



## FILMTEC™ Membranes

### FILMTEC XLE-440 Extra Low Energy RO Element

#### Features

The FILMTEC™ XLE-440 is an extra low energy, high productivity brackish water reverse osmosis element designed to deliver high quality water at low operating costs for municipal and industrial water applications. Its high active area design coupled with the highly productive XLE membrane makes FILMTEC XLE-440 the lowest pressure RO element – resulting in lower energy costs.

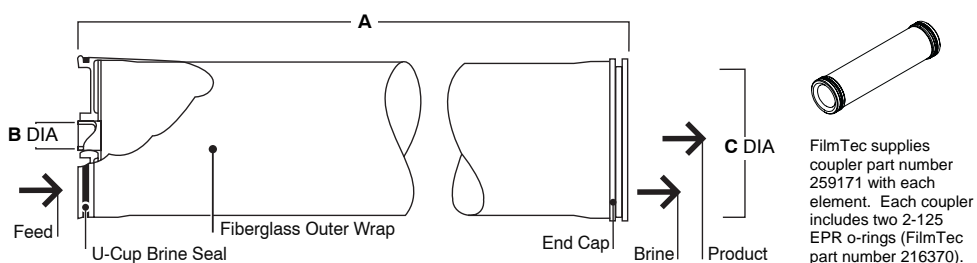
- XLE-440 will operate in many systems at less than half the feed pressure of a standard high rejection RO element and at up to 30% less pressure than other low energy membranes, resulting in lifetime energy savings greater than 100% of the initial membrane investment.
- With 440 square feet (41 square meters) of active membrane area, the FILMTEC XLE-440 element gives system designers the option of designing a system with fewer membrane elements, requiring lower capital expenditures for membranes and components.
- Automated, precision fabrication allows for the industry’s highest active membrane area without compromising the thickness of the feed spacer, resulting in less fouling, less cleaning downtime and lower operating costs than competitive products using thinner spacers.
- XLE-440 is perfectly suited for cold water feeds as the element’s high productivity will deliver lower energy costs and/or higher permeate flow.

#### Product Specifications

Product	Part Number	Nominal Active Area ft <sup>2</sup> (m <sup>2</sup> )	Applied Pressure psig (bar)	Permeate Flow Rate gpd (m <sup>3</sup> /d)	Stabilized Salt Rejection
XLE-440	101060	440 (41)	100 (6.9)	12,700 (48)	99.0%

1. Permeate flow and salt rejection based on the following test conditions: 500 ppm NaCl, pressure specified above, 77°F (25°C) and 15% recovery.
2. Permeate flows for individual elements may vary +25/-15%.
3. Minimum stabilized salt rejection is 98.0%.
4. The above specifications are benchmark values. Please be sure to operate according to system design guidelines.

Figure 1



Dimensions – Inches (mm)

Product	A	B	C
XLE-440	40.0 (1,016)	1.50 (38)	7.9 (201)

5. Refer to FilmTec Design Guidelines for multiple-element systems.
6. XLE-440 fits nominal 8-inch (203 mm) I.D. pressure vessel.

## Operating Limits

- Membrane Type Polyamide Thin-Film Composite
- Maximum Operating Temperature 113°F (45°C)
- Maximum Operating Pressure 600 psig (41 bar)
- Maximum Pressure Drop 15 psig (1.0 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

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

<sup>b</sup> Refer to Cleaning Guidelines in specification sheet 609-23010.

<sup>c</sup> 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, FilmTec 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 "Start-Up Sequence" (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.

## 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.
- 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.

### FILMTEC™ Membranes

For more information about FILMTEC membranes, call the Dow Liquid Separations business:

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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.

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