Product Datasheet

TORAY
Innovation by Chemistry

TBW-HR Series

Advanced Toray RO for neutral molecule rejection



Toray RO TBW series with high neutral molecule (IPA, SiO_2) rejection at low energy (0.75 MPa), provides significant advantage in ultrapure water production and water reuse, for example.

Product Specifications	Unit	TBW-440HR
Membrane Area	ft^2 (m^2)	440 (41)
Nominal Salt Rejection	%	99.8
Minimum Salt Rejection	%	99.5
IPA Rejection (reference)	%	95
SiO_2 Rejection (reference)	%	99.7
Product Flow Rate	gpd (m^3/d)	8,200 (31)
Min. Product Flow Rate	gpd (m^3/d)	6,900 (26)
Feed spacer thickness	mil	28

Test Conditions: Feed water pressure 110 psi (0.75 MPa); Feed water temperature 77 °F (25°C); Feed water concentration 500 mg/L as NaCl; Recovery rate 15%; Feed water pH 7

Applications

Ultrapure water production, Industrial process water, Municipal drinking water

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

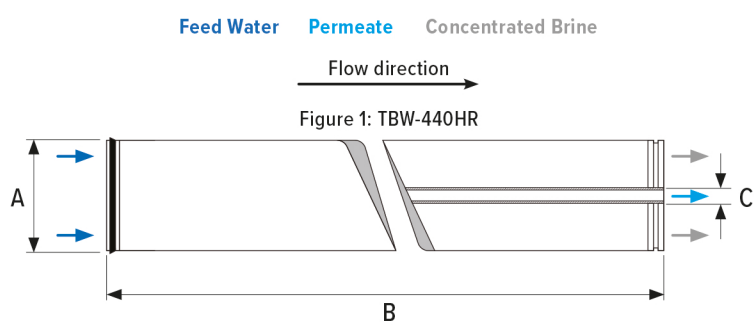


Figure 1: TBW-440HR

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Operating Limits		Unit	Value
Maximum operating pressure[7]		psi (MPa)	600 (4.1)
Maximum feed water temperature		°F (°C)	113 (45)
Maximum feed water SDI_{15}			5
Feed water chlorine concentration		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 RO elements are wet tested, treated with a tested feed water solution, and then vacuum packed in oxygen barrier bags with deoxidant inside.
3. During system shutdown, 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. Please refer to the Toray RO Handling Manual for suggested flushing water quality.
4. 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. Toray strongly recommends removing these oxidizing agents contained in feed water before operating the RO system.
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) 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.