

Product Data Sheet

## FilmTec<sup>™</sup> Seamaxx<sup>™</sup>-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 <sup>™</sup> Elements combine premium membrane quality with automated precision fabrication resulting in outstanding performance, reliability and robustness.				
	<ul> <li>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,</li> <li>FilmTec<sup>™</sup> Seamaxx<sup>™</sup>-440 includes the typical FilmTec<sup>™</sup> Element features:</li> <li>The 28-mil feed spacer combines low differential pressure with low cleaning frequency and high cleaning efficiency.</li> <li>The oxidative-free membrane manufacturing process results in high membrane robustness and long-term stable performance.</li> </ul>				
	<ul> <li>The widest pH range for cleanings (pH 1 – 13) allows effective cleanings even in cases of severe fouling.</li> <li>The automated, precision fabrication gives a greater number of shorter membrane leaves thus reducing fouling while maximizing element efficiency.</li> </ul>				
	FilmTec <sup>™</sup> Seamaxx <sup>™</sup> -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.				

	Active	e Area	Feed Spacer Thickness (mil) 28	Permeate Flowrate		Stabilized Boron	Stabilized Salt		
FilmTec™ Element	(ft <sup>2</sup> )	(m²)		(gpd)	(m <sup>3</sup> /d)	Rejection(%)	Rejection (%)		
Seamaxx™-440	440	41		9,050	34.2	81.8	99.47		
		1. T (2	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.						
<ol> <li>Permeate flows for individual elements may vary ± 15%.</li> <li>Minimum Salt Rejection is 99.25%.</li> </ol>									
		<ol> <li>Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use; depending up feedwater characteristics and operating conditions.</li> </ol>					e; depending upon		
	<ol><li>Product specifications may vary slightly as improvements are implemented.</li></ol>								
	<ol> <li>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.</li> </ol>								
		7 A	ctive area quaranteed + 5	% Active area	as stated by I	PuPont Water Solutions is r	ot comparable to the		

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

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)

Active Area		Feed Spacer	Permeate Flowrate		Stabilized Boron	Stabilized Salt	
FilmTec™ Element	(ft <sup>2</sup> )	(m²)	Thickness (mil)	(gpd)	(m³/d)	Rejection (%)	Rejection (%)
Seamaxx™-440	440	41	28	17,000	64.4	89	99.70

 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<sup>™</sup> Seamaxx<sup>™</sup>-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  $\pm$  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.



1. Refer to FilmTec<sup>™</sup> 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.

Operating and	Maximum Operating Temperature <sup>a, b</sup>	113°F (45°C)				
Cleaning Limits	Maximum Operating Pressure <sup>b</sup>	1,200 psig (83 bar)				
g	Maximum Element Pressure Drop	15 psig (1.0 bar)				
	pH Range					
	Continuous Operation <sup>a</sup>	2-11				
	Short-term Cleaning (30 min) °	1-13				
	Free Chloring Telerance d					
		< 0.1 ppm				
	<ul> <li>a. Maximum temperature for continuous operation above pH 10 is 95°F (35°C).</li> <li>b. Consult your DuPont representative for advice on applications above 95°F (35°C). Refer to FilmTec<sup>™</sup> Elements Operating Limits (Form No. 45-D00691-en) for warranty-voiding conditions and additional information.</li> </ul>					
	<ul> <li>c. Refer to guidelines in <u>Cleaning Guidelines</u> (Form No. 45-D01696-en) for more information.</li> <li>d. 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 <u>Dechlorinating Feedwater</u> (Form No. 45-D01569-en) for more information.</li> </ul>					
Additional	Before use or storage, review these additional resources for important information:					
Important	Start-Up Sequence (Form)	No. 45-D01609-en)				
Information	<ul> <li>Storage and Shipping of Ne</li> </ul>	ew FilmTec™ Elements (Form No. 45-D01633-en)				
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Product	DuPont has a fundamental concern	for all who make, distribute, and use its products, and				
Stewardship	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 s	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 processe 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 the are not intended or tested. DuPont personnel are available to answer your questions an provide reasonable technical support. DuPont product literature, including safety data sheets, should be consulted prior to use of DuPont products. Current safety data sheets available from DuPont.					
	<ul> <li>Please be aware of the following:</li> <li>The use of this product in and of itself does not necessarily guarantee the remove cysts and pathogens from water. Effective cyst and pathogen reduction is dependent on the complete system design and on the operation and maintenan of the system.</li> <li>Permeate obtained from the first hour of operation should be discarded.</li> </ul>					
Regulatory Note	This product may be subject to drir countries; please check the applic	nking water application restrictions in some ation status before use and sale.				

## Have a question? Contact us at:

www.dupont.com/water/contact-us

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