CSM®

CSM® RESIDENTIAL ELEMENTS

THIN-FILM POLYAMIDE MEMBRANE ELEMENTS FOR PRODUCTION OF CLEAN WATER FOR YOUR HOME OR BUSINESS.

FEATURES

RO membrane elements for point-of-use applications: residential drinking water systems, food services, office coolers, aquariums.

Packaged and shipped dry for extended shelf-life.

Featuring high-recovery membrane products.

SPECIFICATIONS

MODEL	PERMEATE FLOW RATE gpd (l/day)	SALT REJECTION % **STABILIZED** / MIN.	APPLIED PRESSURE psi	TEST CONDITIONS 77˚F (25˚C), pH 6.5–7.0 NaCl Solution (mg/L)	Recovery (%)
RE1812-24	24 (91)	**98.0** / 96.0	60	200	15
RE1812-35	35 (132)	**98.0** / 96.0	60	200	15
RE1812-50	50 (189)	**98.0** / 96.0	60	200	15
RE1812-60	60 (227)	**98.0** / 96.0	60	200	15
RE1812-80	80 (303)	**98.0** / 96.0	60	200	15
RE2012-100	100 (397)	**98.0** / 96.0	60	200	15
RE2012-LP	50 (189)	**93.0** / 90.0	20	100	15
RE2012-LPF	60 (227)	**93.0** / 90.0	20	100	15
RE1812-HR+	80 (303)	**99.0** / 96.0	60	200	30
RE1812-R150*	150 (570)	**96.0** / 94.0	60	200	50

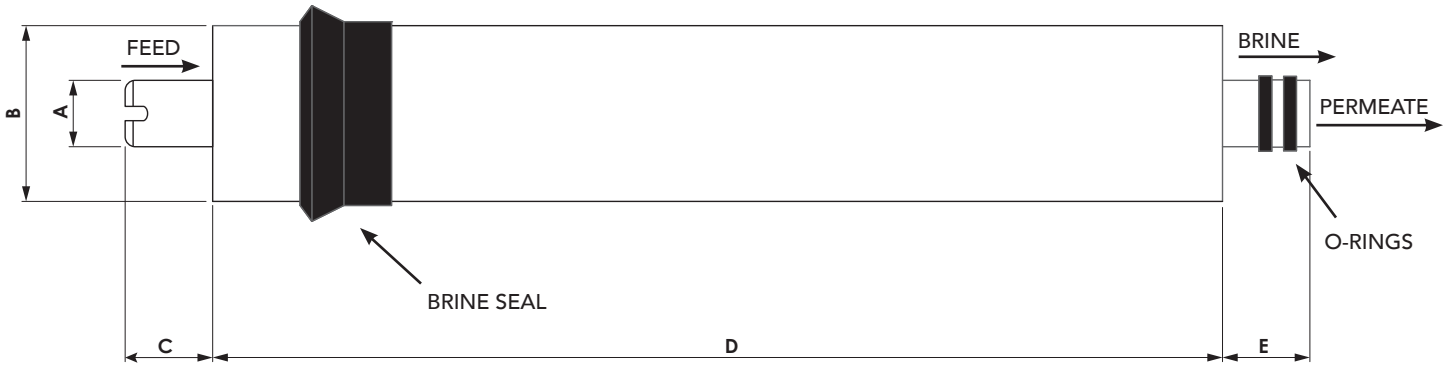
Permeate flow may vary ±15%

*incorporates innovative ROICE™ materials that allow for increased efficiency while maintaining high-performance properties.

MAXIMUM OPERATING LIMITS

Operating Pressure	**125 psi (0.9 MPa)**	Turbidity	**1.0 NTU**
Feed Flow Rate	**2 gpm (0.5 m^3/hr)**	SDI (15 min.)	**5.0**
Operating Temperature	**113˚F (45˚C)**	Chlorine Concentration	**< 0.1 mg/L**
Operating pH Range	**2.0–11.0**		

KEY DIMENSIONS inches (mm)



SIZE	A	B	C	D	E
1812	0.67 (17)	1.77 (45)	0.87 (22)	10.00 (254)	0.87 (22)
2012	0.67 (17)	1.90 (48)	0.50 (12)	10.32 (262)	0.91 (23)

*As per NSF requirement, membrane elements require flushing for a 24-hour period.
Visit NSF.org for list of products listed under NSF/ANSI Standard 58 and data transfer capabilities.

This Reverse Osmosis Membrane Element is Tested and Certified by NSF International against NSF/ANSI Standard 58 for material requirements only.

COMPONENT

GENERAL HANDLING PROCEDURES

Membrane elements must be kept dry at room temperature and not stored in direct sunlight.

If the membrane elements need to be removed from the housing after being wetted, they must be soaked in a mixture of a preservative solution containing 500–1,000 ppm of sodium bisulfite (food grade) and permeate and packaged in an air-tight plastic bag to inhibit bio-growth.

Permeate from the first hour of operation shall be discarded.

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

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

TORAY MEMBRANE USA, INC. 13435 Danielson Street, Poway, CA 92064, U.S.A.
www.csmfilter.com innovation@toraymem.com +1 (858) 218 2360
LinkedIn YouTube

TORAY
Innovation by Chemistry

CSM®

REVERSE OSMOSIS FOR COMMERCIAL & LIGHT INDUSTRIAL APPLICATIONS

FEATURES

Membrane elements for point-of-entry applications for whole-house RO systems and commercial to light industrial applications

Also available with nanofiltration or seawater membranes

Outer fiber-glass wrap for extra durability

Inquire within for custom-engineered solutions.

SPECIFICATIONS

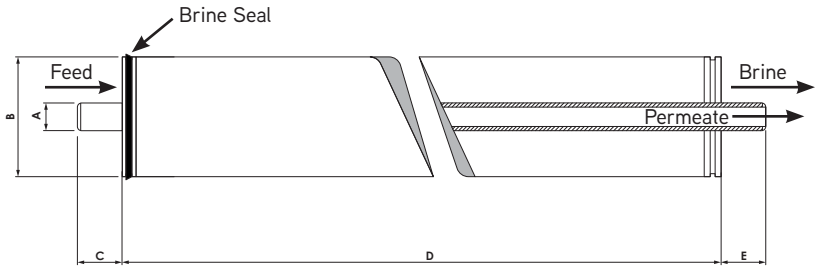
MODEL	PERMEATE FLOW RATE gpd (m^3/day)	SALT REJECTION % **STABILIZED** / MIN.	APPLIED PRESSURE psi	MEMBRANE AREA ft^2 (m^2)	FEED SPACER mil	**TEST CONDITIONS** 77˚F (25˚C), pH 6.5–7.0 NaCl Solution (mg/L)	Recovery (%)
RE2521-BE	400 (1.5)	**99.5** / 99.0	225	12 (1.1)	28	2,000	8
RE2521-BLN	400 (1.5)	**99.2** / 99.0	150	12 (1.1)	28	1,500	8
RE2521-BLF	400 (1.5)	**99.0** / 99.0	100	12 (1.1)	28	500	8
RE2521-SHF	270 (1.02)	**99.4** / 99.0	800	12 (1.1)	28	32,000	4
RE2540-BE	1,000 (3.8)	**99.5** / 99.0	225	27 (2.5)	28	2,000	15
RE2540-BLN	930 (3.5)	**99.2** / 99.0	150	27 (2.5)	28	1,500	15
RE2540-BLF	930 (3.5)	**99.2** / 99.0	100	27 (2.5)	28	500	15
RE2540-SHF	700 (2.65)	**99.4** / 99.0	800	27 (2.5)	28	32,000	8
RE4021-BE	1,200 (4.5)	**99.5** / 99.0	225	35 (3.3)	28	2,000	8
RE4021-BLN	1,200 (4.5)	**99.2** / 99.0	150	35 (3.3)	28	1,500	8
RE4021-BLF	1,200 (4.5)	**99.2** / 99.0	100	35 (3.3)	28	500	8
RE4040-BE	2,400 (9.1)	**99.7** / 99.4	225	85 (7.9)	32	2,000	15
RE4040-BLN	2,600 (9.8)	**99.4** / 99.3	150	85 (7.9)	32	1,500	15
RE4040-BLF	2,500 (9.5)	**99.2** / 99.0	100	85 (7.9)	32	500	15

Permeate flow may vary ±15%

NSF®

Please inquire for a list of products certified under NSF/ANSI Standard 61 for drinking water components.

KEY DIMENSIONS inches (mm)



SIZE	A	B	C	D	E
2521	0.75 (19)	2.5 (64)	1.05 (27)	21.0 (534)	1.05 (27)
2540	0.75 (19)	2.5 (64)	1.05 (27)	40.0 (1,016)	1.05 (27)
4021	0.75 (19)	4.0 (102)	1.05 (27)	21.0 (534)	1.05 (27)
4040	0.75 (19)	4.0 (102)	1.1 (28)	40.0 (1,016)	1.1 (28)

Each element comes packaged with a brine seal and interconnector kit (o-rings installed)

OPERATING LIMITS

Maximum Pressure Drop / Element	**15 psi (0.1 MPa)**
Maximum Pressure Drop / 240" Vessel	**60 psi (0.41 MPa)**
Maximum Operating Pressure	**600 psi (4.14 MPa)**
Maximum Operating Pressure (SHF)	**1,200 psi (8.27 MPa)**
Maximum Feed Flow Rates:	
4040 size	**18 gpm (4.09 m^3/hr)**
4021 size	**13 gpm (3.0 m^3/hr)**
2540, 2521 sizes	**6 gpm (1.36 m^3/hr)**
Minimum Concentrate Flow Rates:	
4040 size	**4 gpm (0.91 m^3/hr)**
4021 size	**3 gpm (0.68 m^3/hr)**
2540, 2521 sizes	**1 gpm (0.23 m^3/hr)**
Maximum Operating Temperature	**113˚F (45˚C)**
Operating pH Range	**2.0–11.0**
CIP pH Range	**1.0–13.0**
Maximum Turbidity	**1.0 NTU**
Maximum SDI (15 min.)	**5.0**
Maximum Chlorine Concentration:	**<0.05 mg/L**
Maximum Chlorine Concentration (SHF)	**<0.1 mg/L**

DESIGN GUIDELINES FOR VARIOUS WATER SOURCES

FEED SOURCE	RO PERMEATE	WELL WATER	SURFACE WATER		WASTEWATER		SEAWATER	
					PRE-TREATED W/ MF	CONVEN-TIONAL	BEACH WELL	OPEN INTAKE
SDI	<1	<3	<3	<5	<3	<5	<3	<5
DESIGN FLUX	**21–30**	**13–17**	**13–17**	**12–16**	**10–14**	**8–12**	**8–12**	**7–10**

GENERAL HANDLING PROCEDURES

Elements must be kept dry at room temperature and not stored in direct sunlight.

After the elements are wetted and need to be removed from the pressure vessels for short-term storage, it is recommended that CSM elements be immersed in a protective solution containing 500–1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.

Permeate from the first hour of operation shall be discarded.

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

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

TORAY MEMBRANE USA, INC. 13435 Danielson Street, Poway, CA 92064, U.S.A.
www.csmfilter.com innovation@toraymem.com +1 (858) 218 2360
LinkedIn YouTube

TORAY
Innovation by Chemistry

CSM®

CSM® NANOFILTRATION MEMBRANE

CSM NF membranes are capable of selectively rejecting divalent ions, making it ideal for a wide range of applications. Typical uses include production of food & beverage, dye recovery, and water softening and removal of specific impurities (i.e. color, DBP, THM) for potable use.

CSM NF Membranes are constructed with either a polyamide or piperazine thin-film layer, and are available in various sizes.

Inquire within for custom-engineered solutions.

SPECIFICATIONS

MODEL	PERMEATE FLOW RATE gpd (m^3/day)	IONIC REJECTION % **MONOVALENT** / DIVALENT	MEMBRANE AREA ft^2 (m^2)	FEED SPACER mil
NE8040-90	8,000 (30.3)	**85–97** / 90–97	400 (37.2)	32
NE4040-90	1,700 (6.4)	**85–97** / 90–97	85 (7.9)	32
NE2540-90	540 (2.0)	**85–97** / 90–97	27 (2.5)	28
NE8040-70	7,000 (26.5)	**40–70** / 45–70	400 (37.2)	32
NE4040-70	1,500 (5.7)	**40–70** / 45–70	85 (7.9)	32
NE8040-40	10,000 (37.9)	**20–40**	400 (37.2)	32
NE4040-40	2,100 (7.9)	**20–40**	85 (7.9)	32

Permeate flow may vary ±15%

Tested at applied pressure 75 psi (0.5 MPa), 15% recovery, 77˚F (25˚C), pH 6.5–7.0
Monovalent ion rejection: 2,000 mg/L NaCl
Divalent ion rejection: 500 mg/L $CaCl_2$
$MgSO_4$ rejection is 97.0% (same test conditions as those used for monovalent ion rejection)

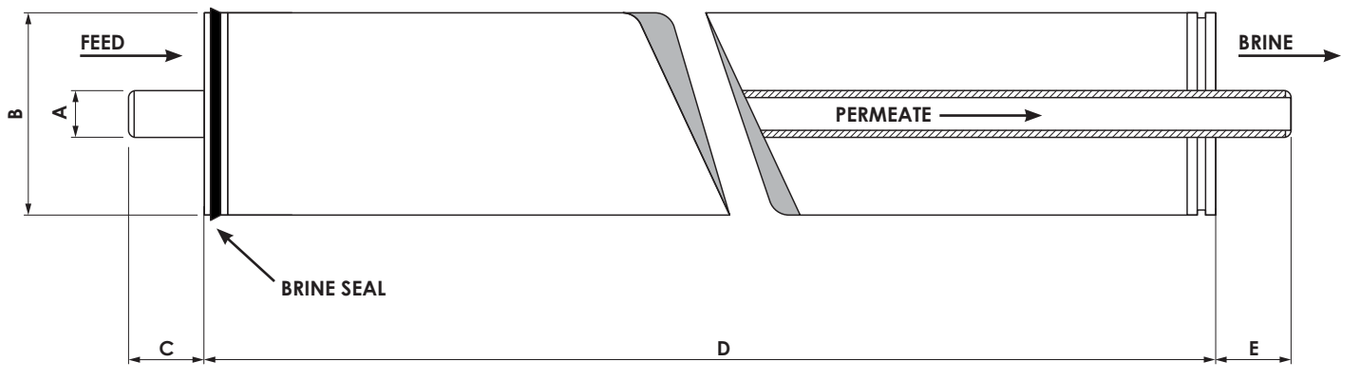
MAXIMUM OPERATING LIMITS

Pressure Drop / Element	**15 psi (0.1 MPa)**
Pressure Drop / 240" Vessel	**60 psi (0.4 MPa)**
Operating Pressure	**600 psi (4.1 MPa)**
Feed Flow Rate (8040 size)	**75 gpm (17.0 m^3/hr)**
Feed Flow Rate (4040 size)	**18 gpm (4.1 m^3/hr)**
Feed Flow Rate (2540 size)	**6 gpm (1.4 m^3/hr)**
Operating Temperature	**113˚F (45˚C)**
Operating pH Range	**2.0–11.0**
CIP pH Range	**1.0–13.0**
Turbidity	**1.0 NTU**
SDI (15 min.)	**5.0**
Chlorine Concentration	**< 0.1 mg/L**

INSTALLATIONS

End-user	Installed Model(s)	Permeate Capacity (MGD)	Target Objective
YUCAIPA VALLEY WATER DISTRICT, CALIFORNIA	NE8040-40	4.0	Removal of DBP precursors in the groundwater while limiting TDS rejection for potable use
EVERGLADES CITY, FLORIDA	HYBRID NE8040-90 / NE8040-70	0.55	Reduction of color and hardness for potable use and OPEX through low operating pressures
ORANGE TREE UTILITIES, FLORIDA	HYBRID NE8040-90 / RE8040-BLN	0.75	Water from the Surficial Aquifer treated with RO/NF (low pressure RO in 1st stage for blending) for potable use
MAPLE SYRUP	NE8040-90	N/A	Sucrose concentration for the production of maple syrup

KEY DIMENSIONS inches (mm)



SIZE	A	B	C	D	E
2540	0.75 (19)	2.5 (64)	1.6 (41)	40.0 (1,016)	1.6 (41)
4040	0.75 (19)	4.0 (102)	1.6 (41)	40.0 (1,016)	1.6 (41)
8040	1.12 (28)	8.0 (203)	N/A (flush cut)	40.0 (1,016)	N/A (flush cut)

Each element comes packaged with a brine seal and interconnector kit (o-rings installed)

Check NSF.org for list of products listed under NSF/ANSI Standard 61.

DESIGN GUIDELINES FOR VARIOUS WATER SOURCES

FEED SOURCE	RO PERMEATE	WELL WATER	SURFACE WATER		WASTEWATER		SEAWATER	
					PRE-TREATED W/ MF	CONVEN-TIONAL	BEACH WELL	OPEN INTAKE
SDI	<1	<3	<3	<5	<3	<5	<3	<5
DESIGN FLUX	**21–30**	**13–17**	**13–17**	**12–16**	**10–14**	**8–12**	**8–12**	**7–10**

GENERAL HANDLING PROCEDURES

Elements must be kept dry at room temperature and not stored in direct sunlight.

After the elements are wetted and need to be removed from the pressure vessels for short-term storage, it is recommended that CSM elements be immersed in a protective solution containing 500–1,000 ppm of sodium bisulfite (food grade) dissolved in permeate.

Permeate from the first hour of operation shall be discarded.

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

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

Visit **www.toraywater.com** for corporate information and Toray brand products
Visit **www.csmwater.com** for CSM brand products

TORAY
Innovation by Chemistry