CSM®

CSM Reverse Osmosis Membrane

woongjin chemical

Applying innovative ideas Woongjin Chemical brings you fresh solutions

CSM membrane technology aims at offering the best solutions to water problems in the world and we always do our best for customer satisfaction

CSM Applications

ULTRAPURE WATER
Rinsing water for Semiconductors, LCDs, and PCBs

PROCESS PURE WATER
Reduces ion concentrations and prevents scaling and corrosion within the pipe

COOLING TOWER MAKEUP WATER / BOILER FEED WATER
Reduces ion concentrations and prevents scaling and corrosion within the pipe

DRINKING WATER
Reduces salt concentrations and viruses in the water

RECYCLING AND ZERO DISCHARGE SYSTEM
Elimination of sewage and accomplishment of zero discharge system

RECOVERY OF DYESTUFF
Dye recovery and reuse

PRODUCTION OF BEVERAGES
Concentration of fruit juices or different drinks

SEAWATER DESALINATION
Reduces salt concentrations in water for household and industrial uses

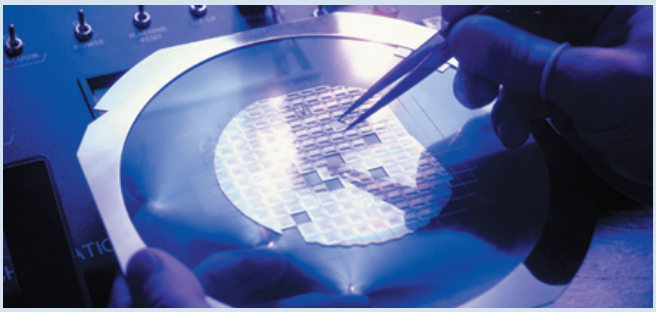
CSM BWM Brackish Water Membrane

Model Name	Performance		Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	Salt Rejection %		Dia Inch (mm)	Length Inch (mm)	
RE16040-BE	41,000 (155.0)	99.7	1600 (148.6)	16 (400)	40 (1016)	40" BW Standard
RE8040-BE*	10,500 (39.7)	99.7	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-BE440	11,500 (43.5)	99.7	440 (40.9)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-BN	9,500 (36.0)	99.7	365 (33.9)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-BR	6,000 (22.7)	99.75	380 (35.3)	8.0 (203)	40 (1016)	40" BW Standard
RE4040-BE	2,400 (9.1)	99.7	85 (7.9)	4.0 (102)	40 (1016)	40" BW Standard
RE4040-BN	2,000 (7.6)	99.7	75 (7.0)	4.0 (102)	40 (1016)	40" BW Standard
RE4021-BE	1,000 (3.8)	99.7	35 (3.3)	4.0 (102)	21 (533)	21" BW Standard

*Certified by NSF to NSF/ANSI standard 61

- *40" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *21" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*

CSM UPWM Ultrapure Water Membrane



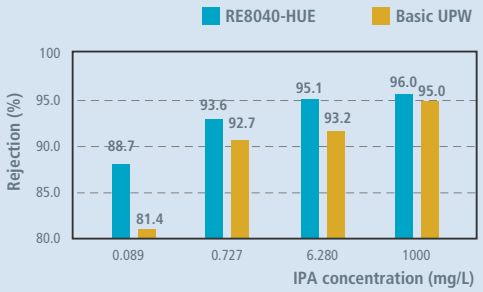
- Ultrapure water for semi-conductor,LCD and etc.
- High TOC rejection, low TOC extraction and TOC rinse down.

Model Name	Performance			Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	NaCl Rejection %	IPA Rejection %		Dia Inch (mm)	Length Inch (mm)	
RE8040-HUE440	10,000 (37.9)	99.5	96.0	440 (40.9)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-HUE	9,000 (34.1)	99.5	96.0	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-UR	5,500 (20.8)	99.7	96.0	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-UL	10,000 (37.9)	99.5	92.0	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard

- *40" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *40" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *IPA rejection test conditions : IPA 1,000 mg/L, Pressure 225 psig for UE, HUE and 150 psig for UL Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*
- *IPA rejection data were obtained after operating membrane element at the IPA rejection test conditions for 2 hours.*

IPA Rejections of CSM UPW Membrane

- Test Conditions : 225psig, 25℃, Recovery15%, pH6.5~7.0
- Analyzed by Anatel -1000

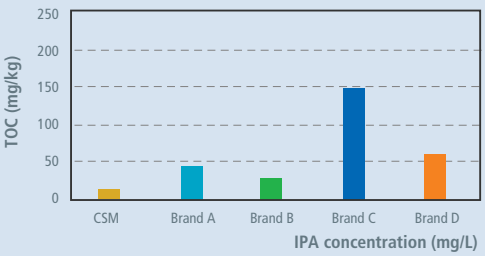


Low TOC Extraction Property

Comparisons of TOC extractions of various UPW elements in the market:

- Extraction testing method: after dipping the weighted permeate channel in 800ml of feed water during 4hours,the extracted TOC conc. was measured. Calculation method for TOC quantity extracted from permeate channel:

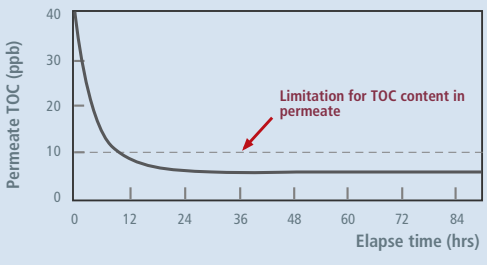
  [(TOC conc. after 4hours dipping - feed water TOC conc. before dipping] x [feed water quantity 0.8Lx0.001])
  Feed water TOC conc. 198ppb



TOC Rinse Down Behavior

Operating Conditions

- Feed TOC : 40~80 ppb
- recovery : 90%
- Feed Pressure : 15bar
- TOC analyzer : Anatel - A1000



CSM LPM Low Pressure Membrane

- Reduces operating and capital costs dramatically.
- Ideal for small drinking water.
- High salt rejection at low pressure.

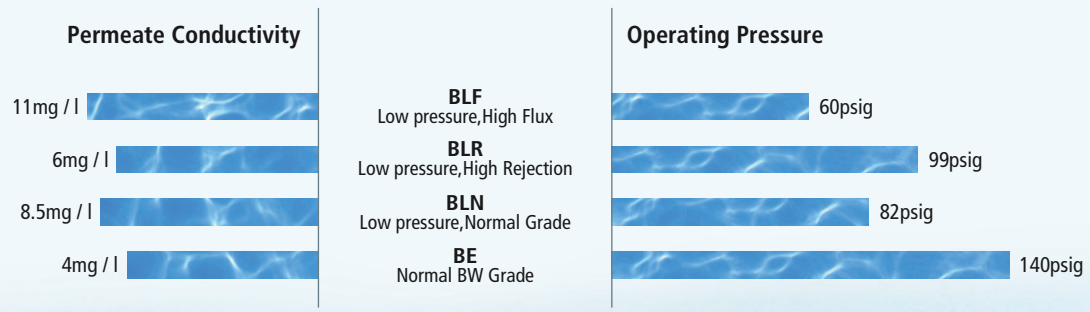
Model Name	Performance		Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	Salt Rejection %		Dia Inch (mm)	Length Inch (mm)	
RE16040-BLR	36,000 (136.3)	99.6	1600 (148.6)	16 (400)	40 (1016)	40" LP Standard
RE8040-BLN440	13,000 (49.2)	99.2	440 (40.9)	8.0 (203)	40 (1016)	40" LP Standard
RE8040-BLN*	12,000 (45.4)	99.2	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
RE8040-BLF*	11,500 (43.5)	99.2	400 (37.2)	8.0 (203)	40 (1016)	40" LP High Flux
RE8040-BLR440	9,900 (37.4)	99.6	440 (40.9)	8.0 (203)	40 (1016)	40" LP Standard
RE8040-BLR*	9,000 (34.1)	99.6	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
RE4040-BLN*	2,600 (9.8)	99.2	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
RE4040-BLF*	2,500 (9.5)	99.2	85 (7.9)	4.0 (102)	40 (1016)	40" LP High Flux
RE4040-BLR*	1,900 (7.2)	99.6	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
RE4040-TL	2,600 (9.8)	99.0	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
RE4021-BL	1,000 (3.8)	99.2	35 (3.3)	4.0 (102)	21 (533)	21" BW Standard
RE4021-TL	1,050 (4.0)	99.0	35 (3.3)	4.0 (102)	21 (533)	21" LP Standard
RE2540-TL	850 (3.2)	99.0	27 (2.5)	2.5 (64)	40 (1016)	40" LP Standard
RE2521-TL	300 (1.1)	99.0	12 (1.1)	2.5 (64)	21 (533)	21" LP Standard

*Certified by NSF to NSF/ANSI standard 61

- *40" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *21" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *40" LP High Flux test conditions : NaCl 500 mg/L, Pressure 100 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *21" BW Standard test conditions: NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*

Product Characteristics

Compared of Permeate TDS and Operating Pressure between CSM BL membranes under the same feed water concentration (500mg L/NaCl) and permeate flux(15gfd) at 25C (recovery15%)



BLF
more useful when:
- Feed water TDS concentration is low
- High salt rejection is not required
- Energy saving is required through low pressure operation

BLR
more useful when:
- Feed water TDS concentration is high
- Energy saving is needed through low pressure operation

BLN
Salt rejection and specific permeate flux are between BLR and BLF products

CSM FRM Fouling Resistant Membrane

- Decreases CIP frequency.
- Saves operating costs.
- Ideal for feed water with fouling potential.

Model Name	Performance		Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	Salt Rejection %		Dia Inch (mm)	Length Inch (mm)	
RE16040-FE[n]	41,000 (155.0)	99.7	1600 (148.6)	16 (400)	40 (1016)	40" BW Standard
RE8040-FE[n]	10,500 (39.7)	99.7	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-FN	9,500 (36.0)	99.7	365 (33.9)	8.0 (203)	40 (1016)	40" BW Standard
RE8040-FD[n]	10,000 (37.9)	99.7	380 (35.3)	8.0 (203)	40 (1016)	40" BW Standard
RE4040-FE[n]	2,400 (9.1)	99.7	85 (7.9)	4.0 (102)	40 (1016)	40" BW Standard
RE16040-FLR	36,000 (136.0)	99.6	1600 (148.6)	16 (400)	40 (1016)	40" LP Standard
RE8040-FLR	9,000 (34.0)	99.6	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
RE8040-FL[n]	11,000 (41.6)	99.0	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
RE4040-FLR	1,900 (7.2)	99.6	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
RE4040-FL[n]	2,400 (9.1)	99.0	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard

- *40" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *40" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min*

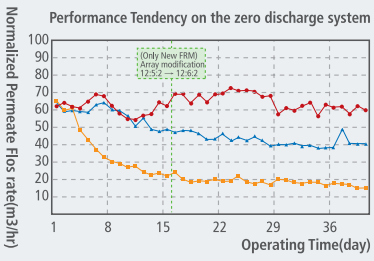
FRM performance in the Real Plant with high fouling potential

- Location : ASAN,KOREA (Motor Company)
- Capacity : 5,000m3/day (Zero Discharge)
- Feed Water Source : Tertiary Treated Wastewater & Sewage
- RO System Configuration
  - 1st Pass : 12 : 5 : 2array, 75%recovery 2Trains of 114pcs of FR RO membrane
  - 2nd Pass for 1st Pass Brine: 4 : 2 : 1 array, 50%recovery 32pcs of SW RO membrane

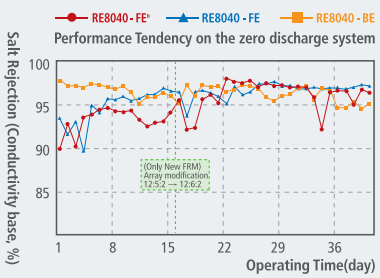
[Feed Water Quality]

Parameter	Unit	Jun.2004
Na	mg/L	810
Cl	mg/L	1,223
SiO2	mg/L	8.49
Turbidity	NTU	1.2
Conductivity	㎲/cm	3,920
TOC	mg/L	23.6
SDI (15min)	-	Over5.0

[Normalized Permeate Flow rate]



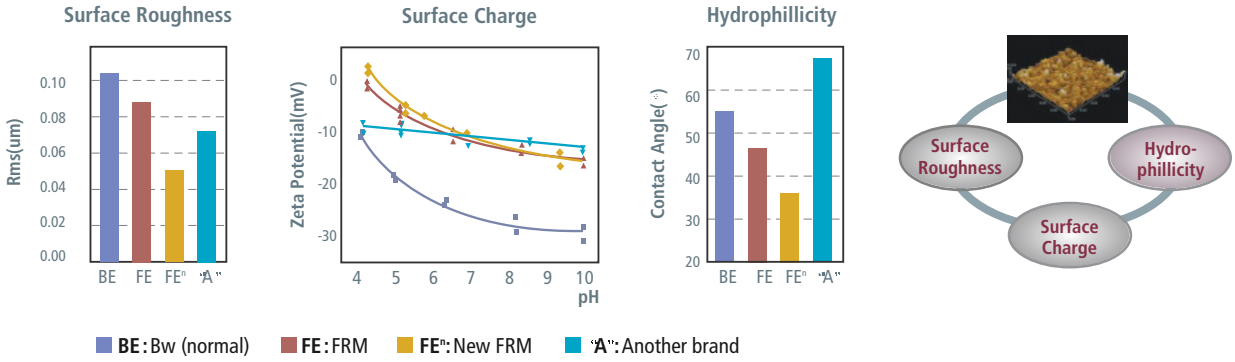
[Salt Rejection]



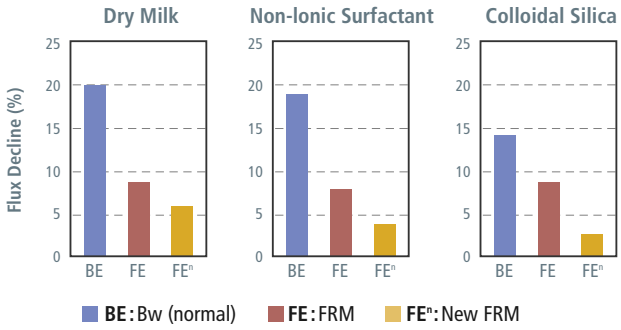
CSM FRM Fouling Resistant Membrane

- Useful for high fouling potential feed water, wastewater reuse.
- Modification of surface roughness, surface charge, and hydrophilicity of the membrane.
- Feed water containing high amount of charged (+,-) and/or non-charged foulants, organic matters, colloidal particles.
- More than 5years application in the real plants.

Surface Properties



FRM performance with Model Foulants



- **Model Foulants :** Test Conditions
- **Dry-Milk :** 30 mg/L, after 8hrs operation
- **Non-Ionic Surfactant :** Tryton X-100:50 mg/L, after 8hrs operation
- **Colloidal Silica :** 100mg/L with divalent cation (Ca2+,Mg2+), after 8hrs operation at pH7

* **CSM FR membranes show excellent fouling resistant properties to organic and inorganic contaminants**

References

Customers	Location	Model	Capacity	Date
VEOLIA WATER (Wollongong) (Wastewater reclamation)	AUSTRALIA	RE8040-FEⁿ	20,000 m³/day (1,610 pcs)	JUN. 2007 APR. 2008
BRISBANE WATER (Luggage Point) (Sewage reclamation)	AUSTRALIA	RE8040-FEⁿ	16,000 m³/day (1,116 pcs)	MAR. 2008
SAMSUNG TOTAL (Boiler Feed)	KOREA	RE8040-FE	65,520 m/day (3,168 pcs)	Since JUL. 2002
VEOLIA WATER (KRANJI II) Expansion (Sewage reclamation)	SINGAPORE	RE8040-FE	42,000 m³/day (2,674 pcs)	FEB. 2006
UNITED KG (Boiler Feed Water)	THAILAND	RE8040-FE	9,200 m³/day (540 pcs)	APR. 2006
WEIDNER (Process Water)	UKRAINE	RE8040-FL	5,200 m³/day (360 pcs)	AUG. 2005

CSM SWM Sea Water Membrane

- Seawater desalination.
- Converts seawater to industrial or drinking water.
- Able to purify high TDS brackish water containing TDS more than 10,000 ppm.

Model Name	Performance		Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	Salt Rejection %		Dia Inch (mm)	Length Inch (mm)	
RE16040-SHN	24,600 (93.1)	99.75	1600 (148.6)	16 (400)	40 (1016)	40" SW Standard
RE16040-SHF	36,000 (136.1)	99.7	1600 (148.6)	16 (400)	40 (1016)	40" SW Standard
RE8040-SN	6,000 (22.7)	99.2	370 (34.4)	8.0 (203)	40 (1016)	40" SW Standard
RE8040-SH	4,500 (17.0)	99.75	370 (34.4)	8.0 (203)	40 (1016)	40" SW Standard
RE8040-SHA400	7,500 (28.4)	99.75	400 (37.2)	8.0 (203)	40 (1016)	40" SW Standard
RE8040-SHN	6,000 (22.7)	99.75	370 (34.4)	8.0 (203)	40 (1016)	40" SW Standard
RE8040-SHN400	6,500 (24.6)	99.75	400 (37.2)	8.0 (203)	40 (1016)	40" SW Standard
RE4040-SHA	1,400 (5.3)	99.75	74 (6.9)	4.0 (102)	40 (1016)	40" SW Standard
RE4040-SHF	1,900 (7.2)	99.7	75 (7.0)	4.0 (102)	40 (1016)	40" SW Standard

- *40" SW Standard test conditions : NaCl 32,000 mg/L, Pressure 800 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *21" SW Standard test conditions : NaCl 32,000 mg/L, Pressure 800 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 4%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*

Customers	Location	Model	Capacity	Date
SOUTH PARS (PHASE (2&3)	IRAN	RE8040-SN RE8040-BE	1800 m³/day	AUG. 2000
SOUTH PARS (PHASE (4&5)	IRAN	RE8040-SR RE8040-BE	360 m³/day	MAY. 2003
CHANGZHOU CANGJIN CHEMICAL	CHINA	RE8040-SR	1200m³/hr	APR. 2004
HYDROPRO	VENEZUELA / MASHAL	RE8040-SR	153 PCS	MAR. 2003
MEMBRANE TECH. IND.	U.S.A / HAWAII	RE8040-SR	1440 m³/day	JUN. 2004
KOREA NAVY FORCE	KOREA JINHAE	RE4040-SR	1485 PCS	Since 1998

CSM NFM Nanofiltration Membrane (NFM)

- Removes divalent up to 90%.
- Effective in dye concentration, dye stuff recovery and food concentration.
- Used in pretreatment desalination system.

Model Name	Performance				Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	NaCl Rejection %	$MgSO_4$ Rejection %	$CaCl_2$ Rejection %		Dia Inch (mm)	Length Inch (mm)	
NE8040-90*	7,500 (28.4)	85~95	97.0	90-95	400 (37.2)	8.0 (203)	40 (1016)	NE Standard
NE4040-90*	1,600 (6.0)	85~95	97.0	90-95	85 (7.9)	4.0 (102)	40 (1016)	NE Standard
NE2540-90	500 (1.9)	85~95	97.0	90-95	27 (2.5)	2.5 (64)	40 (1016)	NE Standard
NE8040-70	7,000 (26.5)	40~70	97.0	45-70	400 (37.2)	8.0 (203)	40 (1016)	NE Standard
NE4040-70	1,500 (5.6)	40~70	97.0	45-70	85 (7.9)	4.0 (102)	40 (1016)	NE Standard
NE2540-70	450 (1.7)	40~70	97.0	45-70	27 (2.5)	2.5 (64)	40 (1016)	NE Standard

*Certified by NSF to NSF/ANSI standard 61

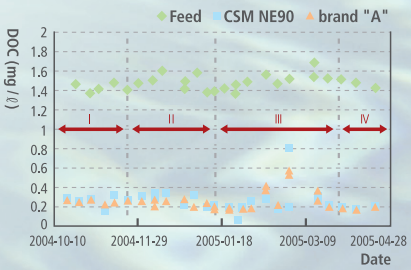
- *NE Standard test conditions: NaCl 2,000 mg/L, 75psig, 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *$MgSO_4$ rejection test conditions: $MgSO_4$ 2,000 mg/L, 75psig, 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *$CaCl_2$ rejection test conditions: $CaCl_2$ 500 mg/L, 75psig, 25°C, pH 6.5 ~ 7.0, Recovery 15%*

Pilot Test Result in the municipal WTP

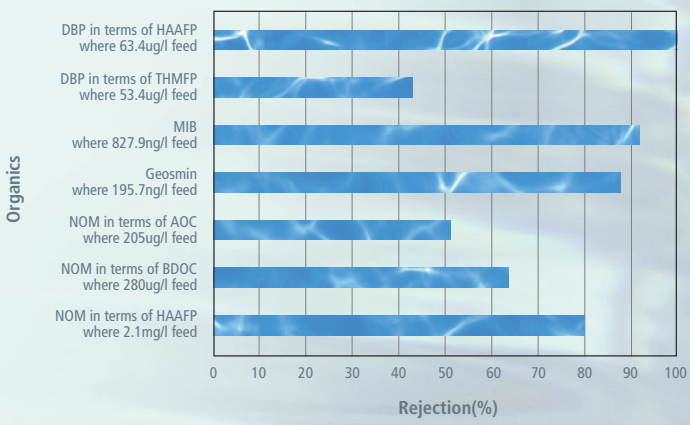
Water source:Paldang Lake in South Korea
Model : NE4040-90

*"A": Another brand

	CSM NE90	"A"	Remark
DOC Removal Efficiency	80% ↑	80% ↑	CSM NE 90 = "A"
Permeability (l/d·m²·kPa)	2.0	1.5	CSM NE 90 > "A"



Organic Rejection Ratio by CSM NE90



CSM TWM Tap Water Membrane

- Ideal for removing low molecular weight polluted substances.
- Perfect for tap water.
- Perfect for treating small quantities of water.

Model Name	Performance		Effective Area ft² (m²)	Dimension		Test Condition
	Permeate Flow rate GPD (m³/day)	Salt Rejection %		Dia Inch (mm)	Length Inch (mm)	
RE4040-TE*	2,400 (9.1)	99.5	85 (7.9)	4.0 (102)	40 (1016)	40" BW Standard
RE4021-TE	1,000 (3.8)	99.5	35 (3.3)	4.0 (102)	21 (533)	21" BW Standard
RE2540-TE*	800 (3.0)	99.5	27 (2.5)	2.5 (64)	40 (1016)	40" BW Standard
RE2521-TE	300 (1.1)	99.5	12 (1.1)	2.5 (64)	21 (533)	21" BW Standard
RE4040-TL	2,600 (9.8)	99.2	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
RE4021-TL	1,050 (4.0)	99.2	35 (3.3)	4.0 (102)	21 (533)	21" LP Standard
RE2540-TL	850 (3.2)	99.2	27 (2.5)	2.5 (64)	40 (1016)	40" LP Standard
RE2521-TL	300 (1.1)	99.2	12 (1.1)	2.5 (64)	21 (533)	21" LP Standard

*Certified by NSF to NSF/ANSI standard 61

- *40" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *21" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *40" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *21" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*

CSM HOUSEHOLD MEMBRANE

- Household membrane can eliminate substances larger than 0.0001 ㎛ such as carcinogen, THMs (Trihalomethanes), heavy metal ions, bacteria and virus in water.
- There are several different products from 35 GPD to 100 GPD.
- Both wet and dry types of elements are available

Model Name	Performance		Dimension		Test Condition
	Permeate Flow rate GPD (L /day)	Salt Rejection %	Dia Inch (mm)	Length Inch (mm)	
RE1810-30	30 (114)	98.0	1.8 (46)	10 (254)	Household Standard
RE1810-50*	50 (189)	98.0	1.8 (45.7)	10 (254)	Household Standard
RE1812-35*	35 (132)	98.0	1.8 (46)	12 (305)	Household Standard
RE1812-CE60	60 (227)	99.5	1.8 (46)	10 (254)	Household Standard
RE70-1812-50	50 (189)	98.0	1.8 (45)	12 (305)	Household Standard
RE1812-60*	60 (227)	98.0	1.8 (46)	12 (305)	Household Standard
RE1812-80*	80 (303)	98.0	1.8 (46)	12 (305)	Household Standard
RE2012-100*	100 (397)	98.0	2.0 (50)	12 (304.8)	Household Standard
RE2012-HD	75 (284)	98.0	1.8 (45)	12 (305)	Household Standard
RE2012-LPF	60 (227)	93.0	2.0 (48)	12 (305)	Household LP
RE2010-LP*	30 (114)	93.0	2.0 (50)	10 (254)	Household LP
RE2012-LP*	50 (189)	93.0	2.0 (50)	12 (305)	Household LP
RE2812-300	300 (1136)	98.0	2.9 (74)	12 (305)	Household Standard

*Certified by NSF to NSF/ANSI standard 58

- *Household Standard test conditions : NaCl 200mg/L, Pressure 60 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 10~20%*
- *Household LP test conditions : NaCl 100mg/L, Pressure 20 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 10~20%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*
- *The above data are based on nominal salt rejection*

TYPE	Model Name	Performance		Effective Area ft² (m²)	Dimension		Test Condition
		Permeate Flow rate GPD (m³/day)	Salt Rejection %		Dia Inch (mm)	Length Inch (mm)	
16 INCH	RE16040-BE	41,000 (155.0)	99.7	1600 (148.6)	16(400)	40 (1016)	40" BW Standard
	RE16040-FE[n]	41,000 (155.0)	99.7	1600 (148.6)	16(400)	40 (1016)	40" BW Standard
	RE16040-BLR	36,000 (136.3)	99.6	1600 (148.6)	16(400)	40 (1016)	40" LP Standard
	RE16040-FLR	36,000 (136.0)	99.6	1600 (148.6)	16(400)	40 (1016)	40" LP Standard
	RE16040-SHN	24,600 (93.1)	99.75	1600 (148.6)	16(400)	40 (1016)	40" SW Standard
	RE16040-SHF	36,000 (136.1)	99.7	1600 (148.6)	16(400)	40 (1016)	40" SW Standard
8 INCH	RE8040-BE	10,500 (39.7)	99.7	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-BE440	11,500 (43.5)	99.7	440 (40.9)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-BN	9,500 (36.0)	99.7	365 (33.9)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-BR	6,000 (22.7)	99.75	380 (35.3)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-FE[n]	10,500 (39.7)	99.7	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-FN	9,500 (36.0)	99.7	365 (33.9)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-FD[n]	10,000 (37.9)	99.7	380 (35.3)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-FLR	9,000 (34.0)	99.6	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
	RE8040-FL[n]	11,000 (41.6)	99.0	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
	RE8040-BLN440	13,000 (49.2)	99.2	440 (40.9)	8.0 (203)	40 (1016)	40" LP Standard
	RE8040-BLN	12,000 (45.4)	99.2	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
	RE8040-BLF	11,500 (43.5)	99.2	400 (37.2)	8.0 (203)	40 (1016)	40" LP High Flux
	RE8040-BLR440	9,900 (37.4)	99.6	440 (40.9)	8.0 (203)	40 (1016)	40" LP Standard
	RE8040-BLR	9,000 (34.1)	99.6	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
	RE8040-SN	6,000 (22.7)	99.2	370 (34.4)	8.0 (203)	40 (1016)	40" SW Standard
	RE8040-SH	4,500 (17.0)	99.75	370 (34.4)	8.0 (203)	40 (1016)	40" SW Standard
	RE8040-SHA400	7,500 (28.4)	99.75	400 (37.2)	8.0 (203)	40 (1016)	40" SW Standard
	RE8040-SHN	6,000 (22.7)	99.75	370 (34.4)	8.0 (203)	40 (1016)	40" SW Standard
	RE8040-SHN400	6,500 (24.6)	99.75	400 (37.2)	8.0 (203)	40 (1016)	40" SW Standard
	RE8040-HUE440	10,000 (37.9)	99.5 (IPA 96)	440 (40.9)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-HUE	9,000 (34.1)	99.5 (IPA 96)	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-UR	5,500 (20.8)	99.7 (IPA 96)	400 (37.2)	8.0 (203)	40 (1016)	40" BW Standard
	RE8040-UL	10,000 (37.9)	99.5 (IPA 92)	400 (37.2)	8.0 (203)	40 (1016)	40" LP Standard
4 INCH	RE4040-BE	2,400 (9.1)	99.7	85 (7.9)	4.0 (102)	40 (1016)	40" BW Standard
	RE4040-BN	2,000 (7.6)	99.7	75 (7.0)	4.0 (102)	40 (1016)	40" BW Standard
	RE4040-FE[n]	2,400 (9.1)	99.7	85 (7.9)	4.0 (102)	40 (1016)	40" BW Standard
	RE4040-FLR	1,900 (7.2)	99.6	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
	RE4040-FL[n]	2,400 (9.1)	99.0	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
	RE4040-BLN	2,600 (9.8)	99.2	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
	RE4040-BLF	2,500 (9.5)	99.2	85 (7.9)	4.0 (102)	40 (1016)	40" LP High Flux
	RE4040-BLR	1,900 (7.2)	99.6	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
	RE4040-TE	2,400 (9.1)	99.5	85 (7.9)	4.0 (102)	40 (1016)	40" BW Standard
	RE4040-TL	2,600 (9.8)	99.2	85 (7.9)	4.0 (102)	40 (1016)	40" LP Standard
	RE4040-SHA	1,400 (5.3)	99.75	74 (6.9)	4.0 (102)	40 (1016)	40" SW Standard
	RE4040-SHF	1,900 (7.2)	99.7	75 (7.0)	4.0 (102)	40 (1016)	40" SW Standard
	RE4021-BE	1,000 (3.8)	99.7	35 (3.3)	4.0 (102)	21 (533)	21" BW Standard
	RE4021-TE	1,000 (3.8)	99.5	35 (3.3)	4.0 (102)	21 (533)	21" BW Standard
	RE4021-BL	1,000 (3.8)	99.2	35 (3.3)	4.0 (102)	21 (533)	21" BW Standard
	RE4021-TL	1,050 (4.0)	99.2	35 (3.3)	4.0 (102)	21 (533)	21" LP Standard
2.5 INCH	RE2540-TE	800 (3.0)	99.5	27 (2.5)	2.5 (64)	40 (1016)	40" BW Standard
	RE2540-TL	850 (3.2)	99.2	27 (2.5)	2.5 (64)	40 (1016)	40" LP Standard
	RE2521-TE	300 (1.1)	99.5	12 (1.1)	2.5 (64)	21 (533)	21" BW Standard
	RE2521-TL	300 (1.1)	99.2	12 (1.1)	2.5 (64)	21 (533)	21" LP Standard

- *40" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *40" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *40" LP High Flux test conditions : NaCl 500 mg/L, Pressure 100 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *40" SW Standard test conditions : NaCl 32,000 mg/L, Pressure 800 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *21" BW Standard test conditions : NaCl 2,000 mg/L, Pressure 225 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *21" LP Standard test conditions : NaCl 1,500 mg/L, Pressure 150 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 8%*
- *21" SW Standard test conditions : NaCl 32,000 mg/L, Pressure 800 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 4%*
- *IPA rejection test conditions : IPA 1,000 mg/L, pressure 225 psig for UE, HUE and 150 psig for UL Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *IPA rejection data were obtained after operating membrane element at the IPA rejection test condition for 2hours.*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*

TYPE	Model Name	Performance			Effective Area ft² (m²)	Dimension		Test Condition
		Permeate Flow rate GPD (m³/day)	NaCl Rejection ($MgSO_4$) %	$CaCl_2$ Rejection %		Dia Inch (mm)	Length Inch (mm)	
NF	NE8040-90	7,500 (28.4)	85~95 (97.0)	90-95	400 (37.2)	8.0 (203)	40 (1016)	NE Standard
	NE4040-90	1,600 (6.0)	85~95 (97.0)	90-95	85 (7.9)	4.0 (102)	40 (1016)	NE Standard
	NE2540-90	500 (1.9)	85~95 (97.0)	90-95	27 (2.5)	2.5 (64)	40 (1016)	NE Standard
	NE8040-70	7,000 (26.5)	40~70 (97.0)	45-70	400 (37.2)	8.0 (203)	40 (1016)	NE Standard
	NE4040-70	1,500 (5.6)	40~70 (97.0)	45-70	85 (7.9)	4.0 (102)	40 (1016)	NE Standard
	NE2540-70	350 (1.3)	40~70 (97.0)	45-70	27 (2.5)	2.5 (64)	40 (1016)	NE Standard

- *NE Standard test conditions : NaCl 2,000 mg/L, Pressure 75 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *$MgSO_4$ rejection test conditions : $MgSO_4$ 2,000 mg/L, Pressure 75 psig, Temperature 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *$CaCl_2$ rejection test conditions: $CaCl_2$ 500 mg/L, 75psig, 25°C, pH 6.5 ~ 7.0, Recovery 15%*
- *The above data were obtained after operating membrane element at the standard test conditions for 30min.*

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