS-REFERENCE GUIDE.....</b>	<b>9</b>
<b>2.5" .....</b>	<b>10</b>
<b>4" .....</b>	<b>12</b>
<b>8" .....</b>	<b>14</b>
<b>ERO-SW .....</b>	<b>16</b>
<b>GLOSSARY.....</b>	<b>18</b>



# WHY choose SPECTRUM PURE RO membranes



## 01

### RANGE OF SIZES

From small scale through to industrial elements. SPECTRUM has an extensive range of membrane configurations to suit almost all water treatment requirements.



## 02

### ANTI-FOULING LAYER

All SPECTRUM RO membranes are cast uniquely with an additional anti-fouling layer to extend service life, saving time and unnecessary costs associated with premature membrane replacement.



## 03

### CERTIFIED

WQA-certified to ensure reliable performance and safety. This certification gives you the confidence that every membrane meets rigorous industry standards for quality and effectiveness.



## 04

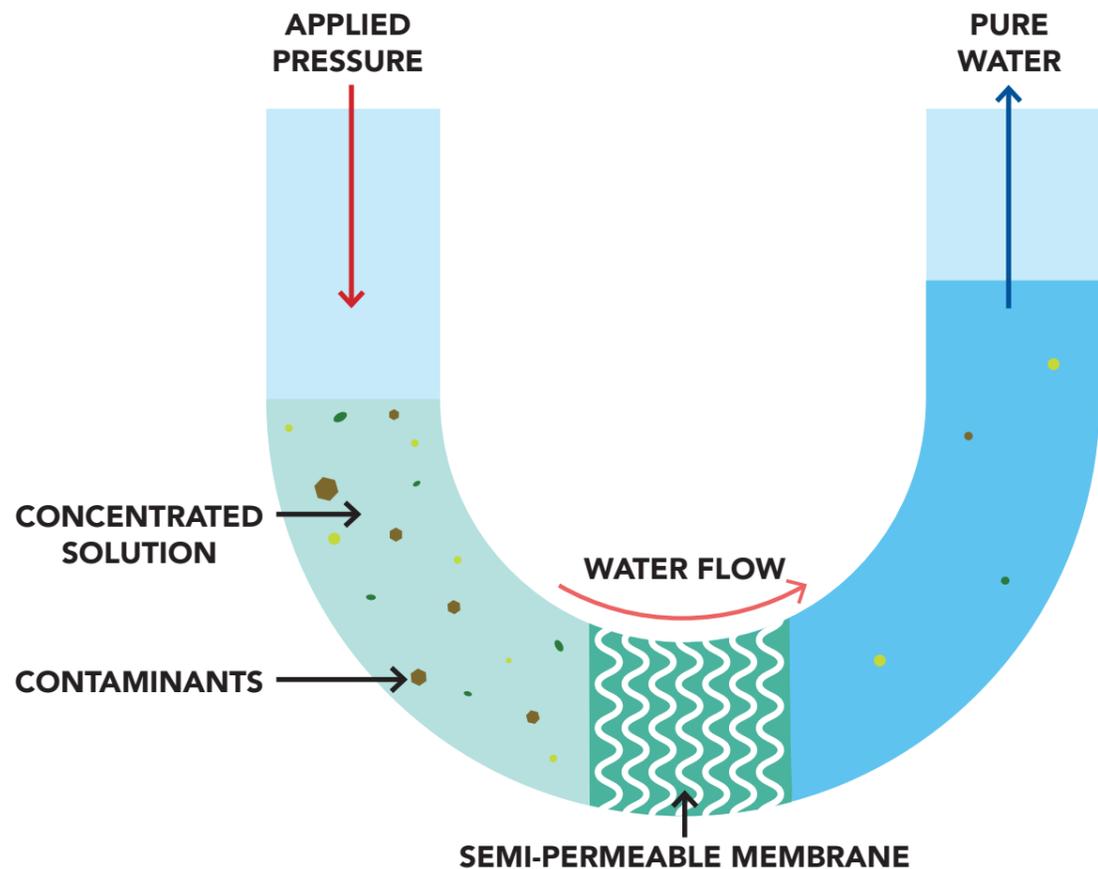
### SUSTAINABLE

SPECTRUM RO membranes are BPA- and PFAS-free, manufactured in a facility committed to sustainability. From organic solvent collection and air suction systems to the reuse of gases at the flat sheet plant, every step reflects a focus on environmental responsibility.

# What is reverse osmosis

Reverse osmosis (RO) is a highly effective water treatment process that separates water from dissolved contaminants. Using a semi-permeable membrane, reverse osmosis removes impurities such as salts, organics, heavy metals and other dissolved ions, collectively known as Total Dissolved Solids (TDS).

The process of reverse osmosis involves water being forced under pressure through a semi-permeable membrane with tiny pores that allow only water molecules to pass through while blocking dissolved contaminants. This is essential for producing purified water that is suitable for a range of applications from window cleaning and aquatics to brewing and industrial desalination, making it a widely adopted method for water purification.

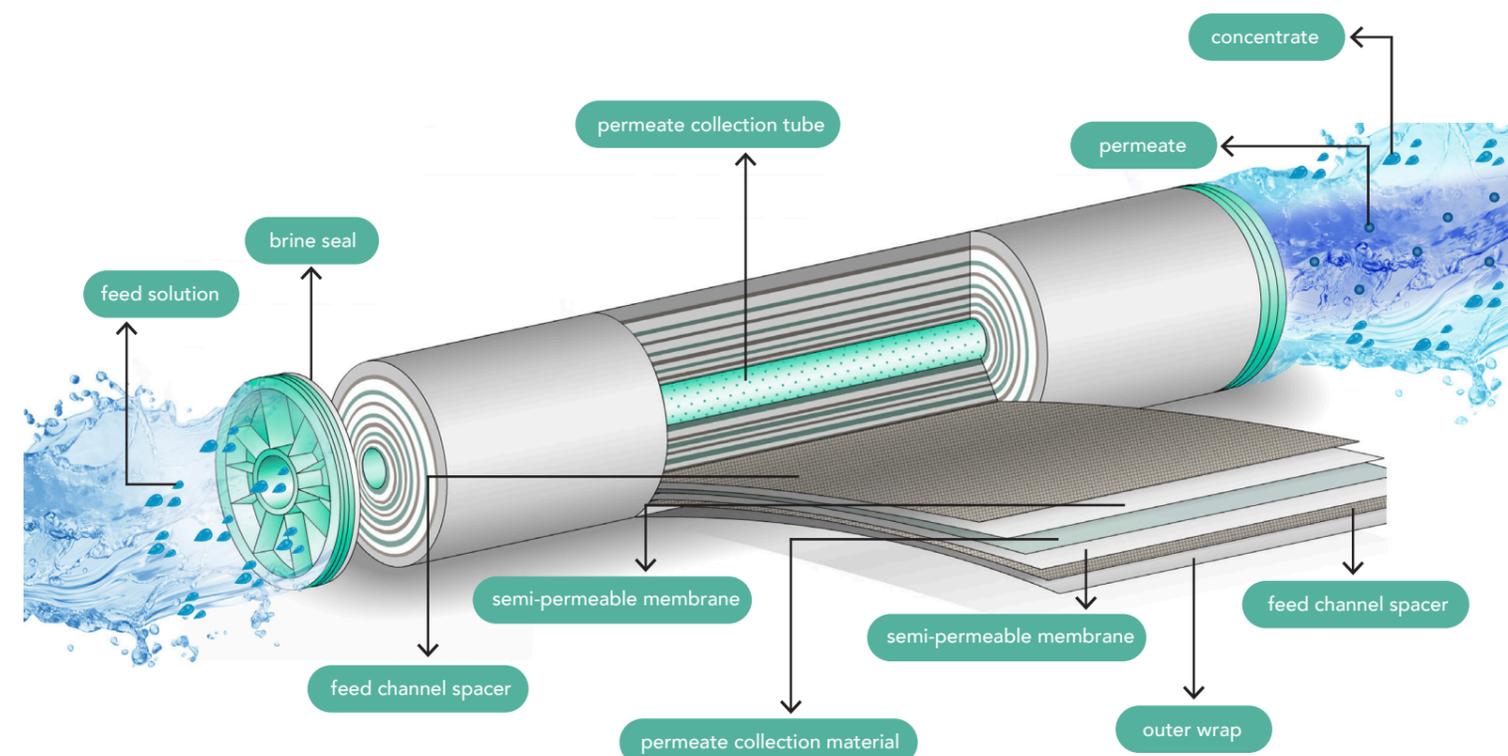


# How reverse osmosis works

Imagine a thin, specially created filter with tiny holes that only let water molecules pass through. That is what the main element of an RO system is made with – a semi-permeable membrane. Here's a step-by-step guide on how the process works.

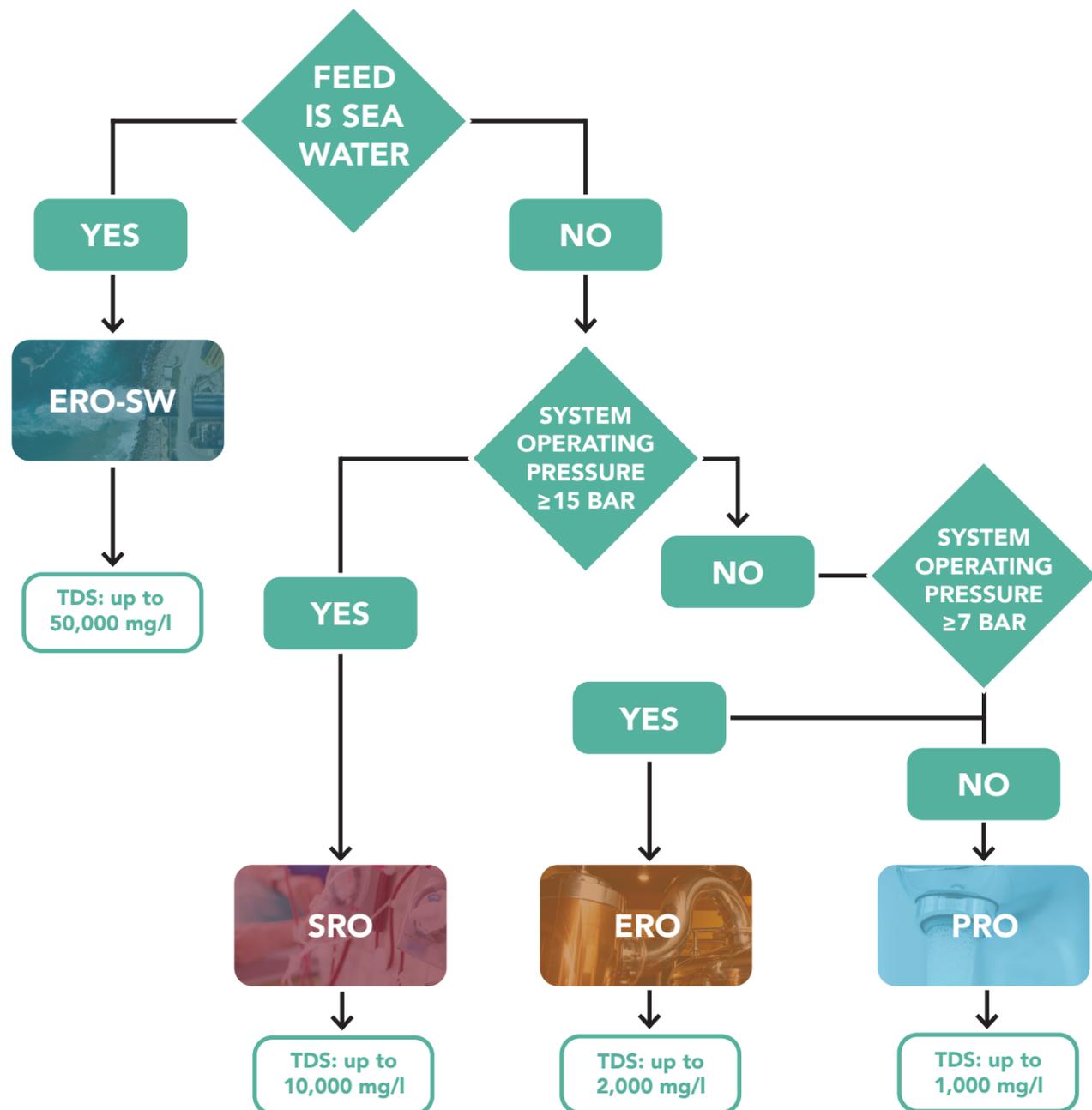
Water is forced under pressure through the semi-permeable membrane, which is where the magic happens. The tiny pores within the membrane are so small, they block up to 99% of dissolved impurities and chemicals from passing through.

Not everything that goes into the RO system comes out as treated water. Some of the water supply, along with rejected impurities, is separated by cross-flow filtration. The feed water passes over the RO media of which permeate goes one way, and contaminated water goes another and is disposed of as waste (known as concentrate).



# RO Membrane Guide

We recommend using the below aid to decide what SPECTRUM membrane is right for you, factoring the type of water and TDS levels.



# Membrane Cross-Reference Guide

	SPECTRUM	AXEON	Hydranautics	Veolia	Toray	Dupont	Mann + Hummel (Oltremare)
2.5" MEMBRANES	ERO-2521	HF4-2521	ESPA-2521	AK2521TM	-	XLE-2521	LOW2-2521
	ERO-SW-2521	-	-	-	-	SW30-2521	SEA2-2521
	ERO-2540	HF4-2540	ESPA-2540	AK2540TM	-	XLE-2540	LOW2-2540
	ERO-SW-2540	-	-	-	-	SW30-2540	SEA2-2540
	SRO-2521	HR3-2521	-	AG2521TM	-	TW30-2521	BR2-2521
	SRO-2540	HR3-2540	-	AG2540TM	-	TW30-2540	BR2-2540
	PRO-2521	HF5-2521	-	-	-	-	LOW4-2521
	PRO-2540	HF5-2540	-	-	-	-	LOW42540
4" MEMBRANES	ERO-4021	HF4-4021	ESPA-4021	AK4021TM	-	XLE-4021	LOW2-4021
	ERO-SW-4021	-	-	-	-	SW30-4021	SEA2-4021
	ERO-4040	HF4-4040	ESPA2-LD-4040	AK90	TM10A	XLE-4040	LOW2-4040
	ERO-SW-4040	-	SWC5-LD-4040	AE-90	TM810V	SW30-4040	SEA2-4040
	SRO-4021	HR3-4021	-	AG4021TM	-	TW30-4021	BR2-4021
	SRO-4040	HR3-4040	CPA7-LD-4040	AG90	TM710D	TW30-4040	BR2-4040
	PRO-4021	HF5-4021	-	-	-	-	LOW4-4021
	PRO-4040	HF5-4040	ESPA4-LD-4040	AK90LE	TMH10A	XLE-4040	LOW4-4040
8" MEMBRANES	ERO-SW-8040	-	SWC5-LD	AE-400,34	TM820V-400	SW30XLE-400, SW30XFR400/34i	-
	ERO-8040-HF	-	ESPA2-LD	AK-400	TMG20-400	LE-400	LOW24-8040
	SRO-8040-HF	-	CPA3	AG-400	TM720-400	BW30-400	BR3-8040
	PRO-8040-HF	-	ESPA4-LD	AK-440LE	RE8040-BLF	XLE-400	-
	ERO-SW-8040-HF	-	SWCS-LD	AD-400	TM820V-400	SW30HRLE-400	-

\* SPECTRUM RO membrane compared to other industry manufacturers.

# 2.5"

## RO for Light Commercial Applications

Whilst other manufacturers are obsoleting the 2.5" range in favour of the mass produced 4" and 8" elements, SPECTRUM is committed to supporting the many systems in the field that incorporate the 2.5" membranes.

Not only offering a retrofit, but one with improved performance, often enabling system production rates to increase without modification. All membranes have the added benefit of a fibreglass wrap for a more robust product.



## Typical Applications

Compact and versatile, 2.5" RO membranes deliver pure water for lower-demand and portable systems, making them ideal for:

Light Commercial & Industrial – small-scale equipment and process water

Cafés & Food Service – beverage prep and compact kitchen systems

Residential Systems – under-sink and point-of-use purification

Aquariums & Hobby Use – safe, pure water for aquatic life

Spot-Free Rinse – portable systems for window cleaning and car valets

Field Units – mobile, military, and emergency applications



PERFORMANCE		FLOW RATE	
Code	LPH (m <sup>3</sup> /day)	Operating Pressure bar (psi)	Avg Rejection %
<b>ERO-2521</b>	47 (1.1)	@ 10.3 (150)	99
<b>ERO-2540</b>	118 (2.8)	@ 10.3 (150)	99
<b>SRO-2521</b>	47 (1.1)	@ 15.5 (225)	99.5
<b>SRO-2540</b>	118 (2.8)	@ 15.5 (225)	99.5
<b>PRO-2521</b>	47 (1.1)	@ 6.9 (100)	99.2
<b>PRO-2540</b>	118 (2.8)	@ 6.9 (100)	99.2

### Testing Criteria:

Permeate flow and rejection based on feedwater of 1500 ppm NaCl, 15% recovery (2540, 4040, 8040=HF); 8% recovery (2521, 4021) and 25°C at the specified applied pressure.

Minimum salt rejection 97.5%.

Permeate flows for individual membranes may vary ±20%.

# 4"

## Fastest Rinse Up RO Membrane

Advancing every area of the user experience, making the SPECTRUM 4" not just a retrofit but a system upgrade. Starting with logistics, where the fibreglass outer finish adds security, as does the strengthened packaging.



## Typical Applications

Designed for higher flow rates while maintaining a compact footprint, 4" RO membranes are suited to medium-scale water purification needs across:

**Food & Beverage Production** – cafés, restaurants, breweries, and small bottling plants

**Industrial Processes** – cooling towers, boiler feed, and process water

**Laboratory & Healthcare** – pure water for testing, rinsing, and equipment sterilisation

**Car Wash & Spot-Free Rinse** – consistent, scale-free finish for vehicles and glass

**Aquaculture & Agriculture** – providing clean water for fish farms and irrigation



PERFORMANCE		FLOW RATE	
Code	LPH (m <sup>3</sup> /day)	Operating Pressure bar (psi)	Avg Rejection %
<b>ERO-4021</b>	189 (4.5)	@ 10.3 (150)	99
<b>ERO-4040</b>	410 (9.8)	@ 10.3 (150)	99
<b>SRO-4021</b>	173 (4.2)	@ 15.5 (225)	99.5
<b>SRO-4040</b>	379 (9.1)	@ 15.5 (225)	99.5
<b>PRO-4021</b>	189 (4.5)	@ 6.9 (100)	99.2
<b>PRO-4040</b>	410 (9.8)	@ 6.9 (100)	99.2

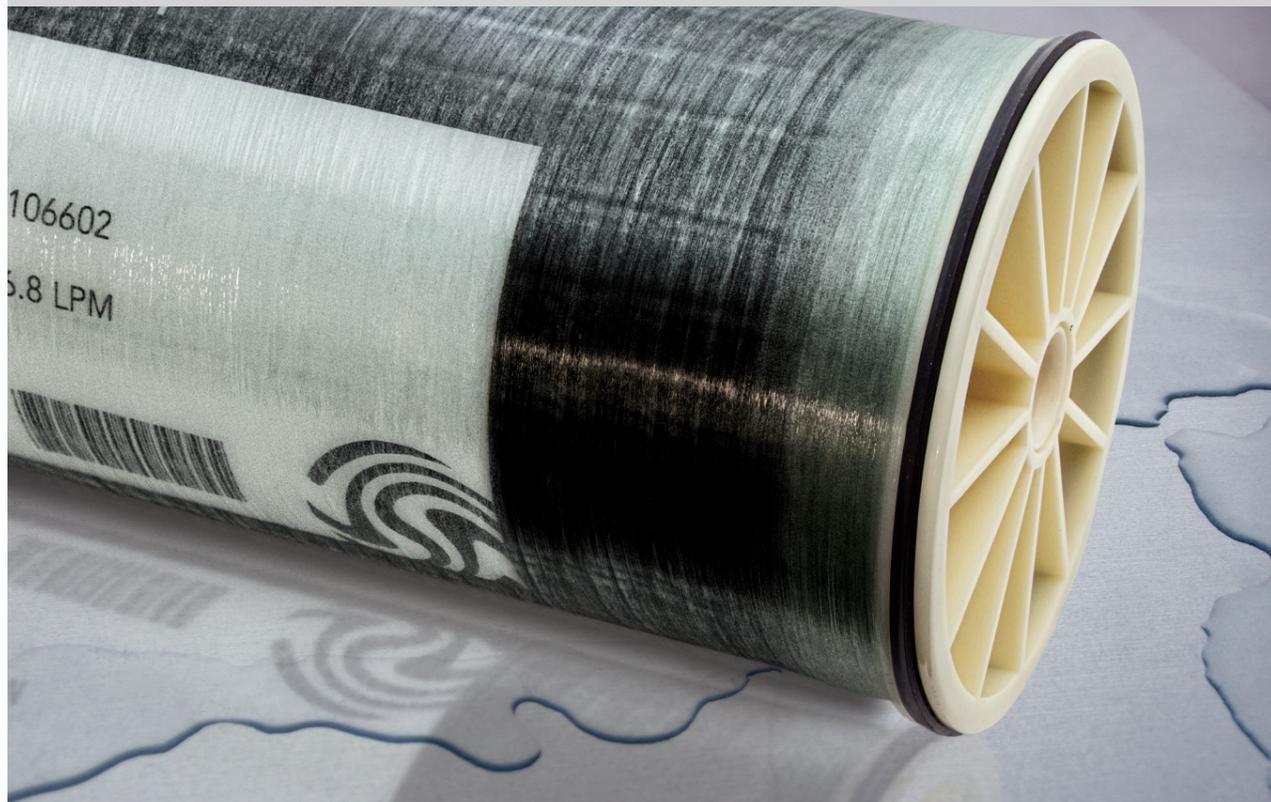
**Testing Criteria:**  
 Permeate flow and rejection based on feedwater of 1500 ppm NaCl, 15% recovery (2540, 4040, 8040=HF); 8% recovery (2521, 4021) and 25°C at the specified applied pressure.  
 Minimum salt rejection 97.5%.  
 Permeate flows for individual membranes may vary ±20%.

# 8"

## Premium Choice for Industrial RO

Boasting all the same advances as the 4" elements, including extended shelf life, dramatically reduced rinse-up time, higher flow rate at lower energy consumption and a neutral surface charge media for reduced fouling, hence longer life.

Also, importantly for 8" systems, the batch testing controls of the media and finished product with serial coding are quality assurances to ensure a consistent product is delivered every time.



## Typical Applications

Engineered for high-capacity systems, 8" RO membranes deliver reliable performance in large-scale water treatment, making them ideal for:

**Municipal Water Treatment** – drinking water plants and large-scale purification

**Large Industrial Facilities** – chemical, pharmaceutical, and electronics manufacturing

**Food & Beverage Production** – bottling plants, dairies, and large breweries

**Power Generation** – boiler feed and cooling tower make-up water

**Oil & Gas** – produced water treatment, injection water, and refinery processes

**Desalination Plants** – seawater and brackish water treatment at scale



PERFORMANCE		FLOW RATE	
Code	LPH (m <sup>3</sup> /day)	Operating Pressure bar (psi)	Avg Rejection %
<b>ERO-8040</b>	1609 (38.9)	@ 10.3 (150)	99
<b>ERO-8040-HF</b>	1767 (42.4)	@ 10.3 (150)	99
<b>SRO-8040</b>	1514 (36.3)	@ 15.5 (225)	99.5
<b>SRO-8040-HF</b>	1656 (39.7)	@ 15.5 (225)	99.5
<b>PRO-8040-HF</b>	1891 (45.4)	@ 6.9 (100)	99.2
<b>PRO-8040-HF-440</b>	2079 (49.9)	@ 6.9 (100)	99.2

**Testing Criteria:**

Permeate flow and rejection based on feedwater of 1500 ppm NaCl, 15% recovery (2540, 4040, 8040=HF); 8% recovery (2521, 4021) and 25°C at the specified applied pressure.

Minimum salt rejection 97.5%.

Permeate flows for individual membranes may vary ±20%.

# ERO-SW

## High Production

A specialised solution for RO seawater desalination applications. With an impressive average rejection rate up to 99.7%, the ERO-SW membrane ensures a thorough reduction in dissolved solids and salts, delivering purified water of exceptional quality.



## Typical Applications

Built to perform under extreme salinity, seawater RO membranes deliver reliable desalination across every scale from yachts and leisure boats through to commercial shipping vessels, offshore platforms, and full municipal desalination plants.



PERFORMANCE		FLOW RATE	
Product Code	LPH (m <sup>3</sup> /day)	Operating Pressure bar (psi)	Avg Rejection %
<b>ERO-SW-2521</b>	34 (0.8)	@ 55 (800)	99.4
<b>ERO-SW-2540</b>	100 (2.4)	@ 55 (800)	99.4
<b>ERO-SW-4021</b>	104 (2.5)	@ 55 (800)	99.4
<b>ERO-SW-4040</b>	300 (7.2)	@ 55 (800)	99.8
<b>ERO-SW-8040-HF</b>	1417 (34)	@ 55 (800)	99.8

**Testing Criteria:**

Permeate flow and rejection based on feedwater of 32000ppm NaCl, 8% recovery (2540, 4040, 8040-HF); 4% recovery (2521, 4021) and 25°C at the specified applied pressure.

Minimum salt rejection 99.5% (4040, 8040-HF). Minimum salt rejection 99% (2521, 2540, 4021).

Permeate flows for individual membranes may vary ±20%.

# Glossary

## ANTI FOULING LAYER

A feature in some reverse osmosis membranes that creates a smooth, more neutral charged membrane flat sheet to reduce interaction with foulants in the feed water.

## BRACKISH WATER

Water that is considered to have a chloride content higher than the drinking water limit, but not enough to not classify as seawater. Typically ranges from 2,000 to 10,000mg/l.

## CONCENTRATE

The high concentration liquid that is collected from a reverse osmosis system and typically directed to the drain.

## CROSS-FLOW FILTRATION

A method of filtration in which the flow of liquid travels over the surface of the media, forcing treated water through the media (permeate), whilst washing away contamination on the surface of the media (concentrate). This method creates two streams of liquid.

## DESALINATION

The process of removing salt from seawater.

## EXTENDED SHELF LIFE

A feature of some reverse osmosis membranes which allows the product to be stored for a longer period of time.

## FLOW RATE

The volume of liquid that flows either into or through a system over a period of time. Typically indicated in litres per minute (lpm) or metres cubed per hour (m<sup>3</sup>/h).

## PRODUCTION

Typically used to describe the volume of water a system will produce.

## MG/L

Milligrams per litre. When working with water, mg/l is equivalent to ppm.

## OSMOSIS

A process by which molecules move through a semi-permeable membrane from a less concentrated solution to a more concentrated solution.

## PERMEATE

The low concentration liquid that has been forced through the semi-permeable membrane of a reverse osmosis element.

## PPM

Parts per million. When working with water, ppm is equivalent to mg/l.

## OPERATING PRESSURE

Typically refers to the running pressure of the liquid being fed into the system.

## RECOVERY

The proportion of treated liquid (permeate) that is produced from a reverse osmosis system. Typically calculated as a percentage of the feed liquid.

$$\text{Recovery} = \frac{\text{Volume of Permeate}}{\text{Volume of Feed Water}} \times 100$$

## REJECTION

The proportion of dissolved contaminants that have been removed from the feed liquid.

$$\text{Rejection} = \frac{(\text{Quality of Feed Water} - \text{Quality of Permeate})}{\text{Quality of Feed Water}} \times 100$$

## REVERSE OSMOSIS

A process by which molecules are forced under pressure through a semi-permeable membrane from a high concentrated solution to a low concentrated solution.

## SEAWATER

Water with a very high chloride content. Typically ranges from 10,000 to 50,000mg/l.

## SEMI-PERMEABLE

A barrier that allows some molecules to pass through but not others.

## TAP WATER

Typically used to describe water that is supplied through a municipal water supply. This water has usually been treated to ensure it is suitable for human consumption. Typically ranges from 50 to 2000mg/l.

## TDS

Total Dissolved Solids. The term used to describe the amount of dissolved ions, such as calcium, magnesium, lead, manganese etc. in a liquid.

## FEED SOLUTION

The feed solution refers to the flow into the first stage of a reverse osmosis system.

## PERMEATE COLLECTION TUBE

The permeate collection tube, is a perforated tube, located in the middle of a spiral wound membrane element and collects the permeate (product) water, directing it to one end of the membrane housings.

## BRINE SEAL

Brine seals are typically a rubber seal on the outside of one end of an RO membrane element to prevent bypass of feed solution around the membrane.

## MEMBRANE

The membrane layer is constructed from a semi-permeable material which allows water as well as some small molecules and ions to pass through, whilst rejecting (blocking) larger molecules and ions.

## FEED CHANNEL SPACER

The structure of the feed channel creates turbulence to help water permeate through the membrane and wash away concentrated contaminants on the surface of the membrane.

## OUTER WRAP

The outer wrap is a protective layer which keep the various layers of a RO membrane element together. The outer wrap can be constructed from a range of materials such as tape, fibreglass and PVC.

## PERMEATE COLLECTION MATERIAL

The permeate collection material is sandwiched between two layers of membrane. This layer collects the treated water (permeate) that has been forced through the semi-permeable membrane and carries it into the permeate collection tube in the middle of the membrane element.





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