FILMTEC Membranes

FILMTEC NF270-400 Nanofiltration Element

Features

The FILMTEC™ NF270-400 element is a high area, high productivity element designed to remove a high percentage of TOC and THM precursors while having a medium to high salt passage; medium hardness passage.

The FILMTEC NF270-400 element is an ideal element for surface and ground water applications where good organic removal is desired with partial softening in order to maintain a minimum level of hardness for organoleptic properties and preservation of distribution networks.

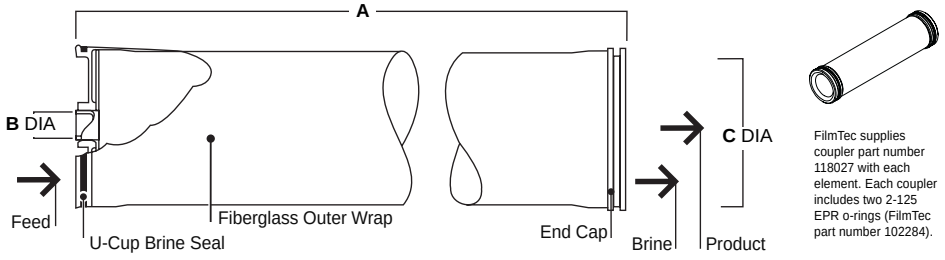
The high active area membrane combined with low net driving pressure of the membrane allows the removal of these compounds at low operating pressure.

Product Specifications

Product	GMID	Nominal Active Surface Area ft^2 (m^2)	Product Water Flow Rate gpd (m^3/d)	Stabilized Salt Passage (%)
NF270-400	148822	400 (37)		
$CaCl_2$			14,700 (55.6)	40-60
$MgSO_4$			12,500 (47.3)	< 3

1. Permeate flow and salt passage based on the following test conditions:
   500 mg/l $CaCl_2$, 70 psi (0.48 MPa), 77°F (25°C) and 15% recovery.
   2,000 mg/l $MgSO_4$, 70 psi (0.48 MPa), 77°F (25°C) and 15% recovery.
2. Flow rates for individual elements may vary +/-15%.
3. The above specifications are benchmark values. Please be sure to operate according to our system design guidelines.

Figure 1



Product	Single-Element Recovery	Dimensions – Inches (mm) A	B	C
NF270-400	15%	40 (1,016)	1.5 (38)	7.9 (201)

1. Refer to FilmTec Design Guidelines for multiple-element applications and recommended element recovery rates for various feed sources.
2. Element to fit nominal 8.00-inch (203 mm) I.D. pressure vessel.

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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[a]	3 – 10
• pH Range, Short-Term Cleaning (30 min.)[b]	1 – 12
• Maximum Feed Flow	70 gpm (15.9 m^3/hr)
• 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, 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. 609-00298) 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 permeate-side backpressure at all times.

FILMTEC Membranes
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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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