Product Data Sheet

FilmTec™ Seamaxx™-440 Element

Seawater Reverse Osmosis Element

Description

DuPont Water Solutions offers various premium seawater reverse osmosis (SWRO) elements designed to reduce capital and operation cost of desalination systems. FilmTec™ Elements combine premium membrane quality with automated precision fabrication resulting in outstanding performance, reliability and robustness.

FilmTec™ Seamaxx™-440 Elements are the choice for seawater systems operating at low to medium levels of salinity and temperature, as well as for brackish water with relatively high salinity. The element's flowrate is significantly above flowrates of any other SWRO element currently available in the market. This extraordinary high element productivity leads to substantial savings, primarily in energy consumption when compared to conventional low-energy SWRO products. In addition, FilmTec™ Seamaxx™-440 includes the typical FilmTec™ Element features:

- The 28-mil feed spacer combines low differential pressure with low cleaning frequency and high cleaning efficiency.
- The oxidative-free membrane manufacturing process results in high membrane robustness and long-term stable performance.
- The widest pH range for cleanings (pH 1 – 13) allows effective cleanings even in cases of severe fouling.
- The automated, precision fabrication gives a greater number of shorter membrane leaves thus reducing fouling while maximizing element efficiency.

FilmTec™ Seamaxx™-440 Elements are tested on flow and rejection performance using a standard test at 600 psi. Potential defects in element construction are detected and elements which do not comply with the quality protocol are discarded. A 600-psi standard test was introduced to specifically account for the high permeability of this seawater element. The results of standard tests performed at 600 psi and 8% recovery are different from the nominal performance condition of 800 psi and 8% recovery. The test conditions for the Certificate of Analysis are defined in the table below.

Product Type

Spiral-wound element with polyamide thin-film composite membrane.

Form No. 45-D00689-en, Rev. 0
August 2019

Typical Properties of Standard Test performed at 600 psi (4.1 MPa)

FilmTec™ Element	Active Area (ft^2)	Active Area (m^2)	Feed Spacer Thickness (mil)	Permeate Flowrate (gpd)	Permeate Flowrate (m^3/d)	Stabilized Boron Rejection	Stabilized Salt Rejection (%)
Seamaxx™-440	440	41	28	9,050	34.2	81.8	99.47

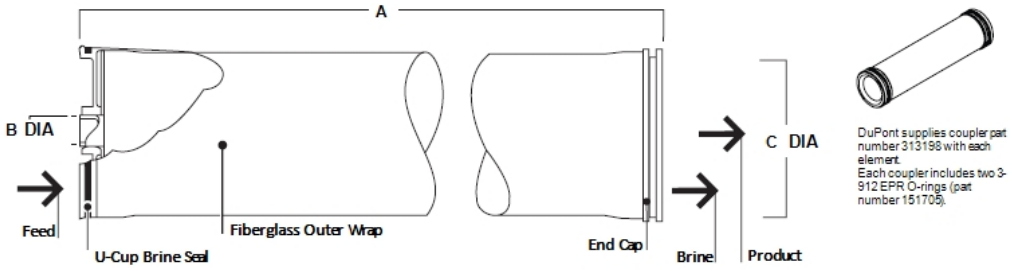
1. The above values are based on the following test conditions: 32,000 ppm NaCl, 600 psi (4.1 MPa), 77°F (25°C), pH 8, 8% recovery.
2. Permeate flows for individual elements may vary ± 15%.
3. Minimum Salt Rejection is 99.25%.
4. Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use; depending upon feedwater characteristics and operating conditions.
5. Product specifications may vary slightly as improvements are implemented.
6. Specific boron stabilized rejection based on the following test conditions: 32,000 ppm NaCl, 5 ppm boron, 600 psi (4.1 MPa), 77°F (25°C), pH 8, 8% recovery.
7. Active area guaranteed ± 5%. Active area as stated by DuPont Water Solutions is not comparable to the nominal membrane area figure often stated by some element suppliers.

Expected Properties and Performance at Common Standard Test Conditions: 800 psi (5.5 MPa)

FilmTec™ Element	Active Area (ft^2)	Active Area (m^2)	Feed Spacer Thickness (mil)	Permeate Flowrate (gpd)	Permeate Flowrate (m^3/d)	Stabilized Boron Rejection (%)	Stabilized Salt Rejection (%)
Seamaxx™-440	440	41	28	17,000	64.4	89	99.70

1. The above values are normalized from the 600-psi specification standard test to the following conditions: 32,000 ppm NaCl, 800 psi (5.5 MPa), 77°F (25°C), pH 8, 8% recovery. Due to the very high permeability of FilmTec™ Seamaxx™-440 Elements, they are not tested at the typical feed pressure for standard test conditions of 800 psi, but at a lower feed pressure of 600 psi. This allows to standard test the element within its operating guidelines.
2. Permeate flows for individual elements may vary ± 15%.
3. Minimum Salt Rejection is 99.58%.
4. Specific boron stabilized rejection based on the following normalization conditions: 32,000 ppm NaCl, 5 ppm boron, 800 psi (5.5 MPa), 77°F (25°C), pH 8, 8% recovery.

Element Dimensions



	Dimensions – inches (mm)					1 inch = 25.4 mm
	A		B		C	
FilmTec™ Element	(in)	(mm)	(in)	(mm)	(in)	(mm)
Seamaxx™-440	40.0	1,016	1.125 ID	29 ID	7.9	201

1. Refer to FilmTec™ Design Guidelines for multiple-element systems of 8-inch elements (Form No. 45-D01695-en).
2. Element to fit nominal 8-inch (203-mm) I.D. pressure vessel.

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Operating and Cleaning Limits

Maximum Operating Pressure and Temperature [a, b]	1,000 psig (69 bar) at T < 35°C 900 psig (62 bar) at T = 35 – 45°C
Maximum Element Pressure Drop	15 psig (1.0 bar)
pH Range	
Continuous Operation [c]	2 – 11
Short-term Cleaning (30 min) [d]	1 – 13
Maximum Feed Silt Density Index (SDI)	SDI 5
Free Chlorine Tolerance [e]	< 0.1 ppm

a. The limits for feed pressure and temperature cover the typical operations.
b. Consult your DuPont representative for advice on applications above 95°F (35°C). Refer to FilmTec™ Elements Operating Limits (Form No. 45-D00691) for warranty-voiding conditions and additional information.
c. Maximum temperature for continuous operation above pH 10 is 95°F (35°C).
d. Refer to guidelines in Cleaning Guidelines (Form No. 45-D01696-en) for more information.
e. Under certain conditions, the presence of free chlorine and other oxidizing agents will cause premature membrane failure. Since oxidation damage is not covered under warranty, DuPont Water Solutions recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to Dechlorinating Feedwater (Form No. 45-D01569-en) for more information.

Additional Important Information

Before use or storage, review these additional resources for important information:

- Usage Guidelines for FilmTec™ 8" Elements (Form No. 45-D01706-en)
- Start-Up Sequence (Form No. 45-D01609-en)
- Storage and Shipping of New FilmTec™ Elements (Form No. 45-D01633-en)

Product Stewardship

DuPont has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with DuPont products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

DuPont strongly encourages its customers to review both their manufacturing processes and their applications of DuPont products from the standpoint of human health and environmental quality to ensure that DuPont products are not used in ways for which they are not intended or tested. DuPont personnel are available to answer your questions and to provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets are available from DuPont.

Please be aware of the following:

- The use of this product in and of itself does not necessarily guarantee the removal of cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenance of the system.
- Permeate obtained from the first hour of operation should be discarded.

Regulatory Note

This product may be subject to drinking water application restrictions in some countries; please check the application status before use and sale.

Have a question? Contact us at:

www.dupont.com/water/contact-us

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Form No. 45-D00689-en, Rev. 0
August 2019