DOW FILMTEC™ Membranes

Large Commercial 4040 Reverse Osmosis Elements

Features

DOW FILMTEC™ LC 4040 product range are available to meet a wide variety of customer needs in commercial applications, from producing high purity water to delivering low total system costs. Dow's fully automated element production enables the most consistent products in the industry that minimizes the total cost of ownership of water treatment systems.

- LC HR-4040 produces high quality water with our state of the art RO membrane.
- LC LE-4040 delivers high quality water at low pressure at harsh water conditions, using Dow's innovative, proprietary technology for low energy applications.

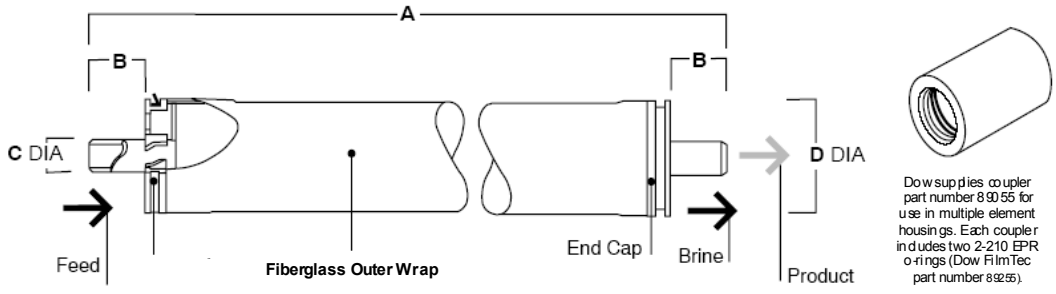
Product Specifications

Product	Part Number Dry (Wet)	Feed Spacer Thickness (mil)	Active Area – ft^2 (m^2)	Permeate Flow Rate gpd (m^3/d)	Min. Salt Rejection (%)	Stabilized Salt Rejection (%)
LC HR-4040	343771 / (343770)	28	94 (8.7)	2900 (11)	99.5	99.7
LC LE-4040	356603 / (356602)	28	94 (8.7)	2500 (9.5)	99.1	99.2

1. Permeate flow and salt rejection based on the following test conditions: 2000 ppm NaCl, 77°F (25°C), 15% recovery, pH 8, and applied pressure 225 psig for LC HR and 125 psig for LC LE
2. Permeate flows for individual elements may vary +/-15%.
3. For the purpose of improvement, specifications may be updated periodically.

LC HR-4040	Solute	NH_4^+	NO_3^-	SiO_2	Boron
	Stabilized rejection (%)	98.8	98.2	99.8	80.0

Figure 1



Product	A Inches (mm)	B Inches (mm)	C Inches (mm)	D Inches (mm)
LC HR-4040 and LC LE-4040	**40.00 (1016)**	**1.05 (25.7)**	**0.75 (19)**	**3.9 (99)**

1. Refer to DOW FILMTEC™ Design Guidelines for multiple-element systems
2. LC HR-4040 and LC HRLE-4040 elements fit nominal 4-inch I.D. pressure vessel.

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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)
Maximum feed flow rate, gpm (m^3/h)	16 gpm (3.6 (m^3/h))
pH range, continuous operation[a]	2 - 11
pH range, short-term cleaning[b]	1 – 13
Maximum Feed Silt Density Index	SDI 5
Free chlorine concentration[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 recommends removing residual free chlorine and other oxidants 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 Bulletin are not strictly followed, the limited warranty in 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 drop across an entire pressure vessel (housing) is 50 psi (3.4 bar).

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.

DOW FILMTEC™ Membranes

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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