

CSM[®] NANOFILTRATION MEMBRANE

Toray manufactures CSM NF membranes for selective rejection and operation at low pressures. Typical applications include food & beverage, dye recovery, 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.



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

Ionic rejection: Monovalents: 2,000 mg/L NaCl / Divalents: 500 mg/L CaCl₂

MgSO₄ rejection is 97.0% (same test conditions as those used for monovalent ion rejection)

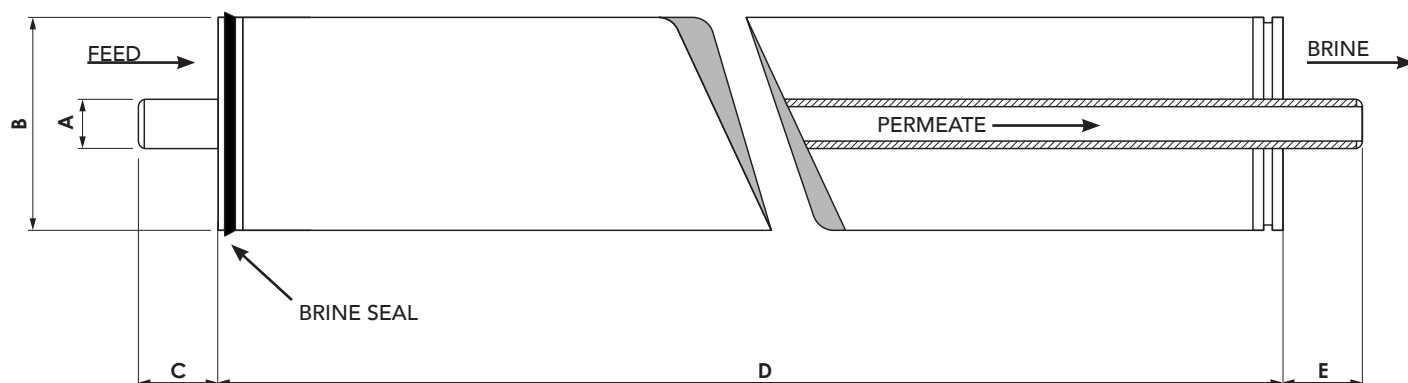
MAXIMUM OPERATING LIMITS

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 m³/hr)
Feed Flow Rate (4040 size)	18 gpm (4.1 m³/hr)
Feed Flow Rate (2540 size)	6 gpm (1.4 m³/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
DARE COUNTY, NORTH CAROLINA	NE8040-90	3.0	Retrofit of ion exchange system to soften water for drinking purposes
MARSHALL COUNTY, WEST VIRGINIA	NE8040-90	3.0	Water softening for drinking purposes
YUCAIPA, 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
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)



Check [NSF.org](https://www.nsf.org) for list of products listed under NSF/ANSI Standard 61.

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

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

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