FILMTEC Membranes

8” Semiconductor Grade Reverse Osmosis Elements

Features

Ultra pure water specifications and analytical measurement capabilities have advanced to meet the exacting needs of microprocessor, semiconductor and other silicon based device manufacturers.

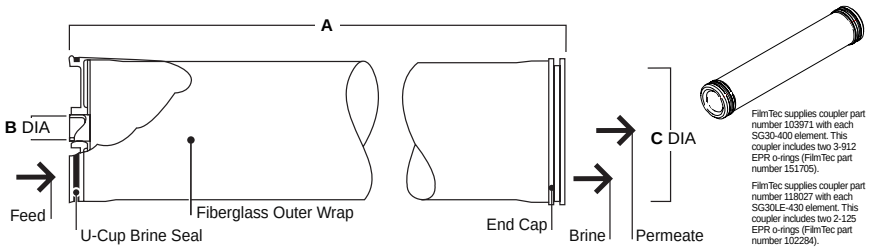
FILMTEC™ SG30-400 and SG30LE-430 reverse osmosis elements have been developed to meet the requirements of higher overall rejection, higher rejection of lower molecular weight organic compounds and silica and an accelerated TOC rinse down profile. These high surface area elements allow for system design with fewer elements and a lower applied operating pressure, thus optimizing amortization of capital costs while lowering operating cost.

Product Specifications

Product	Part Number	Active Area ft^2 (m^2)	Permeate Flow Rate gpd (m^3/d)
SG30-400	139261	400 (37)	10,200[1] (38.6)
SG30LE-430	99519	430 (40)	10,000[2] (38)

1. Pure water flow based on the following conditions: 225 psi (1.55 MPa), 77°F (25°C) and 15% recovery.
2. Pure water flow based on the following conditions: 107 psi (0.74 MPa), 77°F (25°C) and 15% recovery.
3. Flow rates for individual elements may vary but will be not more than 15% below the value shown.
4. Product specifications may vary slightly as improvements are implemented.
5. Typical stabilized salt rejection (Cl^-) for individual element is 99.5% under the test conditions of 2,000 ppm NaCl, 225 psi (1.55 MPa) for SG30-400 and 150 psi (1.03 MPa) for SG30LE-430, 77°F (25°C), pH 8 and 15% recovery. At lower TDS (<5 ppm), ion rejections are decreased depending on ionic strength, pH and ionic species.

Figure 1



Product	Maximum Feed Flow Rate gpm (m^3/h)	Typical Recovery Rate (%)	Dimensions – Inches (mm) A	B	C
SG30-400	85 (19)	15	40.0 (1,016)	1.125 (29)	7.9 (201)
SG30LE-430	85 (19)	15	40.0 (1,016)	1.50 (38)	7.9 (201)

1. Typical recovery rate shown is for a single element. Recovery rate is calculated by dividing permeate flow rate by feed flow rate.
2. Refer to FilmTec Design Guidelines for multiple-element systems.
3. SG30-400 and SG30LE-430 elements fit nominal 8-inch (203 mm) I.D. pressure vessel.

1 inch = 25.4 mm

Operating Limits

- Membrane Type — Polyamide Thin-Film Composite
- Maximum Operating Temperature — 113°F (45°C)
- Maximum Operating Pressure — 600 psi (4.1 MPa)
- Maximum Differential Pressure — 15 psi (0.1 MPa)
- pH Range, Continuous Operation[a] — 2 – 11
- pH Range, Short-Term Cleaning (30 min.)[b] — 1 – 12
- 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 609-00237 for more information.

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Organic Rejection Data

Rejection data for organic species are tabulated below.

Table 1. Typical organic compounds rejection.

Organic Compound	MW	Rejection (%) SG30-400[1]	Rejection (%) SG30LE-430[2]
Methanol	32	14	13
Ethanol	46	50	40
Acetone	58	68	48
Isopropanol	60	95	92

Test Conditions:

1. Feed concentration 10 ppm, 214 psi (1.47 MPa), 25ºC, pH 7 and 15% recovery.
2. Feed concentration 10 ppm, 107 psi (0.74 MPa), 25ºC, pH 7 and 15% recovery.

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 (0.34 MPa).
- 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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