

**FILMTEC™ SEAMAXX™ Element**Seawater Reverse Osmosis Element with *iLEC™* Interlocking Endcaps**Description**

Dow Water & Process Solutions offers various premium seawater reverse osmosis (SWRO) elements designed to reduce capital and operation cost of desalination systems.

DOW FILMTEC™ Elements combine premium membrane quality with automated precision fabrication resulting in outstanding performance, reliability and robustness.

DOW FILMTEC™ SEAMAXX™ 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, DOW FILMTEC SEAMAXX includes the typical DOW FILMTEC product features:

- The 28-mil feed spacer combines low differential pressure with low cleaning frequency and high cleaning efficiency.
- The renowned *iLEC™* Interlocking Endcaps help to reduce system operating costs and the risk of O-ring leaks.
- 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.

DOW FILMTEC SEAMAXX 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.

Product Specifications of Standard Test, performed at 600 psi (4.1 MPa)

DOW FILMTEC™ Element	Active Area		Feed Spacer	Permeate Flow Rate		Stabilized Boron	Stabilized Salt
	(ft²)	(m²)	Thickness (mil)	(GPD)	(m³/d)	Rejection (%)	Rejection (%)
SEAMAXX™	440	41	28	9,050	34.2	81.8	99.47

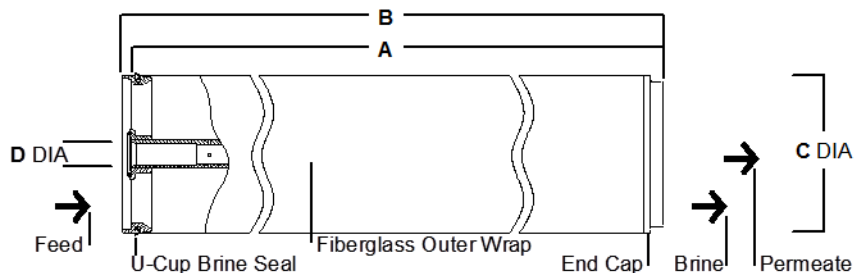
- The above values are based on the following test conditions: 32,000 ppm NaCl, 600 psi (4.1 MPa), 77°F (25°C), pH 8 and 8% recovery.
- Permeate flows for individual elements may vary ± 15%.
- Minimum Salt Rejection is 99.25%.
- Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use; depending upon feedwater characteristics and operating conditions.
- Product specifications may vary slightly as improvements are implemented.
- 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 and 8% recovery.

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

DOW FILMTEC™ Element	Active Area		Feed Spacer	Permeate Flow Rate		Stabilized Boron	Stabilized Salt
	(ft²)	(m²)	Thickness (mil)	(GPD)	(m³/d)	Rejection (%)	Rejection (%)
SEAMAXX™	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 and 8% recovery. Due to the very high permeability of DOW FILMTEC™ SEAMAXX™ 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.
- Permeate flows for individual elements may vary ± 15%.
- Minimum Salt Rejection is 99.58%.
- 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 and 8% recovery.

Element Dimensions



DOW FILMTEC™ Element	A		B		C		D	
	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)	(in.)	(mm)
SEAMAXX™	40.0	1,016	40.5	1,029	7.9	201	1.125 ID	29 ID

- Refer to Dow Water & Process Solutions Design Guidelines for multiple-element applications. 1 inch = 25.4 mm.
- Element to fit nominal 8-inch (203-mm) I.D. pressure vessel.
- Individual elements with iLEC™ Interlocking Endcaps measure 40.5 inches (1,029 mm) in length (B). The net length (A) of the elements when connected is 40.0 inches (1,016 mm).

Operating and

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
pH Range, 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 Operation at pressures up to 1,000 psig (69 bar) is allowable under certain conditions. Consult your Dow representative for advice on applications above 1,000 psig (69 bar) and/or above 95°F (35°C).

^c Maximum temperature for continuous operation above pH 10 is 95°F (35°C).

^d Refer to guidelines in "[Cleaning procedures](#)" 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, Dow Water & Process Solutions recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to technical bulletin "[Dechlorinating feedwater](#)" for more information.

Additional Important

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

* Permeate obtained from first hour of operation should be discarded

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

Product

Dow 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 Dow products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support.



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Notice: 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.

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