

# SeIRO<sup>®</sup> NF Sanitary Spiral Elements

4" and 8" Acid and Caustic Stable Nanofiltration Spiral Elements

## PRODUCT DESCRIPTION

<b>Membrane Chemistry:</b>	Proprietary Composite Nanofiltration Membrane
<b>Membrane Type:</b>	MPS-34 and MPS-36 pH stable nanofiltration membrane
<b>Molecular weight cut-off:</b>	MPS-34: 200 Daltons MPS-36: 1,000 Daltons
<b>Construction:</b>	Sanitary spiral wound with net outerwrap
<b>Regulatory status:</b>	Compliant with US FDA CFR Title 21.
<b>Applications:</b>	Acid and caustic recovery, product concentration and purification
<b>Element Configuration Options:</b>	46-mil (1.2 mm) feed spacer, full fit outerwrap (VYV) 57-mil (1.4 mm) feed spacer, tailed outerwrap (ZYT)

## NOMINAL SPECIFICATIONS

Part Number	Model	Indicative Rejection [%]		Permeate Flow gpd (m <sup>3</sup> /day)	Membrane Area ft <sup>2</sup> (m <sup>2</sup> )
		Glucose / Sucrose	NaCl		
0770251	8038 MPS-34-ZYT	95 / 98	30	7,850 (29.7)	222 (20.6)
0770250	3838 MPS-36-VYV	30 / 50	10	6,470 (24.5)	55 (5.1)

\*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\*

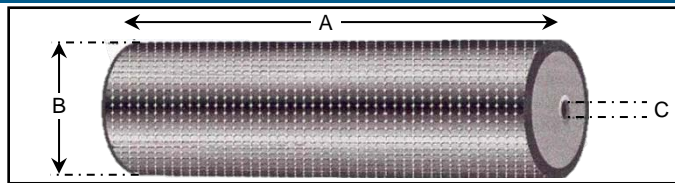
<b>Typical Operating Pressure:</b>	145 - 510 psi (10 - 35 bar)
<b>Operating Temperature Range**:</b>	40 - 158°F (5 - 70°C)
<b>Cleaning Temperature Range**:</b>	95 - 158°F (35 - 70°C)
<b>Maximum Temperature for Hot Water Sanitization ***:</b>	176°F (80°C)
<b>Allowable pH - Continuous Operation:</b>	1-13 for MPS-36, 0-14 for MPS-34
<b>Allowable pH - Clean-In-Place (CIP):</b>	1-13 for MPS-36, 0-14 for MPS-34
<b>Design Pressure Drop Per Element:</b>	6 - 10 psi (0.4 - 0.7 bar)
<b>Design Pressure Drop Per Vessel:</b>	30 - 50 psi (2.1 - 3.4 bar)

\* Consult KSS 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)

\*\*\*Limited to two 30-minute cycles per week at maximum pressure of 5.5 bar (80 psi) at maximum pressure drop per element of 0.35 bar (5 psi). pH during sanitization cycle should be limited to pH range of 4-8.

## NOMINAL DIMENSIONS



Model	A		B		C	
	inches	(mm)	inches	(mm)	inches	(mm)
3838 MPS-34 and MPS-36	38.0	(965)	3.8	(96)	0.831	(21.1)
8038 MPS-34 and MPS-36	38.0	(965)	7.9	(201)	1.125	(28.6)

OPERATING GUIDELINES

**Membrane Characteristics:**

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® NF elements 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:** At normal process temperatures, maximum differential pressure limit is 10 psi (0.7 bar) per element and maximum differential pressure for any length vessel is 50 psi (3.5 bar). Maximum differential pressure during hot water sanitization is 5 psi (0.35 bar). Actual differential pressure will depend on cross flow velocity, temperature, density and viscosity of the process fluid.
- **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. Periodic sanitization at 176°F (80°C) is allowed per the conditions listed in the first page of this document.

**Water Quality for Cleaning and Diafiltration:**

- **Turbidity:** For best performance maximum feed turbidity is 1 NTU.

Please refer to the KSS "Water Quality Guidelines for CIP and Diafiltration" for more detailed information.

**Chlorine and Chemical Exposure:**

- It is not recommended to expose the MPS-36 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-36 membrane to organic solvents, such as alcohol, acetone, etc.

**Feed Flow Rate:**

Maximum and minimum flow rate for SelRO® 8-inch NF elements are as follows:

- Min. 25 gpm (95 liter/min)
- Max. 75 gpm (285 liter/min)

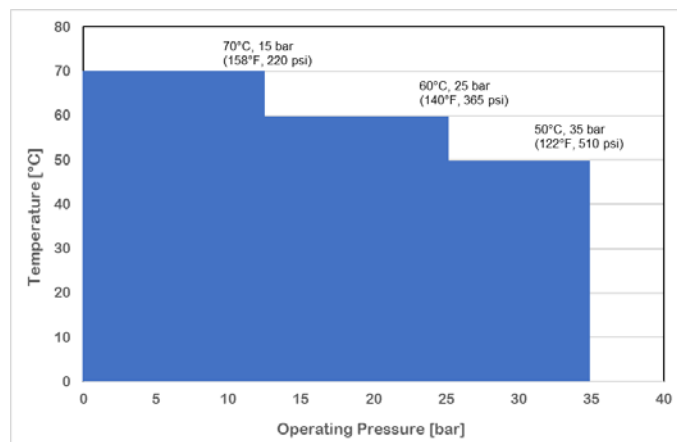
Actual feed flow rate is dependent upon system flux rate, feed characteristics, fouling tendency and system design

**Operating Envelope for SelRO® Code 30 NF 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 operation of the SelRO® NF 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
  - 0.5% anionic surfactant (such as SDS) at 122°F (50°C)

Consult KSS 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:** Refer to KSS "Element Handling and Storage" bulletin.

**Service and Ongoing Technical Support:**

Koch Separation Solutions (KSS) 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. KSS also offers a complete line of KOCHKLEEN® membrane cleaning and maintenance chemicals.

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