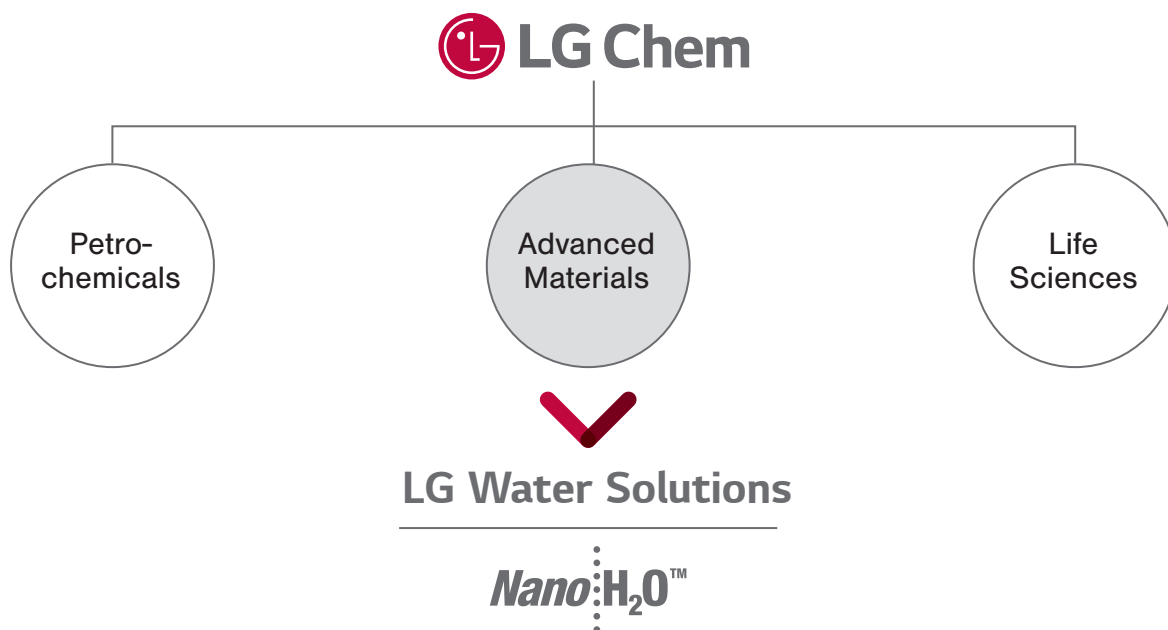


# LG Water Solutions

## TFN RO Membrane Technology



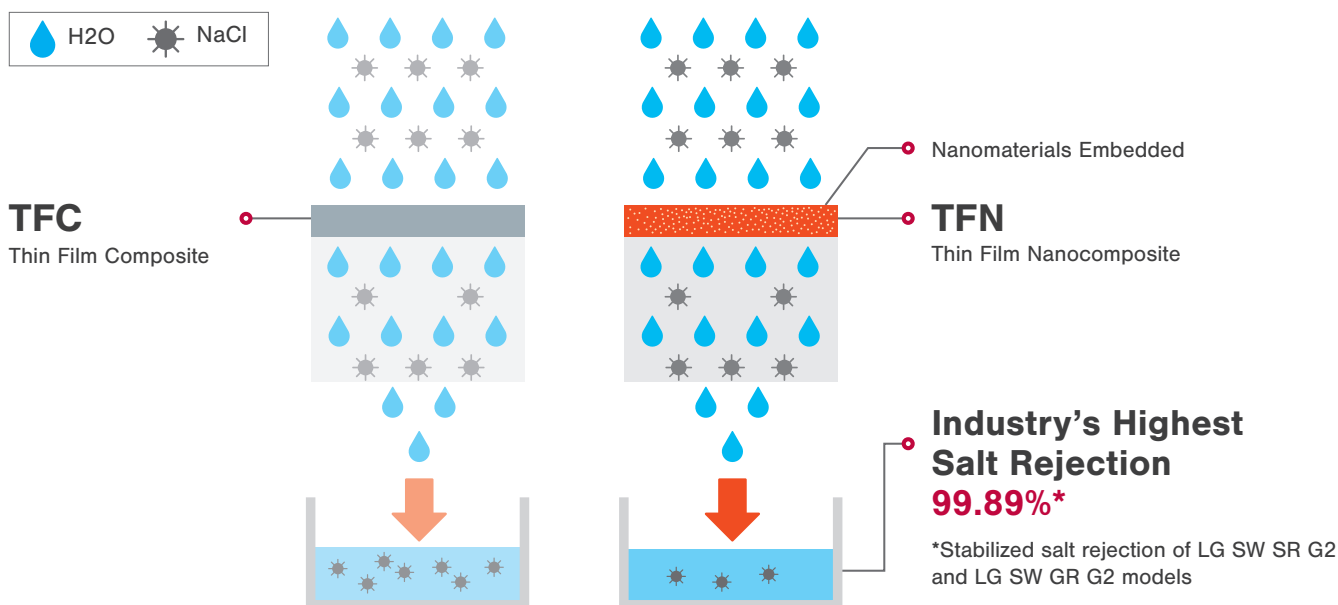
# LG Water Solutions



LG Water Solutions, a business unit of LG Chem, manufactures NanoH<sub>2</sub>O™ seawater and brackish water reverse osmosis (RO) membrane elements based on the breakthrough Thin-Film Nanocomposite (TFN) technology.

## Technology

Thin Film Nanocomposite (TFN) technology improves membrane performance by embedding benign nanomaterials on the membrane surface. This innovative approach increases flux in seawater RO membranes by up to 20% without compromising salt rejection.





## Seawater Reverse Osmosis (SWRO) Membranes

### Lowering the Cost of Desalination

#### Overview

LG Water Solutions' NanoH<sub>2</sub>O™ seawater RO membranes deliver the industry's highest salt rejection and 20% more flow than the membranes based on conventional technologies. Our seawater RO membranes significantly reduce the cost of desalination while delivering superior water quality. With state-of-the-art manufacturing and a customer-centric approach, LG Water Solutions has contracted more than 4,000 million litres per Day (MLD) in seawater projects in the past three years (2021).



#### LG SW SR G2, GR G2 and R G2

Next generation membranes with industry's highest salt rejection up to 99.89%



#### LG SW SR, GR and R

High-rejection membrane ideal for high feed TDS and high permeate quality requirements



#### LG SW ES

Energy saving membranes ideal for low feed TDS and low temperature seawater applications



## Brackish Water Reverse Osmosis (BWRO) Membranes

### Maximize Plant Uptime

#### Overview

LG Water Solutions' NanoH<sub>2</sub>O™ brackish water RO membranes are gaining traction with major utilities and industrial end-users worldwide. The TFN technology, coupled with intrinsic anti-fouling properties, delivers reliable performance and reduced operational downtime, leading to a lower total cost of plant ownership.

#### MaxRO

##### LG MaxRO

Maximized Performance for the Most Challenging Applications

##### LG BW AFR G2

Anti-Fouling, High Rejection, High Flow

##### LG BW R G2

Superior Rejection, High Flow, High Durability

##### LG BW R Dura

High Rejection, High Durability

#### MOST

##### LG BW MOST

Maximized OPEX Saving Technology

##### LG BW R

High Rejection

##### LG BW AFR

Anti-Fouling, High Rejection

##### LG BW ES

Energy Saving

## LG NanoH<sub>2</sub>O™ SW G2 Membranes

With the industry's **highest** salt rejection, LG NanoH<sub>2</sub>O™ SW G2 membranes can deliver:

- **Improved permeate quality** without increasing operating pressure
- **Reduced energy cost** without sacrificing permeate quality
- **Reduced capital and operational costs** for multi-pass SWRO systems

Model	Active Membrane Area, ft <sup>2</sup> (m <sup>2</sup> )	Permeate Flow Rate, GPD (m <sup>3</sup> /d)	Stabilized Salt Rejection, %	Minimum Salt Rejection, %	Boron Rejection, %	Feed Spacer, mil
LG SW 440 SR G2	440 (41)	6,600 (25.0)	99.89	99.75	93	28
LG SW 400 SR G2	400 (37)	6,000 (22.7)	99.89	99.75	93	34
LG SW 440 GR G2	440 (41)	8,250 (31.2)	99.89	99.75	93	28
LG SW 400 GR G2	400 (37)	7,500 (28.4)	99.89	99.75	93	34
LG SW 440 R G2	440 (41)	9,900 (37.5)	99.88	99.75	93	28
LG SW 400 R G2	400 (37)	9,000 (34.1)	99.88	99.75	93	34

Test Conditions : 32,000 ppm NaCl, 5 ppm Boron at 25°C (77°F), 800 psi (55 bar), pH 8, Recovery 8%

## LG NanoH<sub>2</sub>O™ SW G1 Membranes

Model	Active Membrane Area, ft <sup>2</sup> (m <sup>2</sup> )	Permeate Flow Rate, GPD (m <sup>3</sup> /d)	Stabilized Salt Rejection, %	Minimum Salt Rejection, %	Boron Rejection, %	Feed Spacer, mil
LG SW 440 SR	440 (41)	6,600 (25.0)	99.85	99.7	93	28
LG SW 400 SR	400 (37)	6,000 (22.7)	99.85	99.7	93	34
LG SW 440 GR	440 (41)	8,250 (31.2)	99.85	99.7	93	28
LG SW 400 GR	400 (37)	7,500 (28.4)	99.85	99.7	93	34
LG SW 440 R	440 (41)	9,900 (37.5)	99.85	99.7	93	28
LG SW 400 R	400 (37)	9,000 (34.1)	99.85	99.7	93	34
LG SW 440 ES*	440 (41)	7,480 (28.3)	99.60	99.3	81	28
LG SW 440 ES	440 (41)	15,070 (57.0)	99.80	99.6	89	28
LG SW 400 ES*	400 (37)	6,800 (25.7)	99.60	99.3	81	34
LG SW 400 ES	400 (37)	13,700 (51.9)	99.80	99.6	89	34

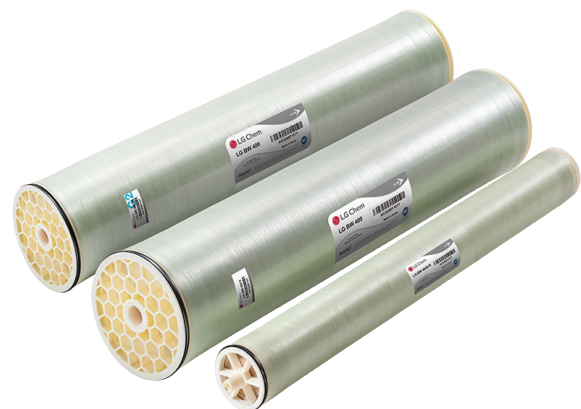
Test Conditions : 32,000 ppm NaCl, 5 ppm Boron at 25°C (77°F), 800 psi (55 bar), pH 8, Recovery 8%

\*Specifications for when test conditions performed at 600 psi (4.1 MPa)

## LG NanoH<sub>2</sub>O™ BWRO Membranes

Model	Active Membrane Area, ft <sup>2</sup> (m <sup>2</sup> )	Permeate Flow Rate, GPD (m <sup>3</sup> /d)	Stabilized Salt Rejection, %	Minimum Salt Rejection, %	Feed Spacer, mil	Operating Pressure, psi (bar)
<b>LG MaxRO:</b> Maximized Performance for the Most Challenging Applications						
LG MaxRO R	400 (37)	11,500 (43.5)	99.8	99.5	36, low dP	225 (15.5)
<b>LG BW AFR G2:</b> BWRO Membrane with Intrinsic Anti-fouling Properties						
LG BW 400 AFR G2	400 (37)	11,500 (43.5)	99.7	99.6	34, low dP	225 (15.5)
LG BW 400 AFR	400 (37)	10,500 (39.7)	99.6	99.5	34	225 (15.5)
<b>LG BW R G2:</b> Highest Rejection BWRO Membrane						
LG BW 400 R G2	400 (37)	11,500 (43.5)	99.8	99.65	34, low dP	225 (15.5)
LG BW 440 R G2	440 (41)	12,650 (47.9)	99.8	99.65	28	225 (15.5)
<b>LG BW R Dura:</b> Enhanced Chemical Durability (Widest Cleaning pH Range)						
LG BW 400 R Dura	400 (37)	10,500 (39.7)	99.7	99.6	34, low dP	225 (15.5)
LG BW 440 R Dura	440 (41)	11,550 (43.7)	99.7	99.6	28	225 (15.5)
<b>LG BW R:</b> High Rejection Membrane with Reliable and Proven Performance						
LG BW 400 R	400 (37)	10,500 (39.7)	99.6	99.5	34	225 (15.5)
LG BW 440 R	440 (41)	11,550 (43.7)	99.6	99.5	28	225 (15.5)
<b>LG BW ES:</b> Energy saving BWRO membrane						
LG BW 400 ES L	400 (37)	10,500 (39.7)	99.6	99.5	34, low dP	150 (10.3)
LG BW 400 ES	400 (37)	10,500 (39.7)	99.6	99.5	34	150 (10.3)
LG BW 440 ES L	440 (41)	11,550 (43.7)	99.6	99.5	28, low dP	150 (10.3)
LG BW 440 ES	440 (41)	11,550 (43.7)	99.6	99.5	28	150 (10.3)
<b>LG MOST:</b> Maximized OPEX Saving Technology for the MOST Energy Savings						
LG BW MOST	400 (37)	13,200 (49.9)	98.5	97.0	34, low dP	125 (8.6)
LG BW MOST+	440 (41)	14,500 (54.9)	98.5	97.0	28, low dP	125 (8.6)

Test Conditions: 2,000 ppm NaCl at 25°C (77°F), pH 7, Recovery 15%



## Light Commercial RO Membranes

Model	Active Membrane Area, ft <sup>2</sup> (m <sup>2</sup> )	Permeate Flow Rate, GPD (m <sup>3</sup> /d)	Stabilized Salt Rejection, %	Minimum Salt Rejection, %	Recovery, %	Operating Pressure, psi (bar)
<b>Seawater<sup>1</sup></b>						
LG SW 4040 R	80 (7.4)	1,950 (7.4)	99.7	99.5	8	800 (55)
<b>High Rejection<sup>2</sup></b>						
LG BW 4040 R	85 (7.9)	2,500 (9.5)	99.6	99.3	15	225 (15.5)
LG BW 4021 R	34 (3.2)	1,000 (3.8)	99.6	99.3	8	225 (15.5)
LG BW 2540 R	22 (2.0)	750 (2.8)	99.6	99.3	15	225 (15.5)
LG BW 2521 R	9 (0.9)	345 (1.3)	99.6	99.3	8	225 (15.5)
<b>Low Pressure / Energy Saving<sup>2</sup></b>						
LG BW 4040 ES	85 (7.9)	2,500 (9.5)	99.5	99.2	15	150 (10.3)
LG BW 4021 ES	34 (3.2)	1,000 (3.8)	99.5	99.2	8	150 (10.3)
LG BW 2540 ES	22 (2.0)	750 (2.8)	99.5	99.2	15	150 (10.3)
LG BW 2521 ES	9 (0.9)	345 (1.3)	99.5	99.2	8	150 (10.3)
<b>Ultra-Energy Saving<sup>3</sup></b>						
LG CW 4040 SF*	85 (7.9)	2,900 (11.0)	99.0	98.0	15	100 (6.9)
LG BW 4040 UES	85 (7.9)	2,700 (10.2)	99.0	98.0	15	100 (6.9)
LG BW 4021 UES	34 (3.2)	1,000 (3.8)	99.0	98.0	8	100 (6.9)
LG BW 2540 UES	21 (2.0)	800 (3.0)	99.0	98.0	15	100 (6.9)
LG BW 2521 UES	9 (0.9)	345 (1.3)	99.0	98.0	8	100 (6.9)

<sup>1</sup>Test conditions: 32,000 ppm NaCl at 25°C (77°F), pH 8

<sup>2</sup>Test conditions: 2,000 ppm NaCl at 25°C (77°F), pH 7

<sup>3</sup>Test conditions: 500 ppm NaCl at 25°C (77°F), pH 7

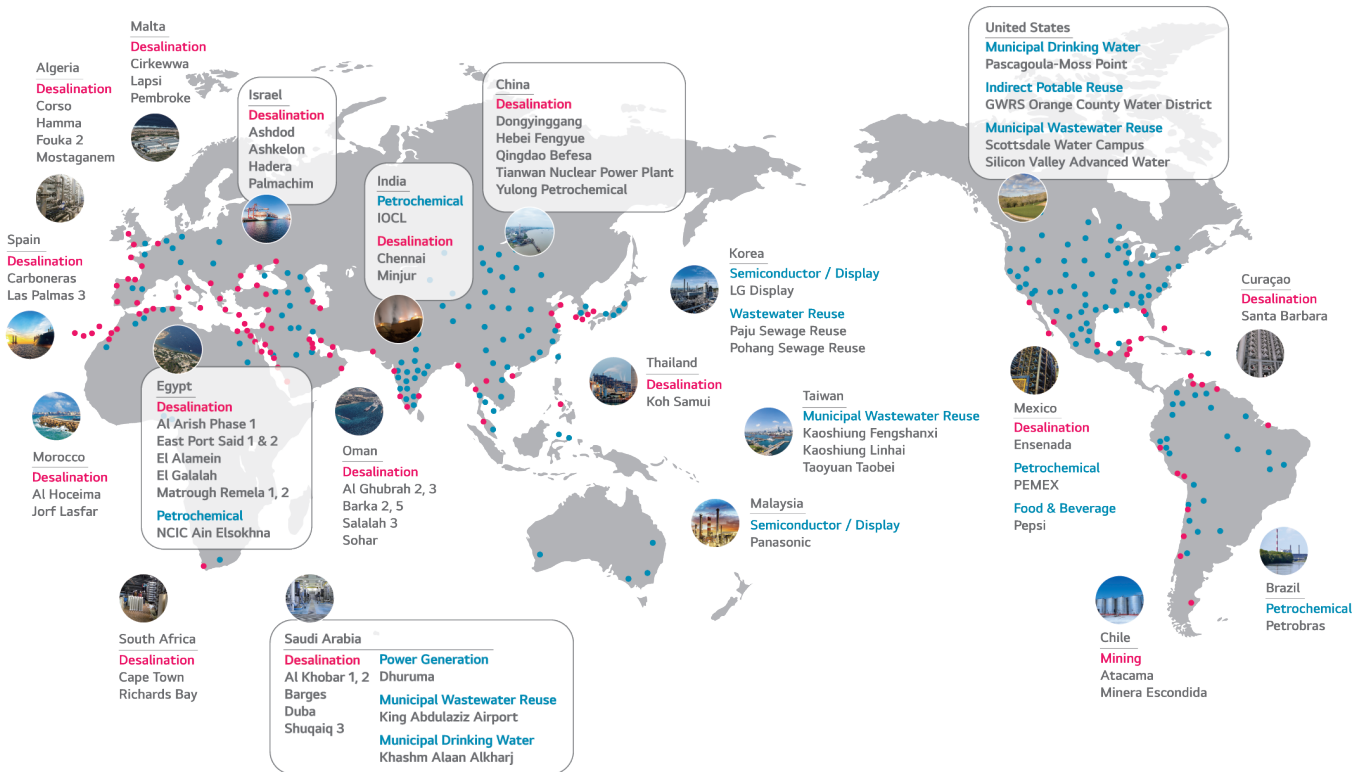
\*Shipped dry



# Proven Track Record of Performance and Quality

## Selected Global References

● SWRO ● BWRO



I-EN-050224



**Nano:H<sub>2</sub>O™**

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