

# LG Water Solutions



## LG Water Solutions



LG Water solutions, part of LG Chem, LTD., manufactures the full line of NanoH<sub>2</sub>O™ seawater, brackish water and residential reverse osmosis (RO) membranes that provide quality water with reliable performance for water treatment. Based on breakthrough nano structured materials and industry-proven polymer technology, these patented membranes dramatically improve energy efficiency and productivity. LG Chem's RO membranes deliver best in class flux and salt rejection in industry-standard configurations that fit easily into existing RO systems, purifying water from a broad range of sources with improved productivity and water quality.

## State of the Art Operations



Membrane casting, coating, rolling and wet-testing all fully-integrated



Commissioned September 2015, located in Cheong-ju, Korea







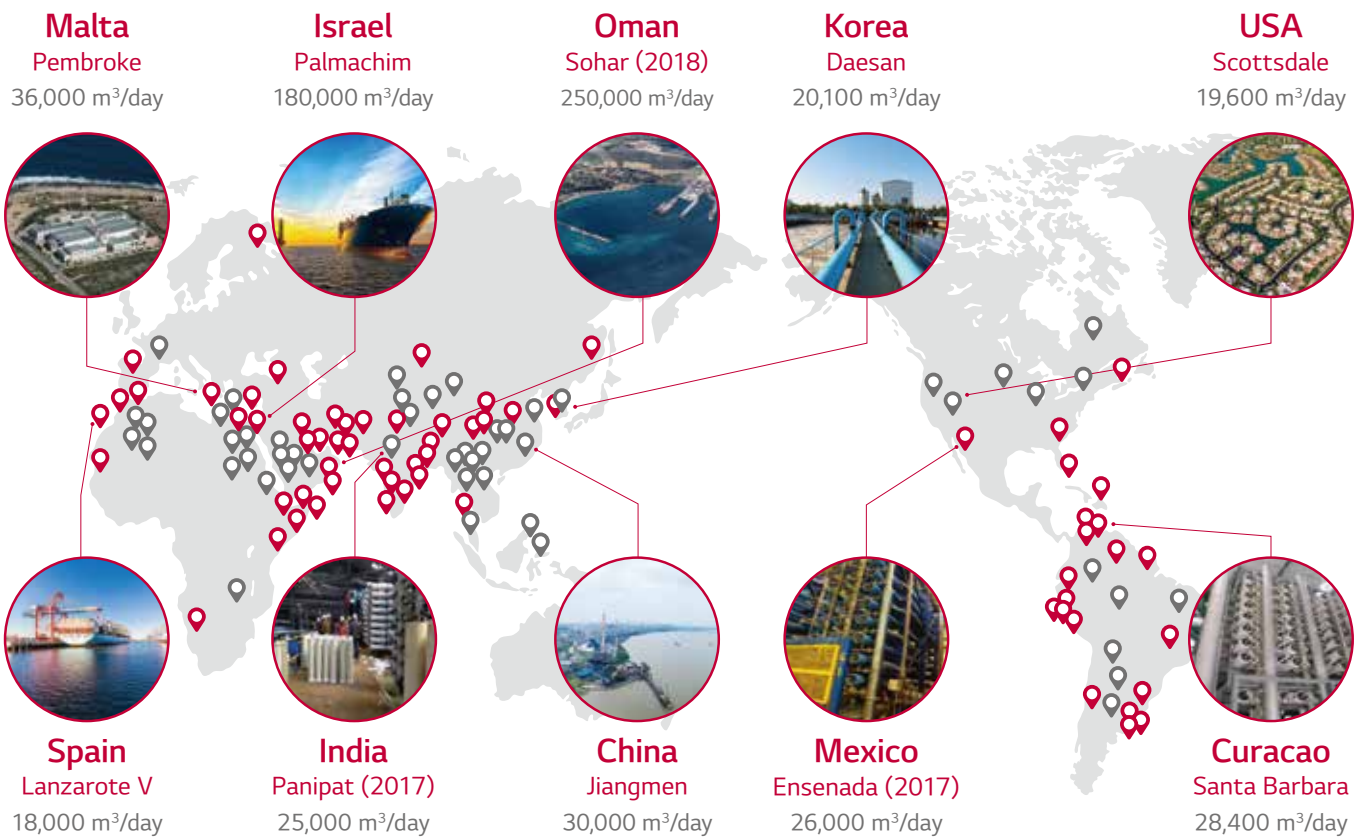
# LG Chem Awarded Sohar Project

Sohar SW RO Company LLC has chosen LG Chem's NanoH<sub>2</sub>O™ RO membranes for its **250 MLD** sea water desalination plant in Oman

## Global Reference: Seawater desalination & Brackish water

Hundreds of installations across 50 countries, delivering quality water across the globe

📍 Seawater desalination | 📍 Brackish water



# LG Water Solutions

## Proven Performance by Winning Large Project



### Seawater RO Membranes

## Global Reference

Seawater desalination

**Algeria**  
Mostaganem  
25,000 m<sup>3</sup>/day

**Malta**  
Pembroke  
36,000 m<sup>3</sup>/day

**Egypt**  
Matrouh Remela Phase 1  
25,000 m<sup>3</sup>/day

**Israel**  
Palmachim  
180,000 m<sup>3</sup>/day

**Curacao**  
Santa Barbara  
28,400 m<sup>3</sup>/day



## Overview

LG Chem's thin-film nanocomposite (TFN) membranes offer lower water treatment costs by improving energy efficiency and productivity. We increase water production by up to 20% and provide industry leading salt rejection of 99.85%. We continue to leverage these technical advantages to win large desalination projects such as the Sohar sea water desalination project in Oman which will produce 250 million liters of water per day upon completion.



-  **LG SW SR, GR and R High rejection membranes**  
Well suited for high TDS and high quality permeate requirements
-  **LG SW ES Energy-Saving membranes**  
Well suited for low TDS and low temperature seawater applications



## Product Specifications

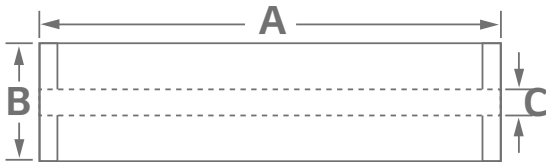
Configuration : 8-inch spiral wound : Thin-film nanocomposite (TFN) polyamide

Product	Flow rate m <sup>3</sup> /d (GPD)	Minimum NaCl rejection (%)	NaCl rejection (%)	Boron rejection (%)	Active area m <sup>2</sup> (ft <sup>2</sup> )	Feed spacer (mil*)
LG SW 400 SR	22.7 (6,000)	99.7	99.85	93	37 (400)	28 or 34
LG SW 440 SR	25 (6,600)	99.7	99.85	93	41 (400)	28
LG SW 400 GR	28.4 (7,500)	99.7	99.85	93	37 (400)	28 or 34
LG SW 440 GR	31.2 (8,250)	99.7	99.85	93	41 (400)	28
LG SW 400 R	34 (9,000)	99.7	99.85	93	37 (400)	28 or 34
LG SW 440 R	37 (9,900)	99.7	99.85	93	41 (400)	28
LG SW 400 ES	52 (13,700)	99.6	99.8	89	37 (400)	28 or 34
LG SW 440 ES	57 (15,070)	99.6	99.8	89	41 (400)	28

\*400 square-foot elements available with either 28 or 34 mil feed spacer

Note : The above values are normalized to the following conditions : 32,000 ppm NaCl, 5 ppm boron, 5.5 MPa (800 psi), 25°C (77°F), pH 8, 8% recovery.

Permeate flows for individual elements may vary +/- 15%.



Length A	Element O.D. B	Perm tube I.D. C	Weight kg (lbs.)
1,016 mm (40 in.)	200 mm (7.9 in.)	28.6 mm (1.125 in.)	16.4 (36)

## Operating Specifications

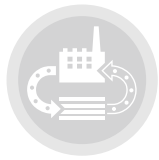
For more information and operating guidelines, visit [www.LGwatersolutions.com](http://www.LGwatersolutions.com)

Max. Applied pressure:	82.7 bar (1,200 psig)
Max. Chlorine concentration:	< 0.1 ppm
Max. Operating temperature:	45°C (113°F)
pH Range, Continuous (Cleaning):	2-11 (2-13)
Max. Feedwater turbidity:	1.0 NTU
Max. Feedwater SDI (15 mins):	5.0
Max. Pressure drop ( $\Delta P$ ) for each element:	1 bar (15 psi)



# LG Water Solutions

## Proven Quality Keeps Repeating Customer



### Brackish Water RO Membranes

## Global Reference

📍 Brackish water

### Greece

Chemitec-2014  
Industrial process



### India

Birla Tyre  
Industrial waste water recycle



### Korea

LG Display-2015/2016 | Hanhwa TOTAL-2016  
UPW | Cooling water



### USA

City of Scottsdale, Arizona-2016  
Golf course irrigation



### Brazil

Veolia-2016  
Industrial process



**Saudi Arabia**  
AES arabia-2015  
Drinking water



**Malaysia**  
ECO Solution-2016  
Process water



Mackenzie-2016  
Boiler



**Chile**  
Embonor (CocaCola)-2015  
Beverages

## Overview

LG Chem's thin-film nanocomposite (TFN) membranes offer lower water treatment costs by improving energy efficiency and productivity. We provide reliable and trouble free performance and have already proven our performance and quality by generating return clients. The new LG BW 400 AFR boasts a proprietary chemistry that reduces performance deterioration due to organic and biological fouling, a common problem in various water treatment applications. We offer industry-standard 8-inch and 4-inch element configurations that retrofit easily into standard pressure vessels.



### LG BW R

### High rejection membranes

Well suited for high salinity feed water and high quality permeate requirements



### LG BW ES

### Energy-Saving membranes

Well suited for low saline water or potable water production



### LG BW AFR

### Anti-Fouling membranes

Well suited for challenging feed water across varying operating conditions



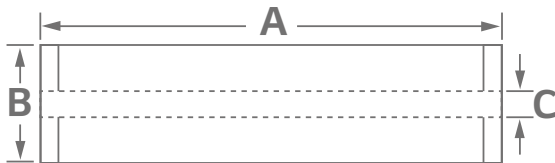
## Product Specifications

Configuration: 8-inch spiral wound : Thin-film nanocomposite (TFN) polyamide

Product	Flow rate m <sup>3</sup> /d (GPD)	Minimum NaCl rejection (%)	NaCl rejection (%)	Active area m <sup>2</sup> (ft <sup>2</sup> )	Feed spacer (mil*)
LG BW 400 R	39.7 (10,500)	99.5	99.6	37 (400)	34
LG BW 440 R	43.7 (11,550)	99.5	99.6	41 (440)	28
LG BW 400 ES	39.7 (10,500)	99.5	99.6	37 (400)	34
LG BW 440 ES	43.7 (11,550)	99.5	99.6	41 (440)	28
LG BW 400 AFR	39.7 (10,500)	99.5	99.6	37 (400)	34

Note : \*LG BW 400 R, LG BW 440 R, LG BW 440 AFR\_The above values are normalized to the following conditions : 2,000 ppm NaCl, 15.5bar (225 psi), 25°C (77°F), pH 8, 15% recovery. Permeate flows for individual elements may vary +/- 15%.

Note : \*LG BW 400 ES, LG BW 440 ES\_The above values are normalized to the following conditions : 2,000 ppm NaCl, 10.3bar (150 psi), 25°C (77°F), pH 8, 15% recovery. Permeate flows for individual elements may vary +/- 15%.



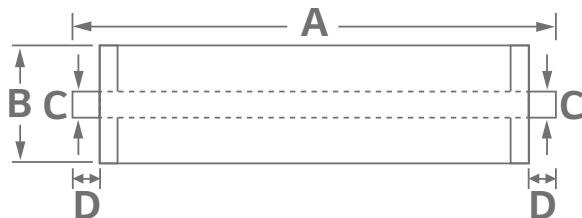
Length A	Element O.D. B	Perm tube I.D. C	Weight kg (lbs.)
1,016 mm (40 in.)	200 mm (7.9 in.)	28.6 mm (1.125 in.)	16.4 (36)

Configuration: 4-inch spiral wound : Thin-film nanocomposite (TFN) polyamide

Product	Flow rate m <sup>3</sup> /d (GPD)	Minimum NaCl rejection (%)	NaCl rejection (%)	Active area m <sup>2</sup> (ft <sup>2</sup> )	Feed spacer (mil*)
LG BW 4040 R	9.5 (2,500)	99.3	99.6	7.9 (85)	28
LG BW 4040 ES	9.5 (2,500)	99.2	99.5	7.9 (85)	28
LG BW 4040 AFR	8.7 (2,300)	99.3	99.6	7.4 (80)	34

Note : \*LG BW 4040 R, LG BW 4040 AFR\_The above values are normalized to the following conditions : 2,000 ppm NaCl, 15.5bar (225 psi), 25°C (77°F), pH 8, 15% recovery. Permeate flows for individual elements may vary +/- 20%.

Note : \*LG BW 4040 ES\_The above values are normalized to the following conditions : 2,000 ppm NaCl, 10.3bar (150 psi), 25°C (77°F), pH 8, 15% recovery. Permeate flows for individual elements may vary +/- 20%.



Length A	Element O.D. B	Core tube I.D. C	Core tube Extension D	Weight kg (lbs.)
1,016 mm (40 in.)	100 mm (3.9 in.)	19 mm (0.75 in.)	28 mm (1.1 in.)	3.6 (8.0)

## Operating Specifications

For more information and operating guidelines, visit [www.LGwatersolutions.com](http://www.LGwatersolutions.com)

Max. Applied pressure:	4.14 MPa (600 psi)
Max. Chlorine concentration:	< 0.1 ppm
Max. Operating temperature:	45°C (113°F)
pH Range, Continuous (Cleaning):	2-11 (2-13)
Max. Feedwater turbidity:	1.0 NTU
Max. Feedwater SDI (15 mins):	5.0
Max. Pressure drop (ΔP) for each element:	1 bar (15 psi)





# LG Water Solutions

## Grow your Consumer Business with LG Chem Brand



### Residential RO



### Overview

LG Chem's NanoH<sub>2</sub>O™ reverse osmosis elements for residential water treatment obtain US patented RO membranes to produce clean water for customer health. We assure quality water by NSF and world-renowned LG brand. These membranes are made in Korea and deliver the reliability and quality to customers from around the world.



#### LG TW RO

#### Tap water membranes

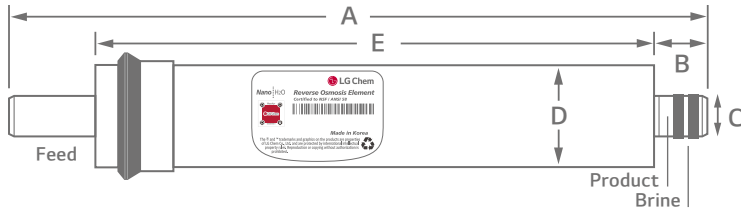
Deliver quality drinking water and reliable performance

### Product Specifications

Product	Minimum permeate flow rate m <sup>3</sup> /d (GPD)	Minimum NaCl rejection (%)	Stabilized NaCl rejection (%)
LG TW RO-1812-35	35	96	98
LG TW RO-1812-50	50	96	98
LG TW RO-1812-80	80	96	98
LG TW RO-2012-100	100	96	98

Note : The above values are normalized to the following conditions: 250 ppm NaCl, pH7.5 controlled by NaHCO<sub>3</sub>, 25°C (77°F), 60 psig (4.1 bar), 15% recovery. Permeate flows for individual elements may vary -10%.





Product	Total length (A)	Front connector length (B)	Connector diameter (C)	Element diameter (D)	Element length (E)
<b>LG TW RO-1812-35</b> <b>LG TW RO-1812-80</b> <b>LG TW RO-1812-50</b>	298 mm (11.7 in.)	18 mm (0.7 in.)	17 mm (0.7 in.)	44.5 mm (1.75 in.)	265 mm (10.4 in.)
<b>LG TW RO-2012-100</b>	298 mm (11.7 in.)	18 mm (0.7 in.)	17 mm (0.7 in.)	48 mm (1.89 in.)	265 mm (10.4 in.)

## Operating Specifications

For more information and operating guidelines, visit [www.LGwatersolutions.com](http://www.LGwatersolutions.com)

- Maximum temperature for continuous operation above pH 10 is (35°C) 95°F.
- Under certain conditions, the presence of free chlorine and other oxidizing agents will cause premature membrane failure. Since oxidation damage is not covered under warranty, LG Chem recommends removing residual free chlorine by pretreatment prior to membrane exposure.

The information and data contained herein are deemed to be accurate and reliable and are offered in good faith, but without guarantee of performance. LG Chem assumes no liability for results obtained or damages incurred through the application of the information contained herein. Customer is responsible for determining whether the products and information presented herein are appropriate.

Maximum operating pressure: 10 bar (150 psig)

Maximum operating temperature: 45°C (113°F)

Maximum feed flow rate: 7.6 lpm (2.0 gpm)

pH Range, Continuous<sup>1</sup>: 2-11

Free chlorine tolerance<sup>2</sup>: <0.1 ppm

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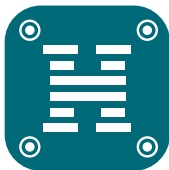
## Authentic LG TW RO guarantee genuine water

Step  
01

Scan the QR code and download "Hiddentag" APP or simply enter "Hiddentag" in app market

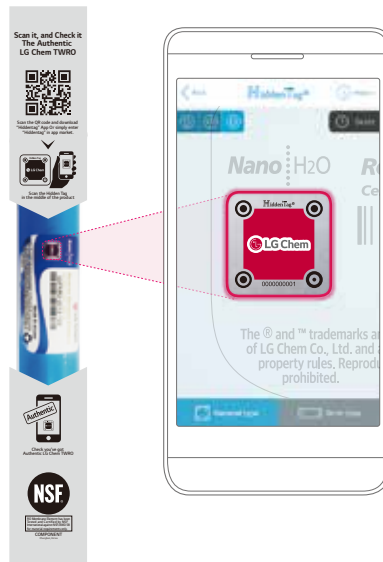


or



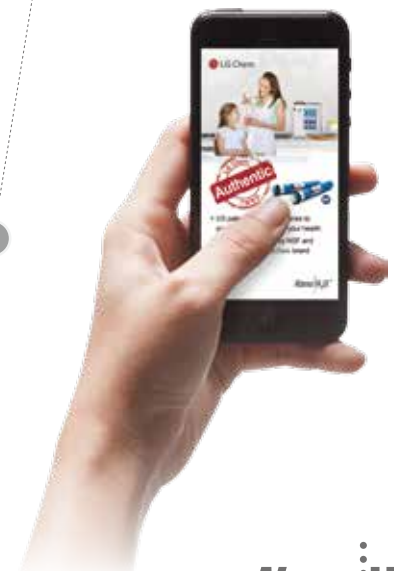
Step  
02

Scan the Hidden Tag in the middle of the product



Step  
03

Check you've got Authentic LG Chem TW RO



**“Responsive & Responsible”**



Regions	Phone Number	Representative Email
America	+1 424 218 4042	nasales@lgchem.com
Europe, Africa except Egypt	+49 162 2970927	eumanasales@lgchem.com
Middle East, Egypt	+971 50 624 3184	mesales@lgchem.com
Korea	+82 2 3773 6572	krsales@lgchem.com
China	+86 2160872900 513	cnsales@lgchem.com
India	+91 9810013345	insales@lgchem.com
South East Asia	+65 9749 7471	seasales@lgchem.com