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HYDRAMEM®
HIGH PERFORMANCE MEMBRANES

# Heat Sanitizable Brackish Water RO Element

## Product Description:

Membrane Type : Extra Low Energy, Heat Sanitizable Composite Polyamide
Construction : Spiral Wound Element with FRP (Fiberglass)
Application : Brackish Water Purification

| Model | Diameter Inches | Active Surface Area $Ft^2$ ($m^2$) | Salt Rejection % | Product Flow Rate gpd (l/h) |
|---|---|---|---|---|
| HM 4021-HSRO-FRP | 4.0 | 35 (3.2) | 99.0 | 1025 (161.6) |
| HM 4040-HSRO-FRP | 4.0 | 85 (7.9) | 99.2 | 2600 (408.3) |
| HM 8040-HSRO-FRP | 8.0 | 400 (37.2) | 99.2 | 12000 (1891.6) |

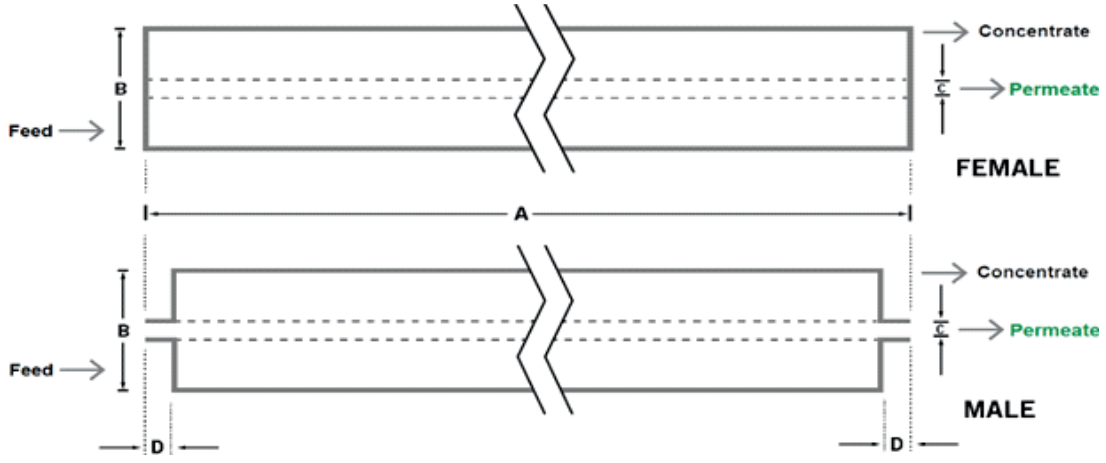
## Test Conditions:

Feed Water Pressure : 100 psi (6.9 $kg/cm^2$)
Feed Water Temperature : 77°F ( 25 °C )
Feed Water Concentration : 500 ppm NaCl Solution
Recovery Rate : 15% for 4040/8040 & 10% for 4021
Feed Water pH : 8.0

**Notes:**
Minimum salt rejection (4040/8040) - 99%
Minimum salt rejection (4021) – 98%
Permeate flow may vary +/-15%
Membrane active area variation – +/- 2

| Physical Dimensions | Element Weight kg (lb)[f] | Dim. A mm (inches) | Dim. B mm (inches) | Dim. C[g] mm (inches) | Permeate Tube[h] |
|---|---|---|---|---|---|
| HM-4021-HSRO-FRP | 1.8 (4) | 533.4 (21) | 101 (3.98) | 19.1 (0.75) | Male |
| HM-4040-HSRO-FRP | 3.6 (8) | 1016 (40) | 101 (3.98) | 19.1 (0.75) | Male |
| HM–8040-HSRO-FRP | 16.4 (36) | 1016 (40) | 200 (7.89) | 28.6 (1.125) | Female |

a. Shipping weight is dependent on packaging material and quantity shipped.
b. For female elements, "C" is the inner diameter. For male elements, "C" is the outer diameter.
c. Male elements have a protruding permeate tube, indicated as "D" in the diagram.
Dimension "D" is 30.5 mm (1.2 in) for modules 4021. For 4040 module is 26.7 mm (1.05 in).



## Operating Limits:

| | | |
|---|---|---|
| Maximum Operating Pressure | : | 600 psi (42.1 kg/cm$^2$) |
| Maximum Operating Temperature | : | 113°F (45°C) / 95°F (35°C)@pH>10 |
| Maximum Sanitizing Temperature | : | 85°C (185°F) |
| Feed Water Chlorine Concentration | : | <0.1ppm |
| Feed Water pH Range, Chemical Cleaning | : | 1-12 |
| Maximum Feed Water SDI (15 Minute Test) | : | SDI ≤ 5 |
| Maximum Feed Turbidity | : | NTU ≤1.0 |
| Maximum Pressure Drop for each Element | : | 10psi per element; 60 psi per housing |

## Operating Information:

Permeate flow is before heat preconditioning. A loss of flow is expected after first heat sanitization cycle. Heat-setting procedure must be performed prior to initial use of elements.

1. **Start-up:** We recommend flushing elements for 30 minutes at low pressure and discarding permeate during the flush prior to operation. For further information, please see Element Start-Up Guidelines.
2. **Heat precondition procedure:** New 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 the RO membrane must have been in operation for at least 24 hours before permeate water is used for preconditioning. Alternatively, prefiltered 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 feed 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)).

Increase temperature up to 85°C as required at a rate not to exceed 4°C/minute. Cool system at a rate not exceeding 7°C/minute.
Permeate should not be recycled during the procedure or fed to a second pass RO
Loss of Permeate Flow following repeated sanitization cycles: due to various reasons which cannot be predicted or simulated, it is almost impossible to predict the loss of flow resulting from repeated hot water sanitization cycles. Likely factors which greatly influence the loss in flow are rate of temperature increase or decrease, feed water type, presence of foulants and scale on the surface of membrane, flow rates and pressure etc. Normally 25÷50% of loss in flow is observed, 90% of which occurs during the first heat sanitization. Sanitization of Nano filtration elements can cause increase in salt rejection and thus should be carried out only if it is necessary.

**1. Cleaning:** During the cleaning check the temperature and pH. Temperature lower than 25°C, range of pH 1-11, if the temperature rises the range of pH changes, at 45°C pH max 10,5.

**2. Storage:** Hydramem membrane elements must be stored appropriately to ensure proper operation and to prevent membrane damage. Please see Element Storage Guidelines.

To the best of our knowledge the information contained in this publication is accurate. Ion Exchange (India) Ltd., maintains a policy of continuous development and reserves the right to amend the information given herein without notice. Please contact our regional/branch office for current product specifications.

HYDRAMEM HIGH PERFORMANCE MEMBRANES is the registered trademark of Ion Exchange (India) Ltd.

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