

**FILMTEC™ Membranes**

FILMTEC NF90-400/34i Nanofiltration Element

Features

The DOW FILMTEC™ NF90-400/34i nanofiltration element is a high area and high productivity element offering an industry wide unique combination of features:

- High removal rate of salts, including nitrates and iron,
- High removal rate of organic compounds such as pesticides, herbicides, and THM precursors.
- A 34 mil feed spacer to lessen the impact of fouling on pressure drop across a vessel and to enhance cleaning effectiveness.

The DOW FILMTEC™ NF90-400/34i is listed to ANSI/NSF61.

For more information visit: <http://www.nsf.org/Certified/PwsComponents>



In addition, the DOW FILMTEC™ NF90-400/34i includes the typical DOW FILMTEC product features:

- iLEC™ interlocking end caps reduce system operating costs and the risk of o-ring leaks.
- The oxidative free membrane manufacturing process results in high membrane robustness and long term stable performance.
- The widest pH range for cleanings (pH1 to pH13) allows effective cleanings even in cases of severe fouling.
- The automated, precision fabrication gives a greater number of shorter membrane leaves thus reducing fouling while maximizing element efficiency.

Product Specifications

Product	Part number	Nominal Active Surface Area ft ² (m ²)	Product Water Flow Rate gpd (m ³ /d)	Stabilized salt rejection (%)
NF90-400/34i	11023067	400 (37)		
NaCl			7,500 (28.4)	85 – 95
MgSO ₄			10,000 (37.9)	>97

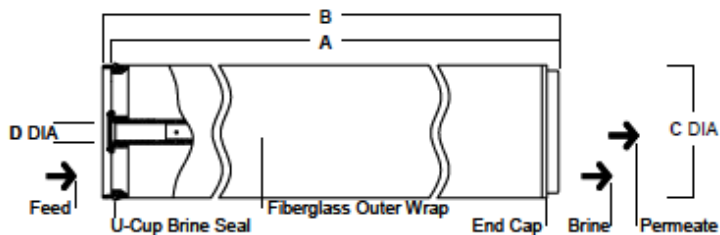
1. Permeate flow and salt passage based on the following test conditions:

2,000 mg/l NaCl, 70 psi (0.48 MPa), 77°F (25°C) and 15% recovery.

2,000 mg/l MgSO₄, 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 D			
NF90-400/34i	15%	40 (1,016)	40.5 (1,029)	7.9 (201)	1.125 ID (29)

1. Refer to FilmTec Design Guidelines for multiple-element applications and recommended element recovery rates for various feed sources. 1 inch = 25.4 mm

2. Element to fit nominal 8.00-inch (203 mm) I.D. pressure vessel.

Operating Limits

Membrane Type	Polyamide Thin-Film Composite
Maximum Operating Temperature ^a	113°F (45°C)
Maximum Operating Pressure	600 psig (41 bar)
pH Range, Continuous Operation ^a	3 - 10
pH Range, Short-Term Cleaning (30 min.) ^b	1 - 13
Maximum Feed Flow	SDI 5
Free Chlorine Tolerance ^c	<0.1 ppm

- Maximum temperature for continuous operation above pH 10 is 95°F (35°C).
- Refer to Cleaning Guidelines in specification sheet 609-23010.
- 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 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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