NANOSUN

NanoSun Ti-PVDF Pressure Vessel Hollow Fibre Membrane

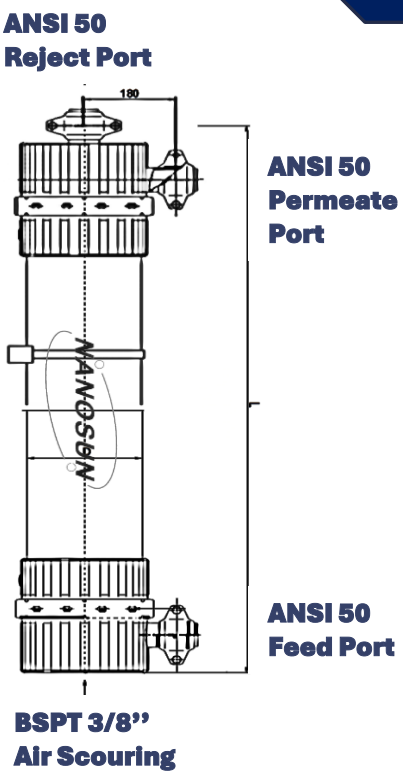
Product Brochure

The Frontier of 3D Printing in Nanomaterial

Operating Principle

Nanosun hollow fiber membrane pressure vessel are designed outside-in configuration for solid/liquid separation process.

Permeate water is obtained after filtering raw water through the membranes by negative pressure suction. Particles larger than 0.1 μm are retained in the reject stream.



PV Hollow Fibre Membrane Specifications

Module Type	NSPV-0650	NSPV-0870
Membrane Material	Ti-PVDF	
Membrane Surface Area (m^2)	53	70
Pore Size (μm)	0.01 – 0.04*	
Length L (mm)	1850	2350
Diameter D (mm)	216	225
Shipping Weight (kg)	50	65

*customized

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Pressure Vessel Design

Hollow fiber pressure vessel are installed vertically with skid or frame to support the pressure vessels. The PVDF membrane is designed and printed with high resistance against chemicals and harsh acids. This allows better cleaning efficiency. The hydrophilic surface improved fouling resistance thus reduces the reliance on frequent chemical wash.

Pressure Vessel Specifications

Connections	NSPV-0650	NSPV-0870
Feed Connection	DN 50 / ANSI 50	
Permeate Connection	DN 50 / ANSI 50	
Reject Connection	DN 50 / ANSI 50	
Air Scouring Connection	BSPT 3/8”	
Materials	**NSPV-0650**	**NSPV-0870**
Potting Material	Epoxy	
Casing	uPVC	
End Cap	uPVC	
Membrane	Ti-PVDF	
O-Ring	EPDM	
Operating Parameters	**NSPV-0650**	**NSPV-0870**
Feed Flow (m^3/h)	11	15
Backwash Flow (m^3/h)	8.5	11.5
Air Scouring Flow (Nm^3/h)	7.2	9.5
Max Feed Pressure (kPa)	300	
Max Backwash Pressure (kPa)	300	
Max TMP (bar)	< 2	
Operating Temperature (ºC)	5 - 45	
Operational pH	1 – 10	

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Hollow Fibre Module Features

Pressurized membrane modules are used for the polishing and refining the water quality. These applications include turbidity removal from drinking water, advanced polishing for municipal or industrial wastewater, and pre-treatment for seawater desalination.

Applications

Nanosun Pressure Vessels are suitable for use in a variety of applications:

- Municipal wastewater treatment
- Industrial wastewater treatment
- Water reuse
- Drinking water treatment
- Pre-treatment of Nanofiltration (NF) /Reverse Osmosis (RO)






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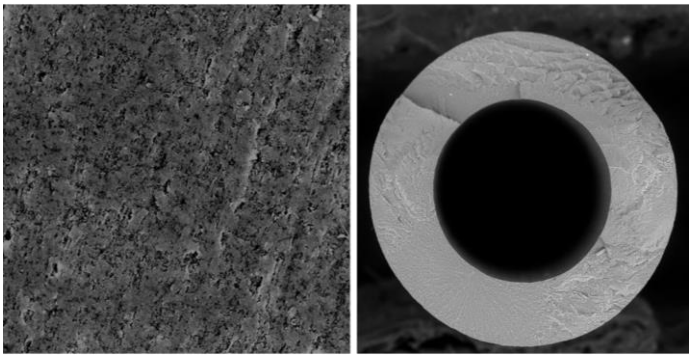
Key Features

High Strength and Durability

Nanosun UF membrane hollow fibers have a sponge-like structure that is free of macro voids which could undermine their structural integrity.
This is achieved by using a unique TIPS method.
The result is a highly durable and high strength membrane with very few fiber breakages that can deliver a long service life and low maintenance requirements.



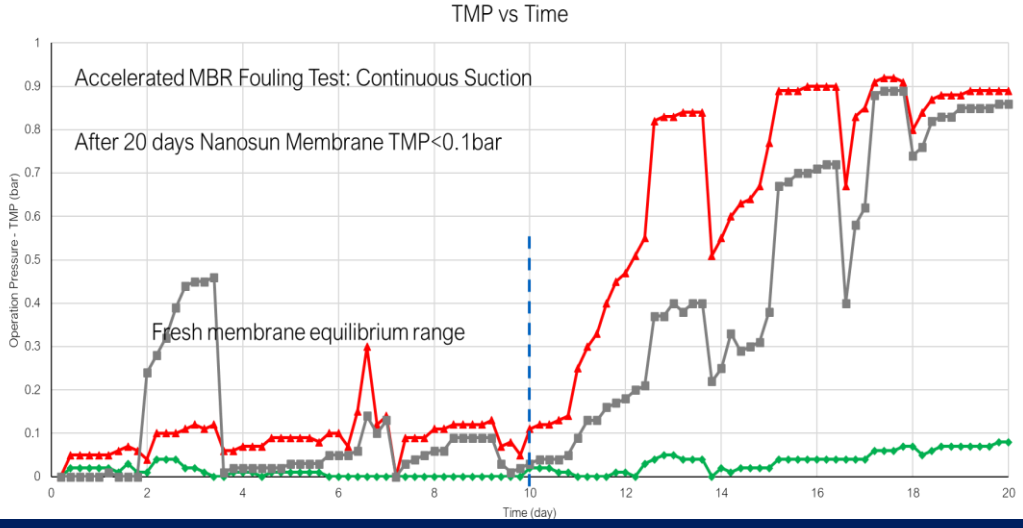
Excellent Anti-Fouling Behaviour

Nanosun UF membrane hollow fibers is printed with an anti-fouling layer on the Polyvinylidene Fluoride (PVDF) base.
This anti-fouling layer helps maintain production rate and decreases the complexity of membrane filtration operation.
Nanosun's unique addictive membrane manufacturing process, our UF membrane can achieve an excellent anti-fouling performance in comparison to others.

High Wastewater Flux

Nanosun UF membrane hollow fibers have high wastewater flux capabilities. High fluxes are desirable characteristics to reduce the membrane requirement.

Nanosun UF membrane hollow fibres offers the highest packing density compared to other type of modules. Because of this, it is ideally suited for high volume applications, occupying a small module footprint.



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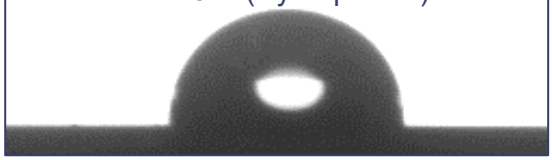
Key Features

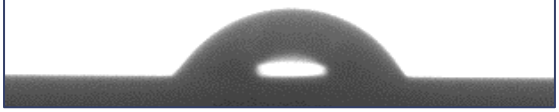
Anti-Fouling Surface

Nanosun Ti-PVDF features a unique hydrophilic surface property. This surface is printed with 3D additive manufacturing process. This hydrophilic surface reduces the fouling tendency and prevents the accumulation of foulant on the separation interface.

TIPS PVDF Contact Angle - 110° (Hydrophobic)



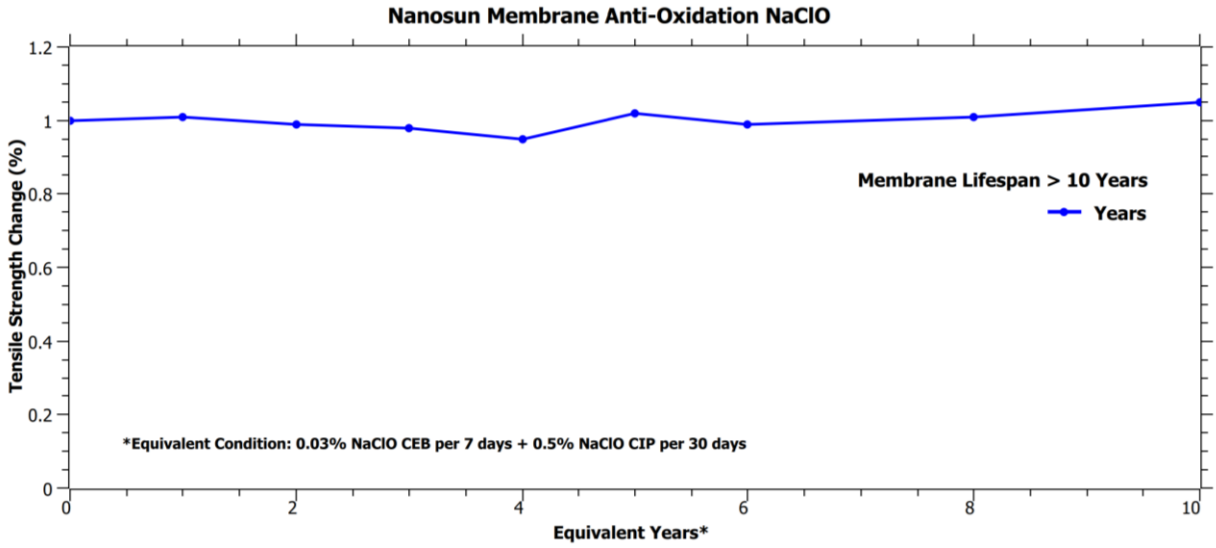
Ti-PVDF Contact Angle - 45° (Hydrophilic)



Minimum Chemical Cleaning Requirement

Polyvinylidene Fluoride (PVDF) material, which has high chemical resistance. Making it extremely tolerable within an extremely wide pH range.

Minimum chemical cleaning allows slower wear-and-tear rates of chemical cleaning cycles. This can have a significant impact on membrane lifetime of more than 10 years.



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With more than 20 years of research in nano technology, the Nanosun research team has managed to incorporate various nano material into the membranes which enable the traditional membranes to possess the multifunctional features such as antifouling through self-cleaning, disinfection, degradation of organic pollutants and energy production.

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