Product datasheet

LENNTECH
Water Treatment Solutions

"TORAY"
Innovation by Chemistry

Hygienic Purified Water Membrane

For food, beverage, pharmaceutical, polisher, and heat sanitizable applications



Toray's Sanitary UF, Sanitary RO, and Heat Sanitizable RO membrane elements provide superior permeate quality for hygienic purified water applications. RO elements use a cross-linked fully aromatic polyamide composite membrane.

Product Specifications

Model	NaCl rejection % / MWCO (Daltons)	Permeate flow rate GPD (m^3/d)	Feed spacer thickness in. (mm)	Active area ft^2 (m^2)
HEAT-SANITIZABLE RO				
TMRO 8040HS	99.5%	9,000* (34.1)	0.028 (0.71)	400 (37.2)
TMRO 4040HS	99.5%	1,975* (7.5)	0.028 (0.71)	85 (7.9)
NET-WRAPPED RO & UF**				
TMRO 8040PS	99.5%	9,000 (34.1)	0.031 (0.79)	390 (36.2)
TMUF5 8040PS	5,000		0.031 (0.79)	370 (34.4)

**Target flow rate after heat conditioning*
***Elements are not heat-sanitizable*

Test Conditions

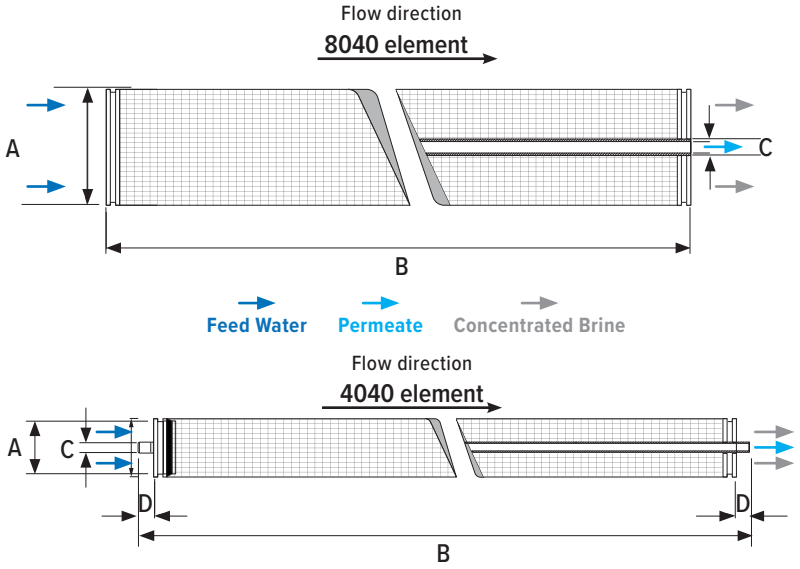
Feed water pressure psi (bar)	**TMRO HS**	150 (10.3)
	TMRO 8040PS	225 (15.5)
Feed water temperature °F (°C)		77 (25)
Feed water concentration mg/l as NaCl		2,000
Recovery rate %		15
Feed water pH		7

If you do not see a configuration or performance requirement that meets your needs, a team of product specialists is ready to develop custom engineered solutions. Please inquire within.

Dimensions in. (mm)

	4040	8040	Size
A	4.0 (101)	7.9 (201)	**Diameter**
B	40 (1,016)	40 (1,016)	**Length**
C	0.75 (19) OD	1.125 (29) ID	**Permeate Tube**
D	1.0 (26)	—	

Hygienic purified water elements (w/ ATD)
Components conform to FDA Regulation CFR Title 21



Material Specifications

Feed spacer & element outer wrap	**Heat-Sanitizable RO**	Polyethylene
	Net-wrapped RO/UF	Polypropylene
Permeate tubes, Anti-telescoping device (ATD), inter-connectors		Polysulfone
Permeate carrier		Proprietary
Adhesives		Proprietary

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OPERATING LIMITS	TMRO HS	TMRO PS	TMUF PS
Maximum operating pressure **psi (bar)**	600 (41.4)	800 (55.2)	200 (13.8)
Maximum sanitizing temperature **°F (°C)**	185 (85)	122 (50)	131 (55)
Maximum operating temperature **°F (°C)**	113 (45)	122 (50)	131 (55)
Maximum cleaning temperature **°F (°C)**	122 (50)	122 (50)	122 (50)
Acceptable operating pH range	2.0–11.0	2.5–10.5	2.5–10.0
Acceptable short-term cleaning pH range	1.7–11.5	1.7–11.5	1.7–11.5
Maximum pressure drop per element **psi (bar)**	15 (1.0)	15 (1.0)	15 (1.0)
Maximum pressure drop per vessel **psi (bar)**	60 (4.1)	60 (4.1)	60 (4.1)

Consult Toray for pressure limits when operating above ambient temperature

OXIDANT TOLERANCE			
Chlorine tolerance, continuous injection **ppm**	Non-detect*	Non-detect*	2
Chlorine tolerance, sanitizing **ppm**			50
Maximum chlorine concentration (CIP) **ppm**			180 at pH 11
H_2O_2 continuous **ppm**	20*	20*	Tolerant
H_2O_2 short-term cleaning <77°F (25°C) **ppm**	1,000*	1,000*	Tolerant

**Free chlorine should not be present in feed*

Conditioning procedure:

1. Flush water to drain with non-scaling water at low pressure, maintaining low permeate rates.
2. Recycle warm water 40–45°C at less than 25 psig (1.7 bar) trans-membrane pressure (TMP). The maximum differential pressure is 2 psi per element or 10 psi per vessel.
3. Introduce hot water to the circulating system to increase the temperature to 175–185°F (80–85°C).
4. Maintain this temperature and a TMP less than 25 psig (1.7 Bar) for 80 minutes.
5. Allow the circulating system to cool to 113°F (45°C).
6. The maximum temperature increase or decrease is 2° C/minute.
7. Flush to drain with clean water maintaining a TMP of <25 psi and a maximum feed pressure of 45 psi (3 bar).
8. Factory pre-conditioned HSRO elements are available. Contact Toray for details.

Applications

- Food & beverage
- Pharmaceutical (water for injection)
- Diafiltration
- Sugar concentration
- Flavor concentration
- Aroma concentration
- Wine de-alcoholization
- Beer de-alcoholization

Regulatory Information

Toray's membrane elements are certified under:

- ISO 9001:2015 QMS to ensure consistency in product and service quality; and
- ISO 14001:2015 EMS to enhance the environmental performance of our products and services.

Heat Sanitization

Toray HSRO-series elements are sanitized with hot water as the preferred method in food and pharmaceutical applications eliminating the need for chemicals and other disposals.

New Toray HSRO-series elements must be pre-conditioned prior to initial use by exposure to hot water. Conditioning water must be high-quality chlorine and oxidant free, non-scaling, non-fouling water. RO permeate is preferred (water from an RO that has been in operation for at least 24 hours.)

NOTICE

1. Elements are preserved in sodium meta-bisulfite. Appropriate personal protective equipment should be worn when handling.
2. 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.
3. All data may change without prior notice, due to technical modifications or production changes.
4. Consult Toray for element sizes not shown.

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