SeIRO™ MPS-34 pH STABLE SANITARY ELEMENT
8” Acid and Caustic Stable Nanofiltration Spiral Element

PRODUCT DESCRIPTION
Membrane Chemistry: Proprietary Composite Nanofiltration Membrane
Membrane Type: MPS-34 pH stable Nanofiltration Membrane
Molecular weight cut-off: 200 Daltons
Construction: Sanitary spiral wound with net trimmable outerwrap
Regulatory status: Compliant with US FDA CFR Title 21.
Applications: Acid and caustic recovery, Product concentration
Feed Spacer: Feed Spacer: 57 mil (1.4 mm)

NOMINAL PERFORMANCE*

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Rejection [%]</th>
<th>Permeate Flow</th>
<th>Membrane Area</th>
<th>Feed Spacer</th>
</tr>
</thead>
<tbody>
<tr>
<td>8038 MPS-34-ZYT</td>
<td>0770251</td>
<td>95 / 97</td>
<td>35</td>
<td>7,800 (29.5)</td>
<td>222 (20.6)</td>
</tr>
</tbody>
</table>

*Test Conditions: RO water at 440 psi (30 bar), 86°F (30°C). Feed solution for rejection tests is 3% glucose / 3% sucrose or 5% NaCl.

OPERATING AND DESIGN INFORMATION*
Typical Operating Pressure: 145 - 510 psi (10 - 35 bar)
Operating Temperature Range**: 40 - 158°F (5 - 70°C)
Cleaning Temperature Range**: 95 - 158°F (35 - 70°C)
Allowable pH - Continuous Operation: 0 - 14
Allowable pH - Clean-In-Place (CIP): 0 - 14
Design Pressure Drop Per Element: 6 - 10 psi (0.4 - 0.7 bar)
Design Pressure Drop Per Vessel: 30 - 50 psi (2.1 - 3.4 bar)

* Consult KMS Process Technology Group for specific applications.
** Refer to the Operating Envelope for Code 30 Membranes Section in this document when temperature is higher than 122°F (50°C)

NOMINAL DIMENSIONS

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Model</th>
<th>A (inches (mm))</th>
<th>B (inches (mm))</th>
<th>C (inches (mm))</th>
</tr>
</thead>
<tbody>
<tr>
<td>0770251</td>
<td>8038 MPS-34-ZYT</td>
<td>38.0 (965)</td>
<td>7.9 (201.0)</td>
<td>1.125 (28.6)</td>
</tr>
</tbody>
</table>

TYPICAL PROCESS STREAMS
5% HCl 15% Acetic acid 3% NaOH
37% HCl 5% HNO₃ 20% NaOH
15% H₂SO₄ 20% H₃PO₄ 10% KOH
Membrane Characteristics and Performance:
SelRO™ composite nanofiltration membrane in a spiral wound configuration, with superior pH and temperature stability. Performance specifications shown on the front side of this document are nominal values.

Operating Limits:
- **Operating Pressure:** Maximum operating pressure for SelRO MPS-34 is 510 psi (35 bar). Actual operating pressure is dependent upon system flux rate, as well as feed, recovery and temperature conditions.
- **Permeate Pressure:** Maximum allowed permeate pressure is 3 psi (0.2 bar).
- **Differential Pressure:** Maximum differential pressure limit is 10 psi (0.7 bar) per element. Maximum differential pressure for any length vessel is 50 psi (3.5 bar).
- **Temperature:** Maximum operating temperature is 158°F (70°C). For guidelines of recommended temperature and pressure please refer to the "Operating Envelope for SelRO Elements" in this document.
- **pH:** Allowable range for continuous operation is 0-14.
- **Water Quality for Cleaning and Diafiltration:**
  - **Turbidity:** For best performance maximum feed turbidity is 1 NTU.
- **Chlorine and Chemical Exposure:**
  - It is not recommended to expose the MPS-34 membrane to chlorine or other oxidants, as it may affect the membrane performance.
  - Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
  - It is not recommended to expose the MPS-34 membrane to organic solvents, such as alcohol, acetone, etc.
- **Feed Flow Rate:** Maximum and minimum flow rate for the MPS-34 spiral element are as follows:
  - Min. 25 gpm (95 liter/min)
  - Max. 75 gpm (285 liter/min)
  Actual feed flow rate is dependent upon system flux rate, feed characteristics, fouling tendency and system design.

Operating Envelope For SelRO Elements:
It is important to follow the pressure - temperature relationship guidelines, in order to prevent irreversible compaction and performance deterioration. The following diagram should be used as a guideline to operating the MPS-34 spiral element:

Element Handling:
- **Recommended Cleaning Materials:** Depending on the nature of the feed, the following cleaning agents can be chosen:
  - 0.1-5% w/w sodium hydroxide at 122°F (50°C)
  - 0.2-1% w/w nitric or phosphoric acid at 122°F (50°C)
  - 0.1-0.5% w/w detergent mix KOCHKLEEN™ KLD-III at 122°F (50°C)
  - 0.5% anionic surfactant (such as SDS) at 122°F (50°C)
  Consult KMS regarding the use of other cleaning materials.
- **Lubricants:** For element installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may damage the element and will void any warranty.
- **Storage Solution:** Should be made with:
  - Short Term (up to two weeks): 0.25 w/w sodium metabisulfite.
  - Long Term: 0.7% w/w benzalkonium chloride.
  - Glycerin should not be used for storage of SelRO membranes.
  - The membrane element should not get dry. It should be stored in a sealed bag, at a temperature ranging from 36°F - 86°F (2°C - 30°C).

Service and Ongoing Technical Support:
Koch Membrane Systems (KMS) has an experienced staff of professionals available to assist end-users and OEM’s for optimization of existing systems and support with the development of new applications. KMS also offers a complete line of KOCHKLEEN™ membrane pretreatment, cleaning, and maintenance chemicals.

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