Nitto

Innovation for Customers

HYDRANAUTICS

SanRO® and SanRO®-HS

Membrane elements for use in USP-purified water and BioPharm systems.

SanRO® and SanRO®-HS elements are USP (United States Pharmacopoeia)-compliant and are typically used in producing purified water in pharmaceutical, medical, biotechnology, food, beverage and semiconductor processes. Elements meet all requirements for purified water (PW) and conform to FDA Regulation CFR, Title 21. NSF 61, USDA 3-A Sanitary Standard 45-03, Kosher and Halal certified.

SanRO® and SanRO®-HS elements feature a net-type outer wrapping that allows easy access for cleaning in place, reducing the potential for element fouling and residual accumulation of contaminants on the element's exterior. Sites where microbial growth might occur are thereby eliminated when compared with fiberglass-wrapped elements. Heat sanitization reaches areas where biocides may not be able to reach and is also a process that is easy to monitor and control.

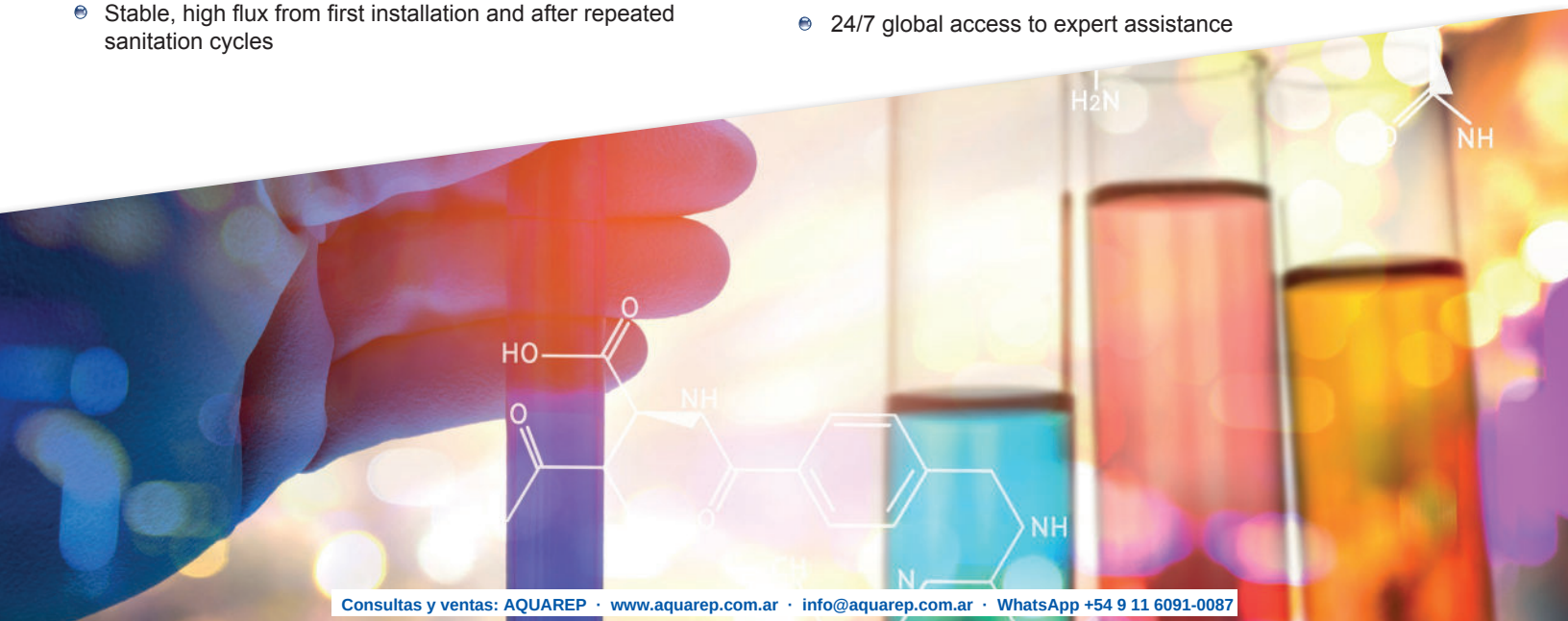
SanRO®-HS elements provide all the benefits of SanRO® with the advantage of being able to be sanitized at temperatures of up to 85 °C. Users of SanRO®-HS elements save the costs of unnecessary cleaning chemicals in a "green" approach to cleaning membrane elements, also eliminating chemical handling and disposal costs.

Key Features:

- Specially selected components for durability in daily sanitization
- Largest possible active membrane area for high flow and low energy costs
- Energy-saving, highly permeable, high rejection membrane
- All elements are heat-set at factory for predictable flows at outset of installation
- ISO 9001-compliant manufacturing
- Computerized application design provided by Hydranautics' IMSDesign software program
- 100% of elements are wet-tested to ensure performance accountability, traceability, and adherence to flow and rejection standards
- Conformance with CGMPs
- SanRO®-HS is heat sanitizable version which allows heat sanitization at 85°C
- SanRO®-HS2 is a higher fluxing version of SanRO®-HS with slightly less rejection

Key Benefits:

- No "stagnant" areas between vessel wall and membrane for improved cleaning, sanitizing and bio-control compared to fiberglass-wrapped elements
- Crystal-clear permeate
- Elements employ a highly permeating, low pressure RO membrane for maximum energy savings compared to higher pressure RO membranes
- Stable, high flux from first installation and after repeated sanitation cycles
- Elements meet EPA potable water standards
- Heat-sanitizable (HS and HS2) elements are heat-set at 90°C and 25 psig at factory, providing assured performance at start-up as well as excellent TOC rinse-out
- Typical microbial action limit of 100 CFU/ml
- Reliable and consistent element flow and rejection throughout element lifespan
- 24/7 global access to expert assistance



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Applications:

- Reduction of bacterial endotoxins and microbes
- Opthalmic and inhalation product production
- Reduction of TDS, TOC and colloids from high purity water
- Removal of algae, fungi, mold, yeast and bacteria as measured in “colony forming units” (CFU)
- Removal of bacteria from cell walls of polysaccharide compounds
- Reduction of microbial growth by minimizing nutrients
- Electronics-grade ultrapure water
- Water for cosmetic production
- Nutriceutical production
- Food and beverage production
- Production of ultrapure or PW (Purified Water)
- Replacement of distillation systems, providing lower energy usage and costs

Type:

Configuration	Sanitary (full-fit) spiral wound
Membrane polymer	Composite polyamide

Application Data:

Maximum applied pressure	600 psig (4.14 MPa)
Maximum chlorine concentration	< 0.1 ppm
Maximum operating temperature	131 °F (55 °C)
Maximum sanitization temperature	185 °F (85 °C)
Maximum sanitization pressure	25 psig (0.17 MPa)
Operating pH range	2.0 - 10.0
Cleaning pH range, ambient	1.0 - 12.0
Maximum pressure drop for a vessel	60 psi (0.41 MPa)

Products and Guidelines:

Membrane Type	Description	Element Performance*			System Performance**	
		Nominal Permeate Flow gpd (m^3/d)		Nominal Rejection	Applied Pressure	Permeate TDS
		4040 model	8040 model			
SanRO-HS	Heat Sanitizable, High Rejection Composite	2,200 (8.3) SanRO-HS-4	10,000 (37.9) SanRO-HS-8	99.7% (99.4% min.)	161 psig (1.11 MPa)	7.8 ppm
SanRO-HS2	Heat Sanitizable, High Flux, High Rejection Composite	3,000 (11.4) SanRO-HS2-4	14,000 (53.0) SanRO-HS2-8	99.6% (99.4% min.)	124 psig (0.85 MPa)	10.6 ppm

* Test Conditions: Element Performance is at 225 psig (1.55 MPa), 1500 mg/l NaCl, 15% Recovery, 77°F (25°C)

** Applied Pressure and Permeate TDS are projected values for a 2:2:1 array system operating at 15 gfd (26 lmh) average flux with 500 mg/l TDS feed (NaCl), 80% recovery, pH 7, 77°F (25°C)

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