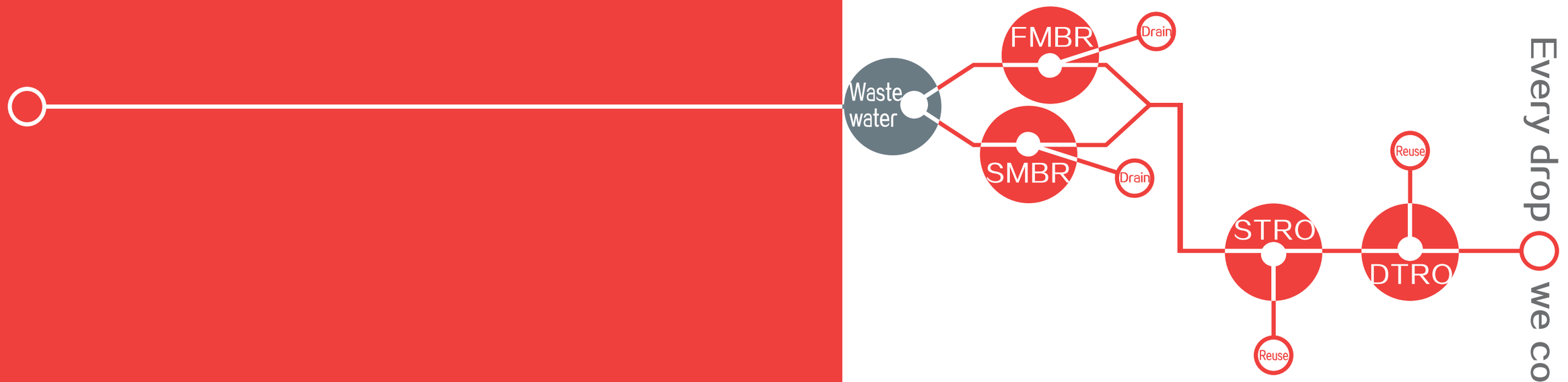



SUN
RisingSun Membrane

Products specification may be updated continually,
please contact us for any inquiry.

Released in March 2019

RisingSun Membrane Technology (Beijing) Co., Ltd.

Add : Add : Shunren Rd. No.51, Linhe Industrial Zone, Shunyi District,
Beijing, China Post code : 101300
Tel : +86-10-89496869 / 89496579 Fax : +86-10-89496839
E-mail: info@risingsunmem.com
Website: www.risingsunmem.com

SUN
RisingSun Membrane

# MEMBRANE PRODUCTS

RisingSun Membrane

Our products enhance your brand

Flat sheet MBR / FMBR

Spiral wound MBR / SMBR

Spacer Tube RO/NF STRO / STNF

Disc Tube RO/NF DTRO / DTNF

Flat sheet membrane

RisingSun Membrane

## Company profile

RisingSun Membrane with location in Beijing China is a very professional membrane products' manufacturer for Microfiltration, Ultrafiltration, Nanofiltration, Reverse Osmosis, and Tubular Anode Cell. We are and will be always focusing on membrane R&D to meet customers' strict filtration needs. We can supply spiral-wound, flat, disc & tubular type. Till now, our membrane products have been widely used for wastewater, biotech fermentation, pharmaceuticals intermediates, dye and e-coat process etc.

We cooperate with so 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.

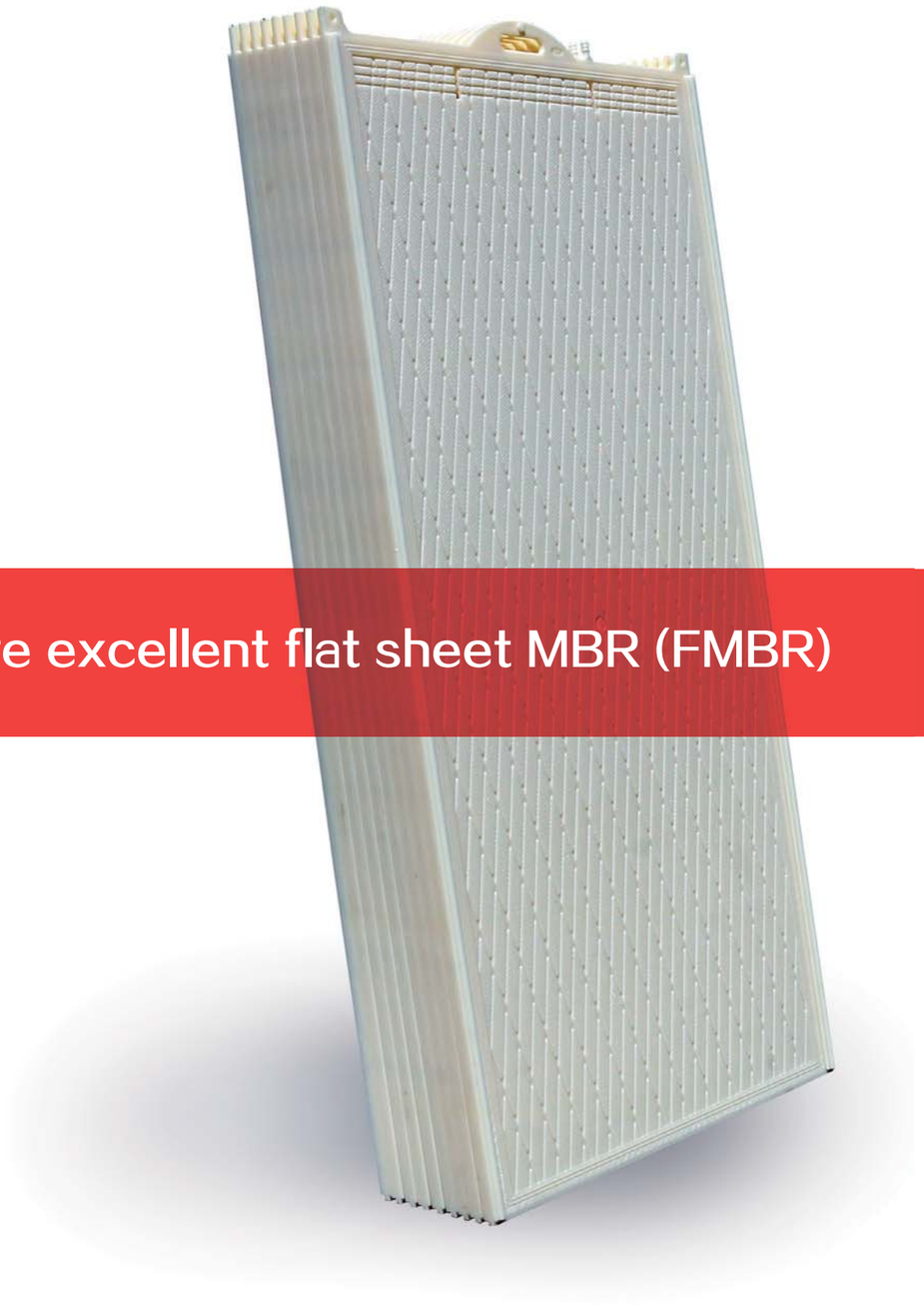
By means of introducing automatic production equipment, advanced membrane technology and raw material, carry out ISO 9001:2008 management, we can deliver more efficient membrane products for you.

## We devote to

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

## We positioning in

A professional manufacturer of membrane products used for waste water treatment.
A professional manufacturer of specialty membranes.
Offer specialty and common membrane R & D for membrane application companies.
Become a customer's unique product reserve base.



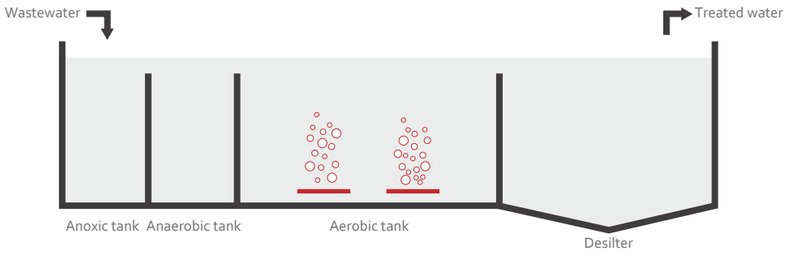
More excellent flat sheet MBR (FMBR)

# Flat sheet MBR (FMBR)

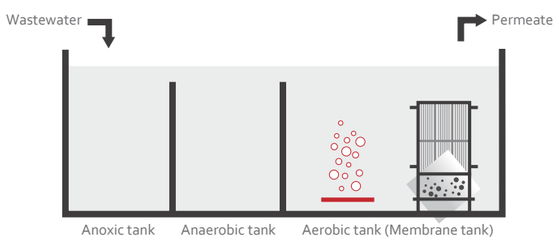
## MBR Introduction

Membrane bioreactor (MBR) is the combination of a membrane process like microfiltration or ultrafiltration with a biological wastewater treatment process and the activated sludge process. It is now widely used for municipal and industrial wastewater treatment. This bioreactor 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

Effluent high quality (low turbidity, low TSS) for regulatory or reuse purposes.
Not reliant on input water MLSS.
Longer activated sludge age and lower sludge disposal costs.
Smaller footprint.
Easy operation.



# 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 |
| Footprint | About 1/3-1/2 $m^2/(m^3.d-1)$ | About $1m^2/(m^3.d-1)$ |
| 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 |

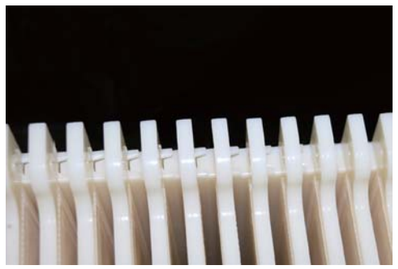
# Flat sheet MBR (FMBR)

## 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 and installed from one side without the limits of the construction site conditions.

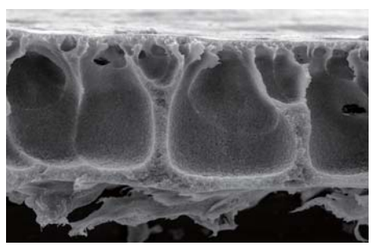
### The mortise and tenon structure

### SUN® support plate



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

### SUN® PVDF membrane electron micrograph

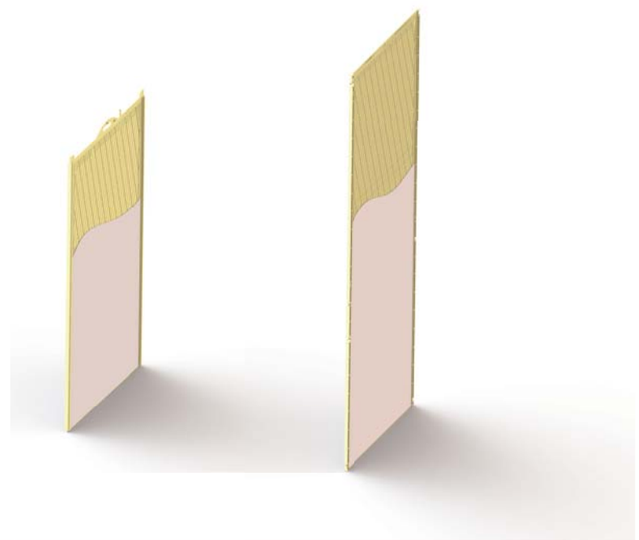


### SUN® support plate flow channel for FMBR160



# 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 (m²) | 0.8 | 1.6 |
| Weight (kg) | 3 | 5 |
| Permeate flux［l /( pc·d )］ | 320-550 | 640-1100 |
| Membrane material | PVDF | PVDF |
| Membrane pore 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 quality, there will be a different water flow rate. 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)

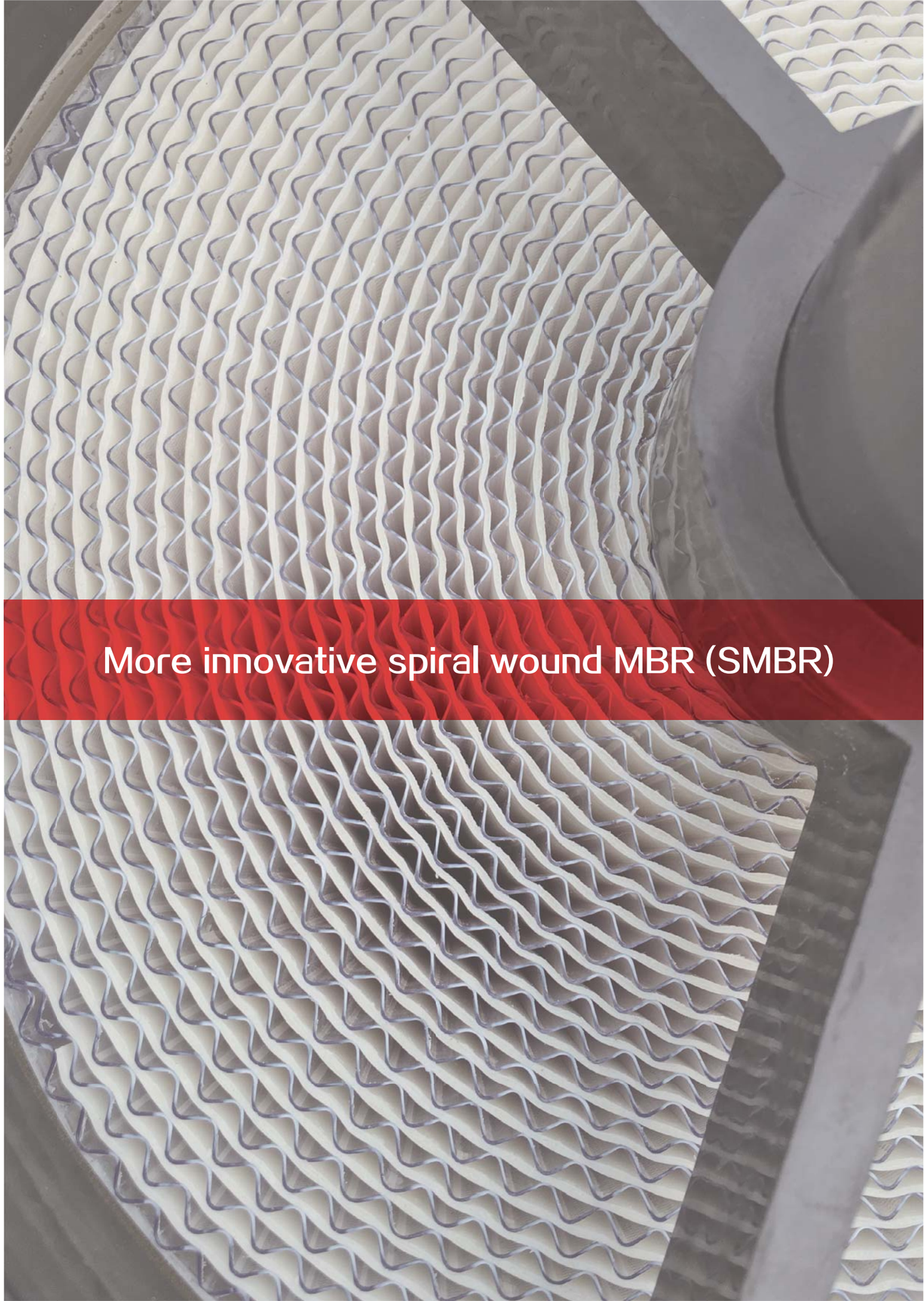
## SUN® Flat sheet MBR module

| Items | FMBR80 | | | |
|---|---|---|---|---|
| Model | FMBR80-50 | FMBR80-125 | FMBR80-250-2 | FMBR80-250-4 |
| Permeate flux(m³/d) | 16-26 | 38-65 | 150-260 | 300-520 |
| Plate qty. (pc) | 50 | 125 | 500 | 1000 |
| Membrane effective area (m²) | 40 | 100 | 400 | 800 |
| Size (mm)(L×W×H) | 820×600×1680 | 1885×600×1680 | 3720×600×2750 | 3720×600×4900 |
| Air flow rate (L/min) | 500 | 1250 | 3500 | 3500 |
| Weight (kg) | 120 | 230 | 900 | 1700 |

| Items | FMBR160 | | | |
|---|---|---|---|---|
| Model | FMBR160-50 | FMBR160-125 | FMBR160-125-2 | FMBR160-150-2 |
| Permeate flux(m³/d) | 32-50 | 75-130 | 150-260 | 180-310 |
| Plate qty. (pc) | 50 | 125 | 250 | 300 |
| Membrane effective area (m²) | 80 | 200 | 400 | 480 |
| Size (mm)(L×W×H) | 830×620×2550 | 1880×620×2550 | 1880×620×4500 | 2230×620×4500 |
| Air flow rate (L/min) | 600 | 1500 | 1750 | 2100 |
| Weight (kg) | 400 | 900 | 1700 | 2000 |

Note: We can provide a single membrane element and any size frame to meet customer's different requests.
Such as: FMBR80-175, FMBR80-200, FMBR80-200-2 (double deck), FMBR80-200-4 (four deck), FMBR160-200, FMBR160-200-2 (double deck) etc.





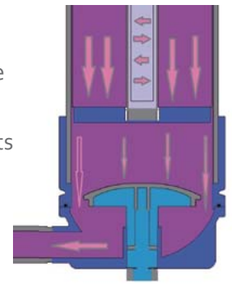
# Spiral wound MBR (SMBR)

## SMBR Introduction

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

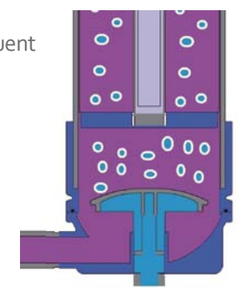
## Features

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



## Applications

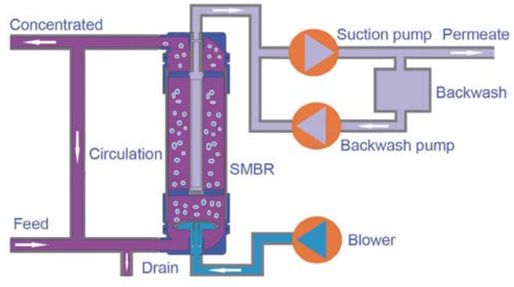
Industrial wastewater reuse
RO pretreatment
Landfill leachate pretreatment
Domestic wastewater reuse
Secondary sedimentation effluent
Removal of heavy metals
Process water
Recycled water





# Spiral wound MBR (SMBR)

## SMBR Introduction




## Comparison of SMBR and Hollow fiber membrane

### Identical

Frequent backwashing
Lower feed requirement
High recycle rate

### Difference

SMBR has lower energy costs
SMBR has no risks of filament break
SMBR has open channels to prevent solid deposition

# Spiral wound MBR (SMBR)

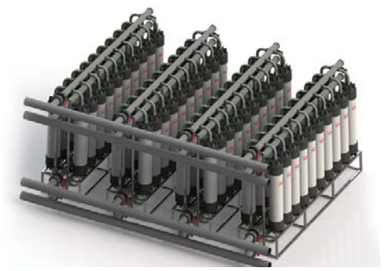
## SMBR-10040 Specifications

### SMBR-10040 Membrane element

| Items | | Completed with vessel & caps | Membrane body only |
|---|---|---|---|
| | |  |  |
| Model | | SP-SMBR-10040 | SG-SMBR-10040 |
| Membrane effective area(m²) | | 23 | 23 |
| Diameter (mm) | | 250 | 250 |
| Membrane material | | PVDF/PES | PVDF/PES |
| Membrane pore size(μm) | | 0.1 | 0.1 |
| TMP range (bar) | | 0.1-0.7 | 0.1-0.7 |
| Configuration | | Split-type | Submerged |
| Operation Pressure | Positive(bar) | 1.0 | 0.5 |
| | Negative(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 | SP-SMBR-20 | SP-SMBR-80 | SP-SMBR-160 |
|---|---|---|---|
| Element qty. (pc) | 20 | 80 | 160 |
| Membrane effective area(m²) | 460 | 1840 | 3680 |
| Permeate flux(m³/h) | 8-18 | 32-70 | 50-130 |
| Size (mm) | 3000×850×1900 | 3000×5800×1900 | 6060×2450×2600 |
| Weight (kg) | 700 | 2800 | 6000 |
| Pipe material | PVC/SUS | PVC/SUS | PVC/SUS |
| Feed flux(m³/h) | 10-22 | 38-80 | 60-150 |
| Air flow rate[l /( min·module )] | 2000 | 8000 | 16000 |





# Spacer Tube RO/NF (STRO/STNF)

## STRO/STNF Introduction

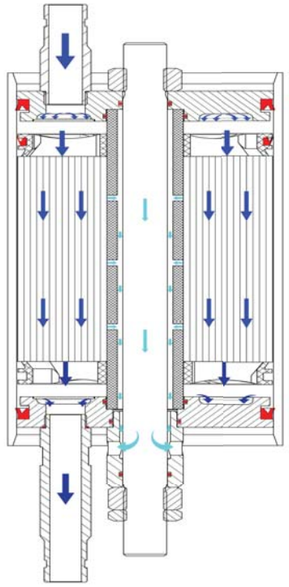
With the development of membrane technology industry, there are more and more special requirements to the performance of membrane products, such as lower feed water quality, higher pressure to increase concentration ratio, longer cleaning cycle and service life. As a result, the open channel type high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

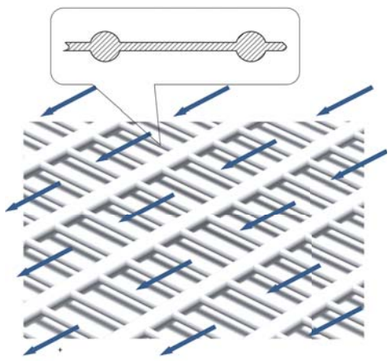
### Features

High strength and high pressure integral design
Open feed spacer enables low flow resistance and low concentration polarization
Spiral wound structure with more membrane area

### Applications

Industrial wastewater
High salts wastewater
Spiral wound RO/NF concentrates





# Spacer Tube RO/NF (STRO/STNF)

## STRO/STNF Introduction

### ST membrane module type

High pressure type
Super high pressure type

### Comparison of different membrane construction

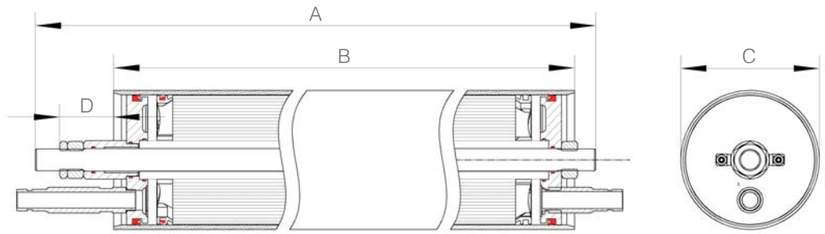
| | DT | ST | SPIRAL |
|---|---|---|---|
| Construction | Disc tube | Special spiral | General spiral |
| Feed spacer construction | Open | Trapezoid open | Diamond |
| Feed spacer thickness (mm) | 1.5 | 0.8-1.2 | 0.4-0.8 |
| Membrane area ($m^2$) | 0.45-9.4 | 25-29 | 25-41 |
| Operation pressure (bar) | 75-160 | 75-120 | 15-41 |
| Pretreatment request | ★★ | ★★★ | ★★★★★ |
| Anti-pollution capacity | ★★★★★ | ★★★★ | ★★ |

# Spacer Tube RO/NF (STRO/STNF)

## STRO/STNF High pressure membrane element specification

| Type | STRO | | STNF |
|---|---|---|---|
| Model | STRO3-8035 | STRO5-8042 | STNF2-8042 |
| Membrane sheet type | RO3 | RO5 | NF2 |
| Effective membrane area (m²) | 25 | 27 | 27 |
| Construction * | Spiral Wound Element with GRP Outerwrap,Brine Seal | | |
| Feed flux range (m³/h) | 5.5-12 | | 5.5-12 |
| Recommend flux (m³/h) | 10 | | 10 |
| Permeate flux ** (m³/d) | 23 | 24 | 25 |
| Stable rejection ** (%) | 98.5 | 99.5 | 98.0 |
| Minimum rejection (%) | 97.5 | 99.0 | 96.0 |
| Feed spacer | Special open type (Trapezoid) | | |
| Element Dry Weight(kgs) | 18 | 20 | 20 |
| Max. element pressure drop (bar) | 1.0 | | 1.0 |
| Max. operation pressure (bar) | 90 | | 90 |
| Max. operation temperature (℃) | 45 | | 45 |
| pH continuous operation | 3-11 | | 3-11 |
| pH CIP | 2-12 | | 2-12 |
| Chlorine tolerance (ppm) | ≤0.1 | | ≤0.1 |

* Brine seal to be installed in flow direction on the low pressure side/element outlet side.
** RO3 test condition: 2,000mg/l NaCl solution at 15.5bar applied pressure, 15% recovery, 25℃; RO5 test condition: 32,000mg/l NaCl solution at 55bar applied pressure, 8% recovery, 25℃; NF2 test condition: 2,000mg/l $MgSO_4$ solution at 7bar, 15% recovery, 25℃. There may have about ±15% change for individual module flow rate.
Performance specifications shown above are nominal values. Individual module permeate flow rate may vary based on inlet water condition.
Note: We could offer any membrane sheet to make ST membrane module, for example, STRO4-8035, STRO5-8035, STRO1-8042, STNF1-8042, etc.




| Model | 8035 | 8042 |
|---|---|---|
| Total tie rod length A (mm) | 1125 | 1305 |
| Vessel length B (mm) | 970 | 1150 |
| Vessel to top of frame D (mm) | 75 | 75 |
| Inlet & outlet connections (inch) | 1 inch Victaulic | 1 inch Victaulic |
| Permeate connection (mm) | 2xG3/8"-90° elbow for 9mm hose | 2xG3/8"-90° elbow for 9mm hose |

| Operation Pressure (bar) | 75 | 90 |
|---|---|---|
| Membrane module diameter C (mm) | 216 | 220 |



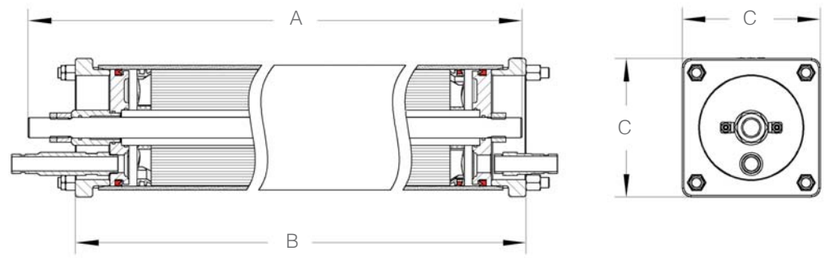
Every drop, we count.

# Spacer Tube RO/NF (STRO/STNF)

## STRO-H Super high pressure membrane element specification

| Type | STRO-H | |
|---|---|---|
| Model | STRO5-8042-H | STRO6-8042-H |
| Membrane sheet type | RO5 | RO6 |
| Effective membrane area (m²) | 27 | |
| Construction * | Spiral Wound Element with GRP Outerwrap,Brine Seal | |
| Feed flux range (m³/h) | 5.5-12 | |
| Recommend flux (m³/h) | 10 | |
| Permeate flux ** (m³/d) | 24 | 20 |
| Stable rejection ** (%) | 99.5 | 99.6 |
| Minimum rejection (%) | 99.0 | 99.0 |
| Feed spacer | Special open type (Trapezoid) | |
| Element Dry Weight(kgs) | 20 | |
| Max. element pressure drop (bar) | 1.0 | |
| Max. operation pressure (bar) | 120 | |
| Max. operation temperature (℃) | 45 | |
| pH continuous operation | 3-11 | |
| pH CIP | 2-12 | |
| Chlorine tolerance (ppm) | ≤0.1 | |

* Brine seal to be installed in flow direction on the low pressure side/element outlet side.
** RO5, RO6 test condition: 32,000mg/l NaCl solution at 55bar applied pressure, 8% recovery, 25℃, pH=8; There may have about ±15% change for individual module flow rate. Performance specifications shown above are nominal values. Individual module permeate flow rate may vary based on inlet water condition.
*** Liquid temperature should less than 30℃ at 120bar pressure.
Note: We could offer any membrane sheet to make ST membrane module, for example, STRO4-8042-H, etc.



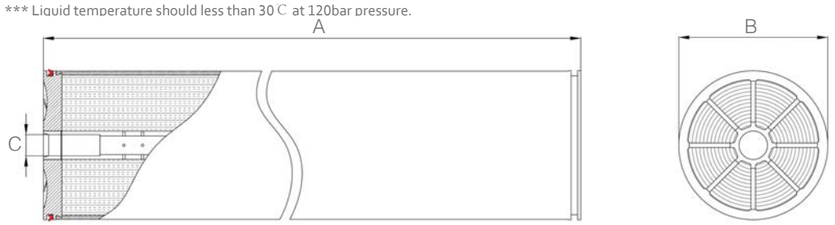

| Model | STRO-8042-H |
|---|---|
| Total tie rod length A (mm) | 1305 |
| Flange interval B (mm) | 1230 |
| Flange width C (mm) | 240 |
| Inlet & outlet connections (inch) | 1 inch Victaulic |
| Permeate connection (mm) | 2 x G3/8"-90° elbow for 9mm hose |

# Spacer Tube RO/NF (STRO/STNF)

## STRO-E Economy membrane element specification

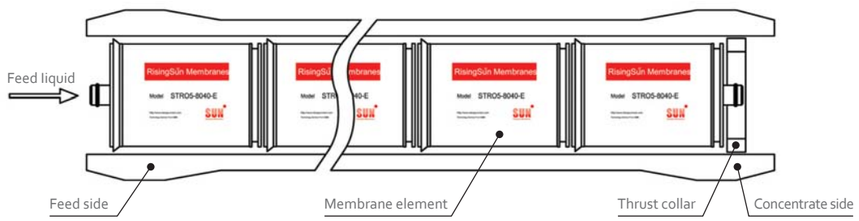
| Type | STRO | | |
|---|---|---|---|
| Model | STRO3-8040-E | STRO5-8040-E | STRO6-8040-E |
| Membrane sheet type | RO3 | RO5 | RO6 |
| Effective membrane area (m²) | 27 | | |
| Feed flux range (m³/h) | 5.5-12 | | |
| Recommend flux (m³/h) | 10 | | |
| Permeate flux ** (m³/d) | 25 | 24 | 20 |
| Stable rejection ** (%) | 98.5 | 99.5 | 99.6 |
| Minimum rejection (%) | 97.5 | 99.0 | 99.0 |
| Feed spacer | Special open type （Trapezoid） | | |
| Max. element pressure drop (bar) | 1.0 | | |
| Max. operation pressure (bar) | 90 | 120*** | 120*** |
| Max. operation temperature (℃) | 45 | | |
| pH continuous operation | 3-11 | | |
| pH CIP | 2-12 | | |
| Chlorine tolerance (ppm) | ≤0.1 | | |

Brine seal to be installed in flow direction on the low pressure side/element outlet side.
** RO3 test condition: 2,000mg/l NaCl solution at 15.5bar applied pressure, 15% recovery, 25℃; RO5, RO6 test condition: 32,000mg/l NaCl solution at 55bar applied pressure, 8% recovery, 25℃, pH=8; There may have about ±15% change for individual module flow rate. Performance specifications shown above are nominal values. Individual module permeate flow rate may vary based on inlet water condition.
*** Liquid temperature should less than 30℃ at 120bar pressure.




| | A (mm) | B (mm) | C (mm) |
|---|---|---|---|
| STRO-E | 1016 | 201 | 29 ID |

## STRO-E using diagram

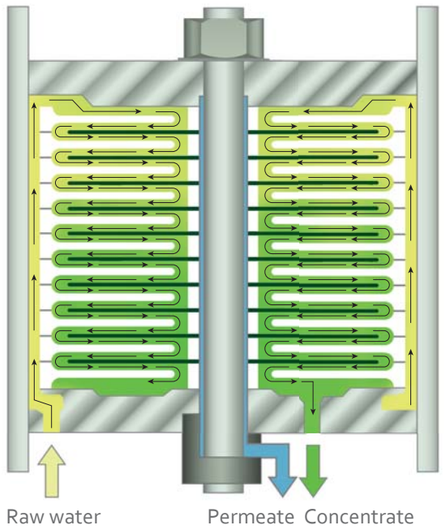





# Disc Tube RO/NF (DTRO/DTNF)

## DTRO/DTNF Introduction

Our Disc Tube membrane module includes DTRO and DTNF by using different kinds of membrane sheet. The Disc Tube module consists of membrane stacks, which are housed in an 8inch high pressure vessel and assembled on a center tie rod and using stainless steel end flanges.




### Features

High strength design, up to 160bar operation pressure
Open channel configuration enables low flow resistance and low concentration polarization
Open channel reduced risks of clogging and crystallization
High salt rejection and high recovery rates (up to 90%-95%)

### Application fields

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

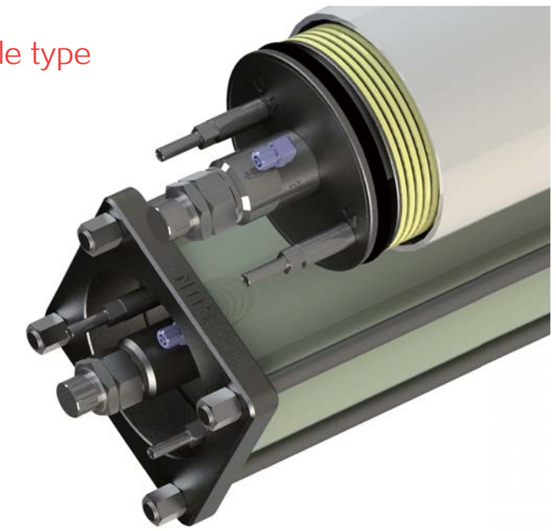


# Disc Tube RO/NF (DTRO/DTNF)

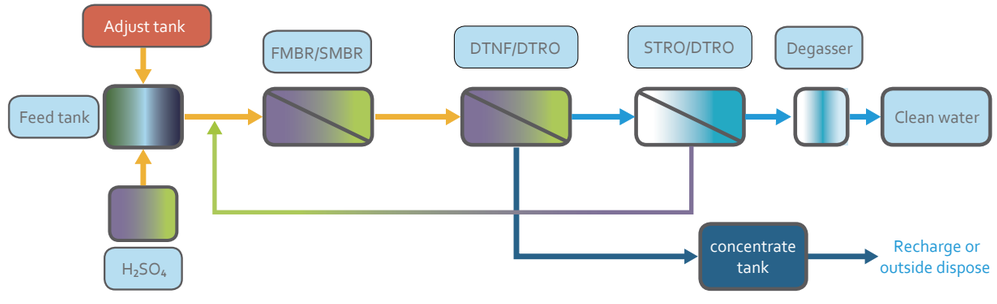
## DTRO/DTNF Introduction

### DT membrane module type

General type
High Pressure type



### A typical process diagram

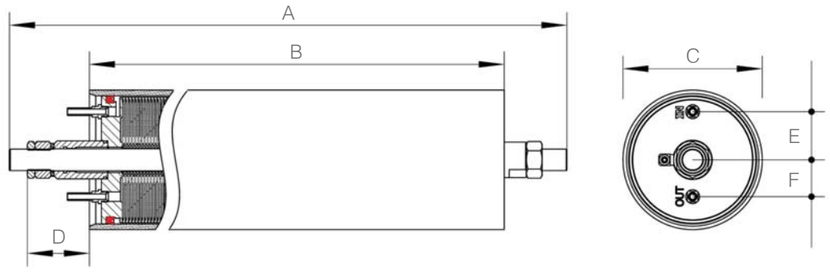


# Disc Tube RO/NF (DTRO/DTNF)

## DTRO/DTNF High pressure membrane module specification

| Type | DTRO | | DTNF |
|---|---|---|---|
| Model | SP-DTRO3-8042 | SP-DTRO5-8042 | SP-DTNF-8042 |
| Membrane sheet model | RO3 | RO5 | NF2 |
| Membrane cushion qty. | 209 | 209 | 209 |
| Membrane area (m²) | >9.4 | >9.4 | >9.4 |
| Feed flux range (L/H) | 500-1200 | 500-1200 | 500-1200 |
| Permeate flux ** (L/H) | 420 | 400 | 450 |
| Stable rejection ** (%) | 98.5 | 99.5 | 98 |
| Min. rejection (%) | 97.5 | 99 | 96 |
| Hydraulic disc material | ABS | ABS | ABS |
| Vessel material | FRP | FRP | FRP |
| Operation pressure (bar) | 75 | 90 | 90 |
| Max. element pressure drop (bar) | 9 | 9 | 9 |
| Max. operation temperature (℃) | 40 | 40 | 40 |
| Chlorine tolerance (ppm) | <0.1 | <0.1 | <0.1 |
| pH continuous operation | 3-11 | 3-11 | 3-11 |
| Chemical cleaning pH@40℃ | 2-12 | 2-12 | 2-12 |

** RO3 test condition: 2,000mg/l NaCl solution at 15.5bar applied pressure, 25℃; RO5 test condition: 32,000mg/l NaCl solution at 55bar applied pressure, 25℃; NF2 test condition: 2,000mg/l MgSO4 solution at 7bar, 25℃. Permeate flux and stable rejection may vary based on inlet water condition. There may have about ±20% change for individual module permeate flux.



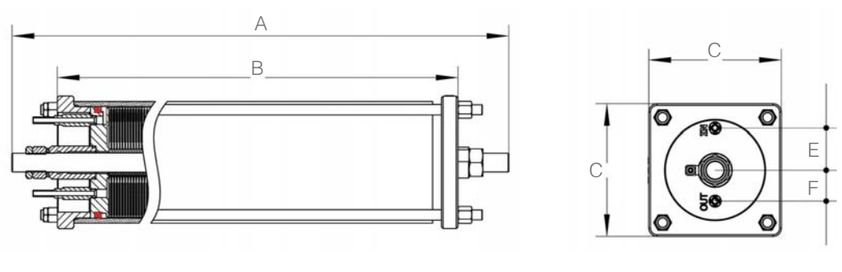

| Operation Pressure (bar) | 75 | 90 |
|---|---|---|
| Total module length A (mm) | 1400 | 1400 |
| Vessel length B (mm) | 1150 | 1150 |
| Module diameter C (mm) | 216 | 220 |
| Vessel to top of frame D (mm) | 98 | 98 |
| Inlet to flange center distance E (mm) | 76 | 76 |
| Outlet to flange center distance F (mm) | 56 | 56 |
| Inlet & outlet connections diameter (mm) | 12 | 12 |
| Permeate connection (mm) | 1 x G3/8"-90° elbow for 9mm hose | |

# Disc Tube RO/NF (DTRO/DTNF)

## DTRO-H Super high pressure membrane module specification

| Type | DTRO-H | |
|---|---|---|
| Model | SP-DTRO5-8042-H | SP-DTRO6-8042-H |
| Membrane sheet model | RO5 | RO6 |
| Membrane cushion qty. | 209 | 209 |
| Membrane area (m²) | >9.4 | >9.4 |
| Feed flux range (L/H) | 500-1200 | 500-1200 |
| Permeate flux ** (L/H) | 400 | 320 |
| Stable rejection ** (%) | 99.5 | 99.6 |
| Min. rejection (%) | 99 | 99 |
| Hydraulic disc material | ABS | ABS |
| Vessel material | FRP | FRP |
| Operation pressure (bar) | 120 | 160 |
| Max. element pressure drop (bar) | 9 | 9 |
| Max. operation temperature (℃) | 40 | 40 |
| Chlorine tolerance (ppm) | <0.1 | <0.1 |
| pH continuous operation | 3-11 | 3-11 |
| Chemical cleaning pH@40℃ | 2-12 | 2-12 |

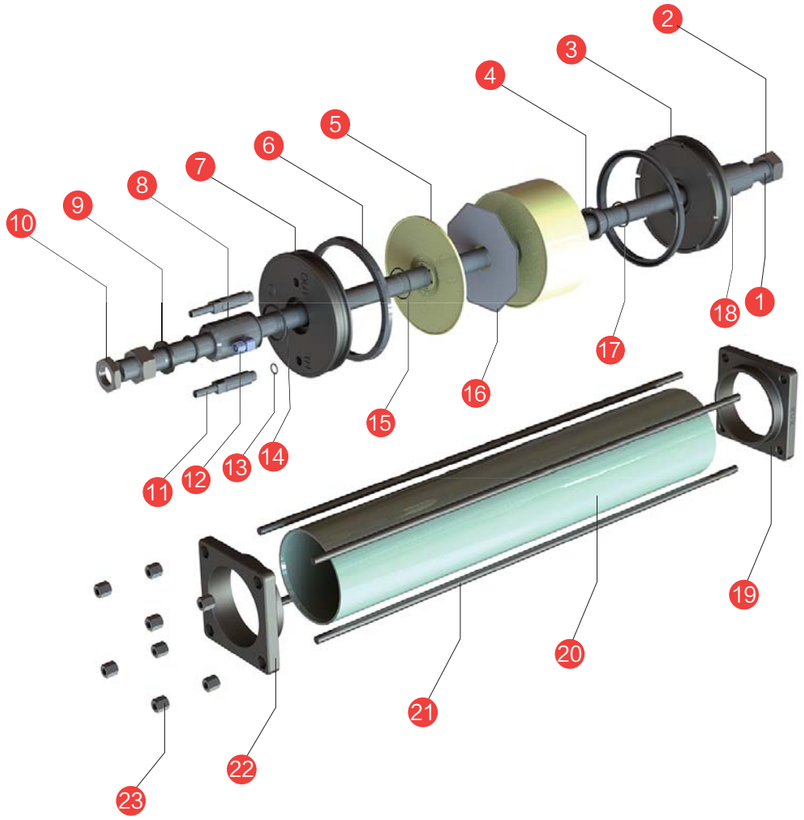
** RO5, RO6 test condition: 32,000mg/l NaCl solution at 55bar applied pressure, 25℃; Permeate flux and stable rejection may vary based on inlet water condition. There may have about ±20% change for individual module permeate flux.




| Operation Pressure (bar) | 120 | 160 |
|---|---|---|
| Total module length A (mm) | 1400 | |
| Two flanges distance B (mm) | 1225 | |
| Flange width C (mm) | 240 | |
| Inlet to flange center distance E (mm) | 76 | |
| Outlet to flange center distance F (mm) | 56 | |
| Inlet & outlet connections diameter (mm) | 12 | |
| Permeate connection (mm) | 1 x G3/8"-90° elbow for 9mm hose | |

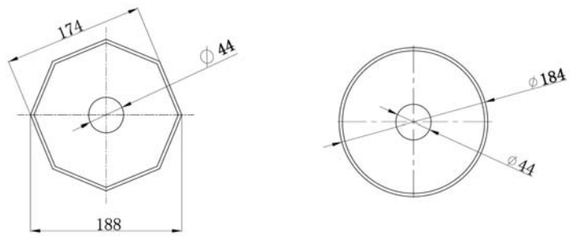
# Disc Tube RO/NF (DTRO/DTNF)

## DTRO/DTNF membrane module structure




| Item | Name | Item | Name | Item | Name | Item | Name |
|---|---|---|---|---|---|---|---|
| 1 | Tie rod | 7 | End flange | 13 | O-ring 14-2 | 19 | Reinforced top flange |
| 2 | Thick nut | 8 | Screwing tie rod | 14 | O-ring 52-4 | 20 | Membrane vessel |
| 3 | Top flange | 9 | Tie rod gasket | 15 | O-ring 48-2 | 21 | Reinforced rod |
| 4 | Distance fitting | 10 | Thin nut | 16 | Membrane cushion | 22 | Reinforced end flange |
| 5 | Hydraulic disc | 11 | Inlet/Outlet connection | 17 | O-ring 39-3 | 23 | Reinforced nut |
| 6 | Lip seal | 12 | Permeate connector | 18 | Screwing tie rod | | |

## DTRO membrane cushion dimensions






# More options for membrane sheet

# Flat sheet membrane

We offer UF, MF, NF, RO flat sheet membrane with various MWCO and chemical, and Ion Exchange Membrane sheet. All membrane derived from USA. High chemical stability, high separation efficiency, long service life, less membrane pollution.

## Membrane materials

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 resistant

| RO membrane | Stable Rejection (%) | Flux rate (LMH) | Replacement reference | Typical applications |
|---|---|---|---|---|
| RO1 | 99.5 | 45 | BW30 | Water treatment; Specific liquid concentration; Sea water desalination; Wastewater treatment; etc. |
| RO2 | 99.2 | 55 | LE | |
| RO3 | 99.5 | 50 | XFR | |
| RO4 | 99.4 | 42 | SW30 | |
| RO5 | 99.7 | 47 | SW30ULE | |
| RO6 | 99.8 | 30 | SW30HR | |

RO1, RO3 test condition: 2,000ppm NaCl, 225psi(1.55MPa), 25℃;
RO2 test condition: 2,000ppm NaCl, 150psi(1.03MPa), 25℃;
RO4, RO5, RO6 test condition: 32,000ppm NaCl, 800psi(5.5MPa), 25℃.

| NF membrane | Stable 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 | NF | |
| NF3 | ≥97.0 | 55 | NF270 | |
| NF4 | 92.0-95.0 | 50 | GE DL | |
| NF5 | ≥98.5 | 38 | GE DK | |
| NF6 | ≥90.0 | 18 | SelRO MPS-34 | |
| NF7 | 85.0-95.0 | 60 | XN45 | |
| NF8 | 60.0-85.0 | 65 | UA60 | |

NF1-NF3 test condition: 2,000ppm MgSO4, 70psi(0.48MPa), 25℃;
NF4, NF5, NF7, NF8 test condition: 2,000ppm MgSO4, 110psi(0.76MPa), 25℃;
NF6 test condition: 2,000ppm NaSO4, 142psi(1.0MPa), 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; Cell harvesting or biomass; Beverage clarification; Pretreatment for RO/NF; etc. |
| UA003 | | 3,500 | 65* | | GK | |
| UE001 | PES | 1,000 | 15** | "MICRODYN | NP030 | |
| UE003 | | 3,000 | 75** | NADIR" | 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 | | |
| | | | | PE020 | | |
| 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 | RC | 5,000 | 150 | STARIOUS | 14529 | |
| UC010 | | 10,000 | 200 | | 14539 | |
| UC050 | | 50,000 | 350 | | 14549 | |

* Test condition: 110psi(0.76MPa), 25℃; ** Test condition: 142psi(1.0MPa), 25℃;
Note: pH rang @25℃: (1)PES 0-14; (2)PS 1-14; (3)PVDF,PAN 1-12; (4)RC 3-8; (5)CA 3-8.

| MF membrane | Membrane material | Pore size (μm) | Flux rate (LMH) @ 25℃,0.35MPa | 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 | | | |

| Ion exchange membrane | Membrane character | Funcational 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 | IONAC MA-3475 | |
| AE3 | | | 1.0 | SYBRON | 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 properties

RisingSun Membrane speed up the progress through continuous investment in membrane technology research and development to improve the performance of the current products and develop new products for emerging industries. At present, we have obtained a wide range of intellectual property rights and some membrane industrial certifications.

## Trademark

RisingSun Membrane
SUN (picture)







# On site application pictures

FMBR for municipal sewage

FMBR for industrial wastewater

SMBR for alkali wastewater

SMBR container for industrial wastewater

STRO for high salt water

DTRO for leachate wastewater

FMBR container for domestic wastewater

SMBR for industrial wastewater