

TMRO-TS Series

Heat-Sanitizable Brackish Water Reverse Osmosis Membrane Element

Toray's Heat Sanitizable RO membrane elements provide superior permeate quality for high purity applications. Using heat sanitization eliminates the need for chemical sanitization, further reducing maintenance costs. RO elements use cross-linked fully aromatic polyamide composite membranes.



Product Specifications	Unit	TMRO-G10TS	TMRO-G20TS	TMRO-G20FTS
Size		4040	8040	8040
Membrane Area	ft ² (m ²)	75 (7.0)	400 (37.2)	440 (40.9)
Nominal Salt Rejection	%	99.5	99.5	99.5
Minimum Salt Rejection	%	99.0	99.0	99.0
Product Flow Rate	gpd (m ³ /d)	1,300 (5.0)	7,900 (30.0)	9,500 (36.0)

Test Conditions: Feed water pressure 150 psi (1.03 MPa); Feed water temperature 25°C (77 °F); Feed water concentration 2,000 mg/L as NaCl; Recovery rate 15%; Feed water pH 7.

*Specified performance values are post heat conditioning

Applications

High purity water generation, Industrial process water

Dimensions in. (mm)		
Size	4040	8040
A	4.0 (101)	7.9 (201)
B	40 (1,016)	40 (1,016)
C	0.75 (19)	1.125 (29)
D	1.05 (26)	

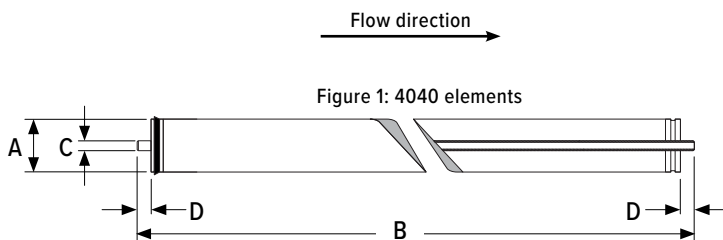


Figure 1: 4040 elements

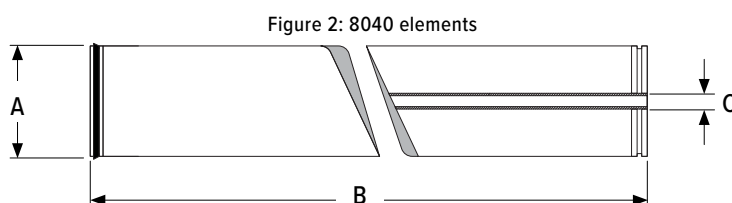


Figure 2: 8040 elements

TMRO-TS Series

Heat-Sanitizable Brackish Water Reverse Osmosis Membrane Element

OPERATING LIMITS	G10TS	G20TS/G20FTS
Maximum operating pressure psi (bar)	600 (41.4)	600 (41.4)
Maximum sanitizing temperature °F (°C)	185 (85)	185 (85)
Maximum operating temperature °F (°C)	113 (45)	113 (45)
Maximum cleaning temperature °F (°C)	122 (50)	122 (50)
Acceptable operating pH range	3.0–9.0	3.0–9.0
Acceptable short-term cleaning pH range	2.0–11.0	2.0–11.0
Maximum pressure drop per element psi (bar)	15 (1.0)	15 (1.0)
Maximum pressure drop per vessel psi (bar)	30 (2.0)	30 (2.0)
Maximum feed turbidity	<4	<4
Feed flow rate per vessel l/min (gpm)	<50 (13)	<200 (52.8)
Brine flow rate per vessel l/min (gpm)	>10 (2.6)	>40 (10.6)

Consult Toray for pressure limits when operating above ambient temperature

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).

NOTICE

1. 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.
3. Consult Toray for element sizes not shown.

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

Sanitization must follow guidelines in Toray's membrane manuals on our website (www.water.toray)