Product Datasheet

TORAY
Innovation by Chemistry

TLF Series

Ultra Low-Pressure and Low-Fouling Reverse Osmosis Membrane Element

Toray's TLF reverse osmosis membrane features an improved hydrophilic polymer layer that minimizes the accumulation of foulants on the membrane surface. The membrane coating helps RO plants reduce frequent chemical cleanings while converting wastewater into a reusable water source by producing high-quality permeate at low energy.

Product Specifications	Unit	TLF-400DG
Membrane Area	ft^2 (m^2)	400 (37)
Nominal Salt Rejection	%	99.7
Minimum Salt Rejection	%	99.5
Product Flow Rate	gpd (m^3/d)	11,500 (43.5)
Min. Product Flow Rate	gpd (m^3/d)	9,300 (35.2)
Feed spacer thickness	mil	34

Test Conditions: Feed water pressure 150 psi (1.05 MPa); Feed water temperature 77 °F (25°C); Feed water concentration 2,000 mg/L as NaCl; Recovery rate 15%; Feed water pH 7

C SA® US
Products manufactured at our U.S. facility (TMUS) are certified to NSF/ANSI 61 for drinking water applications.

Applications

High fouling tendency feed water, Municipal drinking water, Industrial process water, Water reuse

Dimensions in. (mm)	
A	7.9 (201)
B	40 (1,016)
C	1.125 (29)

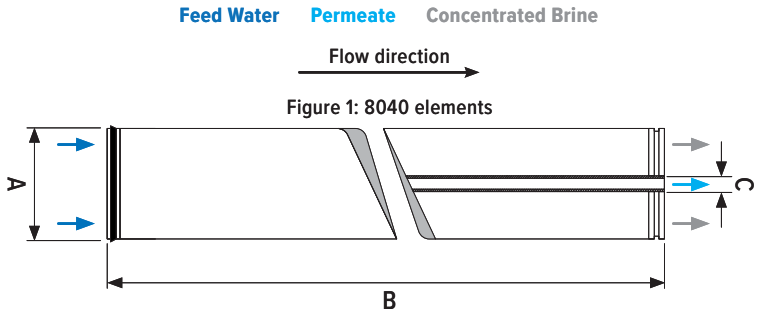

Figure 1: 8040 elements

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Operating Limits		Unit	Value
Maximum operating pressure[7,8]		psi (MPa)	600 (4.1)
Maximum feed water temperature		°F (°C)	113 (45)
Maximum feed water SDI_{15}			5
Feed water chlorine concentration[3]		ppm	< 0.1
Feed water pH range	Continuous operation		2–11
	Chemical cleaning		1–13
Maximum pressure drop per element		psi (MPa)	15 (0.10)
Maximum pressure drop per vessel		psi (MPa)	50 (0.34)

Operating Information

1. Please consult the latest Toray technical bulletin, design guidelines, computer design program, or call an application specialist for the recommended design range. Not strictly following the operating limits stated in this bulletin will void and nullify the Limited Warranty.
2. All elements are wet tested, and then packaged in approximately 0.5–1.0 wt% sodium bisulfite solution, or sodium chloride solution with an oxygen scavenger.
3. The presence of free chlorine and other oxidizing agents under certain conditions, such as heavy metals that act as oxidation catalysts in the feed water, will cause unexpected oxidation of the membrane.
4. Toray recommends flushing Toray RO elements for 30 to 60 minutes once every two days with sufficient quality flushing water, such as pre-treated feed water, to prevent biological growth during system shutdown. Please refer to Toray RO Handling Manual for suggested flushing water quality.
5. Permeate from the first hour of operation shall be discarded.
6. The customer is fully responsible for the effects of chemicals that are incompatible with the elements. Their use will void the element Limited Warranty.
7. Recommended process / operation pressure is < 2.0 MPa (for details, and in special cases, please consult the projection design guideline or contact your membrane supplier).
   a) Ultra low-pressure elements will perform best with low salinity brackish water
   b) Maintain the above pressure range at low temperatures.
8. Maximum operating pressure will vary depending on feed temperature. Please ask for detailed information from Toray if needed.

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. Please be sure to inquire about the latest product specifications.

Headquarters
Japan +81 3 3245 4540

Asia Pacific
China (TBMC) +86 10 8048 5216
Singapore (TAS) +65 6226 0525
Korea (TAK) +82 2 3279 1000

Americas (TMUS)
California +1 (858) 218 2360

Europe & Sub-Saharan Africa (TMEU)
Switzerland +41 61 415 8710

Middle East (TMME)
Saudi Arabia +966 13 568 0091
U.A.E. +971 4 392 8811

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For more info, please visit
water.toray

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