PRODUCT SPECIFICATION SHEET

CSM®
Customer Satisfaction Membrane

CSM RO MEMBRANE, The approved ***Reverse Osmosis Membrane*** in the world.

RE8040-BLR

Low pressure RO membrane element with high salt rejection for brackish water

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Product Specifications

Permeate Flow rate : 9,000 GPD (34.0 m^3/day)

Stabilized Salt Rejection : 99.6 %

Effective Membrane Area : 400 ft^2 (37.2 m^2)

1. The stated performance is initial data taken after 30 minutes of operation based on the following conditions; 1,500 mg/L NaCl solution at 150 psig (1.0 MPa) applied pressure, 15 % recovery, 77 ^{o}F (25 ^{o}C) and pH 6.5~7.0.
2. Minimum salt rejection is 99.5%
3. Permeate Flow rate for individual elements may vary but will be no more than 10 % below the value shown.
4. Effective membrane area may vary within 3 %.
5. All elements are vacuum sealed in a polyethylene bag containing 1.0 % SBS (Sodium bisulfite) solution and packaged individually in a cardboard box.

Product Description

Membrane Type : Thin-film Composite

Membrane Material : PA (Polyamide)

Membrane Surface Charge : Negative

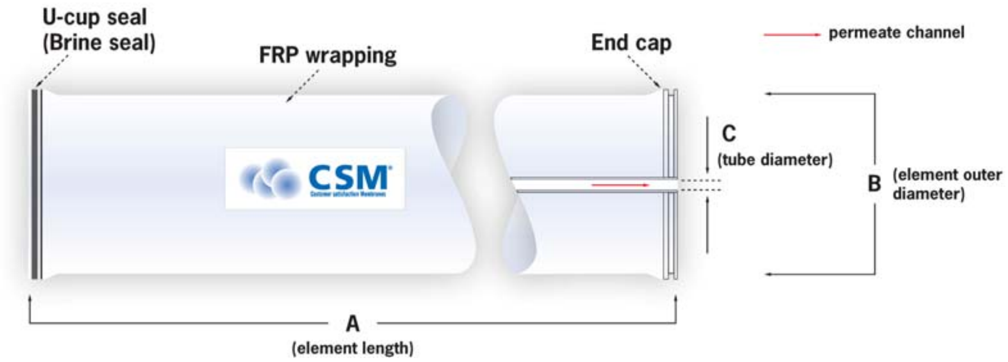
Element Configuration : Spiral-Wound, FRP wrapping

Product Dimensions

A = 40 inch (1,016 mm)

B = 8.0 inch (203 mm)

C = 1.12 inch (28 mm)



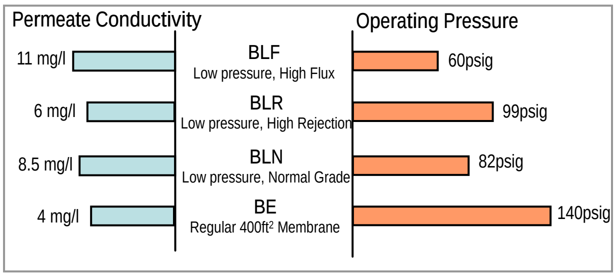
1. One interconnector (coupler) would be supplied for each membrane element.
2. All CSM membrane elements fit nominal 8.0-inch (203 mm) I.D. pressure vessel.
3. Outer feature may vary as design revisions take place.

Features

- CSM BLR element shows higher salt rejection and higher permeate flow at a lower pressure than regular brackish water membrane. It can produce higher quality of water using less energy and less capital cost for the high pressure pumps, plumbing and the pressure vessels than the regular membrane.
- More useful for high TDS feed water or for higher permeate quality.

Product Characteristics Comparison

Comparison of CSM low pressure membranes with respect to permeate TDS and operating pressure under the same feed water condition (500 mg/l NaCl) and permeate flux (15 gfd) at 25℃ (recovery 15 %)



Conditions for Handling CSM in general

- Customers must keep the element boxes dry at room temperature to prevent them from freezing and damages from heat. If the polyethylene bag is broken, a new protective solution has to be added to the RO membrane element and the element has to be repackaged air-tight to prevent from biological growth.
- Keep elements moist at all times after initial wetting
- Permeate water obtained from first hour of operation should be discarded in order to flush the protective solution in the elements.
- CSM elements should be immersed in a protective solution during storage, shipping or system shutdowns to prevent biological growth and freeze damage. The standard storage solution contains one (1) weight percent sodium bisulfite or sodium metabisulfite (food grade). For short term storage of one week, one (1) weight percent sodium metabisulfite solution is adequate for inhibiting biological growth.
- The customer is fully responsible for the effects of incompatible chemicals on elements. Their use will void the element limited warranty.

Application Data

Operating Limits

Max. Pressure drop / Element	15 psi (0.1 MPa)
Max. Pressure drop / 240" vessel	60 psi (0.42 Mpa)
Max. Operating pressure	600 psi (4.14 MPa)
Max. Feed flow rate	66 gpm (15.0 m^3/hr)
Min. Concentrate flow rate	16 gpm (3.6 m^3/hr)
Max. Operating temperature	113 °F (45 °C)
Operating pH range	3.0 ~ 10.0
CIP pH range	2.0 ~ 11.0
Max. Turbidity	1.0 NTU
Max. SDI (15 min)	5.0
Max. Free Chlorine concentration	0.1 mg/L

Design Guideline for Various Water Source

Waste water (SDI < 5)	8 ~ 12 gfd
Waste water pretreated by UF (SDI < 3)	10 ~ 14 gfd
Seawater, open intake (SDI < 5)	7 ~ 10 gfd
High salinity well water (SDI < 3)	8 ~ 12 gfd
Surface water (SDI < 5)	12 ~ 16 gfd
Surface water (SDI < 3)	13 ~ 17 gfd
Well water (SDI < 3)	13 ~ 17 gfd
RO/UF permeate (SDI < 1)	21 ~ 30 gfd

Saturation Limits for Salts

$CaSO_4$	230 % saturation
$SrSO_4$	800 % saturation
$BaSO_4$	6,000 % saturation
SiO_2	100 % saturation

Above values are saturation limit at the tail end of the membrane elements for each sparingly soluble salts with proper scale inhibitor.

$CaCO_3$ Scaling potential limits as LSI or SDSI

Without scale inhibitor	< -0.2
LSI (SDSI) with SHMP	< +0.5
LSI (SDSI) with special inhibitor[1]	< +1.5
SDSI with any inhibitor	< +0.5

1. Special inhibitor means one of approved organic inhibitors. It should be approved from real plant for more than three years.

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