SelRO™ MPS-34 pH STABLE ELEMENTS
Nanofiltration Spiral Element Series - 8040

PRODUCT DESCRIPTION

Membrane Chemistry: Proprietary composite nanofiltration membrane
Membrane Type: pH stable nanofiltration membrane
Molecular Weight Cut-Off (MWCO): 200 Daltons
Construction: Spiral wound element with hard overwrap and polysulfone permeate tube
Major Applications: Acid and caustic recovery, product concentration
Options: Feed channel spacers: 31 mil (N) and 57 mil (Z)

SPECIFICATIONS*

<table>
<thead>
<tr>
<th>Model</th>
<th>Part Number</th>
<th>Rejection [%]</th>
<th>Permeate Flow (gpd)</th>
<th>Membrane Area (m²)</th>
<th>Feed Spacer mil (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>8040 MPS-34-NYHN</td>
<td>0770255</td>
<td>95 / 97</td>
<td>10,900 (41.2)</td>
<td>308 (28.6)</td>
<td>31 (0.8)</td>
</tr>
<tr>
<td>8040 MPS-34-ZYHN</td>
<td>0770256</td>
<td>95 / 97</td>
<td>7,450 (28.1)</td>
<td>210 (19.5)</td>
<td>57 (1.4)</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: 220-510 psi (15-35 bar)
Maximum Temperature: 158°F (70°C)**
Allowable pH - Continuous Operation: 0-14
Allowable pH - Clean-In-Place (CIP): 0-14
Maximum Pressure Drop Per Element: 10 psi (0.7 bar)
Maximum Pressure Drop Per Vessel: 50 psi (3.5 bar)

* Consult Process Technology group for specific applications.
** Refer to the Operating Envelope of the SelRO Elements when temperature is higher than 122°F (50°C).

NOMINAL DIMENSIONS

<table>
<thead>
<tr>
<th>Model</th>
<th>A (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>Interconnector</th>
<th>O-Rings</th>
</tr>
</thead>
<tbody>
<tr>
<td>8040 MPS-34-NYHN</td>
<td>40.0</td>
<td>7.93</td>
<td>1.125</td>
<td>0030585</td>
<td>0035464</td>
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TYPICAL PROCESS STREAMS

| 5% HCl            | 15% Acetic acid | 3% NaOH   |
| 37% HCL           | 5% HNO₃        | 20% NaOH  |
| 15% H₂SO₄        | 20% H₃PO₄     | 10% KOH   |
SelRO™ MPS-34 pH STABLE ELEMENTS

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.