

# CSM 4" MEMBRANES

## RE4021-BE

High productivity RO element for brackish water

CSM®

### SPECIFICATIONS:

<b>General Features</b>	<b>Permeate flow rate:</b>	1,050 GPD (4.0 m <sup>3</sup> /day)
	<b>Nominal salt rejection:</b>	99.7%
	<b>Effective membrane area:</b>	35 ft <sup>2</sup> (3.3 m <sup>2</sup> )

1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:

- 2,000 mg/L NaCl solution at 225 psig (1.5 MPa) applied pressure
- 8% recovery
- 77 °F (25 °C)
- pH 6.5–7.0

2. Minimum salt rejection is 99.4%.

3. Permeate flow rate for each element may vary but will be no more than 10%.

4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

<b>Membrane type:</b>	Thin-Film Composite
<b>Membrane material:</b>	Polyamide (PA)
<b>Element configuration:</b>	Spiral-Wound, FRP Wrapping

### Dimensions

Model Name	A	B	C	D	E
RE4021-BE	21.0 inch (534 mm)	4.0 inch (102 mm)	0.75 inch (19.1 mm)	1.55 inch (39.5 mm)	1.55 inch (39.5 mm)



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4021 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

The information provided in this document is solely for informative purposes. It is the user's responsibility to ensure the appropriate usage of this product. Woongjin Chemical assumes no obligation, liability or damages incurred for the misuse of the product or for the information provided in this document. This document does not express or implies any warranty as to the merchantability or fitness of the product.

# CSM 4" MEMBRANES

## RE402I-BE

High productivity RO element for brackish water

CSM®

### APPLICATION DATA:

#### Operating Limits

· Max. Pressure Drop / Element	15 psi (0.1 MPa)
· Max. Pressure Drop / 240" Vessel	60 psi (0.41 Mpa)
· Max. Operating Pressure	600 psi (4.14 MPa)
· Max. Feed Flow Rate	13 gpm (2.95 m <sup>3</sup> /hr)
· Min. Concentrate Flow Rate	3 gpm (0.68 m <sup>3</sup> /hr)
· Max. Operating Temperature	113 °F (45 °C)
· Operating pH Range	2.0–11.0
· CIP pH Range	1.0–13.0
· Max. Turbidity	1.0 NTU
· Max. SDI (15 min)	5.0
· Max. Chlorine Concentration	< 0.1 mg/L

#### Design Guidelines for Various Water Sources

· Wastewater Conventional (SDI < 5)	8–12 gfd
· Wastewater Pretreated by UF/MF (SDI < 3)	10–14 gfd
· Seawater, Open Intake (SDI < 5)	7–10 gfd
· Seawater, Beach Well (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 permeate (SDI < 1)	21–30 gfd

#### Saturation Limits (Using Antiscalants)<sup>†</sup>

· Langelier Saturation Index (LSI)	<+1.5
· Stiff and Davis Saturation Index (SDSI)	<+0.5
· CaSO <sub>4</sub>	230% saturation
· SrSO <sub>4</sub>	800% saturation
· BaSO <sub>4</sub>	6,000% saturation
· SiO <sub>2</sub>	100% saturation

<sup>†</sup>The above saturation limits are typically accepted by proprietary antiscalant manufacturers. It is the user's responsibility to ensure proper chemical(s) and concentration are dosed ahead of the membrane system to prevent scale formation anywhere within the membrane system. Membrane elements fouled or damaged due to scale formation are not covered by the limited warranty.

### GENERAL HANDLING PROCEDURES

- Elements contained in the boxes must be kept dry at room temperature (7–32°C; 40–95°F) and should not be stored in direct sunlight. If the polyethylene bag is damaged, a new preservative solution (sodium bisulfite) must be added and air-tight sealed to prevent drying and biological growth.
- Permeate from the first hour of operation should be discarded to flush out the preservative solution.
- Elements should be immersed in a preservative solution during storage, shipping and system shutdowns to prevent biological growth and freezing. The standard storage solution contains 1% by weight sodium bisulfite or sodium metabisulfite (food grade). For short term storage (i.e. one week or less) 1% by weight sodium metabisulfite solution is adequate for preventing biological growth.
- Keep elements moist at all times after initial wetting.
- Avoid excessive pressure and flow spikes.
- Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.
- Permeate pressure must always be equal or less than the feed/concentrate pressure. Damage caused by permeate back pressure voids the element limited warranty.

# CSM 4" MEMBRANES

CSM®

## RE4040-BE

High productivity RO element with extended area for brackish water

### SPECIFICATIONS:

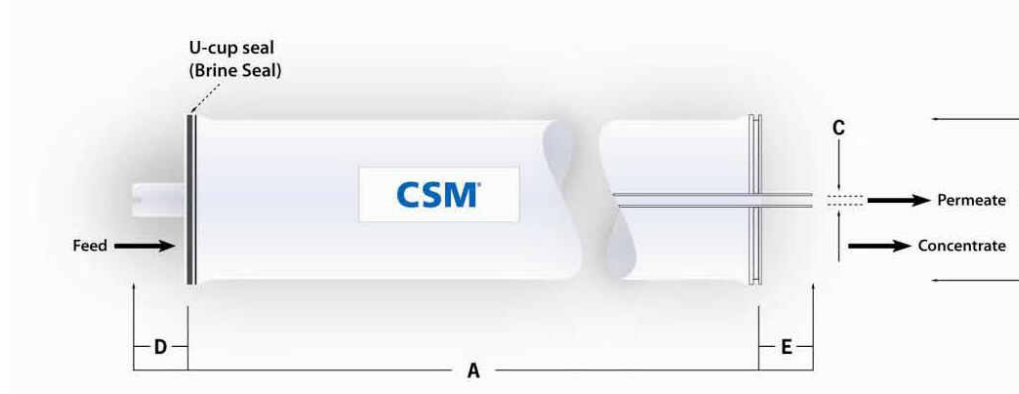
<b>General Features</b>	<b>Permeate flow rate:</b>	2,400 GPD (9.1 m <sup>3</sup> /day)
	<b>Nominal salt rejection:</b>	99.7%
	<b>Effective membrane area:</b>	85 ft <sup>2</sup> (7.9 m <sup>2</sup> )

- The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
  - 2,000 mg/L NaCl solution at 225 psig (1.5 MPa) applied pressure
  - 15% recovery
  - 77 °F (25 °C)
  - pH 6.5–7.0
- Minimum salt rejection is 99.4%.
- Permeate flow rate for each element may vary but will be no more than 10%.
- All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

<b>Membrane type:</b>	Thin-Film Composite
<b>Membrane material:</b>	Polyamide (PA)
<b>Element configuration:</b>	Spiral-Wound, FRP Wrapping

### Dimensions

Model Name	A	B	C	D	E
RE4040-BE	40.0 inch (1,016 mm)	4.0 inch (102 mm)	0.75 inch (19.1 mm)	1.61 inch (41 mm)	1.61 inch (41 mm)



- Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
- All RE4040 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

The information provided in this document is solely for informative purposes. It is the user's responsibility to ensure the appropriate usage of this product. Woongin Chemical assumes no obligation, liability or damages incurred for the misuse of the product or for the information provided in this document. This document does not express or imply any warranty as to the merchantability or fitness of the product.



# CSM 4” MEMBRANES

## RE4040-BE

High productivity RO element with extended area for brackish water

**CSM**<sup>®</sup>

### APPLICATION DATA:

#### Operating Limits

· Max. Pressure Drop / Element	15 psi (0.1 MPa)
· Max. Pressure Drop / 240” Vessel	60 psi (0.41 MPa)
· Max. Operating Pressure	600 psi (4.14 MPa)
· Max. Feed Flow Rate	18 gpm (4.09 m <sup>3</sup> /hr)
· Min. Concentrate Flow Rate	4 gpm (0.91 m <sup>3</sup> /hr)
· Max. Operating Temperature	113 °F (45 °C)
· Operating pH Range	2.0–11.0
· CIP pH Range	1.0–13.0
· Max. Turbidity	1.0 NTU
· Max. SDI (15 min)	5.0
· Max. Chlorine Concentration	< 0.1 mg/L

#### Design Guidelines for Various Water Sources

· Wastewater Conventional (SDI < 5)	8–12 gfd
· Wastewater Pretreated by UF/MF (SDI < 3)	10–14 gfd
· Seawater, Open Intake (SDI < 5)	7–10 gfd
· Seawater, Beach Well (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 permeate (SDI < 1)	21–30 gfd

#### Saturation Limits (Using Antiscalants)<sup>†</sup>

· Langelier Saturation Index (LSI)	<+1.5
· Stiff and Davis Saturation Index (SDSI)	<+0.5
· CaSO <sub>4</sub>	230% saturation
· SrSO <sub>4</sub>	800% saturation
· BaSO <sub>4</sub>	6,000% saturation
· SiO <sub>2</sub>	100% saturation

<sup>†</sup>The above saturation limits are typically accepted by proprietary antiscalant manufacturers. It is the user's responsibility to ensure proper chemical(s) and concentration are dosed ahead of the membrane system to prevent scale formation anywhere within the membrane system. Membrane elements fouled or damaged due to scale formation are not covered by the limited warranty.

### GENERAL HANDLING PROCEDURES

- Elements contained in the boxes must be kept dry at room temperature (7–32°C; 40–95°F) and should not be stored in direct sunlight. If the polyethylene bag is damaged, a new preservative solution (sodium bisulfite) must be added and air-tight sealed to prevent drying and biological growth.
- Permeate from the first hour of operation should be discarded to flush out the preservative solution.
- Elements should be immersed in a preservative solution during storage, shipping and system shutdowns to prevent biological growth and freezing. The standard storage solution contains 1% by weight sodium bisulfite or sodium metabisulfite (food grade). For short term storage (i.e. one week or less) 1% by weight sodium metabisulfite solution is adequate for preventing biological growth.
- Keep elements moist at all times after initial wetting.
- Avoid excessive pressure and flow spikes.
- Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.
- Permeate pressure must always be equal or less than the feed/concentrate pressure. Damage caused by permeate back pressure voids the element limited warranty.