



L 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.	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



SPECIFICATIONS:

General Features

Permeate flow rate: 250 GPD (0.94 m³/day)

Stabilized salt rejection: 97.5%

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:
 - · 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%.
- 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 CompositeMembrane material:Polyamide (PA)

Element configuration: Spiral-Wound, FRPWrapping

Dimensions

Model Name A	N VOV	AV				Part Number	
	Á	В	C D		Ē	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

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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 	I 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	I.0 NTU	
	Max. SDI (15 min)	5.0	
	· Max. Chlorine Concentration	< 0.1 mg/L	
Design Guidelines for Various	Wastewater Conventional (SDI < 5)	8–12 gfd	
Water Sources	· 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 < I)	21-30 gfd	
Saturation Limits		2116	
(Using Antiscalants)	Langlier Saturation Index (LSI)	<+1.5	
(Stiff and Davis Saturation Index (SDSI)	<+0.5	

CaSO₄

· SrSO₄

· BaSO₄

· SiO2

[†]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.

230% saturation

800% saturation

100% saturation

6,000% saturation

 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

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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)

- 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 oF (25 oC)
 - · 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%.
- 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

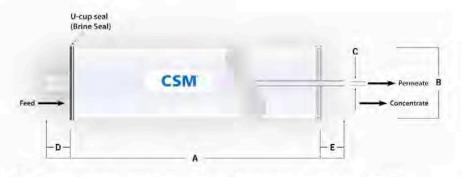
Membrane material: Polyamide (PA)

Element configuration: Spiral-Wound, FRPWrapping

Dimensions

Model Name A					Part Number		
	A	В	C	D	E	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

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APPLICATION DATA:

Operating Limits	Mary Brosson Dress / Claresont	IF: (0 I MP-)		
Operating Linns	 Max. Pressure Drop / Element Max. Operating Pressure 	15 psi (0.1 MPa)		
	Max. Operating Pressure Max. Feed Flow Rate	600 psi (4.14 MPa)		
		6 gpm (1.36 m³/hr)		
	Min. Concentrate Flow Rate	I gpm (0.23 m³/hr)		
	Max. Operating Temperature	113 ∘F (45 ∘C) 2.0–11.0		
	Operating pH Range			
	· CIP pH Range	1.0–13.0 1.0 NTU		
	Max.Turbidity	444044		
	Max SDI (15 min)	5.0		
	Max. Chlorine Concentration	< 0.1 mg/L		
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd		
Water Sources	• 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 < I)	21-30 gfd		
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5		
(Using Antiscalants) [†]	Stiff and Davis Saturation Index (SDSI)	<+0.5		
	· CaSO4	230% saturation		
	· SrSO4	800% saturation		
	· BaSO4	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.			

- 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

CSM

Low pressure grade RO element for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate: 300 GPD (1.1 m³/day)

Stabilized salt rejection: 99.2% Effective membrane area: 12 ft² (1.1 m²)

- 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%.
- 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	7 430 1 60.1					Part Number	
	A	В	C	D	E	Inter- connector	Brine Seal
RE2521-BLN	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-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	I 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	I.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 < I)	21-30 gfd

Saturation Limits (Using Antiscalants) [†]	· Langlier Saturation Index (LSI)	<+1.5
	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO ₄	230% s

CaSO₄
 SrSO₄
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 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.

- 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 RO element for low TDS water

SPECIFICATIONS:

General Features

Permeate flow rate: 350 GPD (1.3 m³/day)

Stabilized salt rejection: 99.2% Effective membrane area: 12 ft² (1.1 m²)

- 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
- 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 but will be no more than 15%.
- 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, FRPWrapping

Dimensions

Model Name A	TO BE WELL	63.50	D	Ē	Part Number		
	A	8 C			Inter- connector	Brine Seal	
RE2521-BLF	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-BLF

Ultra-low pressure 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 m³/hr)
	Min. Concentrate Flow Rate	I 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	I.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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) ^T	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	- BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure	

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.

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.

- 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-BLN

RE2540-BLN

Low pressure grade RO element for brackish water



SPECIFICATIONS:

General Features

Permeate flow rate: 800 GPD (3.0 m³/day)

Stabilized salt rejection: 99.2% Effective membrane area: 27 ft² (2.5 m²)

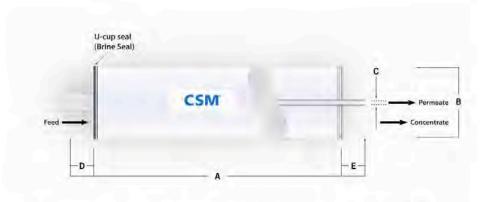
- 1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
 - · 1,500 mg/L NaCl solution at 150 psig (1.0 MPa) applied pressure
 - · 15% recovery
 - 77 °F (25 °C)
 - pH 6.5-7.0
- 2. Minimum salt rejection is 99.0%.
- 3. Permeate flow rate for each element may vary but will be no more than 10%.
- 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	В	С	D	E
RE2540-BLN	40.0 inch	2.5 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(64 mm)	(19.1 mm)	(41 mm)	(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-BLN

Low pressure grade RO element for brackish water

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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	I 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 < I)	21-30 gfd

Saturation Limits (Using Antiscalants)[†]

3.11.5
<+0.5
230% saturation
800% saturation
6,000% saturation
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.

- 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

CSM

Ultra-low pressure RO element for low TDS water

SPECIFICATIONS:

General Features

Permeate flow rate: 800 GPD (3.0 m³/day)

Stabilized salt rejection: 99.2% Effective membrane area: 27 ft² (2.5 m²)

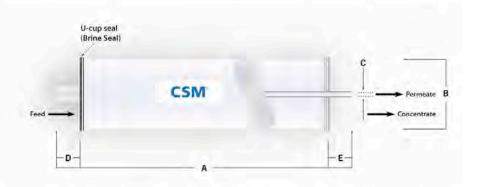
- The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
- · 500 mg/L NaCl solution at 100 psig (0.7 MPa) applied pressure
- 15% recovery
- 77 °F (25 °C)
- · pH 6.5-7.0
- 2. Minimum salt rejection is 99.0%.
- 3. Permeate flow rate for each element may vary but will be no more than 10%.
- 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, FRPWrapping

Dimensions

Model Name	А	В	C	D	E
RE2540-BLF	40.0 inch	2.5 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(64 mm)	(19.1 mm)	(41 mm)	(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-BLF

Ultra-low pressure 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	I 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	I.0 NTU

Max. SDI (15 min) 5.0
Max. Chlorine Concentration < 0.1 mg/L

Design	Guidelines	for	Various
	Carres		

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 < I)	21-30 efd

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
S:O-	100%

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.

- 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 for brackish water

SPECIFICATIONS:

General Features Permeate flow rate: 600 GPD (2.2 m³/day)

Stabilized salt rejection: 99.6% Effective membrane area: 27 ft² (2.5 m²)

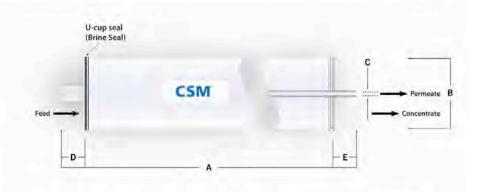
- The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
- · 1,500 mg/L NaCl solution at 150 psig (1.0 MPa) applied pressure
- · 15% recovery
- . 77 oF (25 oC
- · pH 6.5-7.0
- 2. Minimum salt rejection is 99.5%.
- 3. Permeate flow rate for each element may vary but will be no more than 10%.
- 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	В	c	D	Ē
RE2540-BLR	40.0 inch	2.5 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(64 mm)	(19.1 mm)	(41 mm)	(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-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	6 gpm (1.36 m³/hr)
	Min. Concentrate Flow Rate	I 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	I.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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) [™]	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6,000% saturation
	· SiO ₂	100% saturation

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.

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.

- 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

High productivity RO element for brackish water

CSM

SPECIFICATIONS:

General Features Permeate flow rate: 300 GPD (1.1 m³/day)

Stabilized salt rejection: 99.7%
Effective membrane area: 12 ft² (1.1 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 (1.5 MPa) applied pressure
- 15% recovery
- 77 oF (25 oC)
- · 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%.
- All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

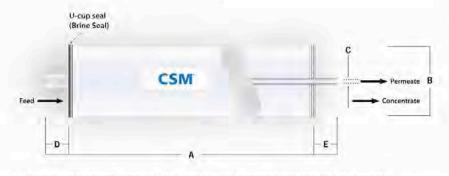
Membrane type: Thin-Film Composite
Membrane material: Polyamide (PA)

Element configuration: Spiral-Wound, FRPWrapping

Dimensions

Model			23.57			Part Number	
Name	A	В	С	D	E	Inter- connector	Brine Seal
RE2521-BE	21.0 inch (534 mm)	2.5 inch (64 mm)	0.75 inch (19.1 mm)	(28 mm)	1.1 inch (28 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.
- 2. All RE2521 elements fit nominal 2.5 inch (64 mm) I.D. pressure vessels.





RE2521-BE

High productivity 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 	I 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	I.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

BaSO₄ 6,000% saturation
 SiO₂ 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.

- 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



High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features

Permeate flow rate: 800 GPD (3.0 m³/day)

Stabilized salt rejection: 99.7% Effective membrane area: 27 ft² (2.5 m²)

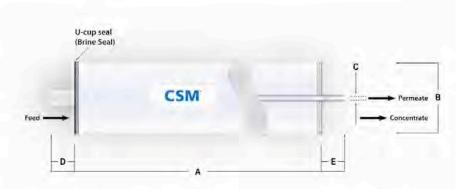
- The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
- 2,000 mg/L NaCl solution at 225 psig (1.5 MPa) applied pressure
- 15% recovery
- 77 °F (25 °C)
- pH 6.5-7.0
- 2. Minimum salt rejection is 99.5%.
- 3. Permeate flow rate for each element may vary but will be no more than 10%.
- 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, FRPWrapping

Dimensions

Model Name	A	В	c	D	E
RE2540-BN	40.0 inch	2,5 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(64 mm)	(19.1 mm)	(41 mm)	(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-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) 600 psi (4.14 MPa) 6 gpm (1.36 m³/hr)	
	· Max. Operating Pressure		
	Max. Feed Flow Rate		
	Min. Concentrate Flow Rate	I 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	I.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 < I)	21-30 gfd	
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5	
(Using Antiscalants) ^T	Stiff and Davis Saturation Index (SDSI)	<+0.5	
	· CaSO4	230% saturation	
	· SrSO ₄	800% saturation	
	· BaSO4	6,000% saturation	
	· SiO ₂	100% saturation	
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and tem to prevent scale lembrane elements fouled	

- 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



Enhanced fouling resistant RO element for brackish water and wastewater reuse

SPECIFICATIONS:

General Features

Permeate flow rate: 800 GPD (3.0 m³/day)

Stabilized salt rejection: 99.7% 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 (1.5 MPa) applied pressure
- 15% recovery
- 77 °F (25 °C)
- · pH 6.5-7.0
- 2. Minimum salt rejection is 99.4%.
- All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

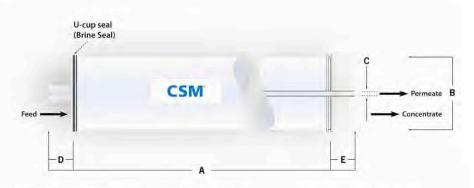
Membrane type: Thin-Film Composite

Membrane material: Polyamide (PA)

Element configuration: Spiral-Wound, FRPWrapping

Dimensions

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

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 (0.42 MPa)
	· Max. Feed Flow Rate	6 gpm (1.36 m ³ /hr)
	· Min. Concentrate Flow Rate	I 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	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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)

Well water (SDI < 3)
 RO permeate (SDI < 1)

Saturation Limits	
(Using Antiscalants)	t

A 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	
Langlier Saturation Index (LSI)	<+1.5
Stiff and Davis Saturation Index (SDSI)	<+0.5

 CaSO4
 230% saturation

 SrSO4
 800% saturation

 BaSO4
 6,000% saturation

 SiO2
 100% saturation

¹The 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.
- · 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.

13–17 gfd 13–17 gfd

21-30 gfd

 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



High productivity RO element for seawater and high salinity well water

SPECIFICATIONS:

General **Features**

300 GPD (1.14 m³/day) Permeate flow rate:

Nominal salt rejection: 99.7% 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
 - 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.

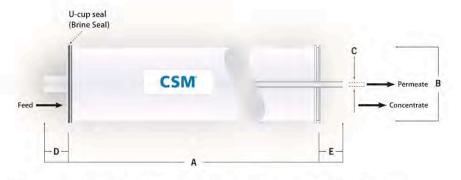
Thin-Film Composite Membrane type: Membrane material: Polyamide (PA)

Element configuration: Spiral-Wound, FRP Wrapping

Dimensions

			1 to 1			Part N	lumber
Model Name	A	В	С	D	E	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

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	I 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	I.0 NTU
	· Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21-30 gfd
Saturation Limits	Langlier Saturation Index (LSI)	<+1.5
(Lleing Antiscalants) ^T		

(Using Antiscalants)

· Stiff and Davis Saturation Index (SDSI) <+0.5 · CaSO₄ 230% saturation SrSO₄ 800% saturation - BaSO4 6,000% 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.

- · 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



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
- · 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 I.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	В	C	D	E
RE2540-SHN	40.0 inch	2.5 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(64 mm)	(19.1 mm)	(41 mm)	(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	I 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
	0.000.000.000.000.000.000.000.000.000.000	
Design Guidelines for Various	- Wastewater Conventional (SDI < 5)	8-12 gfd
Water Sources	 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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) †	Stiff and Davis Saturation Index (SDSI)	<+0.5
	- CaSO4	230% saturation
	· SrSO4	800% saturation
	· BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. M or damaged due to scale formation are not covered	e proper chemical(s) and tem to prevent scale lembrane elements fouled

- 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



High productivity RO element for seawater and high salinity well water

SPECIFICATIONS:

General Features Permeate flow rate: 600 GPD (2.3 m³/day)

Stabilized salt rejection: 99.7%
Effective membrane area: 24 ft² (2.2 m²)

- 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%.
- 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, FRPWrapping

Dimensions

Model Name	A	В	c	D	E
RE2540-SHF	40.0 inch	2.5 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(64 mm)	(19.1 mm)	(41 mm)	(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 m³/hr)
	Min. Concentrate Flow Rate	I 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	I.0 NTU
	· Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	• 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 < I)	21–30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) ^T	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensuriconcentration are dosed ahead of the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and item to prevent scale lembrane elements fouled

- 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

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

500 GPD (1.9 m3/day) Permeate flow rate!: Monovalent ion rejection (NaCl)!: 85.0 - 95.0%

Divalent ion rejection (CaCl2)2: 90.0 - 95.0% 27 ft2 (2.5 m2) Effective membrane area:

- 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 CaCl2 solution at 75 psig (0.5 MPa) applied pressure
 - + 15% recovery
 - 77 °F (25 °C)
 - · pH 6.5-7.0
- 3. MgSO₄ 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, FRPWrapping

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)



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





NE2540-90

Normal grade NF element with high monovalent ion rejection

CSM

APPLICATION DATA:

Operating Limits	May Procesure Dreen / Florenat	IE ==: (0 I MD=1
operating Linus	 Max. Pressure Drop / Element Max. Pressure Drop / 240" Vessel 	15 psi (0.1 MPa) 60 psi (0.41 Mpa)
	· Max. Operating Pressure · Max. Feed Flow Rate	600 psi (4.14 MPa)
	Min. Concentrate Flow Rate	6 gpm (1.36 m³/hr)
		I gpm (0.23 m³/hr)
	Max. Operating Temperature	113 °F (45 °C) 2.0–11.0
	Operating pH Range	1.0-13.0
	CIP pH Range	177
	· Max.Turbidity · Max.SDI (15 min)	1.0 NTU 5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	Wastewater Conventional (SDI < 5)	8-12 gfd
Water Sources	 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 < I)	21-30 gfd
Saturation Limits	Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) [†]	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	SrSO ₄	800% saturation
	- BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensur- concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. M or damaged due to scale formation are not covered	e proper chemical(s) and tem to prevent scale lembrane elements fouled

- 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.



CSM 4" Membranes



Ref. MCRE4021-BLN

RE4021-BLN

Low pressure grade RO element for brackish water

SPECIFICATIONS:

General Features Permeate flow rate: 1,050 GPD (4.0 m³/day)

Nominal salt rejection:

35 ft2 (3.3 m2) Effective membrane area:

- 1. The stated product performance is based on data taken after 30 minutes of operation at the following test
 - · 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 Polyamide (PA) Membrane material:

Element configuration: Spiral-Wound, FRPWrapping

Dimensions

	lel Name A B C		D	É	Part Number		
Model Name		C			Inter- connector	Brine Seal	
RE4021-BLN	21.0 inch (534 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 RE4021 elements fit nominal 4.0 inch (102 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 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	I.0 NTU
	Max. SDI (15 min)	5.0
	· Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21–30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
$(Using Antiscalants)^T$	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	· BaSO ₄	6,000% saturation
	· SiO ₂	100% saturation

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.

[†]The above saturation limits are typically accepted by proprietary antiscalant manufacturers. It is the user's responsibility to ensure proper chemical(s) and

- Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.
- Permeate pressure must always be equal or less than the feed/concentrate pressure. Damage caused by permeate back pressure voids the element limited warranty.



CSM 4" Membranes



Ref. MCRE4021-BLF

RE4021-BLF

Ultra-low pressure RO element for low TDS water

SPECIFICATIONS:

General

1,050 GPD (4.0 m3/day) Permeate flow rate:

Stabilized 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
- . 500 mg/L NaCl solution at 100 psig (0.7 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 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)

Spiral-Wound, FRPWrapping Element configuration:

Dimensions

Model Name A	T. 10 1 1 1 1 1 1 1	11.5	Ď	E	Part Number		
	ВС	Ċ			Inter- connector	Brine Seal	
RE4021-BLF	21.0 inch (534 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 RE4021 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.





RE4021-BLF

Ultra-low pressure 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	13 gpm (2.95 m ³ /hr)
	Min. Concentrate Flow Rate	3 gpm (0.68 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	I.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 < I)	21-30 gfd

Saturation Limits (Using Antiscalants)[†]

· Langlier Saturation Index (LSI)	<+1.5
· Stiff and Davis Saturation Index (SD)	SI) <+0.5
· CaSO4	230% saturation
· SrSO ₄	800% saturation
BaSO ₄	6,000% saturation
· SiOs	IOOV 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.

- 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 with extended area for brackish water

SPECIFICATIONS:

General Features

2,600 GPD (9.8 m³/day) Permeate flow rate:

Nominal salt rejection: 99.2% 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:
 - · 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 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.

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

Element configuration: Spiral-Wound, FRP Wrapping

Dimensions

Model Name	A	В	C	D	E
RE4040-BLN	40.0 inch (1,016 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 RE4040 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

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This product is certified by NSF to NSF/ANSI standard 61





RE4040-BLN

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 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	· Wastewater Conventional (SDI < 5)	8–12 gfd	
Water Sources	• 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 < I)	21–30 gfd	
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5	
(Using Antiscalants) ^T	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 manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys- formation anywhere within the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and stem to prevent scale lembrane elements fouled	

- 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

SPECIFICATIONS:

General **Features**

2,500 GPD (9.5 m³/day) Permeate flow rate:

Nominal salt rejection: 99.2% 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
 - 500 mg/L NaCl solution at 100 psig (0.7 MPa) applied pressure
- + 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 Polyamide (PA)

Membrane material: Element configuration:

Spiral-Wound, FRPWrapping

Dimensions

Model Name	A	В	C	D	E
RE4040-BLF	40.0 inch	4.0 Inch	0.75 inch	1.06 inch	1.06 inch
	(1,016 mm)	(102 mm)	(19.1 mm)	(27 mm)	(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.

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This product is certified by NSF to NSF/ANSI standard 61





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	I.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 < I)	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.

- 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



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

SPECIFICATIONS:

General Features

1,900 GPD (7.2 m³/day) Permeate flow rate:

Nominal salt rejection: 99.6% 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:
- · 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, FRPWrapping

Dimensions

Model Name	A	В	С	D	E
RE4040-BLR	40.0 inch	4.0 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(102 mm)	(19.1 mm)	(41 mm)	(41 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.

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This product is certified by NSF to NSF/ANSI standard 61





RE4040-BLR



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

APPLICATION DATA:

APPLICATION DATA:		
Operating Limits	Max. Pressure Drop / Element Max. Pressure Drop / 240" Vessel Max. Operating Pressure Max. Feed Flow Rate Min. Concentrate Flow Rate Max. Operating Temperature Operating pH Range CIP pH Range Max. Turbidity Max. SDI (15 min) Max. Chlorine Concentration	15 psi (0.1 MPa) 60 psi (0.41 Mpa) 600 psi (4.14 MPa) 18 gpm (4.09 m³/hr) 4 gpm (0.91 m³/hr) 113 °F (45 °C) 2.0-11.0 1.0-13.0 1.0 NTU 5.0 < 0.1 mg/L
Design Guidelines for Various Water Sources	 Wastewater Conventional (SDI < 5) Wastewater Pretreated by UF/MF (SDI < 3) Seawater, Open Intake (SDI < 5) Seawater, Beach Well (SDI < 3) Surface Water (SDI < 5) Surface Water (SDI < 3) Well water (SDI < 3) RO permeate (SDI < I) 	8–12 gfd 10–14 gfd 7–10 gfd 8–12 gfd 12–16 gfd 13–17 gfd 13–17 gfd 21–30 gfd
Saturation Limits (Using Antiscalants) [†]	Langlier Saturation Index (LSI) Stiff and Davis Saturation Index (SDSI) CaSO4 SrSO4 BaSO4 SiO2 The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane system. Mor damaged due to scale formation are not covered.	e proper chemical(s) and item to prevent scale lembrane elements fouled

- 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. MTMG10D



Ultra low pressure BWRO, enhanced chemical tolerance

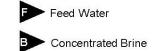
TMG(D)

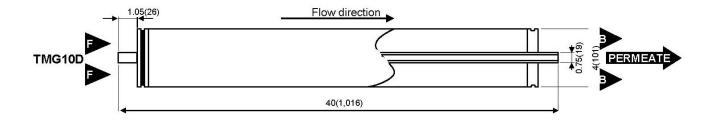
Туре	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TMG10D	4"	87(8)	99.7	2,850(10.8)	34

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions		
	Feed Water Pressure	150 psi(1.03MPa)
	Feed WaterTemperature	77° F(25°C)
	Feed Water Concentration	2000 mg/l Nacl
	Recovery Rate	15%
	Feed Water pH	7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		2,400gpd(9.1m³/d)

Dimensions

All dimensions shown in Inches (millimeter).







Operating Limits

Maximum Operating Pressure	- 365psi (2.5 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.
- 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

- 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

High productivity RO element for brackish water

CSM

SPECIFICATIONS:

General Features

1,050 GPD (4.0 m³/day) Permeate flow rate:

99.7% Nominal salt rejection: 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:
- · 2,000 mg/L NaCl solution at 225 psig (1.5 MPa) applied pressure
- 8% recovery 77 ∘F (25 ∘C)
- · pH 6.5-7.0
- 2. Minimum salt rejection is 99.4%.
- 3. Permeate flow rate for each element may vary but will be no more than 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, FRPWrapping

Dimensions

Model Name A						Part Number	
	A	В	C D	D	E	Inter- connector	Brine Seal
RE4021-BE	21.0 inch (534 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 RE4021 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

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RE4021-BE

High productivity RO element for brackish water

CSM

APPLICATION DATA:

Operating Limits	Mary Bassaura Duna / Flamourt	15: (0 1 MB-)
Operating Linnes	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 m³/hr)
	Min. Concentrate Flow Rate	3 gpm (0.68 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 < I)	21–30 gfd
Saturation Limits	Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) [†]	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6.000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. M	e proper chemical(s) and tem to prevent scale

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.

or damaged due to scale formation are not covered by the limited warranty.

- 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



High productivity RO element with extended area for brackish water

SPECIFICATIONS:

General Features Permeate flow rate: 2,400 GPD (9.1 m³/day)

Nominal salt rejection: 99.7% Effective membrane area: 85 ft² (7.9 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 (1.5 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%.
- 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 CompositeMembrane material:Polyamide (PA)

Element configuration: Spiral-Wound, FRPWrapping

Dimensions

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

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RE4040-BE

CSM°

High productivity RO element with extended area for brackish water

APPLICATION DATA:

Operating Limits	Mary Barrerson David / Classical	IF: (A I MD-)
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 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	I.0 NTU
	- Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
$(Using Antiscalants)^T$	· Stiff and Davis Saturation Index (SDSI)	<+0.5
	- CaSO ₄	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6,000% saturation
	- SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and tem to prevent scale lembrane elements fouled

- 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. MTM710D

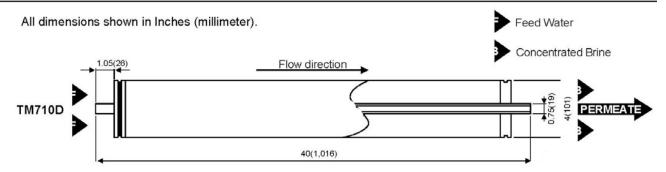


High rejection BWRO, enhanced chemical tolerance

	I WI TOOD						
Туре	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	1	
	Feed Water Pressure	225 psi(1.55MPa)
	Feed Water Temperature	77° F(25°C)
	Feed Water Concentration	2,000 mg/l Nacl
	Recovery Rate	15%
	Feed Water pH	7
3. Minimum Salt Rejection		99.65%
4. Minimum Product Flow Rate		2,150gpd(8.2m³/d)

Dimensions





Operating Limits

Maximum Operating Pressure ————————————————————————————————————	− 600psi (4.1 MPa) − 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 —	- 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

- 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

SPECIFICATIONS:

General Features Permeate flow rate: 1,900 GPD (7.2 m³/day)

Nominal salt rejection: 99.5% Effective membrane area: 85ft² (7.9m²)

- 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 CompositeMembrane material:Polyamide (PA)

Element configuration: Spiral-Wound, FRP Wrapping

Dimensions

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

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RE4040-CE

CSM

15 psi (0.1 MPa)

60 psi (0.41 Mpa)

600 psi (4.14 MPa)

18 gpm (4.09 m³/hr)

4 gpm (0.91 m³/hr) 113 °F (45 °C)

2.0 11.0

1.0 - 13.0

UTM 0.1

5,000 ppm hr

5.0

Innovative chlorine resistant RO element for prolonged membrane lifetime

APPLICATION DATA:

0	perating	Limits	

Max. Pressure Drop / Element
Max. Pressure Drop / 240"Vessel
Max. Operating Pressure
Max. Feed Flow Rate
Min. Concentrate Flow Rate
Max. Operating Temperature
Operating pH Range
CIP pH Range
Max. Turbidity
Max. SDI (15 min)
Free Chlorine Tolerance

Design Guidelines for Various

· 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 12-16 gfd Surface Water (SDI < 5) 13-17 gfd Surface Water (SDI < 3) · 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
CaSO4 230% saturation
SrSO4 800% saturation
BaSO4 6,000% saturation
SiO2 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 safety 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.
- · 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.

· Keep elements moist at all times after initial wetting.





Ref. MCRE4040-FEN

RE4040-FEn



Fouling resistant RO element with extended area for brackish water and wastewater reuse

SPECIFICATIONS:

General Features Permeate flow rate: 2,400 GPD (9.1 m³/day)

Nominal salt rejection: 99.7% Effective membrane area: 85 ft² (7.9 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 (1.5 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%.
- 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	В	C	D	E
RE4040-FEn	40.0 inch	4.0 inch	0.75 inch	1.06 inch	1.06 inch
	(1,016 mm)	(102 mm)	(19.1 mm)	(27 mm)	(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.

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RE4040-FEn

CSM

Fouling resistant RO element with extended area 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	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21-30 gfd

Saturation Limits	
(Using Antiscalants)	T

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.

- 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



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

SPECIFICATIONS:

General Features Permeate flow rate: 1,900 GPD (7.2 m³/day)

Nominal salt rejection: 99.6%

Effective membrane area: 85 ft² (7.9 m²)

- 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 15%.
- 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

		17.2		27		Part Number	
Model Name	A	В	С	D	Ē	Inter- connector	Brine Seal
RE4040-FLR	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 RE4040 elements fit nominal 4.0 inch (102 mm) I.D. pressure vessels.

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RE4040-FLR



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	UTM 0.1
	Max. SDI (15 min)	5.0
	· Max. Chlorine Concentration	< 0.1 mg/L

Design Guidelines for Various Water Sources	Wastewater Conventional (SDI < 5) Wastewater Pretreated by UF/MF (SDI < 3)	8-12 gfd 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 < I)	21-30 gfd

Saturation Limits	Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) ^T	Stiff and Davis Saturation Index (SDSI)	<+0,5
	· CaSO ₄	230% saturation
	- SrSO₄	800% saturation
	· BaSO4	6,000% saturation
	« SíO2	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.
- · 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.

Keep elements moist at all times after initial wetting.





Ref. MTML10D



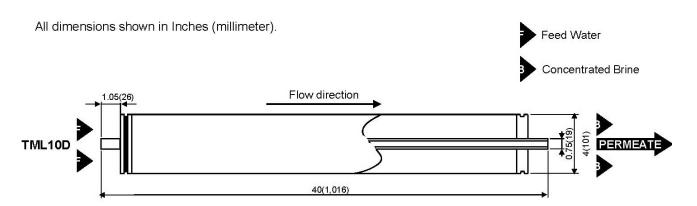
Low fouling and high tolerance RO T M L (D)

=		1 /	_		
	Membrane Area	Salt Rejection	Product Flow	Feed Spacer	-
	$ft^2(m^2)$	%	Rate	Thickness	

Туре	Inch	ft ² (m ²)	%	Rate gpd(m³/d)	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	225 psi(1.55 MPa)
	Feed Water Temperature	77 ° F(25 °C)
	Feed Water Concentration	2,000 mg/l NaCl
	Recovery Rate	15 %
	Feed Water pH	7
3. Minimum Salt Rejection		99.65 %
4. Minimum Product Flow Rate		1,500 gpd(5.8 m³/d)

Dimensions







Operating Limits

Maximum Operating Pressure—	- 600psi (4.1 MPa)
Maximum Feed Water Temperature	· 113° F (45° C)
Maximum Feed Water SDI15————————————————————————————————————	· 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

- 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



High Rejection RO element for seawater and high salinity well water

SPECIFICATIONS:

General Features Permeate flow rate: 600 GPD (2.3 m³/day)

Nominal salt rejection: 99.75% 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 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%.
- 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: Membrane material: Thin-Film Composite Polyamide (PA)

Element configuration:

Spiral-Wound, FRP Wrapping

Dimensions and Weight

Model Name	A		c	D	É
RE4021-	21.0 inch	4.0 inch	0.75 inch		1.55 inch
SHN	(534 mm)	(102 mm)	(19.1 mm)		(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.

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RE4021-SHN

CSM

High Rejection RO element for seawater and high salinity well water

APPLICATION DATA:

APPLICATION DATA:		
Operating Limits	Max. Pressure Drop / Element Max. Pressure Drop / 240" Vessel Max. Operating Pressure Max. Feed Flow Rate Min. Concentrate Flow Rate Max. Operating Temperature Operating pH Range CIP pH Range Max. Turbidity Max. SDI (15 min) Max. Chlorine Concentration	15 psi (0.1 MPa) 60 psi (0.41 Mpa) 1,200 psi (8.27 MPa) 13 gpm (2.95 m³/hr) 3 gpm (0.68 m³/hr) 113 °F (45 °C) 2.0–11.0 1.0–13.0 1.0 NTU 5.0 < 0.1 mg/L
Design Guidelines for Various Water Sources	 Wastewater Conventional (SDI < 5) Wastewater Pretreated by UF/MF (SDI < 3) Seawater, Open Intake (SDI < 5) Seawater, Beach Well (SDI < 3) Surface Water (SDI < 5) Surface Water (SDI < 3) Well water (SDI < 3) RO permeate (SDI < I) 	8–12 gfd 10–14 gfd 7–10 gfd 8–12 gfd 12–16 gfd 13–17 gfd 13–17 gfd 21–30 gfd
Saturation Limits (Using Antiscalants) [†]	Langlier Saturation Index (LSI) Stiff and Davis Saturation Index (SDSI) CaSO4 SrSO4 BaSO4 SiO2 The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane systormation anywhere within the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and stem to prevent scale lembrane elements fouled

- 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. MTM810C



Standard SWRO Type Diameter Membrane Area Salt Rejection Product Flow Rate Feed Spacer Thickness Inch $ft^2(m^2)$ gpd(m3/d) mil TM810C 40 73(7) 99.75 1,200(4.5) 31

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

All dimensions shown in Inches (millimeter). Feed Water Concentrated Brine TM810C Flow direction Flow direction Flow direction Flow direction Flow direction



Operating Limits

Maximum Operating Pressure —	— 1200psi (6.3 MPa)
Maximum Feed Water Temperature ————————————————————————————————————	—— 113° F (45° C)
Maximum Feed Water SDI15 ————————————————————————————————————	 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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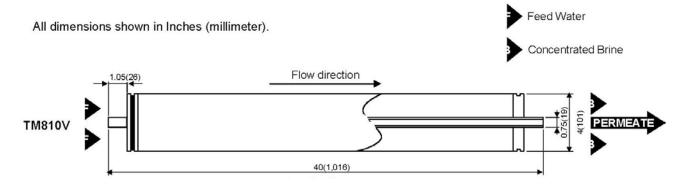
Ref. MTM810V



Low energy SWRO Product Flow Rate Feed Spacer Diameter Membrane Area Salt Rejection Type Thickness gpd(m³/d) Inch $ft^2(m^2)$ mil TM810V 411 87(8) 99.8 1,900(7.2) 28

Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions		
	Feed Water Pressure	800 psi(5.52MPa)
	Feed Water Temperature	77° F(25°C)
	Feed Water Concentration	32,000 mg/l Nacl
	Recovery Rate	8%
	Feed Water pH	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





Operating Limits

Maximum Operating Pressure —	—— 1200psi (8.3 MPa)
Maximum Feed Water Temperature ————————————————————————————————————	—— 113° F (45°C)
Maximum Feed Water SDI15 ————————————————————————————————————	 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 ————————————————————————————————————	
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. MCNE4040-90

NE4040-90

CSM

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

Permeate flow rate: 1,600 GPD (6.0 m³/day)

 Monovalent ion rejection (NaCl)¹:
 85.0 - 95.0%

 Divalent ion rejection (CaCl₂)²:
 90.0 - 95.0%

 Effective membrane area :
 85 ft² (7.9 m²)

- 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
- The stated product performance is based on data taken after 30 minutes of operation at the following divalent test conditions:
 - 500 mg/L CaCl2 solution at 75 psig (0.5 MPa) applied pressure
 - · 15% recovery
 - . 77 °F (25 °C)
 - · pH 6.5-7.0
- 3. MgSO₄ 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%.
- 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, FRPWrapping

Dimensions

Model Name	A	В	C	D	E
NE4040-90	40.0 inch	4.0 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(102 mm)	(19.1 mm)	(41 mm)	(41 mm)



- 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) 1.D. pressure vessels.

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NE4040-90

Normal grade NF element with high monovalent ion rejection

CSM

APPLICATION DATA:

APPLICATION DATA:		
Operating Limits	 Max. Pressure Drop / Element Max. Pressure Drop / 240" Vessel Max. Operating Pressure Max. Feed Flow Rate Min. Concentrate Flow Rate Max. Operating Temperature Operating pH Range CIP pH Range Max. Turbidity Max. SDI (15 min) Max. Chlorine Concentration 	15 psi (0.1 MPa) 60 psi (0.41 Mpa) 600 psi (4.14 MPa) 18 gpm (4.09 m³/hr) 4 gpm (0.91 m³/hr) 113 °F (45 °C) 2.0–11.0 1.0–13.0 1.0 NTU 5.0 < 0.1 mg/L
Design Guidelines for Various Water Sources	 Wastewater Conventional (SDI < 5) Wastewater Pretreated by UF/MF (SDI < 3) Seawater, Open Intake (SDI < 5) Seawater, Beach Well (SDI < 3) Surface Water (SDI < 5) Surface Water (SDI < 3) Well water (SDI < 3) RO permeate (SDI < I) 	8–12 gfd 10–14 gfd 7–10 gfd 8–12 gfd 12–16 gfd 13–17 gfd 13–17 gfd 21–30 gfd
Saturation Limits (Using Antiscalants) [†]	Langlier Saturation Index (LSI) Stiff and Davis Saturation Index (SDSI) CaSO4 SrSO4 BaSO4 SiO2 The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane system. Manufacturers are system. Manufacturers and system. Manufacturers are dosed ahead of the membrane system. Manufacturers are dosed and systems are dosed ahead of the membrane system. Manufacturers are dosed and systems are dosed and system	e proper chemical(s) and stem to prevent scale

- 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. MCNE4040-70

NE4040-70

CSM

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

1,500 GPD (5.7 m³/day) Permeate flow rate!:

Monovalent ion rejection (NaCl)!: 40.0 - 70.0% Divalent ion rejection (CaCl2)2: 45.0 - 70.0% 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 monovalent test conditions:
- · 2,000 mg/L NaCl solution at 75 psig (0.5 MPa) applied pressure
- 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 CaCl2 solution at 75 psig (0.5 MPa) applied pressure
- 77 °F (25 °C)
- · pH 6.5-7.0
- 3. MgSO₄ 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 1.5%.
- 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, FRPWrapping

Dimensions

Model Name	Α	В	C	D	E
NE4040-70	40.0 inch	4.0 inch	0.75 inch	1.61 inch	1.61 inch
	(1,016 mm)	(102 mm)	(19.1 mm)	(41 mm)	(41 mm)



- 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) 1.D. pressure vessels.

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NE4040-70

Normal grade NF element with medium 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	I.0 NTU
	Max. SDI (15 min)	5.0
	· Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	- Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21-30 gfd

Saturation Limits	
(Using Antiscalants)	r

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
C:O-	100%

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.

- 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!: 2.500 GPD (9.45 m³/day)

Monovalent ion rejection (NaCl): 30 -60% Effective membrane area: 85 ft² (7.9 m²)

- 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. Permeate flow rate for each element may vary but will be no more than 20%.
- 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		3 - 3			E	Part Number	
	A	В	C	D		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.

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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) 600 psi (4.14 MPa)	
	· Max. Operating Pressure		
	· 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	· Wastewater Conventional (SDI < 5)	8–12 gfd	
Water Sources	· 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 < I)	21–30 gfd	
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5	
(Using Antiscalants) ^T	· 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.		

- 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	-	-			
MTMG20D-400	TMG20D-400	-	-			

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		

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	

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

Low pressure grade RO element for brackish water

CSM

SPECIFICATIONS:

General Features

Permeate flow rate: 12,000 GPD (45.4 m³/day)

Nominal salt rejection: 99.2%

Effective membrane area: 400 ft² (37.2 m²)

- 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 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.

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RE8040-BLN

Low pressure grade RO element for brackish water

CSM

APPLICATION DATA:

· 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 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	UTM 0.1
 Max. SDI (15 min) 	5.0
· Max. Chlorine Concentration	< 0.1 mg/L
	 Max. Pressure Drop / 240" Vessel Max. Operating Pressure Max. Feed Flow Rate Min. Concentrate Flow Rate Max. Operating Temperature Operating pH Range CIP pH Range Max. Turbidity Max. SDI (15 min)

Design	Guidelines	for	Various
	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 < I)	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
· BaSO4	6,000% 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.

· SiO₂

- 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

CSM

Low pressure grade RO element with extended area for brackish water

SPECIFICATIONS:

General **Features**

13,000 GPD (49.2 m3/day) Permeate flow rate:

Nominal salt rejection: 99.2%

Effective membrane area: 440 ft² (40.9 m²)

- 1. The stated product performance is based on data taken after 30 minutes of operation at the following
- · 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)

Spiral-Wound, FRP Wrapping Element configuration:

Dimensions and Weight

Model Name			Weight	Part Number		
	A	вс		Inter- connector	Brine Seal	
RE8040-BLN440	40.0 inch (1,016 mm)	8.0 inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309



- Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
 All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.
- 3. RE8040-BLN440 element can be also made with a 1.5 inch (38mm) diameter central pipe.

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RE8040-BLN440



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	75 gpm (17.0 m³/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	I.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 < I)	21-30 gfd

Saturation Limits (Using Antiscalants)[†]

· Langlier Saturation Index (LSI)	<+1.5
· Stiff and Davis Saturation Index (S	DSI) <+0.5
· CaSO4	230% saturation
· SrSO ₄	800% saturation
BaSO ₄	6,000% saturation
. SiOs	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

Low pressure grade RO element for brackish water



SPECIFICATIONS:

General Features Permeate flow rate: 9,000 GPD (34.0 m³/day)

Nominal salt rejection: 99.6%

Effective membrane area: 400 ft² (37.2 m²)

- 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.

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RE8040-BLR

Normal 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	I.0 NTU
	· Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	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

Low pressure grade RO element for brackish water

SPECIFICATIONS:

General

Permeate flow rate: 9,900 GPD (37.4 m³/day)

99.6% Nominal salt rejection:

Effective membrane area: 440 ft2 (40.9 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 (1.0 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 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.

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

Spiral-Wound, FRP Wrapping Element configuration:

Dimensions Weight

The section 1			Stant I	IL.	Part Number	
Model Name	A	В	c	Weight	Inter- connector	Brine Seal
RE8040-BLR440	40.0 inch (1,016 mm)	8.0 inch (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.
- 3. RE8040-BLR440 element can be also made with a 1.5 inch (38mm) diameter central pipe.

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RE8040-BLR440

CSM

Normal low pressure grade RO element for brackish water

APPLICATION DATA:

Operating Limits	· Max. Pressure Drop / Element	15 psi (0.1 MPa)
- per uning -	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 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	I.0 NTU
	· Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21–30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) ^T	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO ₄	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and tem to prevent scale lembrane elements fouled

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

Ultra-low pressure RO element for low TDS water



SPECIFICATIONS:

General Features

Permeate flow rate: I I,500 GPD (43.5 m³/day)

Nominal salt rejection: 99.29

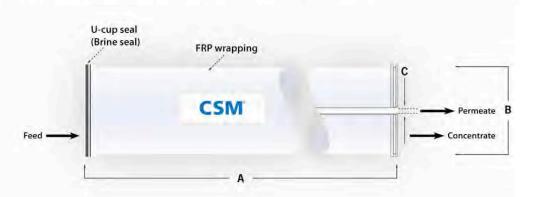
Effective membrane area: 400 ft² (37.2 m²)

- 1. The stated product performance is based on data taken after 30 minutes of operation at the following test conditions:
 - 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 10%.
- 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.

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RE8040-BLF

Ultra-low pressure 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	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	I.0 NTU
	Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	• 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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
$(Using Antiscalants)^T$	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure	e proper chemical(s) and

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.

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.

- 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

Ultra-low pressure RO element for low TDS water



SPECIFICATIONS:

Features

12,650 GPD (37.4 m3/day) Permeate flow rate:

99.2% Nominal salt rejection:

Effective membrane area: 440 ft² (40.9 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
- 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 Polyamide (PA) Membrane material:

Element configuration: Spiral-Wound, FRP Wrapping

Dimensions and Weight

Model Name			5 0 0 7		Part Number	
	A	В	c \	C	Weight	Inter- connector
RE8040-BLF440	40.0 inch (1,016 mm)	8.0 inch (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.
 3. RE8040-BLF440 element can be also made with a 1.5 inch (38mm) diameter central pipe.

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RE8040-BLF440

Ultra-low pressure RO element for low TDS water

CSM

APPLICATION DATA:

	Surface Water (SDI < 3) Surface Water (SDI < 3) Well water (SDI < 3) RO permeate (SDI < I)	13–17 gfd 13–17 gfd 13–17 gfd 21–30 gfd
	Seawater, Beach Well (SDI < 3) Surface Water (SDI < 5)	8–12 gfd 12–16 gfd
Design Guidelines for Various Water Sources	 Wastewater Conventional (SDI < 5) Wastewater Pretreated by UF/MF (SDI < 3) Seawater, Open Intake (SDI < 5) 	8–12 gfd 10–14 gfd 7–10 gfd
	Max. Chlorine Concentration	< 0.1 mg/L
	- Max SDI (15 min)	5.0
	- Max. Turbidity	I.0 NTU
	· CIP pH Range	1.0-13.0
	 Max. Operating Temperature Operating pH Range 	113 °F (45 °C) 2.0–11.0
	Min. Concentrate Flow Rate	16 gpm (3.6 m³/hr)
	Max. Feed Flow Rate	75 gpm (17.0 m³/hr)
	Max. Operating Pressure	600 psi (4.14 MPa)
	· Max. Pressure Drop / 240" Vessel	60 psi (0.41 Mpa)
Operating Limits	 Max. Pressure Drop / Element 	15 psi (0.1 MPa)

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.

[†]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.

 Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.

100% saturation

 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. MTMH20A-400C



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

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(33.3m³/d)

Dimensions

All dimensions shown in Inches (millimeter).

Feed Water

Concentrated Brine

TMH20A-400C

A0(1,016)



Operating Limits

Maximum Operating Pressure ————————————————————————————————————	— 365psi (2.5 MPa)
Maximum Feed Water Temperature ————————————————————————————————————	—— 113° F (45°C)
Maximum Feed Water SDI15 ————————————————————————————————————	 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

- 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. MTMG20D-400



Ultra low pressure BWRO, enhanced chemical tolerance

TMG(D)

Туре	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³ / d)	Feed Spacer Thickness mil
TMG20D-400	8"	400(37)	99.7	12,100(45.8)	34

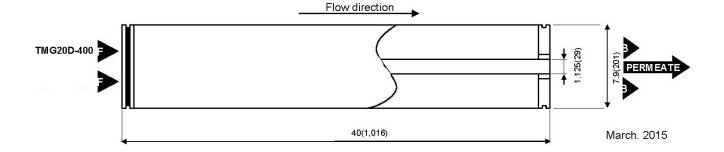
1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions		
	Feed Water Pressure	150 psi(1.03MPa)
	Feed Water Temperature	77° F(25°C)
	Feed Water Concentration	2000 mg/l Nacl
	Recovery Rate	15%
	Feed Water pH	7
3. Minimum Salt Rejection		99.5%
4. Minimum Product Flow Rate		10,300gpd(39.0m³/d)

Dimensions

All dimensions shown in Inches (millimeter).



Concentrated Brine





Operating Limits

Maximum Operating Pressure365psi (2.5 MPa)Maximum Feed Water Temperature113° F (45°C)Maximum Feed Water SDI155Feed Water Chlorine Concentration *See below 3 of Operating Information< 0.1 ppm</td>Feed Water pH Range, Continuous Operation2-11Feed Water pH Range, Chemical Cleaning1-13Maximum Pressure Drop per Element15psi (0.10 MPa)Maximum Pressure Drop per Vessel50psi (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

- 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-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 m³/day)

Nominal salt rejection: 99.7

Effective membrane area: 365 ft² (33.9 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 (1.5 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.

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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 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	I.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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) ^T	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 manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys-	e proper chemical(s) and stem to prevent scale

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.

formation anywhere within the membrane system. Membrane elements fouled or damaged due to scale formation are not covered by the limited warranty.

- 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 for brackish water

CSM

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)

- 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

 - 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: Membrane material: Element configuration: Thin-Film Composite

Polyamide (PA)

Spiral-Wound, FRP Wrapping

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



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

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RE8040-BE

High productivity RO element for brackish water

CSM

APPLICATION DATA:

Operating Limits	M D / Fl	IF == (O I MP N
Operating Linits	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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) ^T	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 manufacturers. It is the user's responsibility to ensure	

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.

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.

- 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



High productivity RO element with extended area for brackish water

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)

- 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
- 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.
- 5. CSM BE440 elements are made equivalent to BN and BE elements but produces more permeate flow due to its extended membrane area.

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

Element configuration: Spiral-Wound, FRP Wrapping

Dimensions and Weight

	246			Part Number		umber
Model Name	Α	В	С	Weight	Inter- connector	Brine Seal
RE8040-BE440	40.0 inch (1,016 mm)	8.0 inch (201 mm)	1.12 inch (28 mm)	15 kg	40000308	40000309



- Each membrane element supplied with one brine seal, one interconnector (coupler) and four o-rings.
 All RE8040 elements fit nominal 8.0 inch (201 mm) I.D. pressure vessels.
- RE8040-BE440 element can be also made with a 1.5 inch (38mm) diameter central pipe.

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RE8040-BE440

CSM

High productivity RO element with extended area for brackish water

· SrSO₄

BaSO₄

APPLICATION DATA:

Saturation Limits (Using Antiscalants) [†]	Langlier Saturation Index (LSI) Stiff and Davis Saturation Index (SDSI)	<+1.5 <+0.5
	RO permeate (SDI < I)	21–30 gfd
	· Well water (SDI < 3)	13-17 gfd
	Surface Water (SDI < 3)	13-17 gfd
	Surface Water (SDI < 5)	12-16 gfd
Water Sources	Seawater, Beach Well (SDI < 3)	8-12 gfd
	· Seawater, Open Intake (SDI < 5)	7-10 gfd
	Wastewater Pretreated by UF/MF (SDI < 3)	10-14 gfd
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
	Max. Chlorine Concentration	< 0.1 mg/L
	Max SDI (15 min)	5.0
	Max.Turbidity	1.0 NTU
	· CIP pH Range	1.0-13.0
	Operating pH Range	2.0-11.0
	 Max. Operating Temperature 	113 °F (45 °C)
	Min. Concentrate Flow Rate	16 gpm (3.6 m³/hr)
	Max. Feed Flow Rate	75 gpm (17.0 m³/hr)
	Max. Operating Pressure	600 psi (4.14 MPa)
	Max. Pressure Drop / 240" Vessel	60 psi (0.41 Mpa)
Operating Limits	Max. Pressure Drop / Element	15 psi (0.1 MPa)

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.

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.

 Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.

800% saturation

6,000% saturation

 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



Normal grade 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 (1.5 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%.
- 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.

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RE8040-BR

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	I.0 NTU
	· Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L

Design	Guidelines	for	Various
Water	Saurcas		

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 < I)	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
0:2	1000/

[†]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)

- 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%.
- 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.

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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)	
- F	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	Wastewater Conventional (SDI < 5)	8–12 gfd	
Water Sources	• 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 < I)	21-30 gfd	
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5	
(Using Antiscalants) [†]	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 manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. M or damaged due to scale formation are not covered	e proper chemical(s) and stem to prevent scale lembrane elements fouled	

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. MTM720D-400



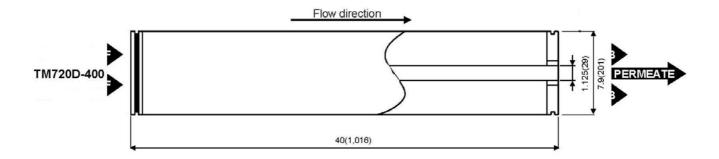
Туре	Diameter Inch	Membrane Area ft²(m²)	Salt Reject %	ion Product Flow gpd(m³/c	
TM720D-400	8"	400(37)	99.8	11,000(41	6) 34
1. Membrane Type			Cr	oss Linked Fully Aromatic	Polyamide Composite
2. Test Conditions		Feed Water Pressure Feed Water Temperature Feed Water Concentration Recovery Rate Feed Water pH	3	225 psi(1.55MPa) 77° F(25°C) 2,000 mg/l Nacl 15%	
		 	-		

Dimensions

All dimensions shown in Inches (millimeter).



Concentrated Brine





Operating Limits

Maximum Operating Pressure	- 600psi (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 —	- 15 psi (0.10 MPa)
Maximum Pressure Drop per Vessel	- 50 psi (0.34 MPa)

Operating Information

- 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

- 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-FE"34



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

- 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%.
- 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

		State.	Part Number			
Model Name	Α	B	C	Weight	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.

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RE8040-FE"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 m ³ /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

 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	 Wastewater Conventional (SDI < 5) 	
Water Sources	VAC	

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)
Stiff and Davis Saturation Index

Stiff and Davis Saturation Index (SDSI) <+0.5
CaSO4 230% saturation
SrSO4 800% saturation
BaSO4 6,000% saturation
SiO2 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.
- · 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.

8-12 gfd

<+1.5

 Permeate pressure must always be equal or less than the feed/concentrate pressure. Damage caused by permeate back pressure voids the element limited warranty.

. Keep elements moist at all times after initial wetting.





Ref. MCRE8040-FEN

RE8040-FEn



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

- 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%.
- 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

			c	Weight	Part Number	
Model Name	A	В			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.

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RE8040-FE"



Enhanced fouling resistant RO element for brackish water and wastewater reuse

APPLICATION DATA:

On superful of the fac

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 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	I.0 NTU
	Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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
		A CONTRACTOR OF THE CONTRACTOR

Surface Water (SDI < 5)

· SiO₂

Saturation Limits	
(Using Antiscalants)	

•	Surface Water (SDI < 3)	13-17 gfd
	Well water (SDI < 3)	13-17 gfd
•	RO permeate (SDI < I)	21–30 gfd
	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

[†]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.

12-16 gfd

100% saturation

 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-FE"440



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

- 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

		8	c	Weight	Part Number	
Model Name	el Name A				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.

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RE8040-FEⁿ440



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 m ³ /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	I.0 NTU
	Max SDI (15 min)	5.0

Max. Chlorine Concentration

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 < I)	21-30 gfd

Saturation Limits (Using Antiscalants)[†]

Langlier Saturation Index (LSI)	<+1.5
Stiff and Davis Saturation Index (SDSI)	<+0.5
CaSO ₄	230% saturatio
Sr5O+	800% saturation

SrSO₄ 800% saturation
BaSO₄ 6,000% saturation
SiO₂ 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.

< 0.1 mg/L

 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



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

SPECIFICATIONS:

General Features

Permeate flow rate: 11,000 GPD (41.6 m³/day)

Nominal salt rejection: 99.0

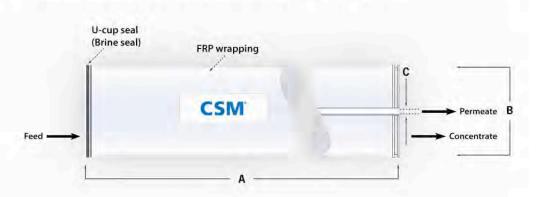
Effective membrane area: 400 ft² (37.2 m²)

- 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%.
- 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.

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RE8040-FL



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)	
10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	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	I.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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
$(Using Antiscalants)^T$	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO ₄	230% saturation
	· SrSO ₄	800% saturation
	- BaSO4	6,000% saturation
	- SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensur- concentration are dosed ahead of the membrane sys formation anywhere within the membrane system. M or damaged due to scale formation are not covered	e proper chemical(s) and item to prevent scale lembrane elements fouled

GENERAL HANDLING PROCEDURES

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



CSM 8" Membranes



Ref. MCRE8040-FLR

RE8040-FLR



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

SPECIFICATIONS:

General Features Permeate flow rate: 9,000 GPD (34.0 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 (1.0 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.

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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 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	I.0 NTU
	Max. SDI (15 min)	5.0
	· Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	· Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21–30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants) [†]	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO4	230% saturation
	· SrSO ₄	800% saturation
	BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	The above saturation limits are typically accepted by	y proprietary antiscalant

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.

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.

- Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.
- Permeate pressure must always be equal or less than the feed/concentrate pressure. Damage caused by permeate back pressure voids the element limited warranty.



CSM 8" Membranes



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

- 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%.
- 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

		Control of the last				Part N	umber
Model Name	A	В	c	Weight	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.

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RE8040-FLR34



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	I.0 NTU
	Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L

· Langlier Saturation Index (LSI)

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 < I)	21-30 gfd

Saturation Limits (Using Antiscalants)[†]

٦	Languer 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
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[†]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.

<+15

 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. MTML20D-400



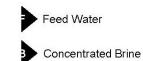
Low fouling and high tolerance RO T M L (D)

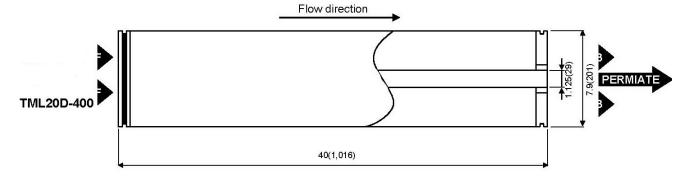
Туре	Diameter Inch	Membrane Area ft²(m²)	Salt Rejection %	Product Flow Rate gpd(m³/d)	Feed Spacer Thickness mil
TML20D-400	8"	400(37)	99.8	10,500(39.7)	34

1. Membrane Type		Cross Linked Fully Aromatic Polyamide Composite
2. Test Conditions		
	Feed Water Pressure	225 psi(1.55 MPa)
	Feed Water Temperature	77 ° F(25 °C)
	Feed Water Concentration	2,000 mg/l NaCl
	Recovery Rate	15 %
	Feed Water pH	7
3. Minimum Salt Rejection		99.65 %
4. Minimum Product Flow Rate		7
		8,400 gpd(31.8 m³/d)

Dimensions

All dimensions shown in Inches (millimeter).









Operating Limits

Maximum Operating Pressure—	- 600psi (4.1 MPa)
Maximum Feed Water Temperature	- 113° F`(45° C)
Maximum Feed Water SDI15	- 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

- 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. MTM820M-400

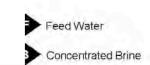


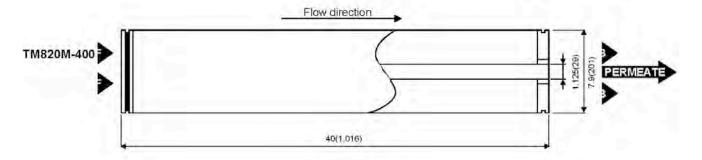
Standard SWRO Product Flow Rate Feed Spacer Type Diameter Membrane Area Salt Rejection Thickness Inch $ft^2(m^2)$ % gpd(m3/d) mil TM820M-400 400(37) 99.8 7,000(26.5) 34

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).









Operating Limits

Maximum Operating Pressure —	— 1200psi (6.3 MPa)
Maximum Feed Water Temperature ————————————————————————————————————	—— 113° F (45° C)
Maximum Feed Water SDI15 ————————————————————————————————————	 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.
- 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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Ref. MTM820M-440

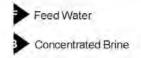
TORAY Innovation by Chemistry

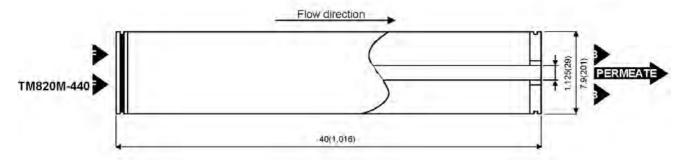
Standard SWRO Type Diameter Membrane Area Salt Rejection Product Flow Rate Feed Spacer Thickness gpd(m3/d) Inch $ft^2(m^2)$ mil TM820M-440 8" 440(41) 99.8 7,700(29.2) 28

1. Membrane Type	= 1 21	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%
3. Minimum Salt Rejection	1 1 1	99.5%
4. Minimum Product Flow Rate		6,200gpd(23.5m³/d)
Boron Rejection (typical value)		95% at pH 8 (5mg/l Boron added to Feed water)

Dimensions

All dimensions shown in Inches (millimeter),







Operating Limits

Maximum Operating Pressure ————————————————————————————————————	1200psi (8.3 MPa)
Maximum Feed Water Temperature —————	———— 113° F (45°C)
Maximum Feed Water SDI15 ————————————————————————————————————	 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 ————————————————————————————————————	
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.
- 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. MTM820V-400



Innovation by Chemistry Low energy SWRO Product Flow Rate Feed Spacer Diameter Membrane Area Salt Rejection Type Thickness $ft^2(m^2)$ gpd(m3/d) Inch mil TM820V-400 8" 9,000(34.1) 400(37) 99.8 34 1. Membrane Type Cross Linked Fully Aromatic Polyamide Composite 2. Test Conditions Feed Water Pressure 800 psi(5.52MPa) Feed Water Temperature 77° F(25°C) Feed Water Concentration 32,000 mg/l Nacl Recovery Rate 8% Feed Water pH 7 3. Minimum Salt Rejection 99.5% 4. Minimum Product Flow Rate 7,500gpd(28.4m3/d) 5. Boron Rejection 92% at pH 8 (5mg/l Boron added to Feed water) (typical value) **Dimensions** Feed Water All dimensions shown in Inches (millimeter). Concentrated Brine Flow direction



Operating Limits

Maximum Operating Pressure —	1200psi (8.3 MPa)
Maximum Feed Water Temperature —————	———— 113° F (45°C)
Maximum Feed Water SDI15 ————————	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

- 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.



CSM 8" Membranes



Ref. MCNE8040-90

NE8040-90

CSM

Normal grade NF element with high monovalent ion rejection

SPECIFICATIONS:

General Features

Permeate flow rate¹: 7,500 GPD (28.4 m³/day)

Monovalent ion rejection (NaCl)1: 85.0 – 95.0% Divalent ion rejection (CaCl₂)2: 90.0 – 95.0% Effective membrane area: 400 ft² (37.2 m²)

- 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
- The stated product performance is based on data taken after 30 minutes of operation at the following divalent test conditions:
 - · 500 mg/L CaCl2 solution at 75 psig (0.5 MPa) applied pressure
 - 15% recovery
- 77 °F (25 °C)
- · pH 6.5-7.0
- 3. MgSO₄ 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%.
- All elements are vacuum sealed in a polyethylene bag containing 1.0% SBS (sodium bisulfite) solution and individually packaged in a cardboard box.

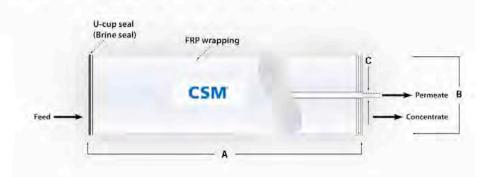
Membrane type:

Thin-Film Composite

Membrane material: Element configuration: Polyamide (PA) Spiral-Wound, FRP Wrapping

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Dimensions A = 40.0 inch (1.016 mm) B = 8.0 inch (203 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 NE8040 elements fit nominal 8.0 inch (203 mm) I.D. pressure vessels.

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NE8040-90

Normal grade NF element with high monovalent ion rejection

CSM

APPLICATION DATA:

O			
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 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	· Wastewater Conventional (SDI < 5)	8–12 gfd	
Water Sources	· 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 < I)	21-30 gfd	
Saturation Limits	Langlier Saturation Index (LSI)	<+1.5	
$(Using Antiscalants)^T$	Stiff and Davis Saturation Index (SDSI)	<+0.5	
	· CaSO4	230% saturation	
	- SrSO ₄	800% saturation	
	· BaSO ₄	6,000% saturation	
	· SiO ₂ I 00% saturation		
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensur- concentration are dosed ahead of the membrane sys	e proper chemical(s) and	

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.

formation anywhere within the membrane system. Membrane elements fouled or damaged due to scale formation are not covered by the limited warranty.

- Only use chemicals compatible with the membrane elements and components. Use of such chemicals may void the element limited warranty.
- Permeate pressure must always be equal or less than the feed/concentrate pressure. Damage caused by permeate back pressure voids the element limited warranty.



CSM 8" Membranes



Ref. MCNE8040-70

NE8040-70



Normal grade NF element with medium monovalent ion rejection

SPECIFICATIONS:

General Features Permeate flow rate!: 7,000 GPD (26.5 m3/day)

Monovalent ion rejection (NaCl)!: 40.0 - 70.0% Divalent ion rejection (CaCl2)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

 - 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 CaCl2 solution at 75 psig (0.5 MPa) applied pressure
 - · 15% recovery
- + 77 °F (25 °C)
- · pH 6.5-7.0
- 3. MgSO₄ 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

A = 40.0 inch (1,016 mm) B = 8.0 inch (203 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 NE8040 elements fit nominal 8.0 inch (203 mm) I.D. pressure vessels.

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





NE8040-70

CSM

Normal grade NF element with medium monovalent ion rejection

APPLICATION DATA:

Operating Limits	· Max. Pressure Drop / Element	15 psi (0.1 MPa)
F	Max. Pressure Drop / 240" Vessel	60 psi (0.41 Mpa)
	• Max. Operating Pressure	600 psi (4.14 MPa)
	Max. Feed Flow Rate	75 gpm (16.0 m ³ /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	I.0 NTU
	· Max. SDI (15 min)	5.0
	Max. Chlorine Concentration	< 0.1 mg/L
Design Guidelines for Various	• Wastewater Conventional (SDI < 5)	8–12 gfd
Water Sources	· 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 < I)	21-30 gfd
Saturation Limits	· Langlier Saturation Index (LSI)	<+1.5
(Using Antiscalants)	Stiff and Davis Saturation Index (SDSI)	<+0.5
	· CaSO ₄	230% saturation
	· SrSO ₄	800% saturation
	· BaSO4	6,000% saturation
	· SiO ₂	100% saturation
	[†] The above saturation limits are typically accepted by manufacturers. It is the user's responsibility to ensure concentration are dosed ahead of the membrane system. Mormation anywhere within the membrane system. Mor damaged due to scale formation are not covered	e proper chemical(s) and item to prevent scale lembrane elements fouled

GENERAL HANDLING PROCEDURES

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



CSM 8" Membranes



Ref. MCNE8040-40

NE8040-40

High productivity NF element



SPECIFICATIONS:

General Features Permeate flow rate!: 13,500 GPD (51 m³/day)

Monovalent ion rejection (NaCl): 20 – 60% Effective membrane area: 400 ft² (37.2 m²)

- 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 MgSO₄ 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. 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

	1 m		70.	40	Part Number	
Model Name	A	В	B C Weight	Weight	Inter- connector	Brine Seal
NE8040-40	40.0 inch (1,016 mm)	8.0 inch (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.

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NE8040-40

High productivity NF element



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	I.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 < I)	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
· BaSO4	6,000% saturation
· SiO ₂	100% saturation
The above saturation limits are typically acce	nted by proprietary apticculant

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 $(7-32^{\circ}\text{C}; 40-95^{\circ}\text{F})$ 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 m³/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			
рН	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 cm³/m³ 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 m³/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			
рН	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 cm³/m³ 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 m³/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 m³/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 BOD₅) 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)



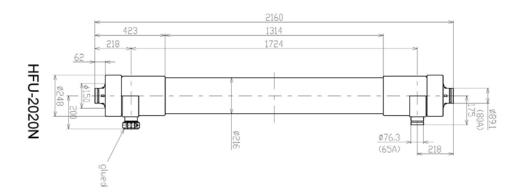
- Membrane Material = PVDF (Polyvinylidene fluoride);
- Housing Material = PVC and/or ABS;
- Potting Material = Epoxy Resin or Urethane Resin;
- Nominal Molecular Weight Cut Off = 150.000;
- Cleaning pH Range 0 ÷ 12;
- Maximum Cleaning Temperature 40°C;
- Maximum Concentration of NaClO Cleaning as Cl₂ = 3.000 mg/liter (10≤pH≤12);
- Maximum NaClO Exposure (lifetime contact time) as Cl₂ = 1.000.000 mg/liter hours;
- Maximum Acid Exposure Contact Time = 1.000 hours (pH≥0).

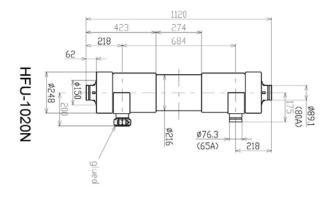
OPERATING CONDITIONS	
Filtration Method	Outside to inside, dead end
Maximum Inlet Pressure	300 kPa (43,5 psi)
Maximum Trans Membrane Pressure	300 kPa (43,5 psi)
Typical Operating Trans Membrane Pressure	< 200 kPa (<29,0 psi)
Operating Temperature Range	0÷40°C
Operating pH Range	1÷10

REF.	MODULE TYPE	MEMBRANE SURFACE AREA (OUTER SURFACE)	DIAMETER	LENGTH	WEIGHT (FULL OF WATER)	WEIGHT (DRAINED)	
		m² (ft²)	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	

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







Dimensions in mm

