



## DOW™ FILMTEC™ Membranes

### DOW™ FILMTEC™ SW30ULE-440/ Seawater Reverse Osmosis Element with *iLEC*™ Interlocking Endcaps

#### Features and Benefits

Dow Water & Process Solutions offers various premium seawater reverse osmosis (RO) elements designed to reduce capital and operation cost of desalination systems. DOW™ FILMTEC™ products combine premium membrane quality with automated precision fabrication which take system performance to unprecedented levels.

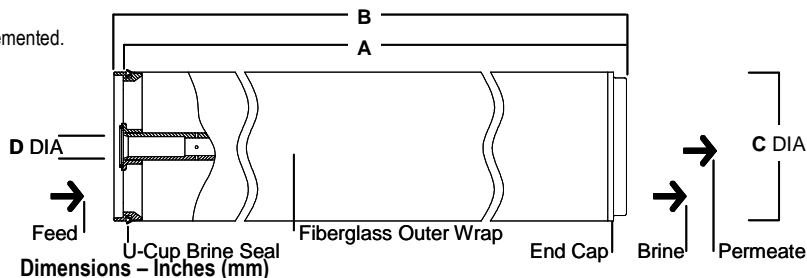
DOW™ FILMTEC™ SW30ULE-440i is an element of choice for low to medium salinity and temperature waters, for permeate staged systems for stringent water quality targets, and for high feed salinity brackish water applications. It has the highest sustainable flow rate available in the industry, coupled with high rejection of NaCl and boron. This performance can lead to significant capital and operation cost savings, especially when this element is mixed with other element types in the same pressure vessel, using the “internally staged design” approach. . In addition, the combination of highest active area and thickest feed spacer of the Dow FILMTEC membranes results in higher productivity and lower cleaning frequency enabling sustainable lower lifecycle cost. Benefits of the DOW FILMTEC SW30ULE-440i element include:

- The highest seawater element flow rate in the industry, coupled with high rejection, allowing ultra-low energy consumptions. This enables lowest capital and operation cost in a seawater system.
- The highest guaranteed active area of 440 ft<sup>2</sup> (41 m<sup>2</sup>) permits lowest system cost by maximizing productivity and enables accurate and predictable system design and operating flux.
- The combination of highest active area with wide feed spacer (28 mil) allows low cleaning frequency and high cleaning efficiency.
- Utilization of the distinct *iLEC*™ interlocking endcaps that help reduce system operating costs and reduce the risk of o-ring leaks that cause poor water quality (See Form No. 609-00446 for information on cost-saving benefits)
- Sustainable high performance over the operating lifetime, because oxidative treatments are not used in membrane production. This is one reason DOW FILMTEC elements are more durable and may be cleaned more effectively over a wider pH range (1-13) than most other RO elements, which use oxidative treatments.
- Can effectively be used in permeate staged seawater desalination systems without impairing the performance of the downstream stage.
- Automated, precision fabrication with a greater number of shorter membrane leaves reduces the effect of overall fouling and maximizes element efficiency, lowering cost of operation.

#### Product Specifications

Product	Part Number	Active Area ft <sup>2</sup> (m <sup>2</sup> )	Maximum Operating Pressure psig (bar)	Permeate Flow Rate gpd (m <sup>3</sup> /d)	Stabilized Boron Rejection %	Minimum Salt Rejection %	Stabilized Salt Rejection %
SW30ULE-440/		440 (41)	1,200 (83)	12,000 (45.4)	89	99.55	99.70

1. The above benchmark values are based on the following test conditions: 32,000 ppm NaCl, 800 psi (5.5 MPa), 77°F (25°C), pH 8 and 8% recovery.
2. Permeate flows for individual elements may vary +/-15%.
3. Product specifications may vary slightly as improvements are implemented.



Product	Feed Spacer (mil)	A	B	C	D
SW30ULE-440/	28	40 (1,016)	40.5 (1,029)	7.9 (201)	1.125 (29)

1. Refer to Dow Design Guidelines for multiple-element systems.
2. Elements fit nominal 8-inch (203 mm) I.D. pressure vessel.

1 inch = 25.4 mm

## Operating Limits

• Membrane Type	Polyamide Thin-Film Composite
• Maximum Operating Temperature	113°F (45°C)
• Maximum Element Pressure Drop	13 psig (0.9 bar)
• pH Range, Continuous Operation <sup>a</sup>	2 – 11
• pH Range, Short-Term Cleaning (30 min.) <sup>b</sup>	1 – 13
• Maximum Feed Silt Density Index (SDI)	SDI 5
• Free Chlorine Tolerance <sup>c</sup> <0.1	ppm

a. Maximum temperature for continuous operation above pH 10 is 95°F (35°C).

b. Refer to Cleaning Guidelines in specification sheet 609-23010.

c. 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, Dow recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to technical bulletin 609-22010 for more information.

## Important Information

Proper start-up of reverse osmosis water treatment systems is essential to prepare the membranes for operating service and to prevent membrane damage due to overfeeding or hydraulic shock. Following the proper start-up sequence also helps ensure that system operating parameters conform to design specifications so that system water quality and productivity goals can be achieved.

Before initiating system start-up procedures, membrane pretreatment, loading of the membrane elements, instrument calibration and other system checks should be completed.

Please refer to the application information literature entitled "[How to Start-Up an RO Membrane System](#)" (Form No. 609-02077) for more information.

## Operation Guidelines

Avoid any abrupt pressure or cross-flow variations on the spiral elements during start-up, shutdown, cleaning or other sequences to prevent possible membrane damage. During start-up, a gradual change from a standstill to operating state is recommended as follows:

- Feed pressure should be increased gradually over a 30-60 second time frame.
- Cross-flow velocity at set operating point should be achieved gradually over 15-20 seconds.
- Permeate obtained from first hour of operation should be discarded.

Please refer to product technical manual.

## General Information

- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines given in this bulletin are not strictly followed, the limited warranty will be null and void. Refer to the [FILMTEC™ Reverse Osmosis and Nanofiltration Element Three-Year Prorated Limited Warranty](#) (609-35010) for more detail.
- To prevent biological growth during prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution.
- The customer is fully responsible for the effects of incompatible chemicals and lubricants on elements.
- Maximum pressure drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).
- Avoid static permeate-side backpressure at all times.
- Wear protective eye shields, gloves, and sleeves to avoid prolonged contact with eyes, skin, and clothing.

**Notice:** The use of this product in and of itself does not necessarily guarantee the removal of cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenance of the system.

Notice: No freedom from any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean The Dow Chemical Company and its consolidated subsidiaries unless otherwise expressly noted. NO WARRANTIES ARE GIVEN EXCEPT FOR ANY LIMITED PERFORMANCE WARRANTY SET FORTH HEREIN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

# LENNTECH

info@lenntech.com

Tel www.lenntech.com

Tel. +31-152-610-900

Fax +31-152-616-289

