

# CSM 8" MEMBRANES

## RE8040-FD<sup>n</sup>

Enhanced fouling resistant RO element with 34mil feed spacer for wastewater reuse

**CSM**<sup>®</sup>

### SPECIFICATIONS:

#### General Features

<b>Permeate flow rate:</b>	10,000 GPD (39.7 m <sup>3</sup> /day)
<b>Nominal salt rejection:</b>	99.7%
<b>Effective membrane area:</b>	380 ft <sup>2</sup> (35.3 m <sup>2</sup> )
<b>Feed spacer thickness:</b>	34 mil

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
- 15% 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**    **A** = 40.0 inch (1,016 mm)    **B** = 8.0 inch (201 mm)    **C** = 1.12 inch (28 mm)



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

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# CSM 8" MEMBRANES

## RE8040-FD<sup>n</sup>

Enhanced fouling resistant RO element with 32mil feed spacer for wastewater reuse

**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	75 gpm (17.0 m <sup>3</sup> /hr)
• Min. Concentrate Flow Rate	16 gpm (3.6 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>

• Langlier 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 8” MEMBRANES

## RE8040-FE<sup>n</sup>

Enhanced fouling resistant RO element for brackish water and wastewater reuse

**CSM**<sup>®</sup>

### SPECIFICATIONS:

#### General Features

<b>Permeate flow rate:</b>	10,500 GPD (39.7 m <sup>3</sup> /day)
<b>Nominal salt rejection:</b>	99.7%
<b>Effective membrane area:</b>	400 ft <sup>2</sup> (37.2 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
- 15% recovery
- 77 °F (25 °C)
- pH 6.5–7.0

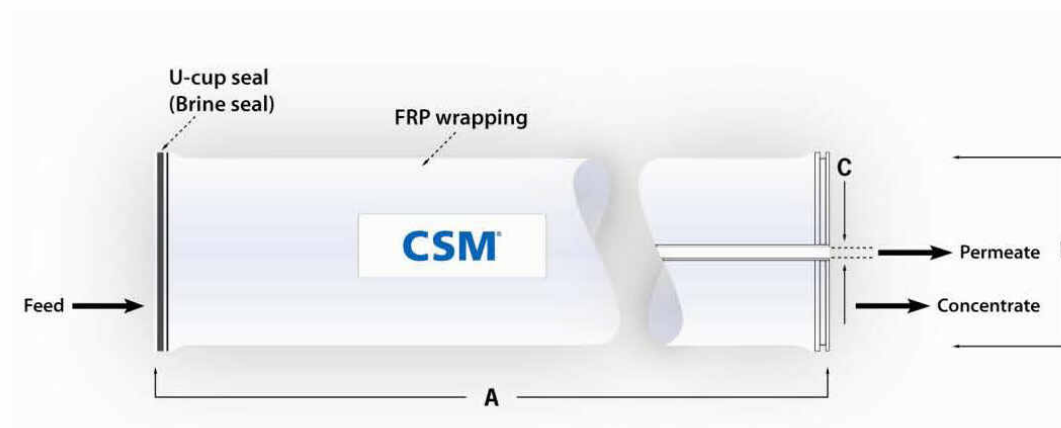
2. Minimum salt rejection is 99.4%.

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**    **A** = 40.0 inch (1,016 mm)    **B** = 8.0 inch (201 mm)    **C** = 1.12 inch (28 mm)



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

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# CSM 8" MEMBRANES

## RE8040-FE<sup>n</sup>

Fouling resistant RO element for brackish water and wastewater reuse

**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	75 gpm (17.0 m <sup>3</sup> /hr)
• Min. Concentrate Flow Rate	16 gpm (3.6 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>

• Langlier 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 8" MEMBRANES

## RE8040-FE<sup>n</sup>440

Enhanced fouling resistant RO element for brackish water and wastewater reuse

**CSM**<sup>®</sup>

### SPECIFICATIONS:

#### General Features

<b>Permeate flow rate:</b>	11,500 GPD (43.5 m <sup>3</sup> /day)
<b>Nominal salt rejection:</b>	99.7%
<b>Effective membrane area:</b>	440 ft <sup>2</sup> (40.9 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
- 15% recovery
- 77 °F (25 °C)
- pH 6.5–7.0

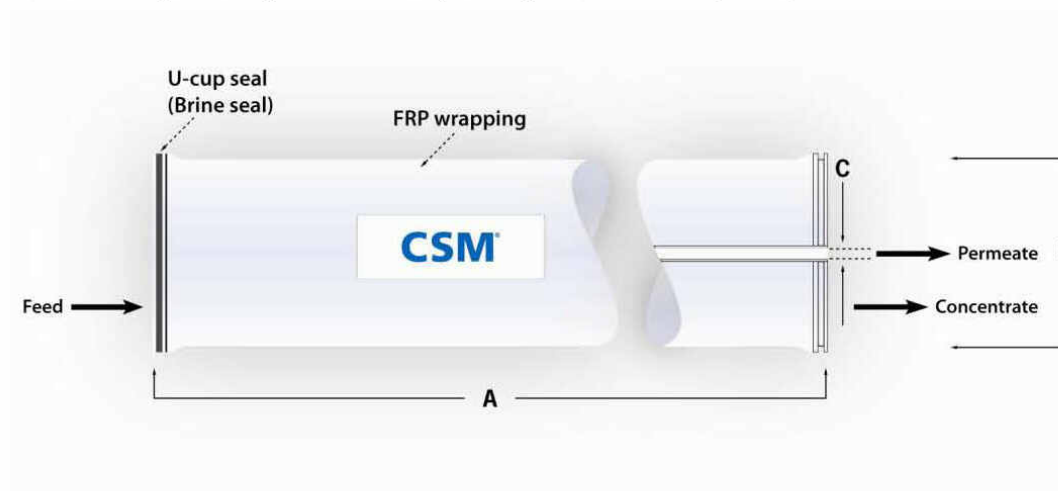
2. Minimum salt rejection is 99.4%.

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**    **A** = 40.0 inch (1,016 mm)    **B** = 8.0 inch (201 mm)    **C** = 1.12 inch (28 mm)



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

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# CSM 8" MEMBRANES

## RE8040-FE

Fouling resistant RO element for brackish water and wastewater reuse

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	75 gpm (17.0 m <sup>3</sup> /hr)
• Min. Concentrate Flow Rate	16 gpm (3.6 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>

• Langlier 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 8” MEMBRANES

## RE8040-FL

Fouling resistant RO element with low pressure for brackish water and wastewater reuse

**CSM®**

### SPECIFICATIONS:

#### General Features

<b>Permeate flow rate:</b>	11,000 GPD (41.6 m <sup>3</sup> /day)
<b>Nominal salt rejection:</b>	99.0%
<b>Effective membrane area:</b>	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )

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

- 1,500 mg/L NaCl solution at 150 psig (1.0 MPa) applied pressure
- 15% recovery
- 77 °F (25 °C)
- pH 6.5–7.0

2. Minimum salt rejection is 98.5%.

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**    **A** = 40.0 inch (1,016 mm)    **B** = 8.0 inch (201 mm)    **C** = 1.12 inch (28 mm)



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

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# CSM 8" MEMBRANES

## RE8040-FL

Fouling resistant RO element with low pressure for brackish water and wastewater reuse

**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	75 gpm (17.0 m <sup>3</sup> /hr)
• Min. Concentrate Flow Rate	16 gpm (3.6 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>

• Langlier 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 8" MEMBRANES

## RE8040-FLR

Fouling resistant RO element with low pressure for brackish water and wastewater reuse

**CSM**<sup>®</sup>

### SPECIFICATIONS:

#### General Features

<b>Permeate flow rate:</b>	9,000 GPD (34.0 m <sup>3</sup> /day)
<b>Nominal salt rejection:</b>	99.6%
<b>Effective membrane area:</b>	400 ft <sup>2</sup> (37.2 m <sup>2</sup> )

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

- 1,500 mg/L NaCl solution at 150 psig (1.0 MPa) applied pressure
- 15% recovery
- 77 °F (25 °C)
- pH 6.5–7.0

2. Minimum salt rejection is 99.5%.

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

**A** = 40.0 inch (1,016 mm)    **B** = 8.0 inch (201 mm)    **C** = 1.12 inch (28 mm)



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

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# CSM 8" MEMBRANES

## RE8040-FLR

**CSM**<sup>®</sup>

Fouling resistant RO element with low pressure for brackish water and wastewater reuse

### 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	75 gpm (17.0 m <sup>3</sup> /hr)
• Min. Concentrate Flow Rate	16 gpm (3.6 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>

• Langlier 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.