

SPIRAPRO™ 8" PHARMACEUTICAL GRADE NF ELEMENTS

Nanofiltration 8" Sanitary Spiral Element Series

PRODUCT DESCRIPTION

Membrane Chemistry:	Proprietary TFC® polyamide
Membrane Type:	SR™3: selective rejection nanofiltration. Molecular weight cut-off: 200 daltons
Construction:	Sanitary spiral wound with net outer wrap and attached ATD's
Applications:	Desalting, concentration, and separation of antibiotics and API's
Regulatory Status:	Have passed USP Class VI testing for element components. Conform to FDA food-contact regulations (CFR Title 21).
Options:	Feed Spacer: N (31 mil) or V (46 mil)

NOMINAL PERFORMANCE*

Part Numbers	Model*	Minimum Rejection (%)	Active Membrane Area ft ² (m ²)	Feed Spacer mil (mm)
8882229	SPIRAPRO 8040 SR3-NYVP	99.0	371 (34.5)	31 0.8
8882231	SPIRAPRO 8040 SR3-VYVP	99.0	291 (27.0)	46 1.1

* Previously designated as 8822 elements

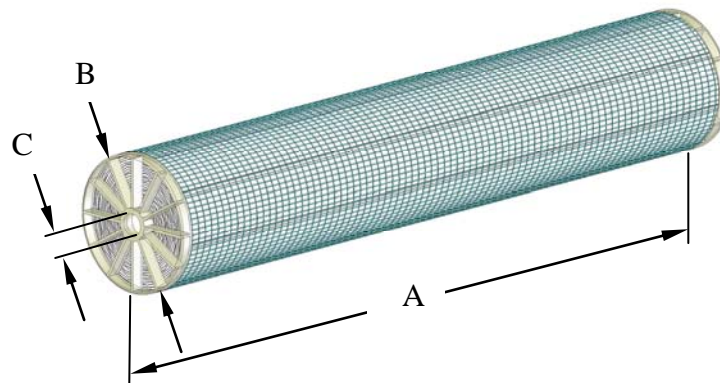
**Test conditions: 5,000 mg/l MgSO₄ in deionized water at 95 psi (6.5 bar) applied pressure, 10% recovery, 77°F (25°C), pH 7.5

OPERATING AND DESIGN INFORMATION*

Maximum Operating Pressure:	650 psi (44.8 bar)
Maximum Process Temperature:	122°F (50°C)
Maximum Cleaning Temperature:	113°F (45°C)
pH Range - Continuous Operation:	4.0-10.0
pH Range - Clean-In-Place (CIP):	1.8-11.0
Design Pressure Drop Per Element:	3 - 6 psi (0.2-0.4 bar)
Design Pressure Drop Per Vessel:	15-35 psi (1.0-2.4 bar)

* Consult KMS Process Technology Group for specific applications.

NOMINAL DIMENSIONS



Part Numbers	Model	A* inches (mm)	B inches (mm)	C inches (mm)
8882229	SPIRAPRO 8040 SR3-NYVP	40.0 (1,016)	7.9 (201.0)	1.125 (28.6)
8882231	SPIRAPRO 8040 SR3-VYVP	40.0 (1,016)	7.9 (201.0)	1.125 (28.6)

* Including two integral anti-telescoping-devices (ATD's)

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Membrane Characteristics:

- SR™3 elements are selected when desalting and organic concentration is the objective. Selective Rejection membranes provide high retention of divalent salts, proteins, and sugars while preferentially passing monovalent salts such as sodium chloride.

Operating Limits:

- **Operating Pressure:** Maximum operating pressure for the SR3 elements are listed in the first page of this document. Actual operating pressure is dependent upon system flux rate (appropriate for feed source) as well as feed, recovery and temperature conditions.
- **Permeate Pressure:** Permeate pressure should not exceed baseline (concentrate) pressure at any time (including online, off-line and during transition). Reverse pressure will damage the module.
- **Differential Pressure:** Maximum differential pressure limit is 6 psi (0.4 bar) per element. Maximum differential pressure for any length vessel is 35 psi (2.4 bar).
- **Temperature:** Maximum operating temperature is 113°F (45°C) for the SR3 elements. Maximum cleaning temperature is 113°F (45°C) for all membrane types.

Water Quality for Cleaning & Diafiltration:

- **Turbidity and SDI:** Maximum feed turbidity is 1 NTU. Maximum feed Silt Density Index (SDI 15-minute test) is 5.0.
- **Guidelines:** Please refer to the KMS "Water Quality Guidelines for CIP and Diafiltration" for more detailed information.

Chlorine and Chemical Tolerance:

- SR3 membranes have a free chlorine tolerance rating of 1,000 ppm-hours at 77°F (25°C), pH 8.
- Maximum continuous chlorine exposure limit is 0.2 ppm.
- Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or similar oxidizers in the feed.
- Chlorine tolerance for SR3 membranes may be significantly reduced if catalyzing metals such as iron are present or if the feed pH and/or temperature conditions are different than stated.
- Recommended pH range for cleaning is 1.8 to 11.0 for the SR3 membranes.

Cationic Polymers and Surfactants:

SR3 membranes may be irreversibly fouled if exposed to cationic (positively charged) polymers or surfactants. Exposure to these chemicals during operation or cleaning is not recommended and will void the warranty.

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 the warranty.

Storage Solution:

The SR3 elements are stored in sorbic acid solution. Refer to KMS RO/NF cleaning procedures to rinse the element prior to use.

Supplemental Technical Bulletins:

- RO/NF Module Cleaning Procedures
- Water Quality Guidelines for CIP and Diafiltration

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. Along with the availability of supplemental technical bulletins, 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 adds value by providing top quality membrane products and by sharing experience in the design and supply of thousands of crossflow membrane systems worldwide.

The information contained in this publication is believed to be accurate and reliable, but is not to be construed as implying any warranty or guarantee of performance. KMS assumes no responsibility, obligation or liability for results obtained or damages incurred through the application of the information contained herein. Refer to Standard Terms and Conditions of Sale and Performance Warranty documentation for additional information.

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