AMS NanoPro™ Solvent Elements

Solvent Stable Nanofiltration Spiral Wound Elements

Description

The AMS NanoPro™ membrane is developed for long-term performance with high and stable fluxes in presence of solvents, featuring high pressure and temperature compatibility. The hydrophilic NanoPro™ S Series solvent-resistant membranes are suitable for non-pure solvent solutions. They are used for the purification and concentration of components in solvent-water solutions. Typical solvents include:

- Methanol, Ethanol, Propanol
- Hexane
- THF
- Acetone, Acetonitrile
- Ethyl acetate
- DMF

Characteristics

Membrane	Cut-off Rate (Da)	Water Flux	$MgSO_4$ Rejection[1]	Glucose Rejection [2]
S-3011	100	22 LMH	98%	98%
S-3012	200	25 LMH	96%	96%
S-3014	400	30 LMH	90%	90%

Limits

Max Operating Pressure	40 bar (580 psi)
Max Pressure Drop	1 bar (14.5 psi) for individual element
Max. Operating Temperature	40 °C (104 °F)
Max. Cleaning Temperature	40 °C (104 °F)
Operating pH range	2 – 12
Cleaning pH range	1 – 13
Recirculation Flow	1812: 4.0 – 8.0 liter/min (1.0 – 2.1 gal/min) 2540: 7.5 – 17 liter/min (2.0 – 4.4 gal/min) 4040: 22 – 42 liter/min (5.8 – 11.1 gal/min) 8040: 90 – 167 liter/min (23 – 42.7 gal/min)
Pressurization/ Depressurization rate	< 0.7 bar/second (10psi/second)
Heating & cool down rate	< 5°C /minute (41 °F/minute)

Area m^2 (ft^2)

Size	1812	2540	4040	8040
31mil (B)	0.19 (2)	1.8 (19)	6.2 (67)	29 (312)
46mil (C)	0.17 (1.8)	1.6 (17)	4.9 (53)	24 (260)

[1] Test condition:
a. 2000ppm $MgSO_4$ solution, 225psi (15.5bar), 86°F (30°C), pH 7.0.
b. Permeate flow for individual elements may vary ± 20%.

[2] Test condition: 5% Glucose solution, 225psi (15.5bar), 86°F (30°C), pH 7.0.

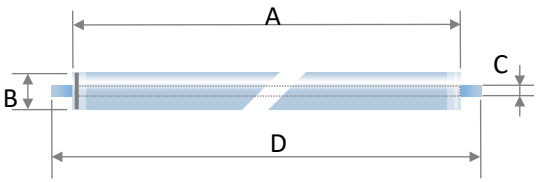
[3] For the purpose of improvement, specifications may be updated periodically.

[4] Consult UNISOL Membrane Technology when intend to operate at elevated pressure, temperature, concentrations.

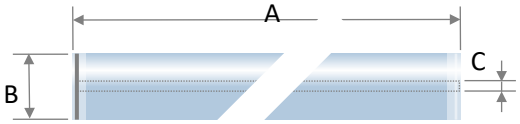
[5] Stabilized salt rejection is generally achieved within 24 – 48 hours of continuous use, depending upon feed water characteristics and operating conditions.

Dimensions

Male Configuration



Female Configuration



Size mm(inch)	A[1]	⌀B[2]	⌀C[3]	D	Permeate tube
1812	305 (12)	46 (1.8)	16 (0.629)	/	Female
2540	956 (37.6)	62 (2.4)	19 (0.748)	1016 (40)	Male
4040	965 (38)	99 (3.9)	19 (0.748)	1016 (40)	Male
8040	1016 (40)	200.5 (7.9)	28.9 (1.138)	/	Female

[1] Tolerance: -2~0 mm
[2] Tolerance: -2~0 mm
[3] 1812 tolerance: ±0.1 mm. 2540/4040-M tolerance: 0~+0.1mm. 8040 tolerance: -0.2~0mm

Handling

Chemical Exposure. Do not expose the membrane to chlorine or other oxidants. Sodium metabisulfite (without catalysts such as cobalt) is the preferred chemical to eliminate free chlorine or other oxidizers in the feed.
* ***NB:*** *Please do not use tap water while testing or cleaning the module since the residual chlorine contained in the tap water could negatively affect the membrane performance.*

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

- Sodium hydroxide at pH 10 – 12, temperature ⩽ 40 °C (104 °F);
- Hydrochloric acid at pH 1 – 2, temperature ⩽ 40 °C (104 °F);
- Nitric acid at pH 1 – 2, temperature ⩽ 40 °C (104 °F);
- Na-EDTA of 0.2 – 1.0 % w/w at pH 10.5 – 11, temperature ⩽ 35 °C (91 °F);
- Anionic surfactant (e.g. sodium dodecyl sulfate) of 0.5 % at pH 10.5 – 11, temperature ⩽ 35 °C (91 °F).

Only demineralized (RO) water must be used for cleaning. **Please flush the module by permeate after processing.** Consult UNISOL Membrane Technology regarding the use of other cleaning materials.

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

Preservation and Storage. Plan ahead to use new membranes. The element should not be allowed to dry: store it in a sealed bag, at 4 – 30 °C (39 – 86 °F). Storage solutions should be made with: 1.5 % w/w sodium metabisulfite. Please refer to “UNISOL Membrane Element Storage and Handling Instructions.”

Annex

Nomenclature: AMS–S-3011–8040–B

AMS	S-3011	8040	B
Design/Application	Membrane	Diameter & Length	Feed spacer
AMS	**S-3011**	1812	**B: 31mil /0.78mm (diamond)**
AMS Membrane series	S-3012	2540	C: 46mil /1.1mm (diamond)
	S-3014	4040	M: 34mil /0.86mm (diamond)
		8040	