KOCH MEMBRANE SYSTEMS

SelRO® MPS-36 - pH Stable Membrane

Nanofiltration Spiral Module Series – 2540, 4040

PRODUCT DESCRIPTION

Membrane Chemistry:	Proprietary composite nanofiltration membrane
Membrane Type:	pH stable nanofiltration membrane
Molecular Weight Cut-Off (MWCO):	1000 Dalton
Construction:	Spiral wound element
Major Applications:	Acid and caustic recovery, Product concentration
Permeate Tube Material:	CPVC

SPECIFICATIONS*

Model	Part Number	Rejection [%] Glucose / Sucrose	Rejection [%] NaCl	Permeate Flow gpd (m^3/day)	Membrane Area ft^2 (m^2)	Feed Spacer mil (mm)
MPS-36 2540 A2X	0770036	30 / 50	10	2,535 (9.6)	17.2 (1.6)	30 (0.8)
MPS-36 4040 A2X	0770194	30 / 50	10	9,350 (35.4)	60.3 (5.6)	30 (0.8)

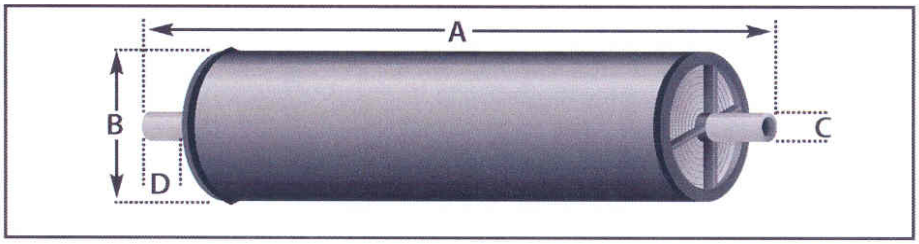
*Test Conditions: RO water at 440 psi (30 bar), 86°F (30°C). Feed solution for rejection tests is 3% glucose / 3% sucrose or 5% NaCl.

OPERATING AND DESIGN INFORMATION*

Typical Operating Pressure:	220-510 psi (15-35 bar)
Maximum Temperature:	122°F (50°C)
Allowable pH - Continuous Operation:	1-13
Allowable pH - Clean-In-Place (CIP):	1-13
Maximum Pressure Drop Per Element:	10 psi (0.7 bar)
Maximum Pressure Drop Per Vessel (5 in Series):	50 psi (3.5 bar)

* Consult Process Technology group for specific applications.
** Please refer to the Operating Envelope of Code 30 Membranes when temperature is higher than 122°F (50°C).

NOMINAL DIMENSIONS



Model	A inches	A (mm)	B inches	B (mm)	C inches	C (mm)	D inches	D (mm)
MPS-36 2540	40.0	(1016)	2.4	(61)	0.75	(19.0)	1.0	(25.4)
MPS-36 4040	40.0	(1016)	3.9	(99)	0.75	(19.0)	1.0	(25.4)

SelRO® MPS-36 - pH Stable Membrane

Membrane Characteristics:

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

Operating Limits:

- Operating Pressure: Maximum operating pressure for SelRO® MPS-36 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).
- Operating and Cleaning Temperature: Maximum temperature is 158°F (70°C) for B2 elements (stainless steel permeate tube). The operating and cleaning temperature is limited to 122°F (50°C) for A2 elements (CPVC permeate tube). For guidelines of recommended temperature and pressure please refer to the "Recommended Envelope for Code 30 membranes" in this document.
- pH: Allowable range for continuous operation is 1-13. When a stainless steel permeate tube is used, corrosive acids should be avoided.
- Water Quality for Cleaning and Diafiltration:

  Turbidity: Maximum feed turbidity is 1 NTU.

  Guidelines: For more details please consult with KMS Process Technology Group.
- 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 the MPS-36 spiral module are as follows:

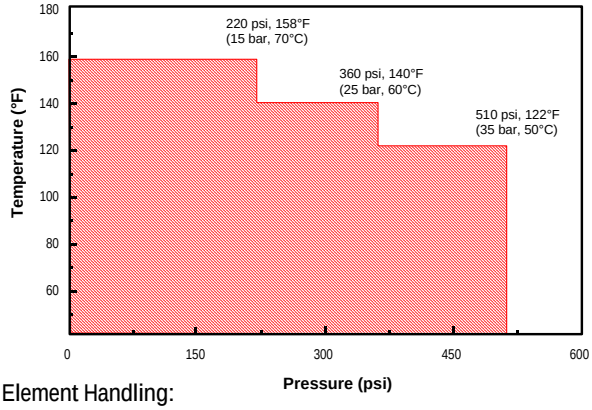
  2540 Minimum 2 gpm (7.5 liter/min)
  2540 Maximum 5 gpm (19 liter/min)

  4040 Minimum 6 gpm (22 liter/min)
  4040 Maximum 17 gpm (65 liter/min)

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

- 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-36 spiral module:



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 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: 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 the MPS-36 membrane.
  The membrane module should not get dry. It should be stored in a sealed bag, in 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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