

Product Information Bulletin



DOW FILMTEC™ Membranes

DOW FILMTEC XFRLE-400/34*i* High Productivity, Fouling Resistant Low-Energy Brackish Water RO Element with *iLEC*™ Technology

Benefits

DOW FILMTEC™ XFRLE-400/34*i* element embodies Dow's latest innovations in treatment of challenging waters with high biological and organic fouling tendencies such as municipal or industrial wastewater or challenging surface water:

- Proven fouling resistance chemistry of the DOW FILMTEC BW30XFR-400/34*i* operating at over 30% lower pressure
- Large 34-mil spacer optimized for pressure drop minimization reducing the impact of fouling and enhancing the cleaning efficiency
- Wide chemical tolerance allowing effective and efficient cleaning of biofilms, organic compounds and scale at cleaning pH from 1 to 13
- High rejection of special solutes such as Nitrate, Ammonium or Silica
- High integrity achieved with proprietary *iLEC*™ technology (interlocking end-caps), minimizing the risk of o-ring leaks that can contribute to poor water quality

Offering long term stable performance at lowest total life cycle cost. The high solute rejection make treated water suitable for reuse in a large number of applications.

Product Specifications

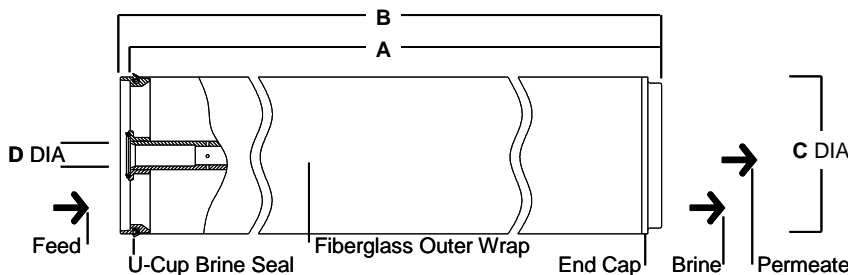
| Product | Part number | Active area ft ² (m ²) | Feed spacer thickness (mil) | Permeate flow rate gpd (m ³ /d) | Stabilized salt rejection (%) | Minimum salt rejection (%) |
|-----------------------|-------------|--|--------------------------------|---|----------------------------------|-------------------------------|
| XFRLE-400/34 <i>i</i> | 347731 | 400 (37) | 34 | 11,500 (44) | 99.4 | 99.2 |

Typical Solute Rejections

| Silica rejection (%) | Nitrate rejection (%) | Ammonium rejection (%) | Isopropyl alcohol rejection (%) |
|-------------------------|--------------------------|---------------------------|------------------------------------|
| 99.7 | 96.4 | 97.0 | 92 |

1. Permeate flow and salt (NaCl) rejection based on the following standard test conditions: 2,000 ppm NaCl, 150 psi (10.3 bar), 77°F (25°C), pH 8 and 15% recovery.
2. For comparison, the XFRLE-400/34*i* will have permeate flow of 12,300 gpd (46.6 m³/d) and stabilized rejection of 99.4% when normalized to a feed solution of 1,500 ppm NaCl as used by some manufacturers.
3. Flow rates for individual elements may vary but will be no more than +/- 15%.
4. Sales specifications may vary as design revisions take place.
5. Active area guaranteed +/-3%. Active area as stated by Dow Water & Process Solutions is not comparable to nominal membrane area often stated by some manufacturers. Measurement method described in Form No. 609-00434.
6. Typical solute stabilized rejections based on the following standard test conditions: 2,000 ppm NaCl, 150 psi (10.3 bar), 77°F (25°C), pH 7 and 15% recovery, 50 ppm SiO₂ or 100 ppm NO₃⁻ or 100 ppm NH₄⁺ or 100 ppm IPA.

Figure 1.



Dimensions – inches (mm)

| Product | A | B | C | D |
|-----------------------|--------------|--------------|-----------|---------------|
| XFRLE-400/34 <i>i</i> | 40.0 (1,016) | 40.5 (1,029) | 7.9 (201) | 1.125 ID (29) |

1. Refer to Dow Water & Process Solutions Design Guidelines for multiple-element applications. 1 inch = 25.4 mm
2. Element to fit nominal 8-inch (203 mm) I.D. pressure vessel.
3. Individual elements with *iLEC* endcaps measure 40.5 inches (1,029 mm) in length (B). The net length (A) of the elements when connected is 40.0 inches (1,016 mm).

Operating Limits

- | | |
|--|-------------------------------|
| • Membrane Type | Polyamide Thin-Film Composite |
| • Maximum Operating Temperature ^a | 113°F (45°C) |
| • Maximum Operating Pressure | 600 psig (41 bar) |
| • Maximum Pressure Drop | 15 psig (1.0 bar) |
| • pH Range, Continuous Operation ^a | 2 - 11 |
| • pH Range, Short-Term Cleaning (30 min.) ^b | 1 - 13 |
| • Maximum Feed Silt Density Index | SDI 5 |
| • Free Chlorine Tolerance ^c | <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 Water & Process Solutions recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to technical bulletin 609-22010 for more information.

General 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.

Important Information

- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines given in this Product Information Bulletin are not strictly followed, the DOW™ [FILMTEC™ Reverse Osmosis and Nanofiltration Element Three-Year Prorated Limited Warranty](#) (Form No. 609-35010) 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 drops are 15 psi (1.0 bar) per element or 50 psi (3.4 bar) per multi-element pressure vessel (housing) whichever value is more limiting.
- Avoid static permeate-side backpressure at all times.

Regulatory Note

These membranes may be subject to drinking water application restrictions in some countries; please check the application status before use and sale.

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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