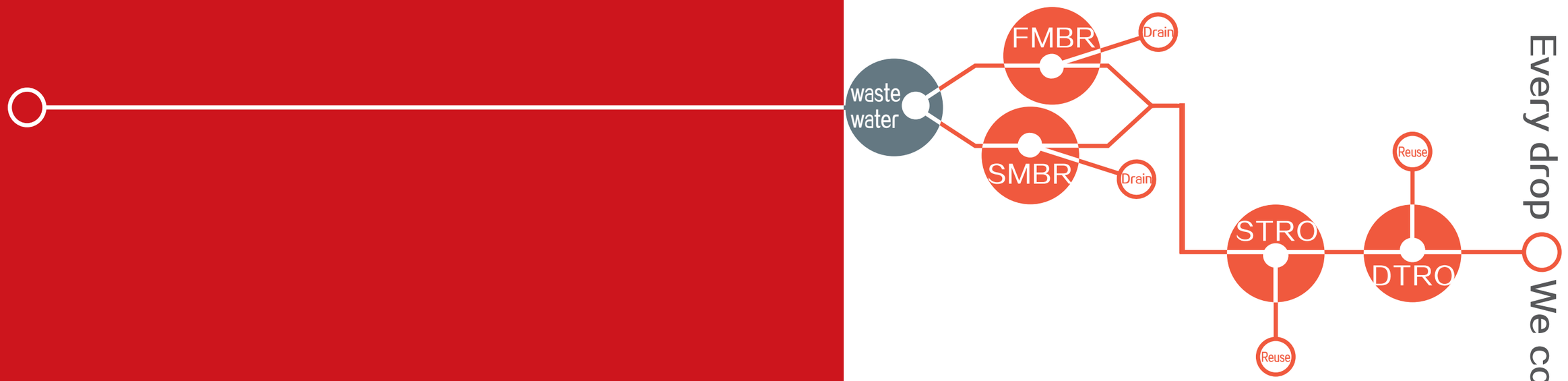

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MEMBRANE PRODUCTS

SUN

RisingSun Membrane

Our products Ehance your brand

Flat sheet MBR / FMBR

Spiral wound MBR / SMBR

Spacer Tube RO/NF STRO / STNF

Disk tubular RO/NFDTRO / DTNF

Flat sheet membrane

RisingSun Membrane

Company profile

RisingSun Membrane with location in Beijing China is a professional membrane products' manufacture for Microfiltration, Ultrafiltration, Nanofiltration, Reverse Osmosis, and Tubular Anode Cell. We are and will be always focusing on membrane research and development to meet customers' strict filtration needs. We can supply spiral-wound, flat & tubular type. Besides, we are active for specialty membrane development for Wastewater treatment,Biotech fermentation, Pharmaceuticals intermediates,Dye and E-coat process.

We cooperated with many steady customers worldwide. To meet customers' requirements, we are not only supply membrane products, but also membrane process design, system consultant service. Our key employees have more than a decade experience in membrane production and applications.

By means of introducing automatic production equipment, advanced membrane technology and membrane material, carry out ISO 9001:2008 management, We can supply spiral-wound, flat, disk & tubular type.

We devote to

Supply integrated solution of membrane products for wastewater treatment
Supply liquid separation, concentration, clarification membrane products and technology

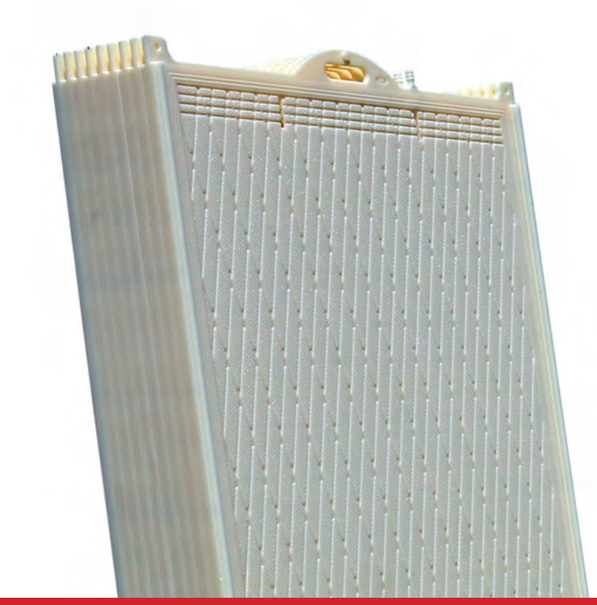
We positioning in

Waste water treatment membrane products manufacturer

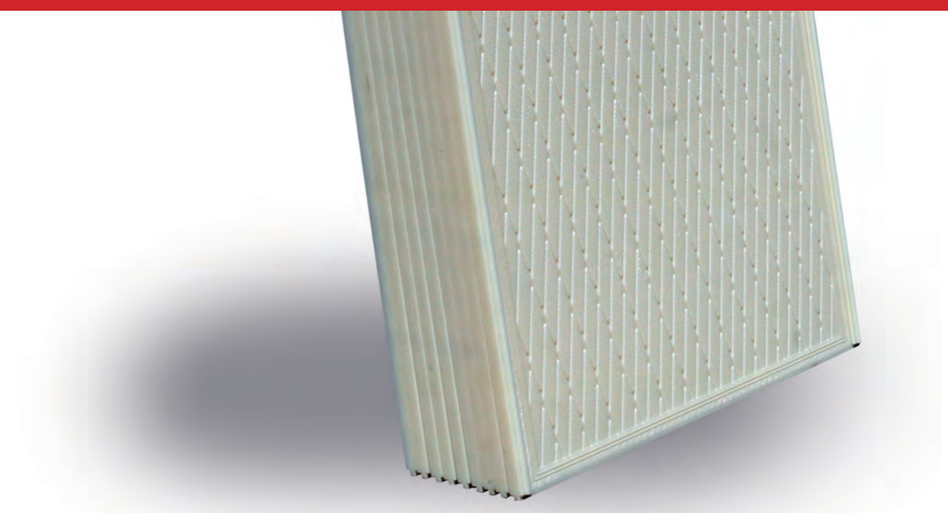
Professional manufacturer of specialty membrane

Exclusive and general membrane research and development for membrane engineering companies

Become a customer's unique product reserve base



More excellent flat sheet MBR (FMBR)

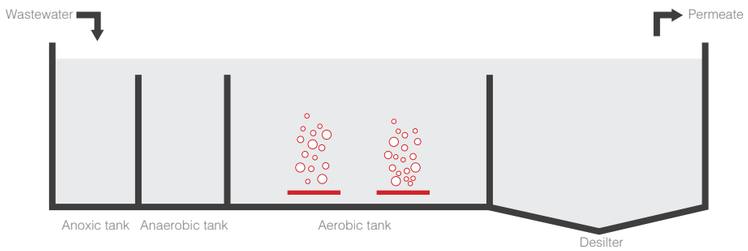


Flat sheet MBR (FMBR)

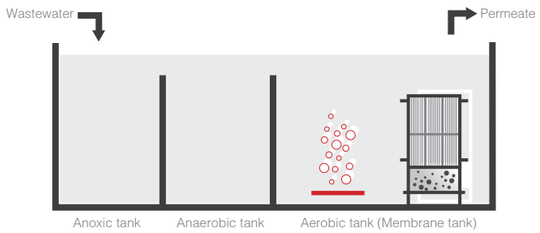
MBR Introduction

The Membrane Bioreactor (MBR) process is a combination of wastewater treatment and membrane filtration. This reactor possesses the advantages of membrane filtration and biological treatment technology. Membrane modules, which can replace the secondary sedimentation tank, are used to separate mud and water. The MBR process has obvious advantages compared with the traditional wastewater treatment technology.

Traditional wastewater treatment process



MBR Process



MBR Advantages

The quality of MBR produced water is much higher. and it will not be affected by the fluctuation of the feed water.
The activated sludge age is longer, and its operation cost and used field area is less than that of conventional treatment process.

Flat sheet MBR (FMBR)

The difference between the MBR and Continuous Aeration System (CAS)

The water quality comparison of MBR and CAS

Description	Input water	Output water		
	Typical municipal wastewater	MBR		CAS
TURBIDITY (NTU)	–	Membrane filtration process	< 1	5–20
SDI	–		< 3	> 5
TSS(mg/L)	100–300		< 1	10–30
BOD_5(mg/L)	300	Biological process	< 5	< 30
COD(mg/L)	600		< 30	< 100
NH_3–N(mg/L)	30		< 0.5	5–10
TN(mg/L)	40		< 15	> 25
TP(mg/L)	10–20		< 0.5	5–8

Note: The removal rate of BOD and COD is related with the biological treatment process.
The removal rate of NH3–N is different based on the degree of nitrification.
The removal rate of TN is different based on the degree of denitrification.
The removal of the phosphorus might need the chemical method.

The other comparisons of MBR and CAS

Description	MBR	CAS
Water quality	Directly reusable, higher than national standard	Meet national standard
Field area	About 1/3–1/2 $m^2/(m^3.d–1)$	About 1 $m^2/(m^3.d–1)$
Construction investment	RMB2000–2600/(m^3.d–1)	RMB1500–2000 /(m^3.d–1)
Operation cost	RMB0.7–1.0 /m^3	< 0.7RMB/m^3 (Direct water discharge) < 1.0RMB/m^3 (Reclaimed water discharge)
Excess sludge	1/3–1/5 of CAS	Volume big, high processing cost
Operations management	Few devices, simple flow process, easy to automatically control, stable operation and remote control feasible	Many devices, complicate flow process, easy to break down and high operation cost
Water application	Reclaimed water and water for industrial use	Emission on standard

Flat sheet MBR (FMBR)

SUN® Flat sheet MBR benefits

SUN® flat sheet membrane is made of PVDF, which has better chemical stability, fouling resistance and mechanical strength. With advanced membrane fabrication technology, we control the membrane pore size around 0.1 um to get a higher water flux and water quality. The mortise and tenon structure is used in the support plate to get a more stable spacing without side panels. The support plate can be installed from top or one side without the limits of the construction site conditions.

The mortise and tenon structure

SUN® support plate

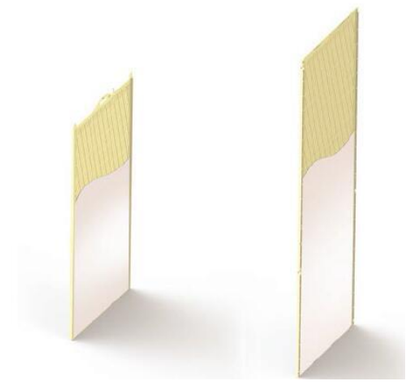
Laser engraving diamond flow path, coupled with special umbrella support structure, makes the suction pressure distribution much better without diverting nonwoven fabrics. This structure reduces the risk of fouling and improves the water flow rate.

The support plate from other company

SUN® support plate

Flat sheet MBR (FMBR)

SUN® Flat sheet MBR element



Items	Standard type	Long type
Model	**FMBR80**	**FMBR160**
Size(L×W×T)(mm)	1020×510×14	1810x 512x14
Membrane effective area(m^2)	0.8	1.6
Weight(kg)	3	5
Permeate flux［l/(pc·d)］	320-550	640-1100
Membrane material	PVDF	PVDF
Membrane proe size(μm)	0.1	0.1
Plate material	ABS	ABS
Air flow rate [l/(min·pc)]	⩾10	⩾12
PH	3～12	3～12
Output turbidity (NTU)	＜1.0	＜1.0
Output SS(mg/L)	⩽5	⩽5
Chemical cleaning	～5,000mg/l NaClO	～5,000mg/l NaClO

Note： For different water qualiy, there will be a different water follow reate. So the user should fully test the membrane module.This parameter is tested at 25℃,-10KPa suction vacuum conditions based on municipal wastewater.

Flat sheet MBR (FMBR)

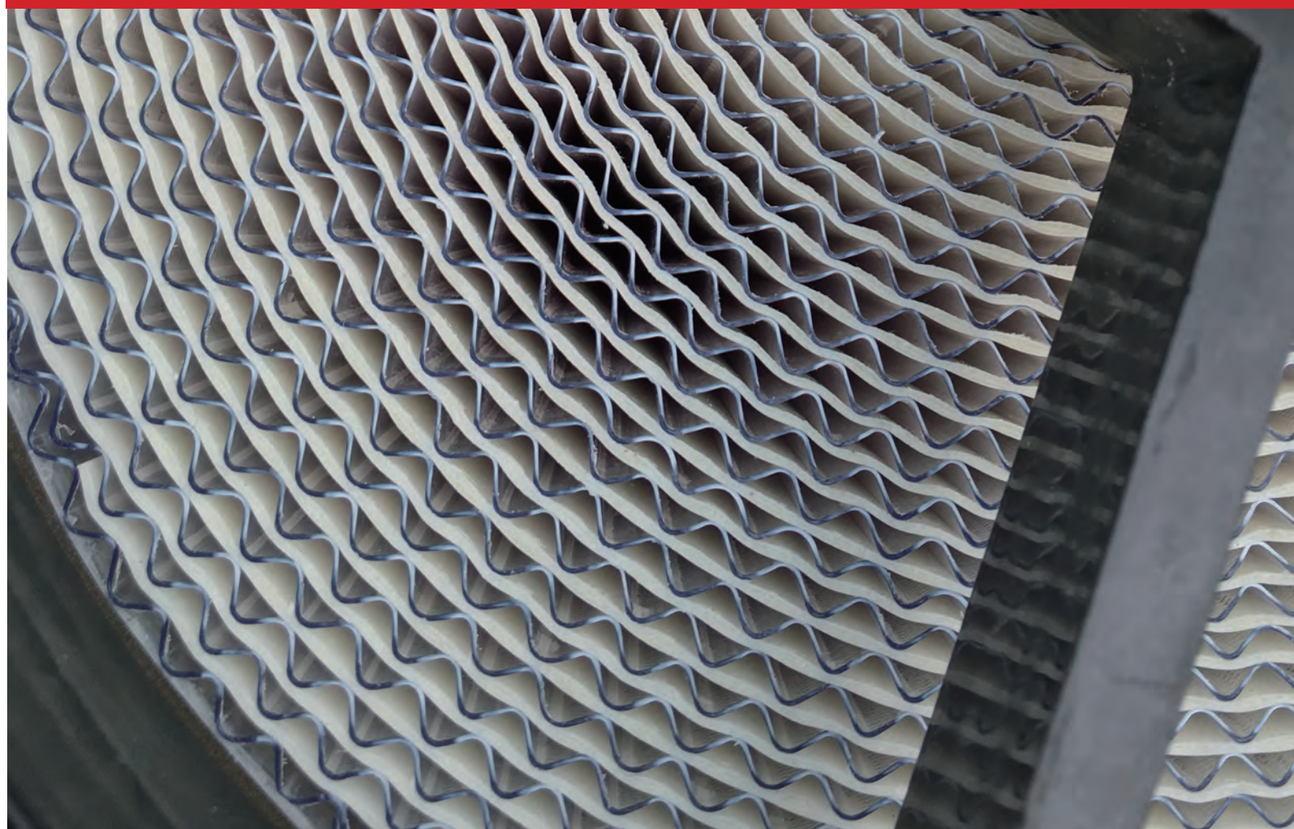
SUN® Flat sheet MBR module

Items	FMBR80 standard			
Model	FMBR80-50	FMBR80-125	FMBR80-250	FMBR80-250-2
Permeate flux (m^3/d)	16-26	38-65	75-130	150-260
Plate qty (pc)	50	125	250	500
Membrane effective area(m^2)	40	100	200	400
Size (mm) (L×W×H)	945×750×1750	1980×750×1750	3700×750×1750	3700×750×3100
Air flow rate (L/min)	500	1250	2500	3000
Weight(kg)	300	650	1200	2100

Items	FMBR160 standard			
Model	FMBR160-50	FMBR160-125	FMBR160-250	FMBR160-250-2
Permeate flux (m3/d)	32-50	75-130	150-260	300-500
Plate qty (pc)	50	125	250	500
Membrane effective area(m2)	80	200	400	800
Size (mm) (L×W×H)	925×750×2550	1980×750×2550	3700×750×2550	3700×750×4500
Air flow rate (L/min)	600	1500	3000	3500
Weight(kg)	400	910	1910	3600

Note： We can provide a single membrane frame and any size MBR modules to make a free combination component, for example： FMBR80-175, FMBR80-200, FMBR80-200-2(double deck),FMBR160-200, FMBR160-200-2(double deck) , etc.

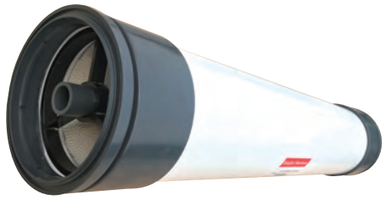
More innovative spiral wound MBR (SMBR)



Spiral wound MBR (SMBR)

SMBR Introduction

SMBR is a submerged backwashable spiral membrane, which is used in the field of industrial wastewater and other processes. SMBR is a innovative product which can implement washing flow from the permeate carrier side with certain pressure. Submerged systems rely on centrifugal pumps to generate a slight vacuum pulling water through the membrane barrier layer. At the same time, its backwashing frequency is the same as hollow fiber membrane.

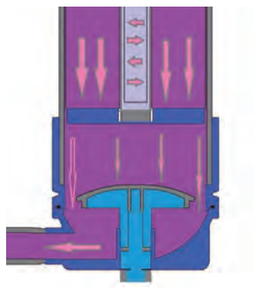


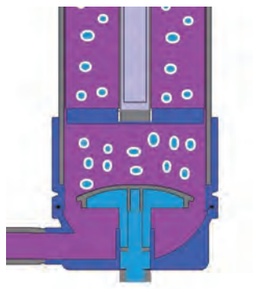
Features

Air scour can decrease the pollutant deposition on membrane surface
Open flow channels allows a worse feed quality
Both submerged and split-type are acceptable with small field area
Frequent backwashing is allowable
The equipment investments and energy costs are lower

Applications

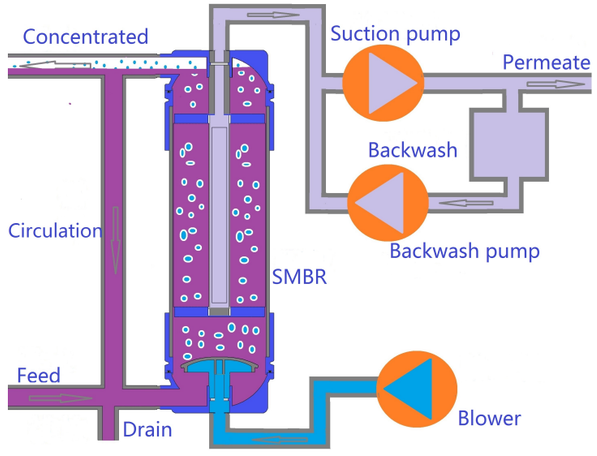
Industrial wastewater reuse
RO pretreatment
Landfill leachate pretreatment
Domestic wastewater reuse
Secondary sedimentation effluent
Removal of heavy metals
Process water
Recycled water





Spiral wound MBR (SMBR)

SMBR Introduction



Comparison of SMBR and Hollow fiber membrane

Identical	Difference
Frequent backwashing	SMBR has lower energy costs
Lower feed quality requirement	SMBR has no risk of filament break
High recycle rate	SMBR has open channels to prevent soild deposition

Spiral wound MBR (SMBR)

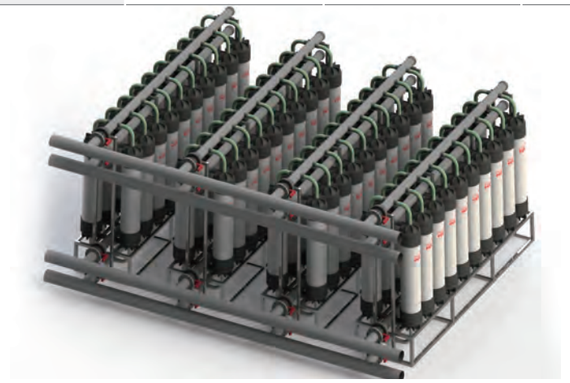
SMBR-10040 Specifications

SMBR-10040 Membrane element

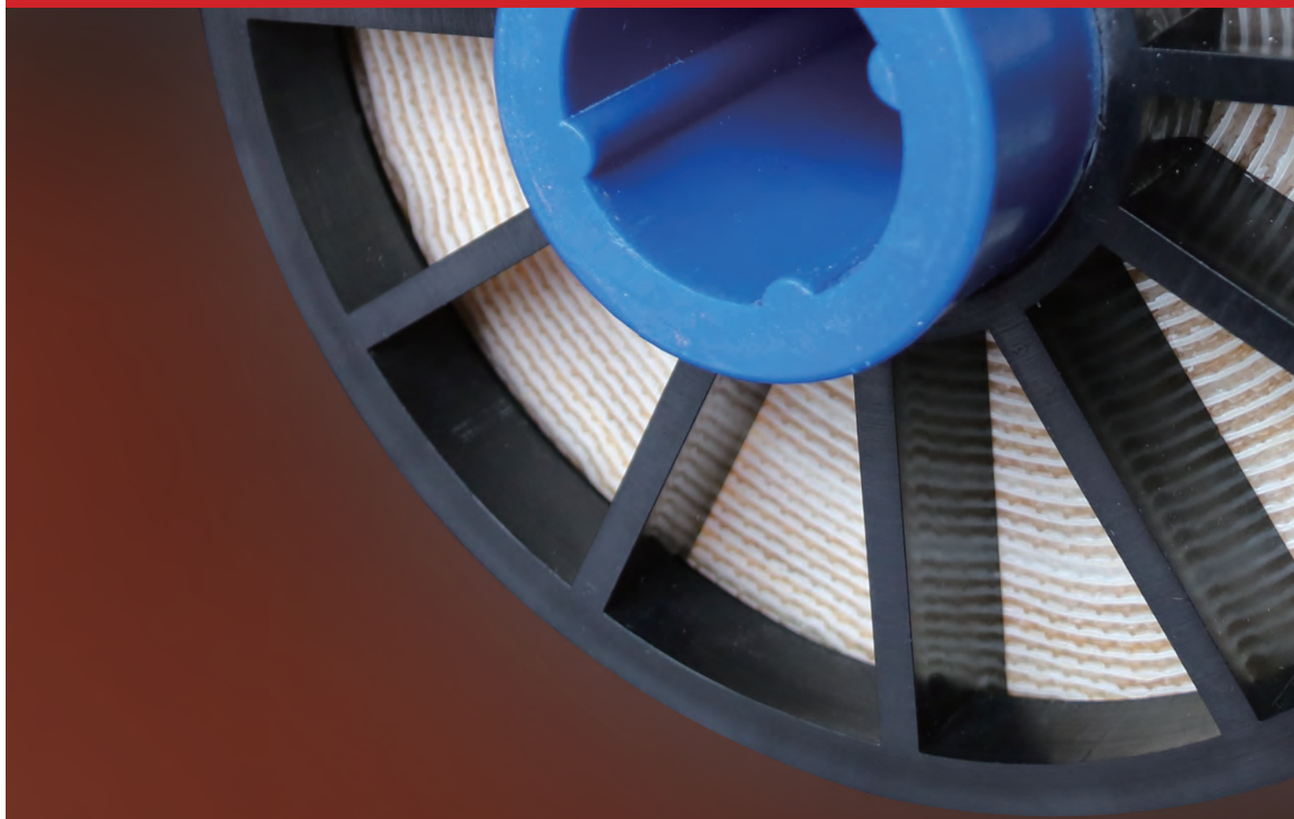
Items		Completed with vessel & caps	Membrane body only
			
Model		SP-SMBR-10040	SG-SMBR-10040
Membrane effective area(m^2)		27.6	27.6
Diameter (mm)		250	250
Membrane material		PVDF	PVDF
Membrane pore size(μ m)		0.1	0.1
TMP range (bar)		0.1-0.7	0.1-0.7
Configuration		Split-type	Submerged
Operation Pressure	Positive pressure(bar)	1.0	0.5
	Negative pressure(bar)	0.7	0.7
Permeate flux (l/h)		400-1000	400-1000
pH (continuous)		2-11	2-11
pH (cleaning)		2-11.5	2-11.5
Air flow rate [l /(min • pc)]		100	100

SMBR-10040 Membrane module

Items	SMBR-10040-20	SMBR-10040-40	SMBR-10040-80
Element qty. (pc)	20	40	80
Membrane effective area(m^2)	520	1040	2080
Permeate flux(m^3/h)	8-18	16-35	32-70
Size (mm)	3000 × 850 × 1900	3000 × 2500 × 1900	3000 × 5800 × 1900
Weight (kg)	700	1400	2800
Pipe material	PVC	PVC	PVC
Feed flux(m^3/h)	10-22	20-42	38-80
Air flow rate [l /(min·module)]	2000	4000	8000



More plentiful spacer tube RO/NF (STRO/STNF)



Spacer tube RO/NF (STRO/STNF)

STRO/STNF Introduction

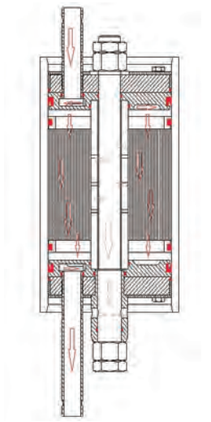
With the development of membrane technology industry, there are differentiated requirements to the performance of the membrane products, such as lower feed quality requirements, higher pressure to improve concentration ratio, longer cleaning cycle and service life. As a result, the open channel type with high pressure membrane arises at the historic moment.

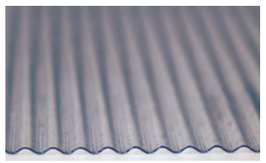
Features

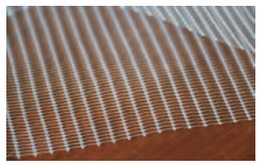
High strength design, up to 120 bar operating pressure
Open feed spacer with low flow resistance and concentration polarization
Spiral wound structure with more membrane area
More options for feed spacer

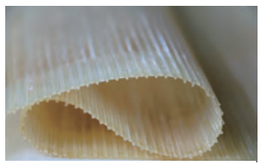
Applications

Industrial wastewater
High salts wastewater
Spiral wound RO/NF concentrates







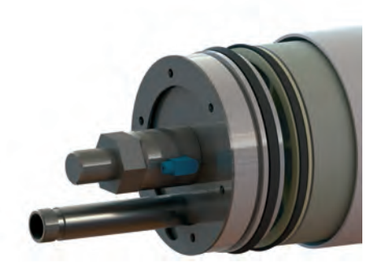


Spacer tube RO/NF (STRO/STNF)

STRO/STNF Introduction

STRO/STNF module

STRO/STNF membrane
High pressure vessel
SUS center link
Inlet and outlet pipe and accessories



Comparison of STRO/STNF and conventional RO/NF

Identical

High membrane area
Integrated design
Cross flow filtration

Difference

SUS center link with high strength and stability
Uniform internal water distribution structure
Reduced impact of the membrane module flow, higher cross-flow
Open feed channel

Spacer tube RO/NF (STRO/STNF)

STRO/STNF Specifications

Type	STRO		STNF
Model	STRO1-8035	STRO5-8042	STNF2-8042
Membrane type	RO1	RO5	NF2
Membrane material	Composite Polyamide		
Membrane effective area (m^2)	25	27	27
Element configuration *	Spiral, fierglass, brine seal		
Feed flux range (m^3/h)	5.5-12		5.5-12
Recommended feed flux (m^3/h)	10		10
Permeate flux range **(m^3/d)	24	18	25
Stable salt rejection ** (%)	98.5	99.5	98
Min.salt rejection (%)	97.5	99	96
Feed spacer	Special open channel		
Max. TMP (bar)	0.7		0.7
Max. operation pressure (bar)	120		90
Max. operation temperature (℃)	40		40
Continuous pH	3-11		3-11
Cleaning pH	2-12		2-12
Chlorine tolerance (ppm)	⩽0.1		⩽0.1

* Salt seal installed on the end of the flow, low pressure side / permeate side.

**Stable flux, salt rejection based on the following test conditions:

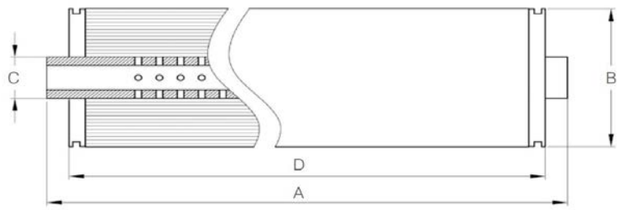
RO1: 2000mg/l NaCl , pressure 15.5bar, recycle rate 15% , temperature 25℃; pH=8.

RO5:32,000 mg/l NaCl , pressure 55bar, recycle rate 8%, temperature 25℃, pH=8.

NF2:2000 mg/l $MgSO_4$, pressure 7barr, recycle rate 15% , temperature 25℃。

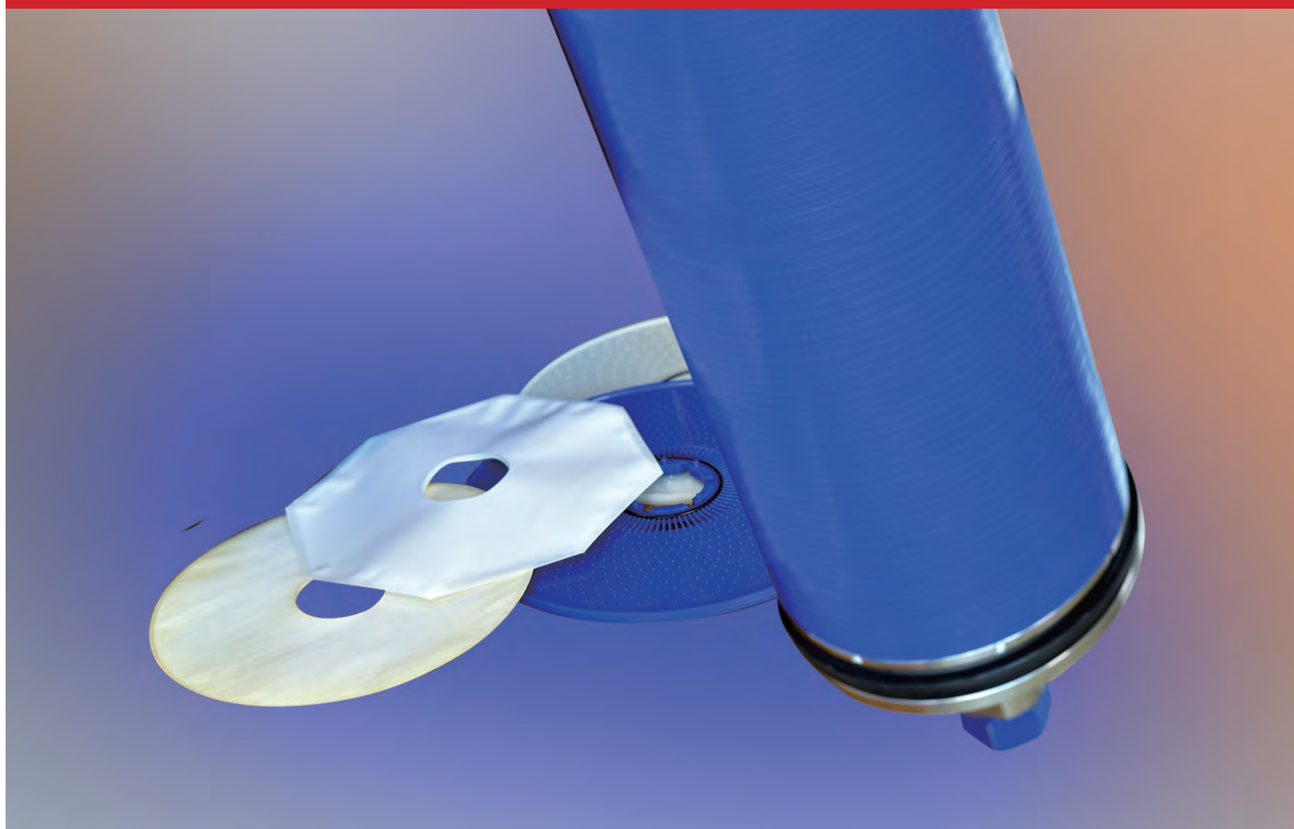
There will be a minor difference of permeate due to the feed water quality.

Note: We can provide any flat sheet membrane to make ST module, for example: STRO4-8035, STRO5-8035, STRO1-8042, STNF1-8042, etc.



Model	8035	8042
Element total length (A)mm	890	1070
Element diameter (B)mm	200	200
Center tube outer diameter (C)mm	60.2	60.2
Membrane body length (D)mm	838	1016

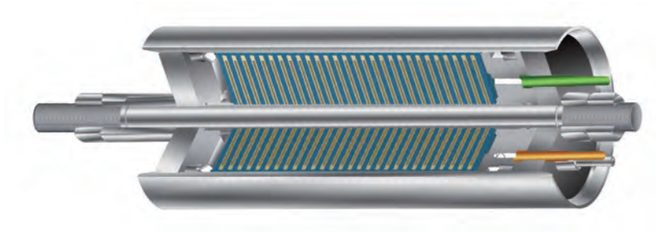
More inexpensive disk tubular RO/NF (DTRO/DTNF)



Disk tubular RO/NF (DTRO/DTNF)

DTRO/DTNF Introduction

Disk tubular membrane technology referred to as DT, common for disk tubular RO (DTRO) and disk tubular (DTNF). The membrane module structure is distinct from the traditional spiral wound membrane.With open flow channels,feed flows through the entrance into the pressure vessel and reach the disk in a short distance. Then the feed flows 180 degrees from one side of the membrane reverse flow into the other side of the membrane,into the next disk again and finally runoff from outlet.The special design makes feed collide with the disk bulge through the membrane surface forming turbulence which increases flow rate and self-cleaning function and long service life of the membrane.



Features

High strength design, up to 120 bar operating pressure
Open disk with low flow resistance and concentration polarization
High pressure resistance and salt rejection membrane

Applications

Landfill leachate
High concentration of industrial wastewater
Spiral wound RO/NF concentrates
Industrial high salts water

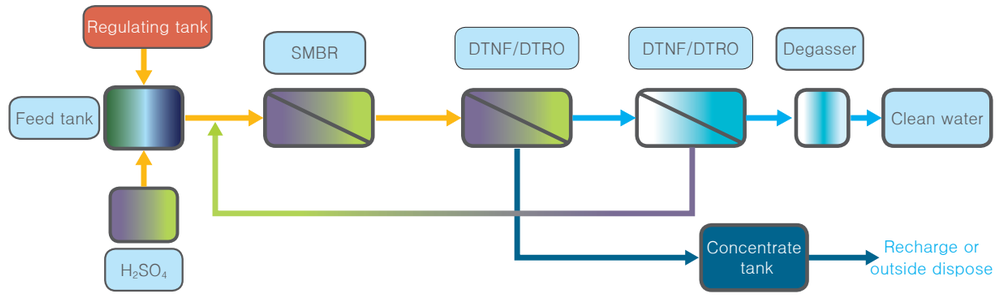
Disk tubular RO/NF (DTRO/DTNF)

DTRO/DTNF Introduction

DTRO/DTNF module

DTRO/DTNF Membrane
Disk
SUS center link
High pressure vessel
Inlet and outlet pipe and accessories

A typical process diagram

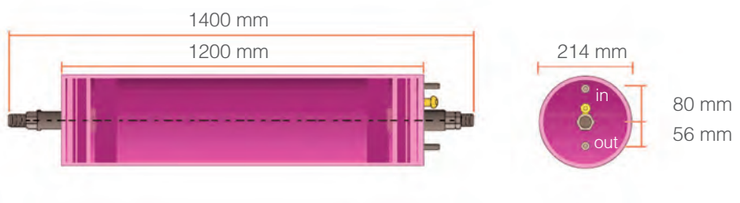


Disk tubular RO/NF (DTRO/DTNF)

DTRO/DTNF Specifications

Items	High pressure	High pressure	Super high pressure
Model	SG–DTRO–1	SG–DTNF–1	SG–DTRO–2
Membrane material	Composite Polyamide	Composite Polyamide	Composite Polyamide
Disk qty. (pc)	209	209	209
Rejection (%)	99	97	99
Membrane effective area(m^2)	9.4	9.4	9.4
Feed flux (l/h)	500–1200	500–1200	500–1000
Permeate flux range (l/h)	8–40	8–40	8–35
Disk material	ABS	ABS	ABS
Vessel material	Fiberglass	Fiberglass	Fiberglass / SUS
Operation pressure (bar)	75	75	120
Max. TMP (bar)	9	9	9
Max. operation temperature (℃)	40	40	40
Chlorine tolerance (ppm)	<0.1	<0.1	<0.1
Recommended operation pH	6–9	6–9	6–9
Chemical cleaning pH@40℃	2–11	2–11	2–11

Note: Performance data above is the nominal value. The actual permeate flux of individual module may be in ± 15% range.
Test condition: RO: NaCl 32,000mg/L @800psi. NF: $MgSO_4$ 30,000mg/L @600psi.



More options for Membrane sheet

Flat sheet membrane

We offer UF/MF/NF/RO flat sheet membrane with various MWCO and Ion Exchange Membrane.
All membrane derived from USA.

Membrane material

Polyether sulfone (PES)
Polysulfone (PS) Polyvinylidene fluoride (PVDF) Polyacrylonitrile (PAN) Polyamide (PA)
Cellulose (CA)
Regenerated cellulose (RC)

Benefits

High thermal and chemical resistance
Precise MWCO
High flux capacity
Fouling resistant
Long service life
Acid/caustic resistant
High temperature resistance

Specifications

RO membrane	Rejection (%)	Flux rate (LMH)	Replacement reference	Typical applications
RO1	99.5	45	BW30	Water treatment; Specific liquid concentration; Sea water desalination; Landfill leachate; Wastewater treatment,etc.
RO2	99.2	55	LE	
RO3	99.0	50	XLE	
RO4	99.4	42	SW30	
RO5	99.7	47	SW30ULE	
RO6	99.7	30	SW30HR	

Testing condition: RO1: 2000ppm NaCl, 225psi(1.55MPa), 25℃;
RO2: 2000ppm NaCl, 150psi(1.03MPa), 25℃; RO3: 500ppm NaCl, 100psi(0.69MPa), 25℃;
RO4,RO5,RO6: 32000ppm NaCl, 800psi(5.5MPa), 25℃。

NF membrane	Rejection (%)	Flux rate (LMH)	Replacement reference		Typical applications
NF1	⩾99.0	43	NF90		Soft water; Acid and caustic recovery; Precious-metals recovery; Dye concentration, desalination; Whey desalination; Antibiotic concentration; Polysaccharide desalination; BOD/COD removal,etc.
NF2	⩾99.0	42	NF245		
NF3	⩾97.0	55	NF270		
NF4	92.0-95.0	50	GE	DL	
NF5	⩾98.5	38		DK	
NF6	⩾99.5	60	KOCH	SelRO MPS-34	
NF7	85.0-95.0	60	XN45		
NF8	60.0-85.0	65	UA60		

Testing condition: NF1-NF3: 2000 ppm $MgSO_4$, 70psi(0.48MPa), 25℃;
NF4,NF5,NF7,NF8: 2000 ppm MgSO4, 110psi(0.76MPa), 25℃; NF6: 2000 ppm, 142psi(1.0 MPa), 25℃;



Flat sheet membrane

UF membrane	Membrane material	MWCO (Dalton)	Flux rate((LMH) @ 25 ℃,0.35MPa	Replacement reference		Typical applications
UA001	PA	1,000	60*	GE	GE	Color Removal; Chondroitin Sulfate Concentration; Antibiotics, Protein & Polypeptide Concentration; Enzyme Concentration; WPC / WPI; Purification of Antibiotics & Vaccines; Recovery of Whey Protein, Gelatin, Enzyme; Electrocoat Paint Recovery; Biochemical Lysate Clarification; Beverage Clarification; Pretreatment for RO/NF,etc.
UA003		3,500	65*		GK	
UE001	PES	1,000	40 **	MICRODYN NADIR	NP030	
UE003		3,000	200 **		NP010	
UE005		5,000	100	KOCH	HFK-328	
				GE	PT	
UE008		8,000	130	GE	GM	
UE010		10,000	150	KOCH	HFK-131	
				GE	PW	
				UP010		
UE020		20,000	200	UP020		
				PE20		
UE030		30,000	240	UH030		
UE050		50,000	260	UH050		
US020	PS	20,000	280	PS20		
US050		50,000	350	US100		
UF050	PVDF	50,000	400	KOCH	HFM-100	
UF100		100,000	500		HFM-300	
UN010	PAN	10,000	150	PA50		
UN050		50,000	400	PA200		
UN100		100,000	450	PA400		
UR030	RC	30,000	250	ALFA LAVAL RC70PP		
UR100		100,000	350			
UC005	CA	5,000	150	STARIOUS	14529	
UC010		10,000	200		14539	
UC050		50,000	350		14549	

* Testing condition：0.76MPa, 25℃; ** Testing condition：4.0MPa, 25℃;
pH range @25℃：(1)PES 0-14;(2)PS 1-14;(3)PVDF,PAN 1-12;(4)RC 1-11;(5)CA 3-9。

MF membrane	Membrane material	Pore size (μm)	Flux rate((LMH) @ 25 ℃,0.1MPa	Replacement reference		Typical applications
ME005	PES	0.05	>280	MICRODYN NADIR MP005		MBR Industry; Biotech/Pharmaceutical; Microbial Removal; Protein Separation; Antibiotic Clarification; Enzyme Clarification; Pretreatment for RO/NF,etc.
ME010		0.10	>320	KOCH MFK-603		
MF010	PVDF	0.10	>500	TORAY	MBR	
MF022		0.22	>1000	KUBOTA		
MF045		0.45	>1500	ENVIS		

Ion exchange membrane	Membrane character	Functional group	Exchange capacity (meq/g)	Replacement reference		Typical applications
AE1	Anion Exchange	Quaternary Ammonium	1.0±0.1	MI	AMI-7001	The anode & cathode electrocoating process; EDI, etc.
AE2			0.9	LANXESS SYBRON	IONAC MA-3475	
AE3			1.0		IONAC MA-7500	
CE1	Cation Exchange	Sulfonic Acids	1.6±0.1	MI	CMI-7000	
CE2			1.4	LANXESS SYBRON	IONAC MC-3470	

1.The above data may vary but will be no more than 15% below the value shown; Products specifications may vary as design revisions take place.
2.The standard width of membrane sheet is 40inch, sample is available.

Intellectual property

RisingSun Membrane picks up the pace through continuous investment in membrane technology research and development to improve the performance of the original products and develop new industry products. At present, we have received a wide range of intellectual property rights and industrial certifications.

Trademark

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Intellectual property

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