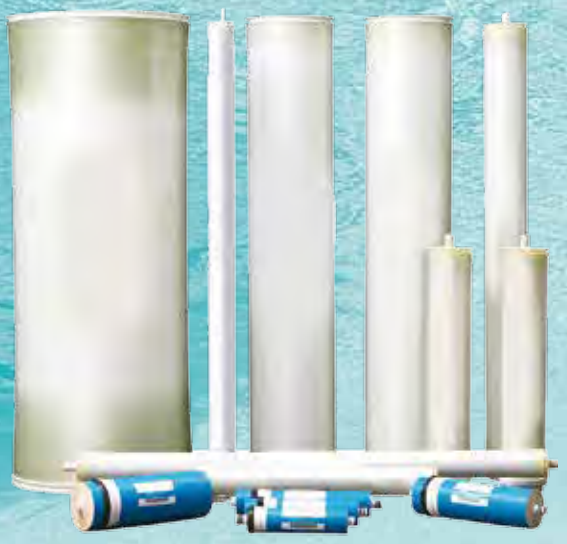
Membranes reverse osmosis and Ultra Filtration



EUROTROL®
WATER TREATMENT COMPONENTS

TORAY
CSM®

CSM 2 ½" Membranes

LOW PRESSURE LPM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE2514-TL	RE2514-TL	-	Compliant	
MCRE2514-TLF	RE2514-TLF	-	Compliant	
MCRE2521-BLN	RE2521-BLN	-	Compliant	
MCRE2521-BLF	RE2521-BLF	-	Compliant	
MCRE2540-BLN	RE2540-BLN	-	Compliant	
MCRE2540-BLF	RE2540-BLF	-	Compliant	
MCRE2540-BLR	RE2540-BLR	-	Compliant	

BRACKISH WATER BWM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE2521-BE	RE2521-BE	-	Compliant	
MCRE2540-BE	RE2540-BE	-	Compliant	

FOULING RESISTANT FRM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE2540-FEN	RE2540-FEn	-	Compliant	

SEA WATER SWM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE2521-SHF	RE2521-SHF	-	Compliant	
MCRE2540-SHN	RE2540-SHN	-	Compliant	
MCRE2540-SHF	RE2540-SHF	-	Compliant	

NANOFILTRATION NFM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCNE2540-90	NE2540-90	-	Compliant	

Ref. MCRE2514-TL

RE2514-TL

RO element for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	250 GPD (0.94 m^3/day)
Stabilized salt rejection:	97.5%
Effective membrane area:	7 ft^2 (0.65 m^2)

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 99.0%.
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D	E	Part Number	
						Inter-connector	Brine Seal
RE2514-TL	14.0 inch (356 mm)	2.4 inch (61 mm)	0.75 inch (19.1 mm)	1.18 inch (30 mm)	1.18 inch (30 mm)	DD004 (*)	DC005 (*)

(*) see 05-03-99-EN data sheet.

1. Each membrane element comes with one brine seal, one interconnector (coupler) and four o-rings.

RE2514-TL

RO element for brackish water

CSM

APPLICATION DATA:

Operating Limits	· Max. Pressure Drop / Element	15 psi (0.1 MPa)
	· Max. Operating Pressure	600 psi (4.14 MPa)
	· Max. Feed Flow Rate	6 gpm (1.36 m³/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m³/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2514-TLF

RE2514-TLF

CSM

RO element for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	250 GPD (0.94 m³/day)
Stabilized salt rejection:	96.5%
Effective membrane area:	7 ft² (0.65 m²)

1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
   - **500 mg/L NaCl solution at 100 psig (0.7 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D	E	Part Number	
						Inter-connector	Brine Seal
RE2514-TLF	14.0 inch (356 mm)	2.4 inch (61 mm)	0.75 inch (19.1 mm)	1.18 inch (30 mm)	1.18 inch (30 mm)	DD004 (*)	DC005 (*)

(*) see 05-03-99-EN data sheet.

1. Each membrane element comes with one brine seal, one interconnector (coupler) and four o-rings.

RE2514-TLF

RO element for brackish water

CSM

APPLICATION DATA:

Operating Limits	· Max. Pressure Drop / Element	15 psi (0.1 MPa)
	· Max. Operating Pressure	600 psi (4.14 MPa)
	· Max. Feed Flow Rate	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2521-BLN

RE2521- BLN

Low pressure grade RO element for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	400 GPD (1.5 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	12 ft^2 (1.1 m^2)

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 (1.03 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

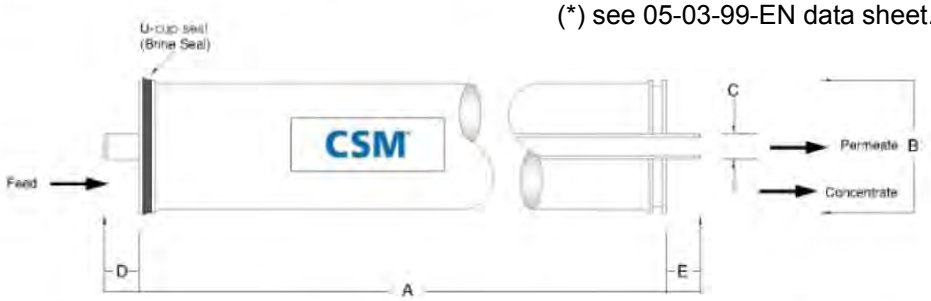
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2521-BLN	21.0 inch (533.4 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.1 inch (28.0 mm)	DD004 (*)	DC005 (*)

(*) see 05-03-99-EN data sheet.



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2521 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2521- BLN

CSM

Low pressure grade RO element for brackish water

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	6 gpm (1.36 m³/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m³/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2521-BLF

RE2521- BLF

Ultra-low pressure grade RO element for low TDS water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	400 GPD (1.5 m^3/day)
Nominal salt rejection:	99.0%
Effective membrane area:	12 ft^2 (1.1 m^2)

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

   - **500 mg/L NaCl solution at 100 psig (0.69 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

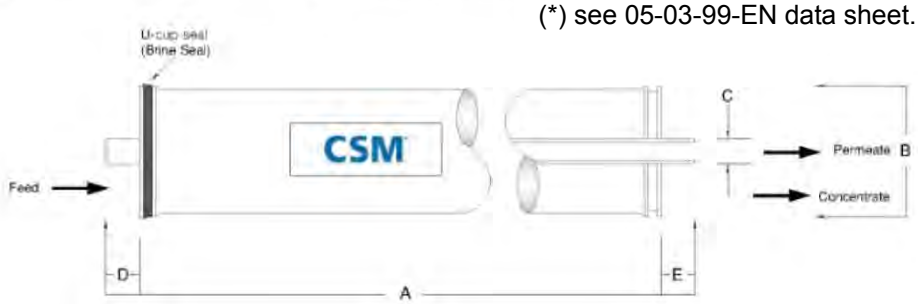
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2521-BLF	21.0 inch (533.4 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.1 inch (28.0 mm)	DD004 (*)	DC005 (*)

(*) see 05-03-99-EN data sheet.



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2521 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2521-BLF

CSM

Ultra-low pressure grade RO element for low TDS water

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	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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 2 ½" Membranes

Ref. MCRE2540-BLN

RE2540-BLN

Low pressure grade RO element for brackish water

CSM®

SPECIFICATIONS:

General Features

Permeate flow rate:	930 GPD (3.5 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	27 ft^2 (2.5 m^2)

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

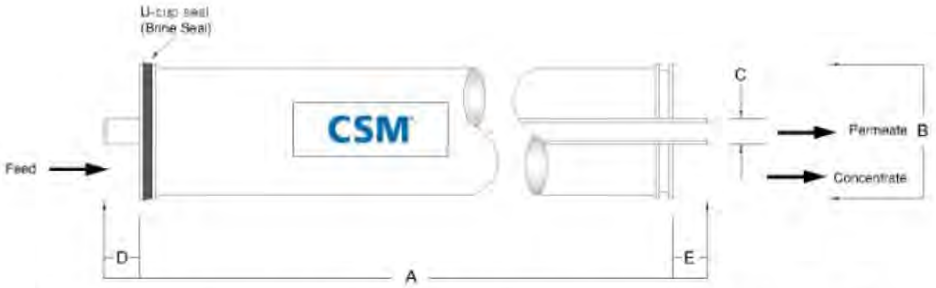
   - **1,500 mg/L NaCl solution at 150 psig (1.03 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2540-BLN	40.0 inch (1,016 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01047



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2540-BLN

Low pressure grade 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	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2540-BLF

RE2540-BLF

Ultra-low pressure grade RO element for low TDS water

CSM®

SPECIFICATIONS:

General Features

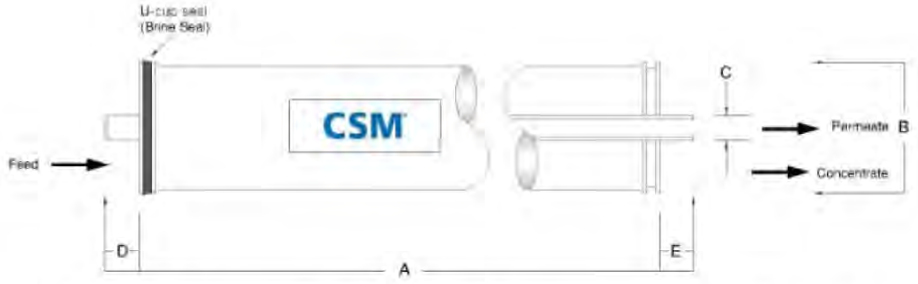
Permeate flow rate:	930 GPD (3.5 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	27 ft^2 (2.5 m^2)

1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
   - **500 mg/L NaCl solution at 100 psig (0.69 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2540-BLF	40.0 inch (1,016 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01047



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2540-BLF

Ultra-low pressure grade RO element for low TDS 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	6 gpm (1.36 m^3/hr)
	Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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	< 0.05 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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

Ref. MCRE2540-BLR

RE2540-BLR

CSM

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

SPECIFICATIONS:

General Features

Permeate flow rate:	740 GPD (2.8 m³/day)
Nominal salt rejection:	99.6%
Effective membrane area:	27 ft² (2.5 m²)

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 (1.03 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 -15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2540-BLR	40.0 inch (1,016 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01047

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2540-BLR

CSM

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

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	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2521-BE

RE2521-BE

CSM

High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	400 GPD (1.5 m³/day)
Nominal salt rejection:	99.5%
Effective membrane area:	12 ft² (1.1 m²)

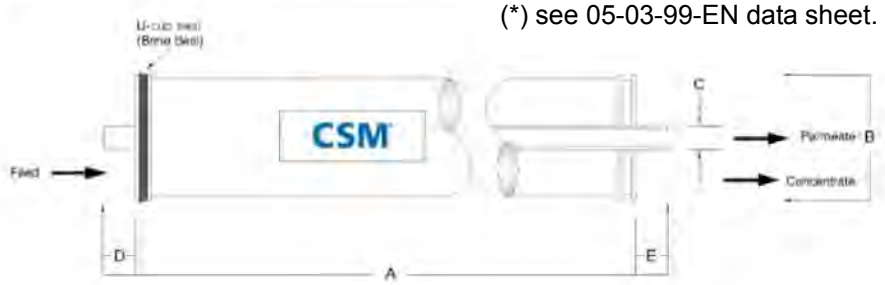
1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
   5
   - **2,000 mg/L NaCl solution at 225 psig (1.55 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2521-BE	21.0 inch (533.4 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.1 inch (28.0 mm)	DD004 (*)	DC005 (*)

(*) see 05-03-99-EN data sheet.



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2521 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2521-BE

CSM

High productivity RO element with extended area for brackish water

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	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2540-BE

RE2540-BE

CSM

High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	1,000 GPD (3.8 m^3/day)
Nominal salt rejection:	99.5%
Effective membrane area:	27 ft^2 (2.5 m^2)

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

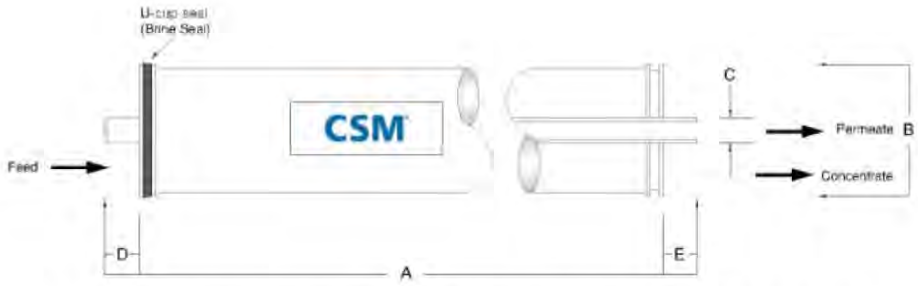
   - **2,000 mg/L NaCl solution at 225 psig (1.55 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2540-BE	40.0 inch (1,016 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01047



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2540-BE

CSM

High productivity RO element with extended area for brackish water

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	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2540-FEN

RE2540-FEⁿ

CSM

Enhanced fouling resistant RO element for brackish water and wastewater reuse

SPECIFICATIONS:

General Features

Permeate flow rate:	1,000 GPD (3.8 m³/day)
Nominal salt rejection:	99.5%
Effective membrane area:	27 ft² (2.5 m²)

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 (1.55 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 / -25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE2540-FEn	40.0 inch (1,016 mm)	2.4 inch (60.8 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01047

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (63.5 mm) I.D. pressure vessels.

RE2540-FE^{n}

CSM

Enhanced fouling resistant RO element 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	6 gpm (1.36 m³/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m³/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2521-SHF

RE2521-SHF

CSM

High productivity RO element for seawater and high salinity well water

SPECIFICATIONS:

General Features

Permeate flow rate:	300 GPD (1.14 m^3/day)
Nominal salt rejection:	99.7%
Effective membrane area:	12 ft^2 (1.1 m^2)

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

   - **32,000 mg/L NaCl solution at 800 psig (5.5 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Minimum salt rejection is 99.6%.
3. Permeate flow rate for each element may vary but will be no more than 20%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D	E	Part Number	
						Inter-connector	Brine Seal
RE2521-SHF	21.0 inch (534 mm)	2.5 inch (64 mm)	0.75 inch (19.1 mm)	1.1 inch (28 mm)	1.1 inch (28 mm)	DD004 (*)	DC005 (*)

(*) see 05-03-99-EN data sheet.

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2521 elements fit nominal 2.5 inch (64 mm) I.D. pressure vessels.

RE2521-SHF

CSM

High rejection RO element for seawater and high salinity well water

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	1,200 psi (8.27 MPa)
	· Max. Feed Flow Rate	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2540-SHN

RE2540-SHN

CSM

High Rejection RO element for seawater and high salinity well water

SPECIFICATIONS:

General Features

Permeate flow rate:	500 GPD (1.9 m³/day)
Stabilized salt rejection:	99.75%
Effective membrane area:	24 ft² (2.2 m²)

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

   - **32,000 mg/L NaCl solution at 800 psig (5.5 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Minimum salt rejection is 99.6%.
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D	E
RE2540-SHN	40.0 inch (1,016 mm)	2.5 inch (64 mm)	0.75 inch (19.1 mm)	1.61 inch (41 mm)	1.61 inch (41 mm)

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (64 mm) I.D. pressure vessels.

RE2540-SHN

CSM

High rejection RO element for seawater and high salinity well water

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	1,200 psi (8.27 MPa)
	· Max. Feed Flow Rate	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE2540-SHF

RE2540-SHF

CSM

High productivity RO element for seawater and high salinity well water

SPECIFICATIONS:

General Features

Permeate flow rate:	600 GPD (2.3 m^3/day)
Stabilized salt rejection:	99.7%
Effective membrane area:	24 ft^2 (2.2 m^2)

1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
   - **32,000 mg/L NaCl solution at 800 psig (5.5 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.6%.
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D	E
RE2540-SHF	40.0 inch (1,016 mm)	2.5 inch (64 mm)	0.75 inch (19.1 mm)	1.61 inch (41 mm)	1.61 inch (41 mm)

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE2540 elements fit nominal 2.5 inch (64 mm) I.D. pressure vessels.

RE2540-SHF

CSM

High productivity RO element for seawater and high salinity well water

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	1,200 psi (8.27 MPa)
	· Max. Feed Flow Rate	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCNE2540-90

NE2540-90

CSM

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

Permeate flow rate[1]:	500 GPD (1.9 m^3/day)
Monovalent ion rejection (NaCl)[1]:	85.0 – 95.0%
Divalent ion rejection ($CaCl_2$)[2]:	90.0 – 95.0%
Effective membrane area:	27 ft^2 (2.5 m^2)

1. The stated product performance is based on data taken after 30 minutes of operation at the following monovalent test conditions:
   - **2,000 mg/L NaCl solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. The stated product performance is based on data taken after 30 minutes of operation at the following divalent test conditions:
   - **500 mg/L $CaCl_2$ solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
3. $MgSO_4$ rejection is 97.0%. (Test conditions are equivalent with NaCl)
4. Permeate flow rate for each element may vary but will be no more than 15%.
5. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D	E
NE2540-90	40.0 inch (1,016 mm)	2.5 inch (64 mm)	0.75 inch (19.1 mm)	1.61 inch (41 mm)	1.61 inch (41 mm)

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE2540 elements fit nominal 2.5 inch (64 mm) I.D. pressure vessels.

NE2540-90

CSM

Normal grade NF element with high monovalent ion rejection

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	6 gpm (1.36 m^3/hr)
	· Min. Concentrate Flow Rate	1 gpm (0.23 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY CSM 4” Membranes

LOW PRESSURE LPM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE4021-BLN	RE4021-BLN	-	Compliant	
MCRE4021-BLF	RE4021-BLF	-	Compliant	
MCRE4040-BLN	RE4040-BLN	Standard 61	Compliant	
MCRE4040-BLF	RE4040-BLF	Standard 61	Compliant	
MCRE4040-BLR	RE4040-BLR	Standard 61	Compliant	
MTMG10D	TMG10D	-	Compliant	

BRACKISH WATER BWM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE4021-BE	RE4021-BE	-	Compliant	
MCRE4040-BE	RE4040-BE	-	Compliant	
MTM710D	TM710D	-	Compliant	

CHLORINE RESISTANT CRM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE4040-CE (*)	RE4040-CE	-	Compliant	

FOULING RESISTANT FRM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE4040-FEN	RE4040-FEn	-	Compliant	
MCRE4040-FLR	RE4040-FLR	-	Compliant	
MTML10D	TML10D	-	Compliant	

SEA WATER SWM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE4021-SHN	RE4021-SHN	-	Compliant	
MTM810C	TM810C	-	Compliant	
MTM810V	TM810V	-	Compliant	

NANOFILTRATION NFM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCNE4040-90	NE4040-90	-	Compliant	
MCNE4040-70 (*)	NE4040-70	-	Compliant	
MCNE4040-40 (*)	NE4040-40	-	Compliant	

(*) not available in stock.

Ref. MCRE4021-BLN

RE4021-BLN

Low pressure grade RO element for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	1,200 GPD (4.5 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	35 ft^2 (3.3 m^2)

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 (1.03 MPa) applied pressure**
- **8% recovery**
- **77 °F (25 °C)**
- **pH 6.5–7.0**

1. Minimum salt rejection is 99.0%.
2. Permeate flow rate for each element may vary +25 /-25%.
3. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE4021-BLN	21.0 inch (533.4 mm)	3.9 inch (99 mm)	0.75 inch (19.1 mm)	1.1 inch (28.0 mm)	SWA01050	SWA01046

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 (101.6 mm) I.D. pressure vessels.

RE4021-BLN

Low pressure grade 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^3/hr)
	· Min. Concentrate Flow Rate	3 gpm (0.68 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE4021-BLF

RE4021-BLF

CSM

Ultra-low pressure grade RO element for low TDS water

SPECIFICATIONS:

General Features

Permeate flow rate:	1,200 GPD (4.5 m³/day)
Nominal salt rejection:	99.2%
Effective membrane area:	35 ft² (3.3 m²)

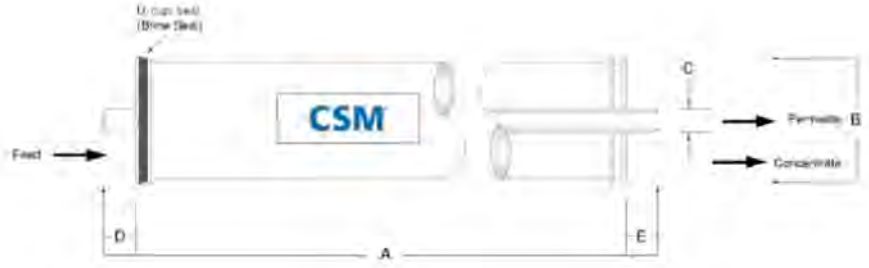
1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
   - **500 mg/L NaCl solution at 100 psig (0.69 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 /-25%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE4021-BLF	21.0 inch (533.4 mm)	3.9 inch (99 mm)	0.75 inch (19.1 mm)	1.1 inch (28.0 mm)	DD004 (*)	DD003 (*)

(*) see 05-03-99-EN data sheet.



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 (101.6 mm) I.D. pressure vessels.

RE4021-BLF

Ultra-low pressure grade RO element for low TDS water

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^3/hr)
	· Min. Concentrate Flow Rate	3 gpm (0.68 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE4040-BLN

RE4040-BLN

Low pressure grade RO element for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	2,600 GPD (9.8 m^3/day)
Nominal salt rejection:	99.4%
Effective membrane area:	85 ft^2 (7.9 m^2)

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 (1.03 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.3%.
3. Permeate flow rate for each element may vary +25 /-15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE4040-BLN	40.0 inch (1,016 mm)	3.9 inch (99 mm)	0.75 inch (19 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01046

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4040 elements fit nominal 4.0 inch (101.6 mm) I.D. pressure vessels.

RE4040-BLN

CSM

Low pressure grade RO element for brackish water

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 m³/hr)
	Min. Concentrate Flow Rate	4 gpm (0.91 m³/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	< 0.05 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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

Ref. MCRE4040-BLF

RE4040-BLF

Ultra-low pressure grade RO element for low TDS water

CSM

SPECIFICATIONS:

General Features

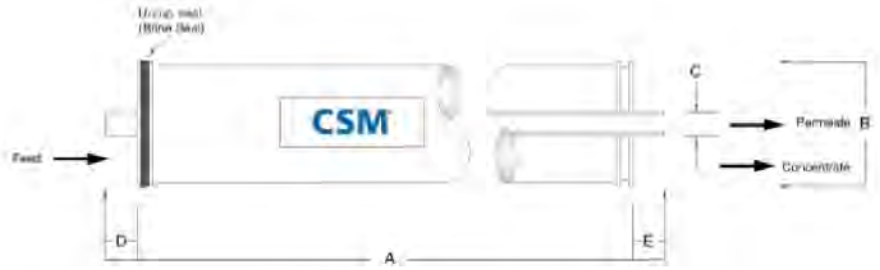
Permeate flow rate:	2,500 GPD (9.5 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	85 ft^2 (7.9 m^2)

1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
   - **500 mg/L NaCl solution at 100 psig (0.69 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. Minimum salt rejection is 99.0%.
3. Permeate flow rate for each element may vary +25 /-15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE4040-BLF	40.0 inch (1,016 mm)	3.9 inch (99 mm)	0.75 inch (19 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01046



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4040 elements fit nominal 4.0 inch (101.6 mm) I.D. pressure vessels.

RE4040-BLF

Ultra-low pressure grade RO element for low TDS 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	18 gpm (4.09 m^3/hr)
	· Min. Concentrate Flow Rate	4 gpm (0.91 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE4040-BLR

RE4040-BLR

CSM

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

SPECIFICATIONS:

General Features

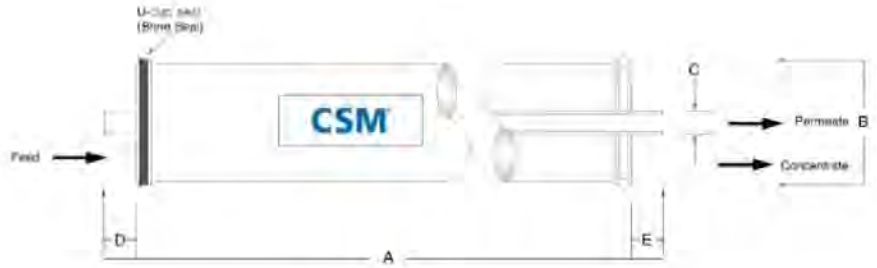
Permeate flow rate:	2,100 GPD (7.9 m^3/day)
Nominal salt rejection:	99.6%
Effective membrane area:	85 ft^2 (7.9 m^2)

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 (1.03 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 -5%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D/E	Part Number	
					Inter-connector	Brine Seal
RE4040-BLR	40.0 inch (1,016 mm)	3.9 inch (99 mm)	0.75 inch (19 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01046



1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4040 elements fit nominal 4.0 inch (101.6 mm) I.D. pressure vessels.

RE4040-BLR

CSM

Low pressure grade RO element with extended area for brackish water

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 m³/hr)
	Min. Concentrate Flow Rate	4 gpm (0.91 m³/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	< 0.05 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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

TORAY 4” Membranes

Ref. MTMG10D

'TORAY'
Innovation by Chemistry

Ultra low pressure BWRO, enhanced chemical tolerance

TMG(D)

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TMG10D	4”	87(8)	99.7	2,850(10.8)	34

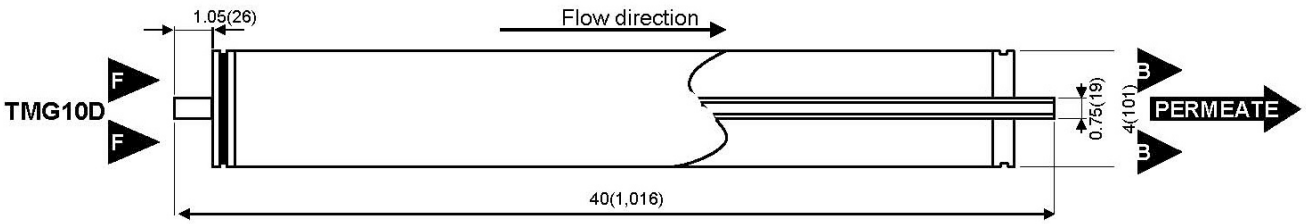
1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	150 psi(1.03MPa) 77° F(25°C) 2000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		2,400gpd($9.1m^3/d$)

Dimensions

All dimensions shown in Inches (millimeter).

F Feed Water

B Concentrated Brine



TORAY 4” Membranes

Operating Limits

Maximum Operating Pressure	365psi (2.5 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI15	5
Feed Water Chlorine Concentration *See below 3 of Operating Information	< 0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. Since oxidation damage is not covered under warranty, it is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCRE4021-BE

RE4021-BE

CSM

High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	1,200 GPD (4.5 m³/day)
Nominal salt rejection:	99.5%
Effective membrane area:	35 ft² (3.3 m²)

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 (1.55 MPa) applied pressure**
- **8% recovery**
- **77 °F (25 °C)**
- **pH 6.5–7.0**

1. Minimum salt rejection is 99.0%.
2. Permeate flow rate for each element may vary +25 /-25%.
3. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE4021-BE	21.0 inch (533.4 mm)	3.9 inch (99 mm)	0.75 inch (19.1 mm)	1.1 inch (28.0 mm)	SWA01050	SWA01046

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 (101.6 mm) I.D. pressure vessels.

RE4021-BE

CSM

High productivity RO element with extended area for brackish water

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^3/hr)
	· Min. Concentrate Flow Rate	3 gpm (0.68 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE4040-BE

RE4040-BE

CSM

High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	2,400 GPD (9.1 m^3/day)
Nominal salt rejection:	99.7%
Effective membrane area:	85 ft^2 (7.9 m^2)

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 (1.55 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 +25 /-15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D / E	Part Number	
					Inter-connector	Brine Seal
RE4040-BE	40.0 inch (1,016 mm)	3.9 inch (99 mm)	0.75 inch (19 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01046

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4040 elements fit nominal 4.0 inch (101.6 mm) I.D. pressure vessels.

RE4040-BE

High productivity RO element with extended area 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	18 gpm (4.09 m^3/hr)
	· Min. Concentrate Flow Rate	4 gpm (0.91 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY 4” Membranes

Ref. MTM710D

'TORAY'
Innovation by Chemistry

High rejection BWRO, enhanced chemical tolerance

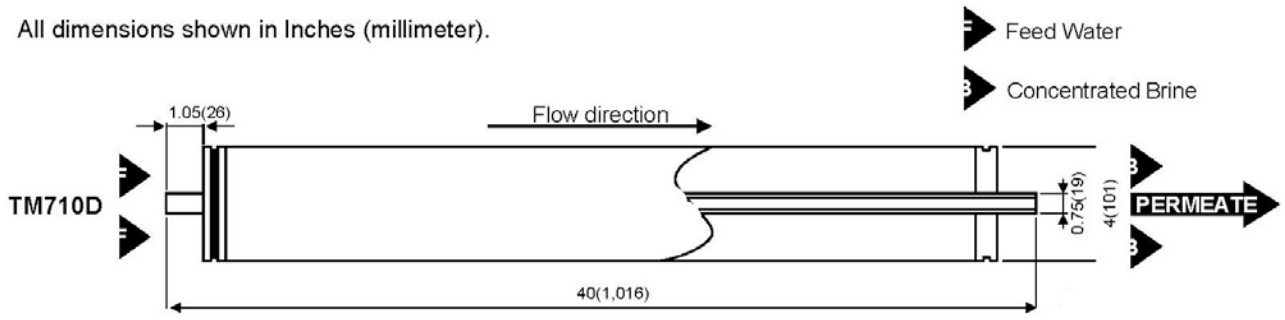
TM700D

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM710D	4”	87(8)	99.8	2,600(9.8)	31

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	225 psi(1.55MPa) 77° F(25℃) 2,000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.65%
4. Minimum Product Flow Rate		2,150gpd(8.2m³/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 4” Membranes

Operating Limits

Maximum Operating Pressure	600psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI15	5
Feed Water Chlorine Concentration *See below 3 of Operating Information	<0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCRE4040-CE

RE4040-CE

Innovative chlorine resistant RO element for prolonged membrane lifetime

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	1,900 GPD (7.2 m^3/day)
Nominal salt rejection:	99.5%
Effective membrane area:	85ft^2 (7.9m^2)

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 99.0%
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

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

Dimensions

Model Name	A	B	C	D	E
RE4040-CE	40.0 inch (1,016 mm)	4.0 inch (102 mm)	0.75 inch (19.1 mm)	1.06 inch (27 mm)	1.06 inch (27 mm)

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

RE4040-CE

CSM

Innovative chlorine resistant RO element for prolonged membrane lifetime

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^3/hr)
	Min. Concentrate Flow Rate	4 gpm (0.91 m^3/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
	Free Chlorine Tolerance	5,000 ppm·hr
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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

Ref. MCRE4040-FEN

RE4040-FEn

CSM

Enhanced fouling resistant RO element for brackish water and wastewater reuse

SPECIFICATIONS:

General Features

Permeate flow rate:	2,400 GPD (9.1 m^3/day)
Nominal salt rejection:	99.7%
Effective membrane area:	85 ft^2 (7.9 m^2)

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 (1.55 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 +25 /-15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D/E	Part Number	
					Inter-connector	Brine Seal
RE4040-FEn	40.0 inch (1,016 mm)	3.9 inch (99 mm)	0.75 inch (19 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01046

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4040 elements fit nominal 4.0 inch (101.6 mm) I.D. pressure vessels.

RE4040-FE^n

CSM

Enhanced fouling resistant RO element 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	18 gpm (4.09 m³/hr)
	· Min. Concentrate Flow Rate	4 gpm (0.91 m³/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE4040-FLR

RE4040-FLR

CSM

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

SPECIFICATIONS:

General Features

Permeate flow rate:	2,100 GPD (7.9 m^3/day)
Nominal salt rejection:	99.6%
Effective membrane area:	85 ft^2 (7.9 m^2)

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 (1.03 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 -5%
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions

Model Name	A	B	C	D/E	Part Number	
					Inter-connector	Brine Seal
RE4040-FLR	40.0 inch (1,016 mm)	3.9 inch (99 mm)	0.75 inch (19 mm)	1.05 inch (26.7 mm)	SWA01050	SWA01046

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All RE4040 elements fit nominal 4.0 inch (101.6 mm) I.D. pressure vessels.

RE4040-FLR

CSM®

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	18 gpm (4.09 m^3/hr)
	· Min. Concentrate Flow Rate	4 gpm (0.91 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY 4” Membranes

Ref. MTML10D

TORAY

Low fouling and high tolerance RO

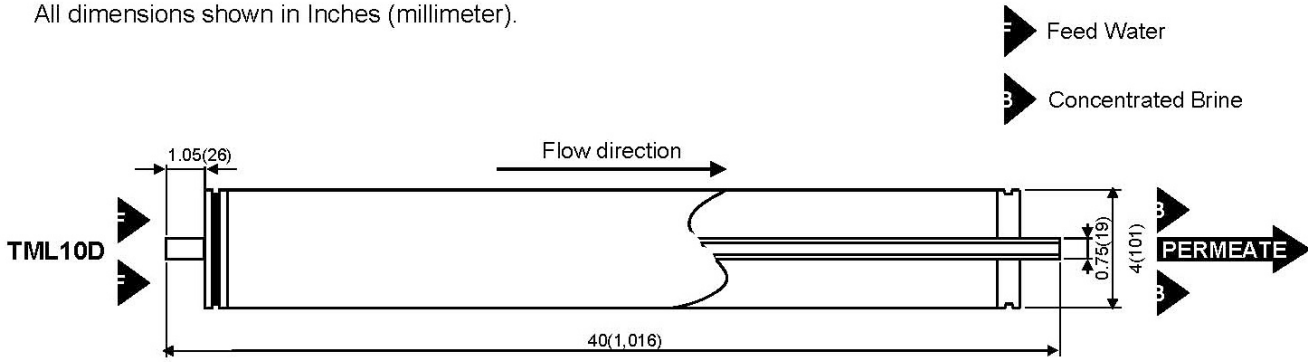
TML(D)

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TML10D	4”	73(7)	99.8	1,900(7.2)	34

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	225 psi(1.55 MPa) 77 ° F(25 ℃) 2,000 mg/l NaCl 15 % 7
3. Minimum Salt Rejection		99.65 %
4. Minimum Product Flow Rate		1,500 gpd(5.8 m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 4” Membranes

Operating Limits

Maximum Operating Pressure	600psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45°C)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	<0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCRE4021-SHN

RE4021-SHN

CSM

High Rejection RO element for seawater and high salinity well water

SPECIFICATIONS:

General Features

Permeate flow rate:	600 GPD (2.3 m^3/day)
Nominal salt rejection:	99.75%
Effective membrane area:	35 ft^2 (3.3 m^2)

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

   - **32,000 mg/L NaCl solution at 800 psig (5.5 MPa) applied pressure**
   - **8% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Minimum salt rejection is 99.6%
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	D	E
RE4021-SHN	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.

RE4021-SHN

CSM®

High Rejection RO element for seawater and high salinity well water

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	1,200 psi (8.27 MPa)
	· Max. Feed Flow Rate	13 gpm (2.95 m^3/hr)
	· Min. Concentrate Flow Rate	3 gpm (0.68 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY 4” Membranes

Ref. MTM810C

'TORAY'
Innovation by Chemistry

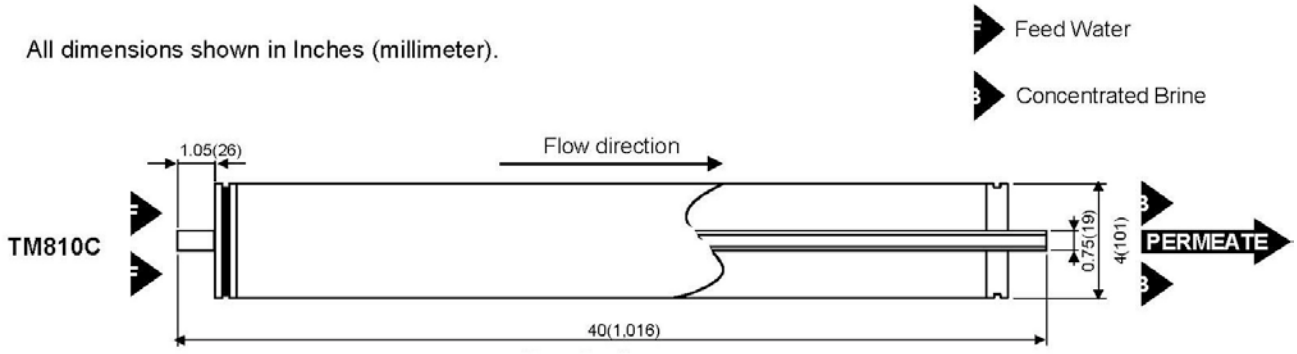
Standard SWRO
TM800C

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM810C	4”	73(7)	99.75	1,200(4.5)	31

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	800 psi(5.52MPa) 77° F(25°C) 32,000 mg/l Nacl 8% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		1,000gpd(3.8m³/d)
5. Boron Rejection (typical value)		93% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 4” Membranes

Operating Limits

Maximum Operating Pressure	1200psi (8.3 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guidelines,computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during system shutdown, it is recommended to perform 30-60 minutes flushing of Toray elements with seawater once in every two days.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 4” Membranes

Ref. MTM810V

TORAY
Innovation by Chemistry

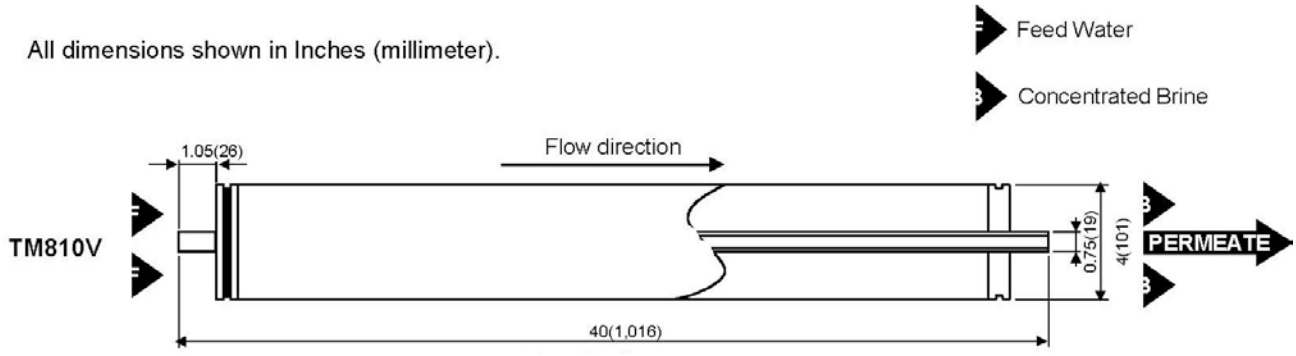
Low energy SWRO
TM800V

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM810V	4”	87(8)	99.8	1,900(7.2)	28

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	800 psi(5.52MPa) 77° F(25℃) 32,000 mg/l Nacl 8% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		1,550gpd(5.9m³/d)
5. Boron Rejection (typical value)		92% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 4” Membranes

Operating Limits

Maximum Operating Pressure	1200psi (8.3 MPa)
Maximum Feed Water Temperature	113° F (45°C)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guidelines,computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during system shutdown, it is recommended to perform 30-60 minutes flushing of Toray elements with seawater once in every two days.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCNE4040-90

NE4040-90

CSM

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

Permeate flow rate :	1,700 GPD (6.4 m^3/day)
Monovalent ion rejection (NaCl)[1]:	85.0 – 97.0%
Divalent ion rejection ($CaCl_2$)[2]:	90.0 – 97.0%
Effective membrane area :	85 ft^2 (7.9 m^2)

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

   - **2,000 mg/L NaCl solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

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

   - **500 mg/L $CaCl_2$ solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

3. $MgSO_4$ rejection is 97.0%. (Test conditions are equivalent with NaCl)
4. Permeate flow rate for each element may vary but will be no more than 15%.
5. Elements can be supplied as dry or wet-type. Wet-tested elements are soaked in a preservative solution (1.0% food grade SBS) and vacuum sealed in a poly bag. All elements are individually boxed.

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

Dimensions

Model Name	A	B	C	D	E	Part Number: Inter-connector	Part Number: Brine Seal
NE4040-70	40.0 inch (1,016 mm)	4.0 inch (102 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	1.05 inch (26.7 mm)	40000305	40000306

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE4040 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

NE4040-90

Normal grade NF element with high monovalent ion rejection

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	18 gpm (4.09 m^3/hr)
	· Min. Concentrate Flow Rate	4 gpm (0.91 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.
- Wet 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.

Ref. MCNE4040-70

NE4040-70

Normal grade NF element with high monovalent ion rejection

CSM

SPECIFICATIONS:

General Features

Permeate flow rate[1]:	1,500 GPD (5.7 m^3/day)
Monovalent ion rejection (NaCl)[1]:	40.0 – 70.0%
Divalent ion rejection ($CaCl_2$)[2]:	45.0 – 70.0%
Effective membrane area:	85 ft^2 (7.9 m^2)

1. The stated product performance is based on data taken after 30 minutes of operation at the following monovalent test conditions:
   - **2,000 mg/L NaCl solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. The stated product performance is based on data taken after 30 minutes of operation at the following divalent test conditions:
   - **500 mg/L $CaCl_2$ solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
3. $MgSO_4$ rejection is 97.0%. (Test conditions are equivalent with NaCl)
4. Permeate flow rate for each element may vary but will be no more than 15%.
5. Elements are supplied as dry-type. Dry elements are sealed in a poly bag and individually boxed.

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

Dimensions

Model Name	A	B	C	D	E	Part Number	
						Inter-connector	Brine Seal
NE4040-70	40.0 inch (1,016 mm)	4.0 inch (102 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	1.05 inch (26.7 mm)	40000305	40000306

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE4040 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

NE4040-70

CSM

Normal grade NF element with medium monovalent ion rejection

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 m³/hr)
	Min. Concentrate Flow Rate	4 gpm (0.91 m³/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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

Ref. MCNE4040-40

NE4040-40

High productivity NF element

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	2,100 GPD (7.9 m³/day)
Monovalent ion rejection (NaCl):	20 – 40%
Effective membrane area:	85 ft² (7.9 m²)

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 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Permeate flow rate for each element may vary but will be no more than 20%.
3. Elements are supplied as dry-type. Dry elements are sealed in a poly bag and individually boxed.

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

Dimensions

Model Name	A	B	C	D	E	Part Number	
						Inter-connector	Brine Seal
NE4040-40	40.0 inch (1,016 mm)	4.0 inch (102 mm)	0.75 inch (19.1 mm)	1.05 inch (26.7 mm)	1.05 inch (26.7 mm)	DD004	DD003

(*) see 05-03-99-EN data sheet.

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE4040 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

NE4040-40

High productivity NF element

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	18 gpm (4.09 m^3/hr)
	· Min. Concentrate Flow Rate	4 gpm (0.91 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY CSM 8” Membranes

LOW PRESSURE LPM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE8040-BLN	RE8040-BLN	Standard 61	Compliant	
MCRE8040-BLN440	RE8040-BLN440	-	Compliant	
MCRE8040-BLR	RE8040-BLR	Standard 61	Compliant	
MCRE8040-BLR440	RE8040-BLR440	-	Compliant	
MCRE8040-BLF	RE8040-BLF	Standard 61	Compliant	
MCRE8040-BLF440	RE8040-BLF440	-	Compliant	
MTMH20A-400C	TMH20A-400C	-	Compliant	
MTMH20A-440C (*)	TMH20A-440C	-	Compliant	
MTMG20D-400	TMG20D-400	-	Compliant	
MTMG20D-440 (*)	TMG20D-440	-	Compliant	

BRACKISH WATER BWM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE8040-BN	RE8040-BN	Standard 61	Compliant	
MCRE8040-BE	RE8040-BE	Standard 61	Compliant	
MCRE8040-BE440	RE8040-BE440	Standard 61	Compliant	
MCRE8040-BR	RE8040-BR	-	Compliant	
MCRE8040-BR400 (**)	RE8040-BR400	-	Compliant	
MTM720D-400	TM720D-400	-	Compliant	
MTM720D-440 (*)	TM720D-440	-	Compliant	
MTM720L-440 (*)	TM720L-440	-	Compliant	

FOULING RESISTANT FRM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCRE8040-FEN34	RE8040-FEn34	-	Compliant	
MCRE8040-FEN	RE8040-FEn	Standard 61	Compliant	
MCRE8040-FEN440 (*)	RE8040-FEn440	Standard 61	Compliant	
MCRE8040-FL (*)	RE8040-FL	-	Compliant	
MCRE8040-FLR (**)	RE8040-FLR	-	Compliant	
MCRE8040-FLR34	RE8040-FLR34	-	Compliant	
MTML20D-400	TML20D-400	-	Compliant	

SEA WATER SWM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MTM820M-400	TM820M-400	-	Compliant	
MTM820M-440 (*)	TM820M-440	-	Compliant	
MTM820V-400	TM820V-400	-	Compliant	
MTM820V-440 (*)	TM820V-440	-	Compliant	

NANOFILTRATION NFM MEMBRANES				
REF.	**MODEL**	**NSF/ANSI**	**DM174-2004**	
MCNE8040-90	NE8040-90	Standard 61	Compliant	
MCNE8040-70 (*)	NE8040-70	Standard 61	Compliant	
MCNE8040-40 (*)	NE8040-40	Standard 61	Compliant	

(*) not available in stock. (**) available till it will be out-of-stock.

Ref. MCRE8040-BLN

RE8040-BLN

CSM

Low pressure grade RO element for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	12,000 GPD (45.4 m³/day)
Nominal salt rejection:	99.5%
Effective membrane area:	400 ft² (37.2 m²)

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 (1.03 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 +25 / -15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BLN	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BLN

Low pressure grade 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	75 gpm (17.0 m^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/hr)
	· Max. Operating Temperature	113 °F (45 °C)
	· Operating pH Range	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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BLN440

RE8040-BLN440

Low pressure grade RO element for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	13,000 GPD (49.2 m^3/day)
Nominal salt rejection:	99.5%
Effective membrane area:	440 ft^2 (40.9 m^2)

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 (1.03 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 +25 / -15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BLN440	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BLN440

Low pressure grade 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	75 gpm (17.0 m^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/hr)
	· Max. Operating Temperature	113 °F (45 °C)
	· Operating pH Range	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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BLR

RE8040-BLR

CSM

Low pressure grade RO element for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	10,000 GPD (37.9 m³/day)
Nominal salt rejection:	99.6%
Effective membrane area:	400 ft² (37.2 m²)

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 (1.03 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 -5%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BLR	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BLR

Low pressure grade 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	75 gpm (17.0 m^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/hr)
	· Max. Operating Temperature	113 °F (45 °C)
	· Operating pH Range	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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BLR440

RE8040-BLR440

CSM

Low pressure grade RO element for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	11,000 GPD (41.6 m^3/day)
Nominal salt rejection:	99.6%
Effective membrane area:	440 ft^2 (40.9 m^2)

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 (1.03 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 -5%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BLR440	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BLR440

Low pressure grade 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	75 gpm (17.0 m^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/hr)
	· Max. Operating Temperature	113 °F (45 °C)
	· Operating pH Range	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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BLF

RE8040-BLF

CSM

Ultra-low pressure grade RO element for low TDS water

SPECIFICATIONS:

General Features

Permeate flow rate:	11,500 GPD (43.5 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	400 ft^2 (37.2 m^2)

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

- **500 mg/L NaCl solution at 100 psig (0.69 MPa) applied pressure**
- **15% recovery**
- **77 °F (25 °C)**
- **pH 6.5–7.0**

1. Minimum salt rejection is 99.0%.
2. Permeate flow rate for each element may vary +25 / -15%.
3. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BLF	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BLF

CSM

Ultra-low pressure grade RO element for low TDS water

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 m³/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m³/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BLF440

RE8040-BLF440

CSM

Ultra-low pressure grade RO element for low TDS water

SPECIFICATIONS:

General Features

Permeate flow rate:	12,650 GPD (47.9 m^3/day)
Nominal salt rejection:	99.2%
Effective membrane area:	440 ft^2 (40.9 m^2)

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

- **500 mg/L NaCl solution at 100 psig (0.69 MPa) applied pressure**
- **15% recovery**
- **77 °F (25 °C)**
- **pH 6.5–7.0**

1. Minimum salt rejection is 99.0%.
2. Permeate flow rate for each element may vary +25 / -15%.
3. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BLF440	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BLF440

CSM

Ultra-low pressure grade RO element for low TDS water

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY 8” Membranes

Ref. MTMH20A-400C

'TORAY'
Innovation by Chemistry

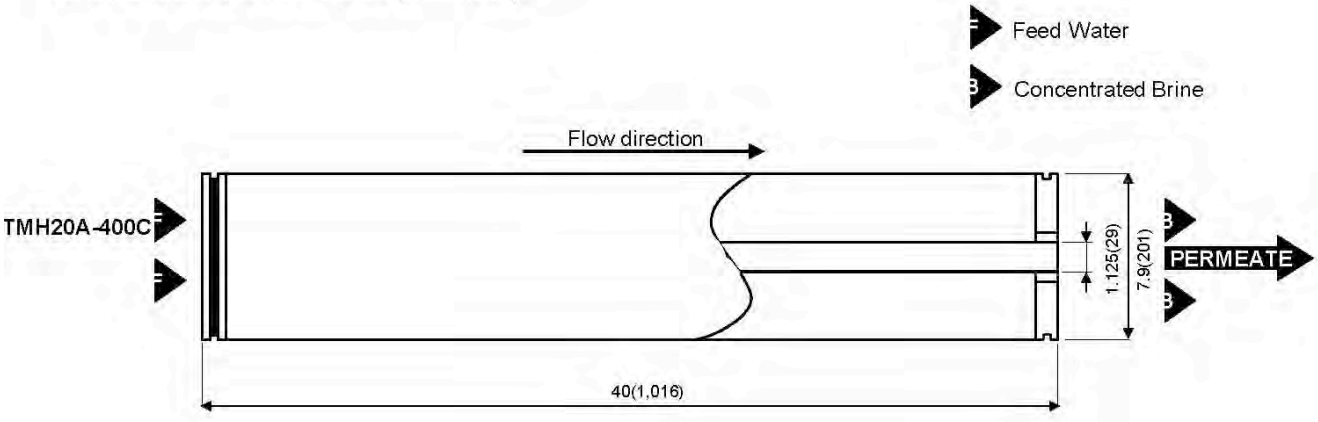
Ultra low pressure BWRO
TMHA (C)

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TMH20A-400C	8”	400(37)	99.3	11,000(41.6)	34

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	100 psi(0.69MPa) 77° F(25°C) 500 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.0%
4. Minimum Product Flow Rate		8,800gpd(33.3m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	365psi (2.5 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not Detactable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 8” Membranes

Ref. MTMH20A-440C

'TORAY'
Innovation by Chemistry

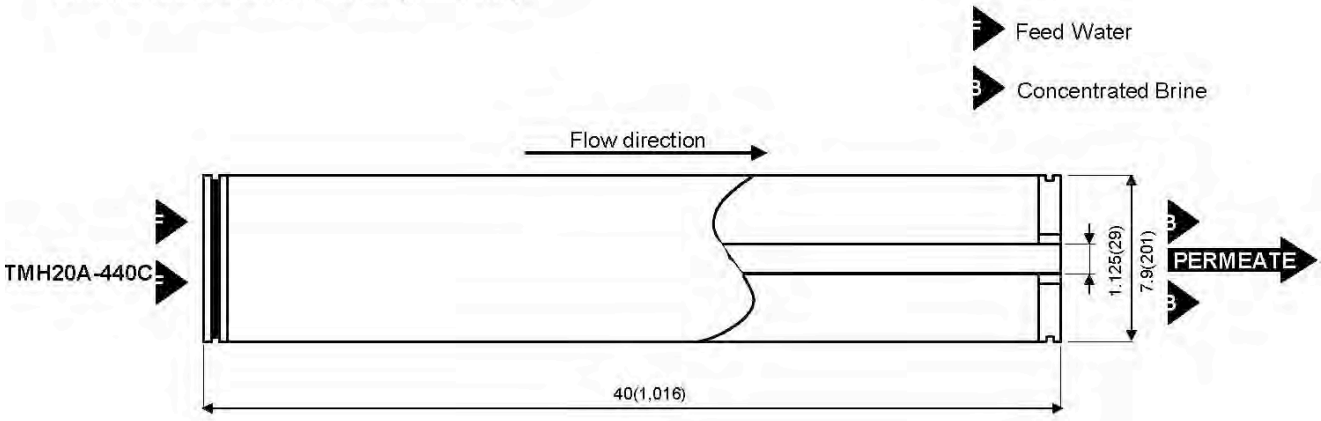
Ultra low pressure BWRO
TMHA (C)

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TMH20A-440C	8”	440(41)	99.3	12,100(45.7)	28

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	100 psi(0.69MPa) 77° F(25°C) 500 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.0%
4. Minimum Product Flow Rate		9,700gpd(36.7m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	365psi (2.5 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not Detactable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

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2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 8” Membranes

Ref. MTMG20D-400

'TORAY'
Innovation by Chemistry

Ultra low pressure BWRO, enhanced chemical tolerance

TMG(D)

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TMG20D-400	8”	400(37)	99.7	12,100(45.8)	34

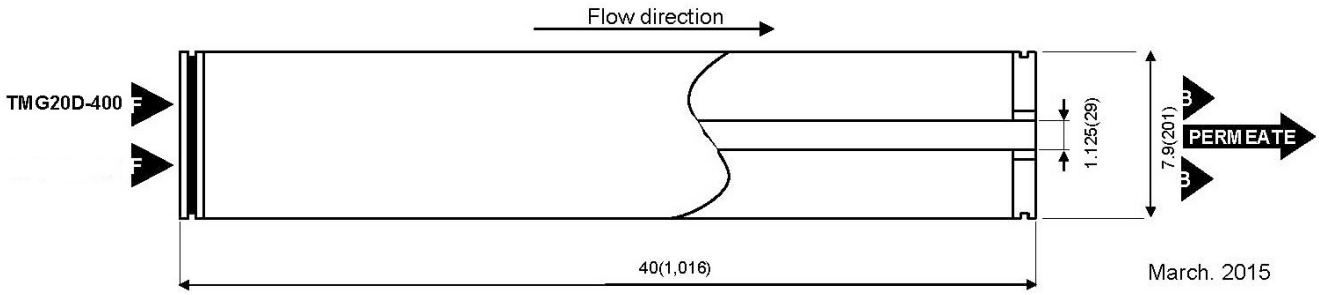
1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	150 psi(1.03MPa) 77° F(25°C) 2000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		10,300gpd(39.0m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).

F Feed Water

B Concentrated Brine



March. 2015

TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	365psi (2.5 MPa)
Maximum Feed Water Temperature	113° F (45°C)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration *See below 3 of Operating Information	< 0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. Since oxidation damage is not covered under warranty, it is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

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2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 8” Membranes

Ref. MTMG20D-440

TORAY
Innovation by Chemistry

Ultra low pressure BWRO, enhanced chemical tolerance

TMG(D)

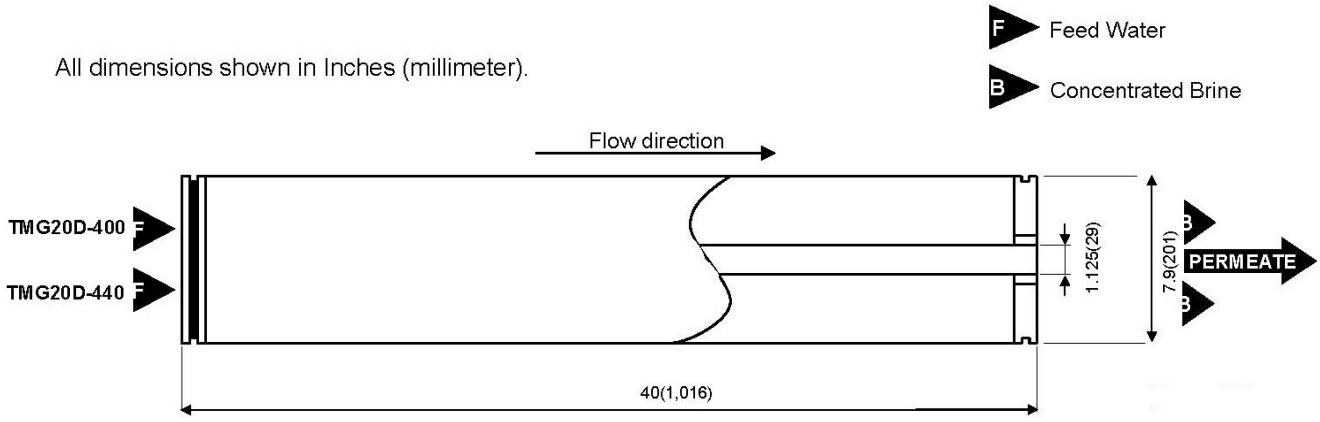
Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TMG20D-440	8”	440(41)	99.7	13,300(50.3)	28

*** Above two types of TMG20D are with 29mm centerpipe as described in below “Dimensions”. Please note that while *TMG20* series with 29 mm centerpipe are distinguished by “C style”, TMG20D series are only with 29 mm centerpipe and not distinguished by “C style”.**

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	150 psi(1.03MPa) 77° F(25°C) 2000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		11,200gpd(42.4m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	600 psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45°C)
Maximum Feed Water SDI15	5
Feed Water Chlorine Concentration *See below 3 of Operating Information	< 0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. Since oxidation damage is not covered under warranty, it is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system. Please refer to Toray RO Element Three-Year Prorated Limited Warranty.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.
6. Recommended Process/ Operation pressure is < 2.0 MPa
   a) Ultra low pressure elements will perform best with low salinity brackish water
   b) Above pressure range should be maintained also at low temperature
   For more details, and in special cases, please consult the projection design guideline or contact your membrane supplier.

Notice

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2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCRE8040-BN

RE8040-BN

CSM®

Low pressure grade RO element with thick feed spacer for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	9,500 GPD (36.0 m^3/day)
Nominal salt rejection:	99.7%
Effective membrane area:	365 ft^2 (33.9 m^2)

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.

Membrane type:	Thin-Film Composite
Membrane material:	Polyamide (PA)
Element configuration:	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.

RE8040-BN

CSM

Low pressure grade RO element with thick feed spacer for brackish water

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BE

RE8040-BE

High productivity RO element with extended area for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	11,000 GPD (41.6 m³/day)
Nominal salt rejection:	99.7%
Effective membrane area:	400 ft² (37.2 m²)

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 (1.55 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 +25 / -15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BE	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BE

CSM

High productivity RO element with extended area for brackish water

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^3/hr)
	Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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	< 0.05 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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

Ref. MCRE8040-BE440

RE8040-BE440

CSM

High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	12,000 GPD (45.4 m^3/day)
Nominal salt rejection:	99.7%
Effective membrane area:	440 ft^2 (40.9 m^2)

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 (1.55 MPa) applied pressure**
- **15% recovery**
- **77 °F (25 °C)**
- **pH 6.5–7.0**

1. Minimum salt rejection is 99.5%.
2. Permeate flow rate for each element may vary +25 / -15%.
3. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BE440	40.0 inch (1,016 mm)	7.9 inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BE440

CSM

High productivity RO element with extended area for brackish water

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BR

RE8040-BR

CSM

High Rejection RO element with thick feed spacer for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	6,000 GPD (22.7 m³/day)
Nominal salt rejection:	99.75%
Effective membrane area:	380 ft² (35.3 m²)

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 (1.55 MPa) applied pressure**
- **15% recovery**
- **77 °F (25 °C)**
- **pH 6.5–7.0**

1. Minimum salt rejection is 99.5%.
2. Permeate flow rate for each element may vary +25 / -15%.
3. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-BR	40.0 inch (1,016 mm)	7.9inch (200 mm)	1.12 inch (28.5 mm)	15 kg	SWA01049	SWA01043

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 (203.2 mm) I.D. pressure vessels.

RE8040-BR

CSM

High Rejection RO element with thick feed spacer for brackish water

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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	< 0.05 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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-BR400

RE8040-BR400

CSM

Normal grade RO element with thick feed spacer for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate:	6,600 GPD (24.9 m³/day)
Nominal salt rejection:	99.75%
Effective membrane area:	400 ft² (37.2 m²)

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.

Membrane type:	Thin-Film Composite
Membrane material:	Polyamide (PA)
Element configuration:	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.

RE8040-BR400

CSM

Normal grade RO element with thick feed spacer for brackish water

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY 8” Membranes

Ref. MTM720D-400

'TORAY'
Innovation by Chemistry

High rejection BWRO, enhanced chemical tolerance

TM700D

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM720D-400	8”	400(37)	99.8	11,000(41.6)	34

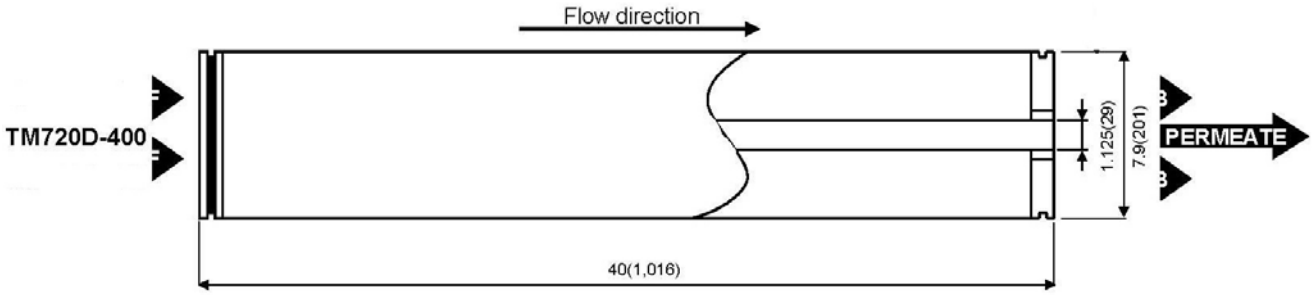
1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	225 psi(1.55MPa) 77° F(25°C) 2,000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.65%
4. Minimum Product Flow Rate		8,900gpd(33.6m³/d)

Dimensions

All dimensions shown in Inches (millimeter).

F Feed Water

B Concentrated Brine



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	600psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI15	5
Feed Water Chlorine Concentration *See below 3 of Operating Information	<0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 8” Membranes

Ref. MTM720D-440

'TORAY'
Innovation by Chemistry

High rejection BWRO, enhanced chemical tolerance

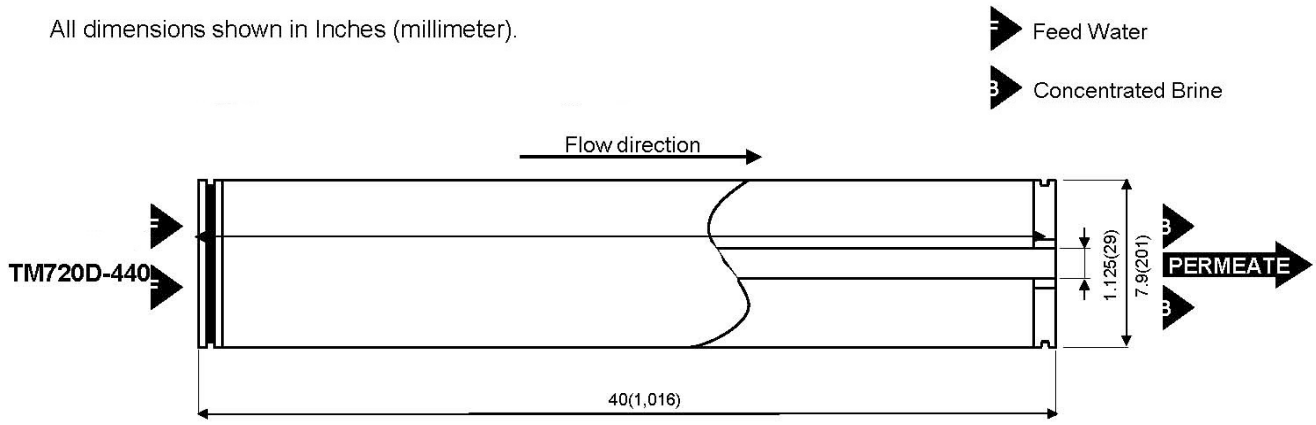
TM700D

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TM720D-440	8”	440(41)	99.8	12,100(45.8)	28

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	225 psi(1.55MPa) 77° F(25°C) 2,000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.65%
4. Minimum Product Flow Rate		9,800gpd(37.0m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	600psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	< 0.1 ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 8” Membranes

Ref. MTM720L-440

"TORAY"
Innovation by Chemistry

Brackish Water RO Elements

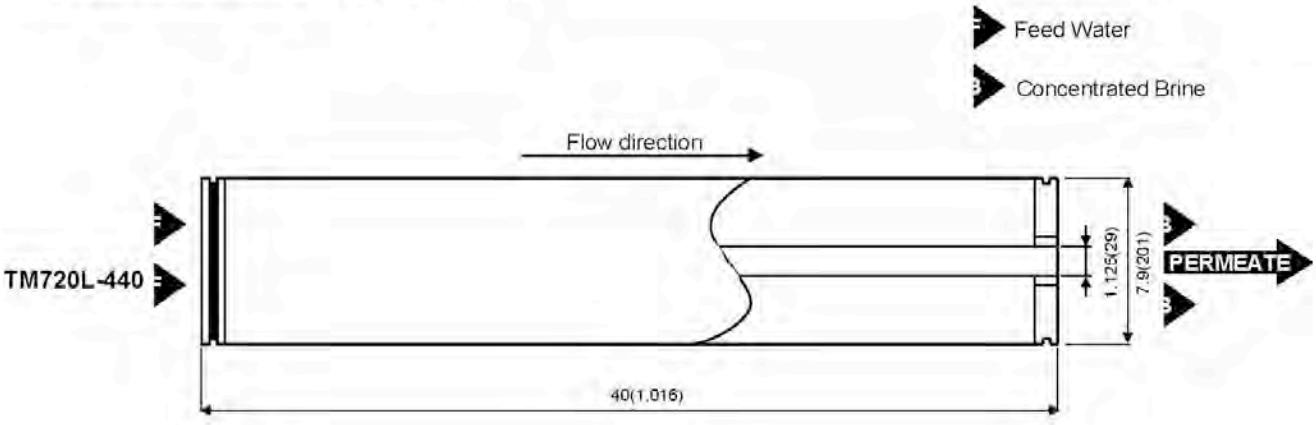
TM700L

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM720L-440	8"	440(41)	99.5	9,400(35.6)	28

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	150 psi(1.03MPa) 77° F(25°C) 2,000 mg/l Nacl 15% 7
3. Minimum Salt Rejection		99.0%
4. Minimum Product Flow Rate		7,500gpd(28.4m³/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	600psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45°C)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not Detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

1. Toray accepts no responsibility for results obtained by the application of this information or the safety or suitability of Toray's products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each product combination for their own purposes.
2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCRE8040-FEN34

RE8040-FEn34

CSM

Enhanced fouling resistant RO element for brackish water and wastewater reuse

SPECIFICATIONS:

General Features

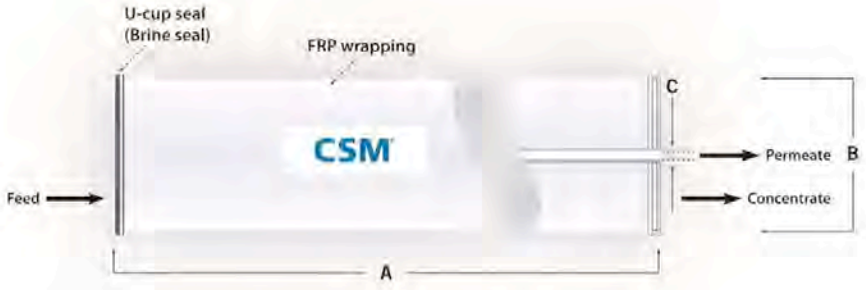
Permeate flow rate:	10,500 GPD (39.7 m³/day)
Nominal salt rejection:	99.7%
Effective membrane area:	400 ft² (37.2 m²)
Feed spacer thickness:	34mil

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 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-FEn34	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309



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.

RE8040-FE^{n}34

CSM

Enhanced fouling resistant RO element 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 m³/hr)
	Min. Concentrate Flow Rate	16 gpm (3.6 m³/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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.

Ref. MCRE8040-FEN

RE8040-FEⁿ

CSM

Enhanced fouling resistant RO element for brackish water and wastewater reuse

SPECIFICATIONS:

General Features

Permeate flow rate:	10,500 GPD (39.7 m³/day)
Nominal salt rejection:	99.7%
Effective membrane area:	400 ft² (37.2 m²)
Feed spacer thickness:	32 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 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-FEn	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309

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.

RE8040-FE^{n}

CSM

Enhanced fouling resistant RO element 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 m³/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m³/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-FEN440

RE8040-FEⁿ440

CSM

Enhanced fouling resistant RO element for brackish water and wastewater reuse

SPECIFICATIONS:

General Features

Permeate flow rate:	11,500 GPD (43.5 m³/day)
Nominal salt rejection:	99.7%
Effective membrane area:	440 ft² (40.9 m²)
Feed spacer thickness:	28mil

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

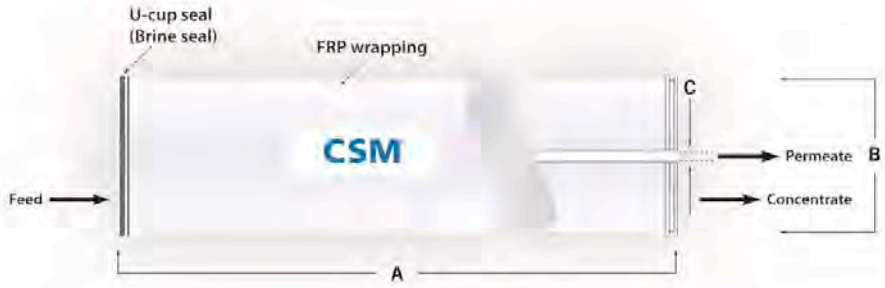
   - **2,000 mg/L NaCl solution at 225 psig (1.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**

2. Minimum salt rejection is 99.4%.
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-FEn440	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309



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.

RE8040-FE^{n}440

CSM

Enhanced fouling resistant RO element 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 m³/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m³/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-FL

RE8040-FL

CSM

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

SPECIFICATIONS:

General Features

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

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.

Membrane type:	Thin-Film Composite
Membrane material:	Polyamide (PA)
Element configuration:	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.

RE8040-FL

CSM

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-FLR

RE8040-FLR

CSM

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

SPECIFICATIONS:

General Features

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

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.

Membrane type:	Thin-Film Composite
Membrane material:	Polyamide (PA)
Element configuration:	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.

RE8040-FLR

CSM®

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCRE8040-FLR34

RE8040-FLR34

CSM

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

SPECIFICATIONS:

General Features

Permeate flow rate:	10,000 GPD (37.8 m³/day)
Nominal salt rejection:	99.6%
Effective membrane area:	400 ft² (37.2 m²)
Feed spacer thickness:	34mil

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 99.4%.
3. Permeate flow rate for each element may vary but will be no more than 15%.
4. All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
RE8040-FLR34	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309

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.

RE8040-FLR34

CSM®

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

TORAY 8” Membranes

Ref. MTML20D-400

TORAY

Low fouling and high tolerance RO

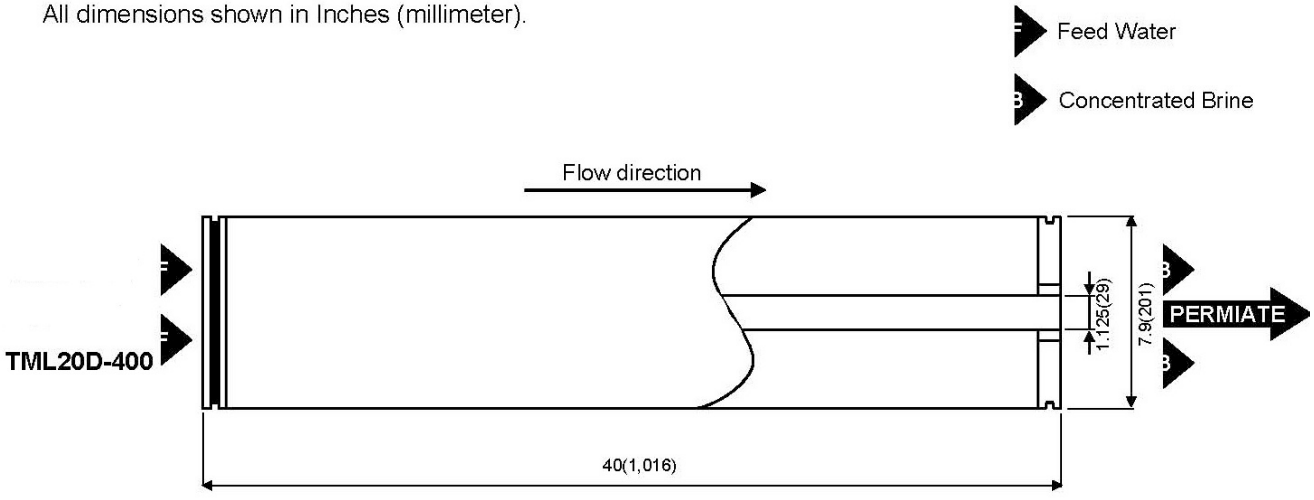
TML(D)

Type	Diameter Inch	Membrane Area $ft^2(m^2)$	Salt Rejection %	Product Flow Rate $gpd(m^3/d)$	Feed Spacer Thickness mil
TML20D-400	8”	400(37)	99.8	10,500(39.7)	34

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	225 psi(1.55 MPa) 77 ° F(25 ℃) 2,000 mg/l NaCl 15 % 7
3. Minimum Salt Rejection		99.65 %
4. Minimum Product Flow Rate		8,400 gpd(31.8 m^3/d)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	600psi (4.1 MPa)
Maximum Feed Water Temperature	113° F (45°C)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	<0.1ppm
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-13
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guide lines, computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with a 1% by weight percent sodium bisulfite storage solution, and then vacuum packed in oxygen barrier bags, or treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during short term storage, shipment, or system shutdown, it is recommended that Toray elements be immersed in a protective solution containing 500 - 1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

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2. All data may change without prior notice, due to technical modifications or production changes.

TORAY 8” Membranes

Ref. MTM820M-400

'TORAY'
Innovation by Chemistry

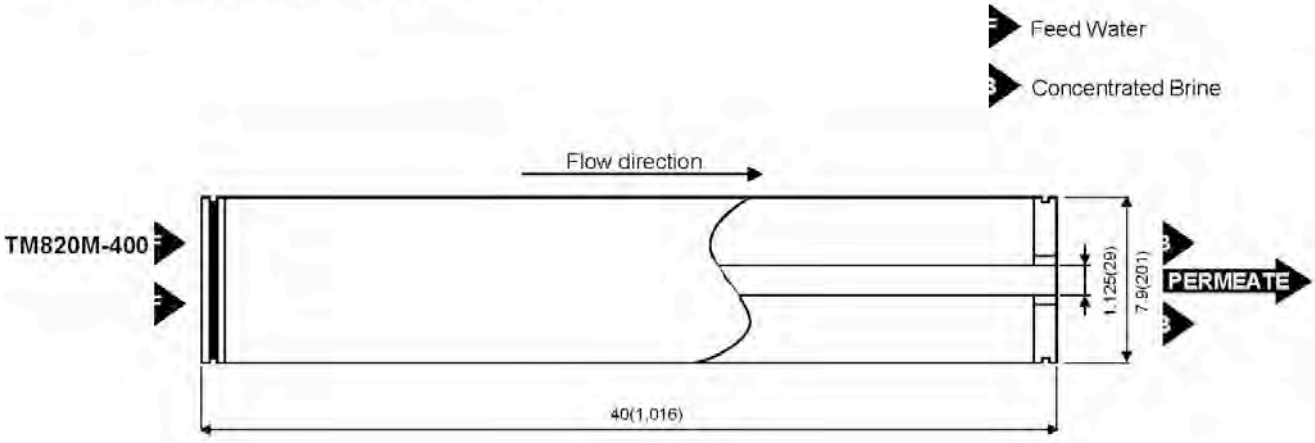
Standard SWRO
TM800M

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM820M-400	8"	400(37)	99.8	7,000(26.5)	34

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	800 psi(5.52MPa) 77° F(25°C) 32,000 mg/l Nacl 8% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		5,600gpd(21.2m³/d)
5. Boron Rejection (typical value)		95% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	1200psi (8.3 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guidelines,computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during system shutdown, it is recommended to perform 30-60 minutes flushing of Toray elements with seawater once in every two days.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

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TORAY 8” Membranes

Ref. MTM820M-440

TORAY
Innovation by Chemistry

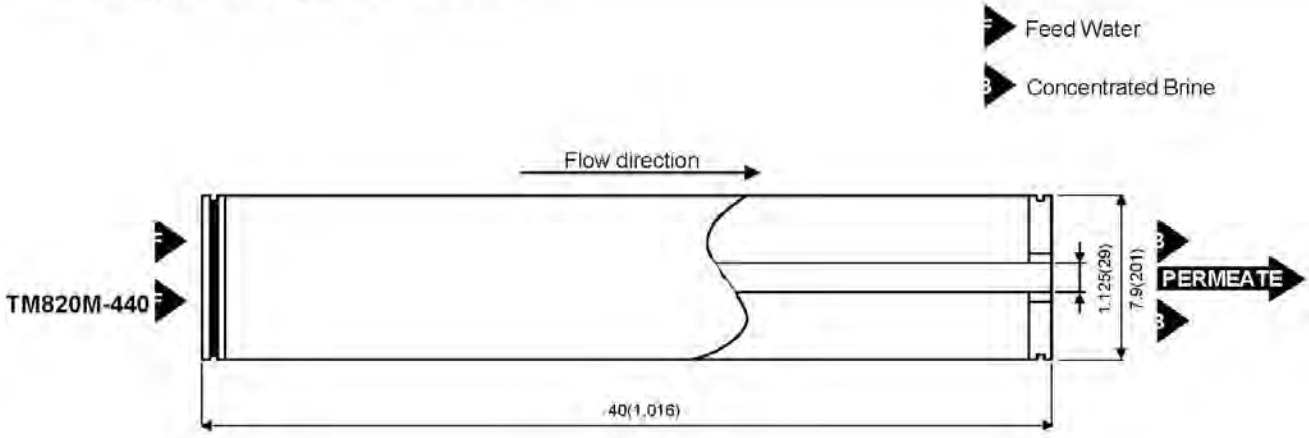
Standard SWRO
TM800M

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM820M-440	8”	440(41)	99.8	7,700(29.2)	28

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	800 psi(5.52MPa) 77° F(25°C) 32,000 mg/l Nacl 8% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		6,200gpd(23.5m³/d)
5. Boron Rejection (typical value)		95% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	1200psi (8.3 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1.For the recommended design range, please consult the latest Toray technical bulletin, design guidelines,computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.

2. All elements are wet tested, treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during system shutdown, it is recommended to perform 30-60 minutes flushing of Toray elements with seawater once in every two days.

3.The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.

4. Permeate from the first hour of operation shall be discarded.

5.The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

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TORAY 8” Membranes

Ref. MTM820V-400

'TORAY'
Innovation by Chemistry

Low energy SWRO
TM800V

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM820V-400	8"	400(37)	99.8	9,000(34.1)	34

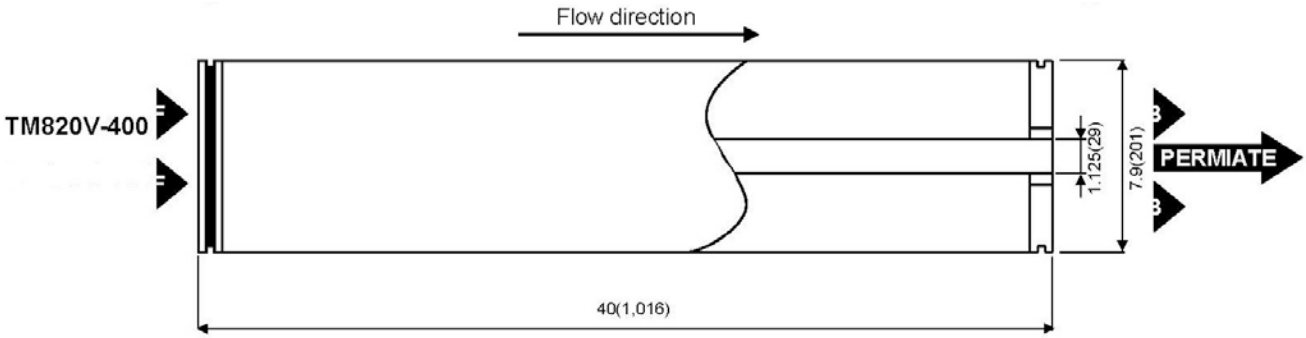
1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	800 psi(5.52MPa) 77° F(25°C) 32,000 mg/l Nacl 8% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		7,500gpd(28.4m³/d)
5. Boron Rejection (typical value)		92% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter).

F Feed Water

B Concentrated Brine



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	1200psi (8.3 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guidelines,computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during system shutdown, it is recommended to perform 30-60 minutes flushing of Toray elements with seawater once in every two days.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

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TORAY 8” Membranes

Ref. MTM820V-440

'TORAY'
Innovation by Chemistry

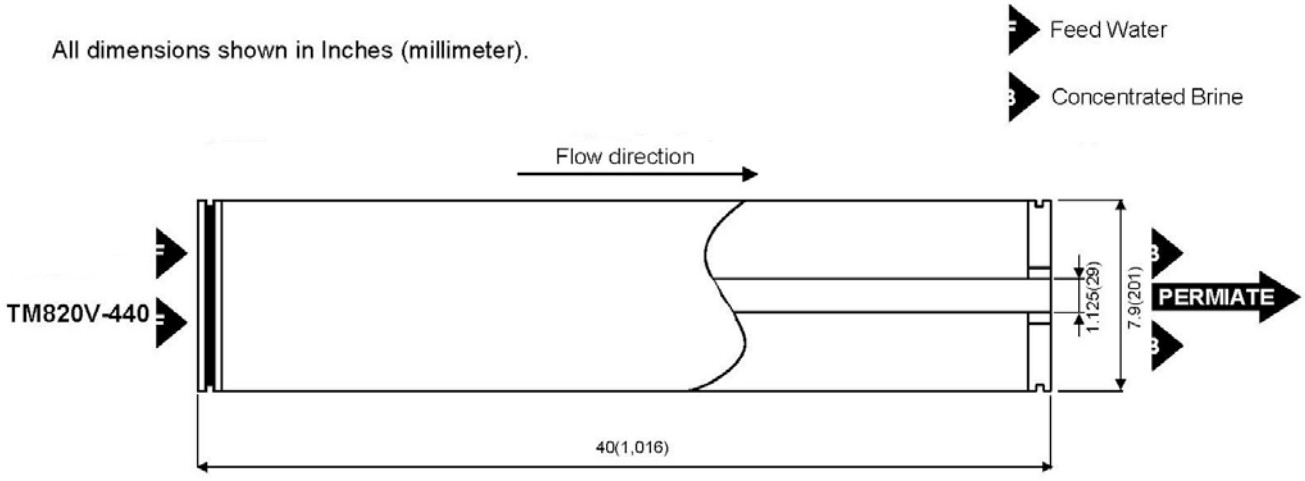
Low energy SWRO
TM800V

Type	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TM820V-440	8"	440(41)	99.8	9,900(37.5)	28

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions	Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	800 psi(5.52MPa) 77° F(25℃) 32,000 mg/l Nacl 8% 7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		8,250gpd(31.2m³/d)
5. Boron Rejection (typical value)		92% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter).



TORAY 8” Membranes

Operating Limits

Maximum Operating Pressure	1200psi (8.3 MPa)
Maximum Feed Water Temperature	113° F (45℃)
Maximum Feed Water SDI_{15}	5
Feed Water Chlorine Concentration	Not detectable
Feed Water pH Range, Continuous Operation	2-11
Feed Water pH Range, Chemical Cleaning	1-12
Maximum Pressure Drop per Element	15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	50 psi (0.34 MPa)

Operating Information

1. For the recommended design range, please consult the latest Toray technical bulletin, design guidelines,computer design program, and/ or call an application specialist. If the operating limits given in this Product Information Bulletin are not strictly followed, the Limited Warranty will be null and void.
2. All elements are wet tested, treated with tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside. To prevent biological growth during system shutdown, it is recommended to perform 30-60 minutes flushing of Toray elements with seawater once in every two days.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals which acts as oxidation catalyst in the feed water will cause unexpected oxidation of the membrane. It is strongly recommended to remove these oxidizing agents contained in feed water before operating RO system.
4. Permeate from the first hour of operation shall be discarded.
5. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.

Notice

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2. All data may change without prior notice, due to technical modifications or production changes.

Ref. MCNE8040-90

NE8040-90

CSM

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

Permeate flow rate[1]:	8,000 GPD (30.3 m^3/day)
Monovalent ion rejection (NaCl)[1]:	85.0 – 97.0%
Divalent ion rejection ($CaCl_2$)[2]:	90.0 – 97.0%
Effective membrane area:	400 ft^2 (37.2 m^2)

1. The stated product performance is based on data taken after 30 minutes of operation at the following monovalent test conditions:
   - **2,000 mg/L NaCl solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. The stated product performance is based on data taken after 30 minutes of operation at the following divalent test conditions:
   - **500 mg/L $CaCl_2$ solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
3. $MgSO_4$ rejection is 97.0%. (Test conditions are equivalent with NaCl)
4. Permeate flow rate for each element may vary but will be no more than 15%.
5. Elements can be supplied as dry or wet-type. Wet-tested elements are soaked in a preservative solution (1.0% food grade SBS) and vacuum sealed in a poly bag. All elements are individually boxed.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
NE8040-90	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

NE8040-90

Normal grade NF element with high monovalent ion rejection

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^3/hr)
	Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	$CaSO_4$	230% saturation
	$SrSO_4$	800% saturation
	$BaSO_4$	6,000% saturation
	SiO_2	100% saturation

†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.
- Wet 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.

Ref. MCNE8040-70

NE8040-70

Normal grade NF element with high monovalent ion rejection

CSM

SPECIFICATIONS:

General Features

Permeate flow rate[1]:	7,000 GPD (26.5 m³/day)
Monovalent ion rejection (NaCl)[1]:	40.0 – 70.0%
Divalent ion rejection ($CaCl_2$)[2]:	45.0 – 70.0%
Effective membrane area:	400 ft² (37.2 m²)

1. The stated product performance is based on data taken after 30 minutes of operation at the following monovalent test conditions:
   - **2,000 mg/L NaCl solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. The stated product performance is based on data taken after 30 minutes of operation at the following divalent test conditions:
   - **500 mg/L $CaCl_2$ solution at 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
3. $MgSO_4$ rejection is 97.0%. (Test conditions are equivalent with NaCl)
4. Permeate flow rate for each element may vary but will be no more than 20%.
5. Elements are supplied as dry-type. Dry elements are sealed in a poly bag and individually boxed.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
NE8040-70	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

NE8040-70

CSM

Normal grade NF element with high monovalent ion rejection

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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.

Ref. MCNE8040-40

NE8040-40

High productivity NF element

CSM

SPECIFICATIONS:

General Features

Permeate flow rate:	10,000 GPD (37.9 m³/day)
Nominal salt rejection:	20 – 40%
Effective membrane area:	400 ft² (37.2 m²)

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 75 psig (0.5 MPa) applied pressure**
   - **15% recovery**
   - **77 °F (25 °C)**
   - **pH 6.5–7.0**
2. $MgSO_4$ rejection is 97.0% (Test conditions are equivalent with NaCl)
3. Permeate flow rate for each element may vary but will be no more than 20%.
4. Elements are supplied as dry-type. Dry elements are sealed in a poly bag and individually boxed.

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

Dimensions and Weight

Model Name	A	B	C	Weight	Part Number	
					Inter-connector	Brine Seal
NE8040-40	40.0 inch (1,016 mm)	8.0inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309

1. Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
2. All NE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.

NE8040-40

High productivity NF element

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^3/hr)
	· Min. Concentrate Flow Rate	16 gpm (3.6 m^3/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)†	· Langlier Saturation Index (LSI)	<+1.5
	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· $CaSO_4$	230% saturation
	· $SrSO_4$	800% saturation
	· $BaSO_4$	6,000% saturation
	· SiO_2	100% saturation

†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 Membranes Brine Seal and Interconnector

- Each membrane element supplied with one brine seal and one interconnector (excepted for 2,5” membrane element, supplied without interconnector).

BRINE SEAL				
REF.	**DESCRIPTION**	**MATERIAL**	**FOR MEMBRANES**	
DC005	EPDM BRINE SEAL 2.5" CSM	EPDM	2,5”	
DD003	EPDM BRINE SEAL 4" CSM	EPDM	4”	
EA798	EPDM BRINE SEAL 8" CSM	EPDM	8”	

INTERCONNECTOR					
REF.	**DESCRIPTION**	**MATERIAL**	**COLOR**	**FOR MEMBRANES**	
DD004	ABS FEMALE INTERCONNECTOR CSM 2.5" & 4" WITH O-RING	ABS	WHITE	2,5” – 4”	
EA797	ABS MALE INTERCONNECTOR 1.5" CSM WITH O-RING	ABS	WHITE	8”	
EA799	ABS MALE INTERCONNECTOR 1.125" CSM WITH O-RING -BW TYPE	ABS	BLACK	8”	
EA800	NORYL MALE INTERCONNECTOR 1.125" CSM WITH O-RING - SW TYPE	NORYL	BLACK	8”	

Antiscaling for R. O. Membranes
Permascale Eut 110

- PERMASCALE EUT110 is a product that prevents scales and iron sediment on R.O. membranes systems;
- for industrial systems and for potable water treatment systems;
- very effective on various kinds of water, minimize the fouling and reduce the frequency of membranes cleaning;
- particularly suitable for big plants with permeate flows higher than 100 m^3/day;
- compatible with all kinds of membranes;
- replace totally or partially the acidification;
- easy to use due to the liquid form.

Characteristics	
Formulation	special phosphonated
pH	7,8 ± 0,5
Appearance	light yellow liquid
Density @ 20°C	1,30 ± 0,05 g/ml
Checking	phosphonated value
Solubility in water	complete

REF.	
EA100	

Use

Injection by dosing pump of pure or diluted product.
The dosage is according to the concentration of scaling salts and iron, and can vary from 2 to 10 cm^3/m^3 of feed water.

Instructions and Packaging

Handling: following safety data sheet. Take the normal precautions to handle chemical products.

Packaging: 25 kg drum.

Storage: closed on the original packaging, sheltered from cold and heat.

Antiscaling for R.O. Membranes
Permascale EUT 120

- PERMASCALE EUT120 is a product that prevents scales and iron sediment on R.O. membranes systems;
- very effective on various kinds of water, minimize the fouling and reduce the frequency of membranes cleaning;
- particularly suitable for plants with permeate flows lower than 100 m^3/day;
- compatible with all kinds of membranes;
- replace totally or partially the acidification;
- easy to use due to the liquid form.

Characteristics	
Formulation	special phosphonated
pH	7,5 ± 0,5
Appearance	light yellow liquid
Density @ 20°C	1,30 ± 0,02 g/ml
Checking	phosphonated value
Solubility in water	complete

REF.	
EA101	

Use

Injection by dosing pump of pure or diluted product.
The dosage is according to the concentration of scaling salts and iron, and can vary from 3 to 13 cm^3/m^3 of feed water.

Instructions and Packaging

Handling : following safety data sheet. Take the normal precautions to handle chemical products.
Packaging: 25 kg drum.
Storage: closed on the original packaging, sheltered from cold and heat.

Antiscaling for R. O. Membranes
PermaTreat PC-391T

- PermaTreat PC-391T is recommended for systems that produce less than 545 m^3/day (100 GPM) of permeate. This program is less concentrated than PermaTreat PC-191T and, therefore, offers the benefits and advantages of neat feed for smaller RO systems;
- PermaTreat PC-391T has exhibited excellent performance against the following foulants: calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate and iron;
- Packaging: 25 kg drum.

Physical & Chemical Properties	
Color	Clear, yellow
Form	Liquid
Odor	Slight ammonia smell
Specific gravity @ 25°C	1,10
pH (Neat)	10,8
Solubility in water	Complete

REF.	
EA102 (*)	

(*) not available in stock.

Compatible Materials
Stainless Steel 304, CPVC Piping, Polyethylene, Polypropylene, Plasite 4300 and Plasite 7122.
All membrane elements based on Polyamide chemistries including Thin Film Composite (TFC) membranes when used as directed.

Not Compatible Materials
Neoprene, Hypalon elastomer, Buna-N and EPDM: P.S. for all these materials, O-rings are acceptable for static applications. If the fitting is opened, O-ring must be replaced.
Brass, Polyurethane and Viton.

Dosage and Feeding
PermaTreat PC-391T must be fed continuously. The feedpoint location should be as close to the RO membrane as practical but one that ensures good mixing with the feedwater prior to entering the RO system.
PermaTreat PC-391T dosage is dependent on feedwater chemistry, membrane type, system operating parameters (e.g., recovery, temperature and pressure). These parameters determine the potential foulant that is likely to foul the membrane elements.
Please, consult our Technical Department for detailed dosage and feeding information.

Antiscaling for R. O. Membranes
PermaTreat PC-391T

CONSEQUENCES OF OVERFEED
Overfeed of PermaTreat PC-391T will result in higher chemical cost.

CONSEQUENCES OF UNDERFEED
Underfeed of PermaTreat PC-391T will result in poor scale inhibition. This will lead to fouled RO membranes and reduce system performance and/or premature membrane replacement. In RO units, scaling is typically seen in the tail-end elements that have the highest reject concentration (4:1 for a 75% recovery system).

Please, consult our Technical Department for detailed dosage and feeding information.

ENVIRONMENTAL AND TOXICITY DATA
Refer to the MSDS for all available mammalian and aquatic toxicity information.

	ppm/ppm product
Biological Oxygen Demand (5-day BOD_5)	Not Available
Chemical Oxygen Demand (COD)	Not Available
Total Organic Carbon (TOC)	Not Available

SAFETY AND HANDLING
Before using PermaTreat PC-391T, please refer to the Material Safety Data Sheet (MSDS) for proper personal protective equipment (PPE) and for health effects.

STORAGE
PermaTreat PC-391T has a suggested in-plant storage limit of one year. The suggested maximum storage temperature is 38°C.
Refer to the (MSDS) for the most current data.

REMARKS
For Medical and Transportation Emergencies, please see the MSDS.

Antiscaling for R. O. Membranes
PermaTreat PC-191T

- PermaTreat PC-191T is a highly effective scale inhibitor whose active components were developed to treat reverse osmosis (RO) systems;
- PermaTreat PC-191T has shown excellent performance against the following scalants: calcium carbonate, calcium sulfate, barium sulfate, strontium sulfate, calcium fluoride, silica and iron;
- **For RO units with a feedwater flowrate of 545 m^3/day (100 GPM) or less, the recommended product would be PermaTreat PC-391T (our ref. EA102);**
- PermaTreat PC-191T is used when the silica level in the brine is less than 185 mg/l at a brine pH of 7,5 and temperature 25°C;
- Packaging: 25 kg drum.

Physical & Chemical Properties	
Color	Clear, yellow
Form	Liquid
Odor	Slight ammonia smell
Specific gravity @ 25°C	1,36
pH (Neat)	10,5
Solubility in water	Complete

REF.	
EA103 (*)	

(*) not available in stock.

Compatible Materials
Stainless Steel 304, CPVC Piping, Polyethylene, Polypropylene, Plasite 4300 and Plasite 7122.
All membrane elements based on Polyamide chemistries including Thin Film Composite (TFC) membranes when used as directed.

Not Compatible Materials
Neoprene, Hypalon elastomer, Buna-N and EPDM: P.S. for all these materials, O-rings are acceptable for static applications. If the fitting is opened, O-ring must be replaced.
Brass, Polyurethane and Viton.

Dosage and Feeding
PermaTreat PC-191T must be fed continuously. The feedpoint location should be as close to the RO membrane as practical but one that ensures good mixing with the feedwater prior to entering the RO system.
PermaTreat PC-191T dosage is dependent on feedwater chemistry, membrane type, system operating parameters (e.g., recovery, temperature and pressure). These parameters determine the potential foulant that is likely to foul the membrane elements.
Please, consult our Technical Department for detailed dosage and feeding information.

Antiscaling for R. O. Membranes
PermaTreat PC-191T

CONSEQUENCES OF OVERFEED
Overfeed of PermaTreat PC-191T will result in higher chemical cost.

CONSEQUENCES OF UNDERFEED
Underfeed of PermaTreat PC-191T will result in poor scale inhibition. This will lead to fouled RO membranes and reduce system performance and/or premature membrane replacement. In RO units, scaling is typically seen in the tail-end elements that have the highest reject concentration (4:1 for a 75% recovery system).

Please, consult our Technical Department for detailed dosage and feeding information.

ENVIRONMENTAL AND TOXICITY DATA
Refer to the MSDS for all available mammalian and aquatic toxicity information.

	ppm/ppm product
Biological Oxygen Demand (5-day BOD_5)	Not Available
Chemical Oxygen Demand (COD)	Not Available
Total Organic Carbon (TOC)	Not Available

SAFETY AND HANDLING
Before using PermaTreat PC-191T, please refer to the Material Safety Data Sheet (MSDS) for proper personal protective equipment (PPE) and for health effects.

STORAGE
PermaTreat PC-191T has a suggested in-plant storage limit of one year. The suggested maximum storage temperature is 38°C.
Refer to the (MSDS) for the most current data.

REMARKS
For Medical and Transportation Emergencies, please see the MSDS.

TORAY PVDF Hollow Fiber Membrane Module
HFU series (type N)

- Membrane Material = PVDF (Polyvinylidene fluoride);
- Housing Material = PVC and/or ABS;
- Potting Material = Epoxy Resin or Urethane Resin;
- Nominal Molecular Weight Cut Off = 150.000;
- Cleaning pH Range 0 ÷ 12;
- Maximum Cleaning Temperature 40°C;
- Maximum Concentration of NaClO Cleaning as Cl_2 = 3.000 mg/liter (10≤pH≤12);
- Maximum NaClO Exposure (lifetime contact time) as Cl_2 = 1.000.000 mg/liter hours;
- Maximum Acid Exposure Contact Time = 1.000 hours (pH≥0).

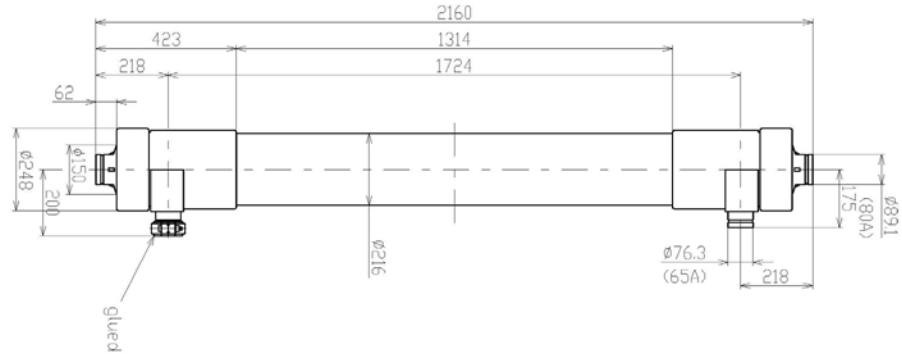
OPERATING CONDITIONS	
Filtration Method	Outside to inside, dead end
Maximum Inlet Pressure	300 kPa (43,5 psi)
Maximum Trans Membrane Pressure	300 kPa (43,5 psi)
Typical Operating Trans Membrane Pressure	< 200 kPa (<29,0 psi)
Operating Temperature Range	0÷40°C
Operating pH Range	1÷10

REF.	**MODULE TYPE**	**MEMBRANE SURFACE AREA (OUTER SURFACE)**	**DIAMETER**	**LENGTH**	**WEIGHT (FULL OF WATER)**	**WEIGHT (DRAINED)**	
		m^2 (ft^2)	**mm**	**mm**	**kg**	**kg**	
MTHFU-2020N (*)	HFU-2020N	72 (775)	216	2160	110	67	
MTHFU-1020N (*)	HFU-1020N	29 (312)	216	1120	60	40	
MTHFU-1010N (*)	HFU-1010N	7 (75)	114	1078	15	9	
MTHFU-2008N (*)	HFU-2008N	11,5 (124)	89	2000	18	11	

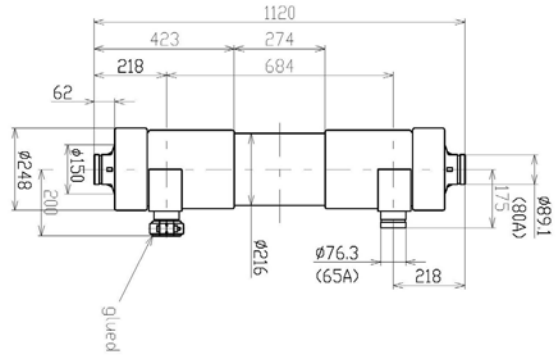
(*) not available in stock.

TORAY PVDF Hollow Fiber Membrane Module
HFU series (type N)

HFU-2020N

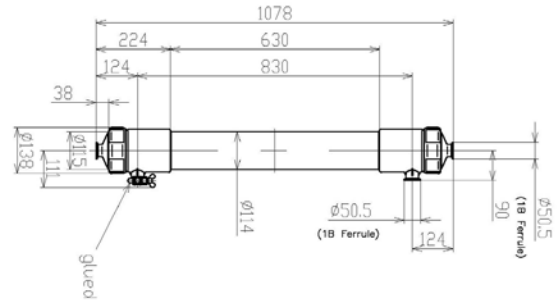


HFU-1020N



Dimensions in mm

HFU-1010N



HFU-2008N