Product Data Sheet

DOW FILMTEC™ Membranes

DOW FILMTEC Heat Sanitizable RO 390-FF Element

Features

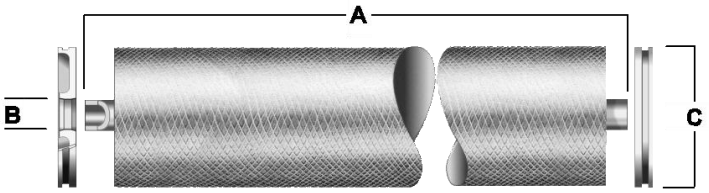
DOW FILMTEC™ HSRO-390-FF heat sanitizable reverse osmosis membrane element delivers outstanding quality water with the added capability to withstand sanitization with hot water. Hot Water sanitization eliminates the need for chemical sanitizers. The full-fit configuration minimizes stagnant areas and is optimal for applications requiring a sanitary design. All components comply with FDA standards.

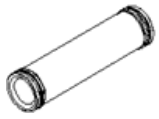
Product Specifications

Product	Part Number	Active Area ft^2 (m^2)	Applied Pressure psig (bar)	Permeate Flow Rate gpd (m^3/d)	Stabilized Salt Rejection %
HSRO-390-FF	170701	390 (36)	150 (10.3)	9,000 (34)	99.5

1. Permeate flow and salt rejection based on the following test conditions: 2,000 ppm NaCl, pressure specified above, 77°F (25°C) and 15% recovery.
2. Elements must be conditioned prior to start-up. A one-time flux loss will occur during stabilization. Listed values apply after performance stabilization.
3. Permeate flows for individual elements may vary +/-20%.
4. For the purpose of improvement, specifications may be updated periodically.

Figure 1





DOW FILMTEC supplies two end caps (part number 113199) and one coupler (part number 255289) with each HSRO-390- FF element. Each coupler includes two 3-912 EPR o-rings (part number 151705).

Dimensions – inches (mm) **1 inch = 25.4 mm**

Product	A	B	C
HSRO-390-FF	40.0 (1,016)	1.13 ID (28.6)	7.9 (200)

1. Refer to DOW FILMTEC™ Design Guidelines for multiple-element systems.
2. HSRO-390-FF fits nominal 8 inch I.D. pressure vessels.

Operating Limits

Membrane Type	Polyamide Thin-Film Composite
Maximum Operating Temperature[a]	113ºF (45ºC)
Maximum Sanitization Temperature (@ 25 psig)	185ºF (85ºC)
Maximum Operating Pressure	600 psig (41 bar)
Maximum Element Pressure Drop	15 psig (1.0 bar)
pH Range, Continuous Operation[a]	2 - 11
pH Range, Short-Term Cleaning[b]	1 - 12
Maximum Feed Silt Density Index (SDI)	SDI 5
Free Chlorine Tolerance[c]	< 0.1 ppm

a. Maximum temperature for continuous operation above pH 10 is 95ºF (35ºC).
b. Refer to Cleaning Guidelines in specification sheet 609-23010.
c. 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 FILMTEC recommends removing residual free chlorine by pretreatment prior to membrane exposure. Please refer to technical bulletin 609-22010 for more information.

Important Information

New HSRO heat sanitizable spiral elements must be pre-conditioned prior to initial use by exposure to hot water. Suitable quality water must be used during all pre-conditioning steps. This water is chlorine-free, non scaling/fouling water. RO permeate is preferred, but pre-filtered feed water may be used. An appropriate conditioning procedure consists of the following:

- Flush to drain with suitable quality water at low pressure and low permeate flow rate.
- Recycle warm water (45°C or less) at very low pressure (< 25 psig trans-membrane pressure with a maximum feed pressure of 45 psig (3 bar)).
- Introduce hot water to the system to increase temperature to 80°C (176°F).
- Keep trans-membrane pressure below 25 psig (1.7 bar) when warm or hot water (45°C or higher) is being fed to the membranes.
- Maintain temperature for 60-90 minutes.
- Allow system to cool to 45°C or below.
- Flush to drain with suitable water quality at very low pressure (< 25 psig trans-membrane pressure with maximum feed pressure of 45 psig (3 bar)) [d].
- DO NOT recycle permeate during pre-conditioning.
- DO NOT start-up a second pass RO before the first pass RO has been pre-conditioned.

[d] This step is needed to ensure that the element components have cooled to below 45°C.

Operation Guidelines

Avoid any abrupt pressure or cross-flow variations on the spiral elements during start-up, shutdown, cleaning or other sequences to prevent possible membrane damage. During start-up, a gradual change from a standstill to operating state is recommended as follows:

- Feed pressure should be increased gradually over a 30-60 second time frame.
- Cross-flow velocity at set operating point should be achieved gradually over 15-20 seconds.
- Permeate obtained from first hour of operation should be discarded.

Please refer to the product technical manual.

General Information

- Keep elements moist at all times after initial wetting.
- If operating limits and guidelines given in this bulletin are not strictly followed, the limited warranty will be null and void.
- To control biological growth during prolonged system shutdowns, it is recommended that membrane elements be immersed in a preservative solution.
- The customer is fully responsible for the effects of incompatible chemicals and lubricants on elements.
- Maximum pressure drop across an entire pressure vessel (housing) is 60 psi (4.1 bar).
- Avoid static permeate-backpressure at all times.

Product Stewardship

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.

Customer Notice

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. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

Certified to NSF/ANSI 61

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