KOCH MEMBRANE SYSTEMS

SelRO® NF 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:	Conform to USDA 3-A standards and FDA regulations (CFR Title 21)
Applications:	Acid and caustic recovery, Product concentration
Feed Spacer:	Feed Spacer: 57 mil (1.4 mm)

NOMINAL PERFORMANCE*

Part Number	Model	Rejection (%)	Permeate Flow gpd	Permeate Flow (m^3/d)	Active Membrane Area ft^2	Active Membrane Area (m^2)
0770251	8038 MPS-34-ZYT	98	6,600	(25.0)	222	(20.6)

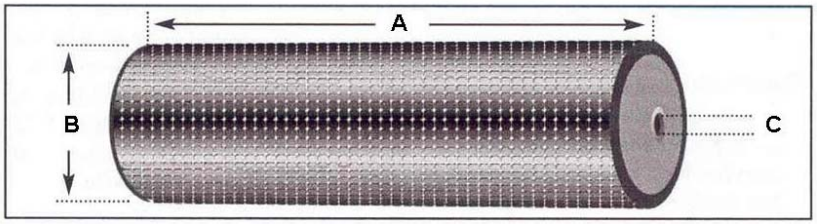
Test conditions: 5,000 mg/l $MgSO_4$ in deionized water at 225 psi (15.5 bar) applied pressure, 15% recovery, 77°F (25°C), pH 7.5

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



Part Number	Model	A inches (mm)	B inches (mm)	C inches (mm)
0770251	8038 MPS-34-ZYT	38.0 (965)	7.9 (201.0)	1.125 (28.6)

TYPICAL PROCESS STREAMS

5% HCl	15% Acetic acid	3% NaOH
37% HCl	5% HNO_3	20% NaOH
15% H_2SO_4	20% H_3PO_4	10% KOH

SelRO® NF SANITARY ELEMENTS

Membrane Characteristics: SelRO® Composite nanofiltration membrane in a spiral wound configuration, with superior pH and temperature stability.

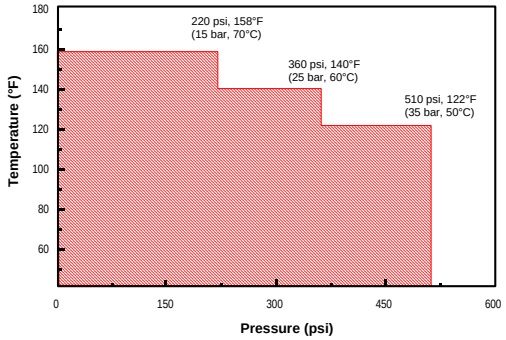
Operating Parameters

- Operating Pressure: Maximum operating pressure is 510 psi (35 bar). Actual operating pressure is dependent upon system flux rate, as well as feed, recovery and temperature conditions.
- Maximum Allowed Permeate Pressure: 3 psi (0.2 bar).
- Differential Pressure: Maximum differential pressure per single element is 10 psi (0.7 bar) per housing. Maximum differential pressure per housing of any length is 50 psi (3.4 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 Code 30 membranes" section of this document.
- pH: Allowable range for continuous operation is 0-14.
- Water Quality for Cleaning & Diafiltration:
  Turbidity: Maximum feed turbidity is 1 NTU.
  SDI: Maximum feed Silt Density Index (SDI) is 5.0 (15-minute test).
  Please refer to the KMS "Water Quality Guidelines for CIP and Diafiltration" for more detailed information.
- 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 similar oxidizers in the feed.
  - It is not recommended to expose the membrane to organic solvents, such as alcohol, acetone, etc.
- Feed Flow Rate: Maximum feed flow rate is 75 gpm (285 Liter per minute). Actual feed flow rate is dependent upon system flux rate, feed characteristics, fouling tendency and system design.

Lubricants: For element installation, use only water or glycerin to lubricate seals. The use of petroleum or vegetable-based oils or solvents may cause damage and will void any warranty.

Storage: The membrane should not be permitted to get dry. It should be stored in a sealed bag, in temperature ranging from 25°F - 86°F (-4°C - 30°C).

- Operating Envelope For Code 30 Membranes: 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 membrane.



Recommended Cleaning Materials: Depending on the nature of the feed material, a choice can be made from the following cleaning agents:

- 0.1-5% w/w sodium hydroxide
- 0.2-1% w/w nitric or phosphoric acid
- 0.1-0.5% w/w detergent mix KLD-III
- 0.5% Anionic surfactant (such as SDS)

Consult KMS regarding the use of other cleaning materials.

Preservation: Should be made with:

- Short Term (up to two weeks): 0.25 w/w Sodium metabisulfite
- Long Term: 0.7% w/w Benzalkonium chloride

Note that concentrated glycerin should not be used to preserve the MPS-34 membrane.

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® cleaning and maintenance chemicals.

KMS Capability: KMS is the leader in crossflow membrane technology, manufacturing reverse osmosis, nanofiltration, microfiltration, and ultrafiltration membranes and membrane systems. The industries served include food, dairy and beverage, semiconductors, automotive, water and wastewater, chemical and general manufacturing. KMS provides top quality membrane products and shares experience in the design and supply of thousands of crossflow membrane systems worldwide.

Koch Membrane Systems, Inc., www.kochmembrane.com
Corporate Headquarters: 850 Main Street, Wilmington, Massachusetts 01887-3388, USA, Tel. Toll Free: 1-888-677-5624, Telephone: 1-978-694-7000, Fax: 1-978-657-5208
European Headquarters: Koch Chemical Technology Group Ltd., The Granary, Telegraph Street, Stafford ST17 4AT, United Kingdom, Telephone: +44-178-527-2500, Fax: +44-178-522-3149
• San Diego, California • Aachen, Germany • Lyon, France • Madrid, Spain • Milan, Italy • Wijnegem, Belgium • Beijing & Shanghai, China • Mumbai, India •
• Melbourne, Australia • Singapore • Sao Paulo, Brazil • Manama, Kingdom of Bahrain •

01/11 Rev. 11-1