Product Datasheet

TORAY
Innovation by Chemistry

TLF Series

Low-Fouling Reverse Osmosis Membrane Element with Higher Chemical Tolerance, Enhanced Durability, and Ultra-Low Differential Pressure

Toray's reverse osmosis membrane technology applies decades of R&D and precision automated manufacturing under ISO 9001 for consistency in product quality. State-of-the-art cross-linked fully aromatic polyamide composite membranes produce high-quality permeate and robust membrane chemistry for improved performance and longer membrane life.

Product Specifications	Unit	TLF-400ULD
Size		8040
Membrane Area	ft^2 (m^2)	400 (37)
Nominal Salt Rejection	%	99.8
Minimum Salt Rejection	%	99.65
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	38

Test Conditions: Feed water pressure 225 psi (1.55 MPa); Feed water temperature 77 °F (25°C); Feed water concentration 2,000 mg/L as NaCl; Recovery rate 15%; Feed water pH 7

Applications

Feed water sources with high fouling tendency, Municipal drinking water, Industrial process water, Water reuse

Dimensions in. (mm)	
Size	**8040**
A	7.9 (201)
B	40 (1,016)
C	1.125 (29)

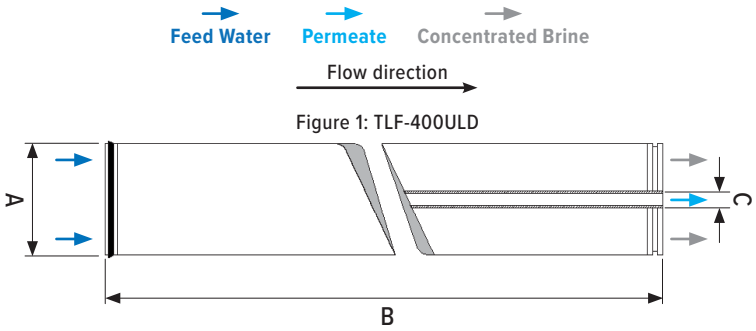

Figure 1: TLF-400ULD

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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 contact your membrane supplier).
8. Maximum operating pressure will vary depending on feed temperature. Please ask for detailed information from Toray if needed.

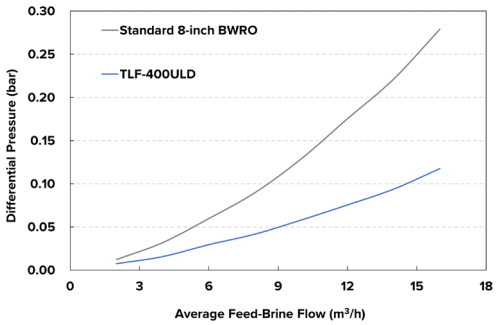

Figure 2: Average Feed-Brine Flow vs. Differential Pressure characteristics for TLF-400ULD and standard 8-inch BWRO Elements

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For more info, please visit
water.toray