Nitto
Innovation for Customers

HYDRANAUTICS

PRO-XS3

Extra Selectivity Nanofiltration

The Hydranautics® PRO-XS series is a unique set of nanofiltration spiral wound membranes customized specifically for challenging industrial process applications. These membranes are based on Hydranautics high performance membrane products which have then been specially designed to treat a variety of challenging industrial feed streams including high fouling, high TDS, and having special ion separation requirements.

Specified Performance*

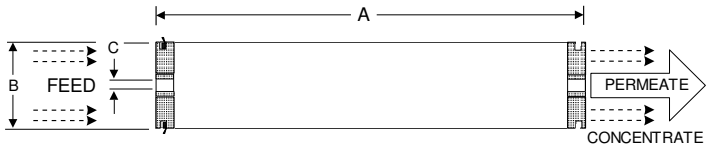
Permeate Flow (Nominal):	9,650 gpd (36.5 m^3/d)
$MgSO_4$ Rejection:	99.7% (99.6% minimum)
Test Conditions:	2,000 ppm $MgSO_4$ 110 psig (0.76 MPa) Applied Pressure 77ºF (25 °C) Operating Temperature 15% Permeate Recovery 6.5 - 7.0 Feed pH
Preference Synthetic Water Performance†:	
Nominal Sulfate Rejection:	99.8%
Nominal Chloride Rejection:	<10%

* The Specified Performance is based on data taken after a minimum of 10 minutes of operation. Actual testing of elements may be done at conditions which vary from these exact values; in which case, the performance is normalized back to these standard conditions. Permeate flow for individual elements may vary ±20 percent from the value specified.
† Reference Synthetic Water Test Condition: 10,000 ppm NaCl + 10,000 ppm Na_2SO_4, at 15 lmh operating flux condition, 77 °F (25 °C), 15% permeate recovery, 6.5-7.0 feed pH.

General Product Description**

Configuration:	Spiral Wound
Membrane Polymer:	Composite Polyamide
Membrane Active Area**:	400 ft^2 (37.2 m^2)
Feed Spacer:	34 mil (0.86 mm)

Packaging: All membrane elements are supplied with a brine seal, interconnector, and O-rings. Elements are enclosed in a sealed polyethylene bag containing less than 2% Safeguard® 100 as preservation solution, and then packaged in a cardboard box. For more Safeguard® 100 flushing instructions, please refer to Hydranautics TSB118. For proper storage and handling, including storage temperature limitations, please refer to Hydranautics TSB 608.



Element Details**

A, inches (mm)	B, inches (mm)	C, inches (mm)
40.0 (1016)	7.89 (200)	1.125 (28.6)

**Values listed are indicative, not specified. For more detailed specifications, see our Technical Service Bulletin documents or contact Hydranautics Technical Department.

Product Use and Restrictions^

Maximum Applied Pressure§:	1,200 psig (8.27 MPa)
Maximum Chlorine Concentration:	< 0.1 ppm
Maximum Operating Temperature:	113 ºF (45 ºC)
pH Range, Continuous (Cleaning£):	3.0 - 9.0 (1.0 - 11.5)
Maximum Feedwater Turbidity:	1.0 NTU
Maximum Feedwater SDI (15 mins):	5.0
Maximum Feed Flow:	85 gpm (19.3 m^3/h)
Minimum Brine Flow:	12 gpm (2.7 m^3/h)
Maximum Pressure Drop for Each Element:	15 psi (0.10 MPa)

^ The limitations shown here are for general use. For specific projects, operating at more conservative values may ensure the best performance and longest life of the membrane. See Hydranautics Technical Bulletins for more detail on operation limits, cleaning pH, and cleaning temperatures.
§ The recommended maximum applied pressure is specific to feed water temperature. See maximum feed pressure and temperature curve on page 2 for pressure limit.
£ For more information on cleaning pH and temperature, please refer to Hydranautics TSB 608.

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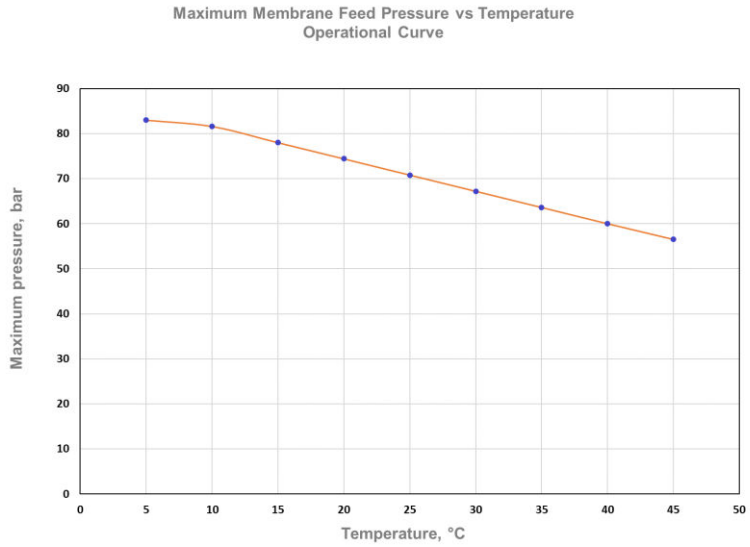
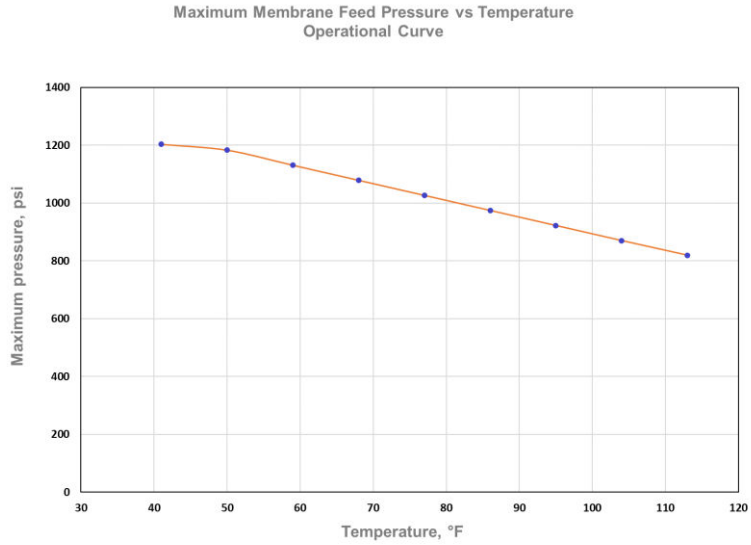
Operating Pressure Limits

Temperature, °C	Temperature, °F	Pressure, psi	Pressure, bar
5	41	1204	83
10	50	1183	82
20	68	1079	74
30	86	974	67
40	104	870	60
45	113	819	57





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