

AMS NanoPro™ Acid Elements

Acid Stable Nanofiltration Spiral Wound Elements

Description	The AMS NanoPro™ membrane is developed for long-term performance with high and stable fluxes in very acidic environment, featuring high pressure and temperature compatibility. AMS NanoPro™ elements are used for acid purification and metals concentration in low pH streams. Typical solutions include: <ul style="list-style-type: none"> • 20% H₂SO₄ • 20% HCl • 30% H₃PO₄ • 10% CH₃COOH 			
Characteristics	Membrane	Cut-off Rate (Da)	Flux ^[1]	MgSO ₄ Rejection ^[1]
	A-3011	100	35 LMH	99%
	A-3012	200	40 LMH	98%
	A-3014	400	50 LMH	90%
Limits	Max Operating Pressure		55 bar (800 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		0-12	
	Cleaning pH range		0-13	
	Recirculation Flow		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 m² (ft²)	Size	2540	4040	8040
	31mil (B)	1.8 (19)	6.2 (67)	29 (312)
	46mil (C)	1.6 (17)	4.9 (53)	24 (260)

^[1] Test condition:

- a. 2000ppm MgSO₄ solution, 225psi (15.5bar), 86°F (30°C), pH7.0.
- b. Permeate flow for individual elements may vary ± 20%.

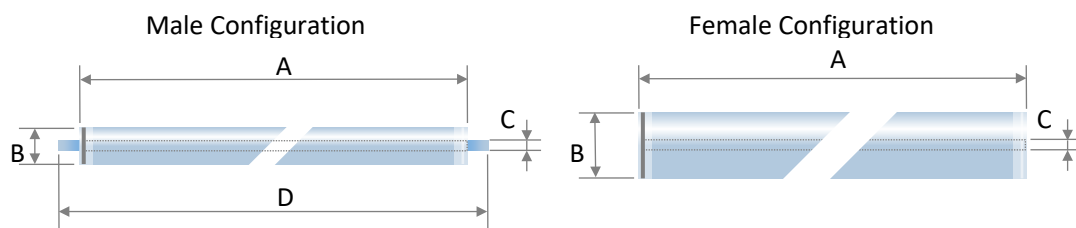
^[2] Test condition: 5% Glucose solution, 225psi (15.5bar), 86°F (30°C), pH7.0.

^[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



Size mm(inch)	A ^[1]	∅B ^[2]	∅C ^[3]	D	Permeate tube
2540	965 (38)	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] 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–A-3011–8040–B

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