

E-MEM

PRODUCT MANUALS

HANGZHOU E-MEM ENVIRONMENTAL TECHNOLOGY CO., LTD.

HANGZHOU E-MEM ENVIRONMENTAL TECHNOLOGY CO., LTD.

Address: No.26 Longquan Rd, Future SCI-TECH City Hangzhou City,
Zhejiang Province, China 311121.

Tel: +86-571-86989169

Fax: +86-571-89056513

Email: info@e-mem.cn

Website: www.e-mem.cn



NSF/ISO9001:2008/14001:2004 CERTIFIED COMPANY



ULTRAFILTRATION MEMBRANE MODULE

With the excellent ability of technological innovation and the high-standard and advanced manufacturing process, Hangzhou E-MEM provides clients various membrane products with reliable quality that is featured with well fiber-strength, uniform pore distribution, very good oxidation resistance and super anti-pollution performance.

High strength and high flow rate

- Spongy-like pore structure, breaking strength is above 320g and the elongation of breaking is above 150%.
- Interpenetration net structure can reduce the filtration pressure inside of the membrane. The average pore distribution can guarantee the filtration precision of the membrane.
- Long service time and excellent anti-pollution performance.
- Membrane material is PVDF that is well-resistant to chemical washing agent.
- Material is hydrophilic and modified to guarantee the stable flow rate and good recovery ability.

UF characteristics



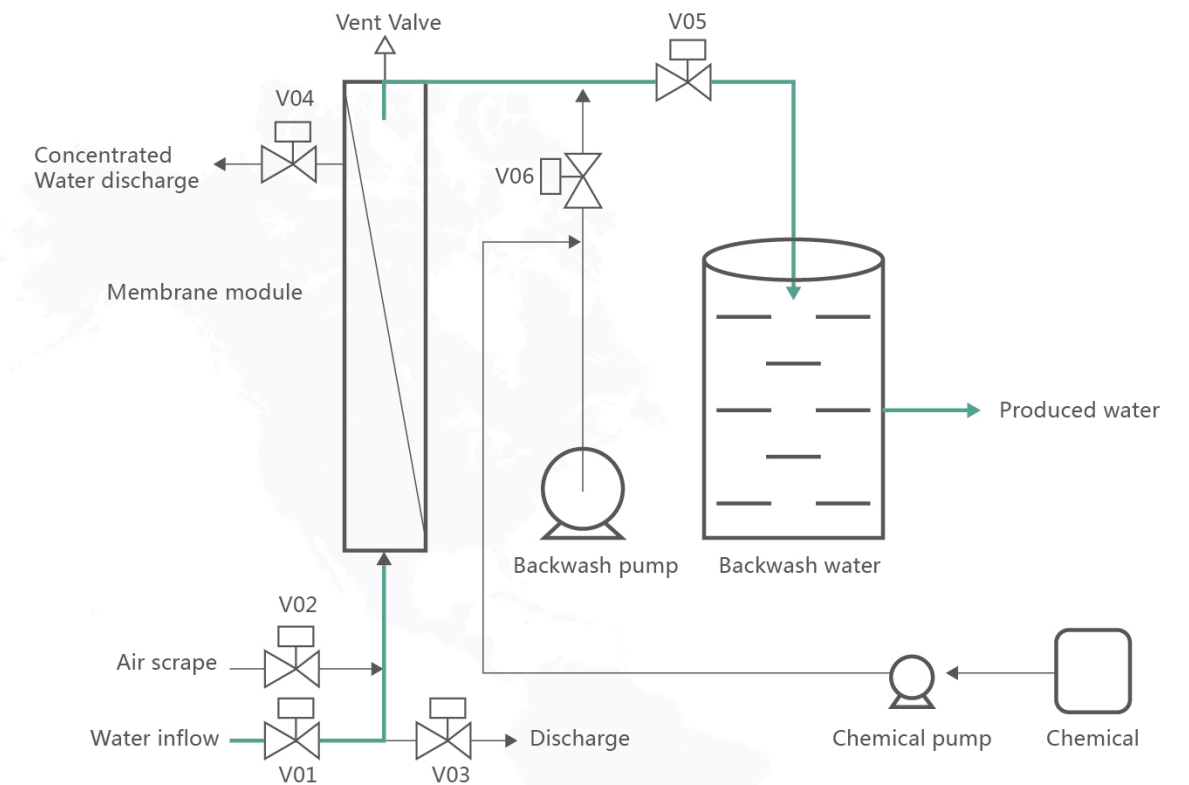
Features

- Long service time and long-term resistance to strong acid & alkali washing.
- High strength of the hollow fiber can well adapt to the harsh working condition and washing condition.
- High water production flux.
- Stable effluent quality.
- Large space for pollutant storage, which makes membrane easy washing and enhances its applicability.
- Spongy-similar pore structure, average pore distribution and high filtration precision.

UF design characteristics

- The loading density of the membrane is high.
- Supporting material is not necessary.
- Concentration polarization can be ignored.
- Good economic returns.
- Applied to various industries, especially the large scale industry. It can reduce the floor area and the construction cost and achieve to the economic membrane system design.

UF standard process flow

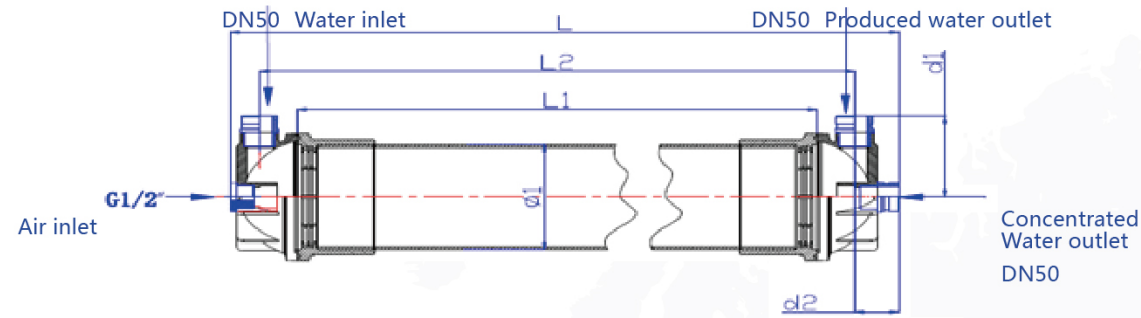


V01 Inflow valve | V02 Backwash valve | V03 Discharge valve | V04 Concentrated water valve | V05 Produced water valve | V06 Backwash valve

UF design guideline

Design flux			
Inflow water condition			Suggest design flux (L/m ² ·hr)
Inflow water source	Turbidity(NTU)	TOC(mg/L)	
Underground water	< 2	< 1	50-100
Tap water	< 3	< 2	50-75
Surface water	2~5	< 2	50-60
Surface water	5~15	< 5	40-50
Surface water	15~50	< 10	40-50
Sea water	< 20	—	50-60
Advanced treated wastewater	0~5	—	30-50

UF dimension

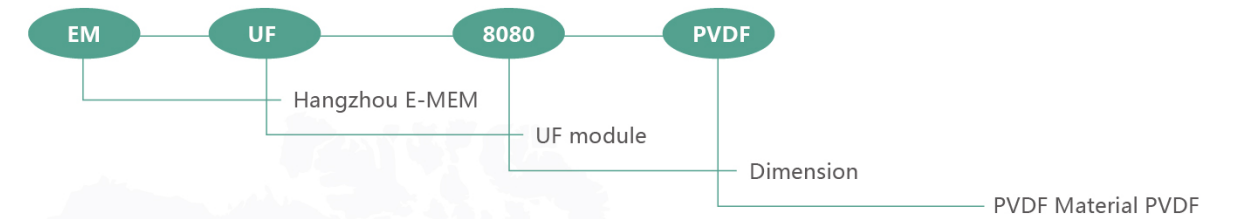


Model	Length(mm)			Space between(mm)		Diameter(mm)
	L	L1	L2	d2	d2	Φ1
EM-UF-8060-PVDF	1742.5±1.0	1496±1.0	1622±1.0	172.5±1.0	73±1.0	225±1.0
EM-UF-8080-PVDF	2242.5±1.0	1996±1.0	2122±1.0	172.5±1.0	73±1.0	225±1.0

UF specification form

① Membrane parameter			
Membrane material	PVDF	Membrane form	Out-in hollow fiber
Inner/outer diameter	0.7/1.3mm	Mean pore size	0.04um
Fiber strength	>3N		
② Module parameter			
Housing material	UPVC	Cap material	UPVC
Cap clamp material	304 stainless steel	Seal ring material	EPDM rubber
Interface connection	Coupling connection	End sealing material	Epoxy resin/PU
Pure water flux	>120L/m ² ·hr bar(25°C)		
Module model	EM-UF-8060-PVDF	EM-UF-8080-PVDF	
Area	50m ²	70m ²	
Water capacity	30L	40L	
Weight(wet)	30kg	40kg	
③ Working condition			
Operation mode	Full flow/cross flow	Working temperature	5-45°C
Max inflow water pressure	<3 bar	Working pH range	2-11
Max TMP	<2 bar	Max inflow water particle diameter	300um
Max backwash pressure	≤1.5 bar	Max tolerant concentration of NaClO	2000mg/L
Oil	<3mg/l		
④ Produced water quality			
Turbidity	≤0.15 NTU	Produced water SDI ₁₅	≤3

UF model Instruction



UF craft

Hangzhou E-MEM UF Membrane module is widely used in the field of dyeing and printing wastewater reuse, RO pretreatment(double-membrane process) and industrial wastewater treatment. E-MEM UF membrane technology center is equipped with advanced testing and analysis equipments, And has a professional technical service team to provide customers with comprehensive and diversified water quality analysis services, With convenient technical support and timely fault diagnosis for customers, we solve all kinds of complicated problems encountered to clients.

Features

- The UF process is carried out at room temperature, mild conditions and no component damage. So it is particularly suitable for the separation, classification, concentration and enrichment of heat sensitive substances such as drugs, enzymes, juices, etc.
- The UF process does not change phase, no heating, low energy consumption and no need to add chemical reagents, no pollution, It is an energy-saving and environmentally friendly separation technology.
- The UF technology has high separation efficiency, and it is quite effective for recovering trace components in a dilute solution and concentrating low concentration solution.
- The UF process adopts only pressure as the power for membrane separation, so the separation device is simple, the process is short, the operation is simple, and it is easy to control and maintain.



Application range

In recent years, the application of uf technology can be roughly divided into the following three parts:

- Advanced treatment of industrial wastewater, such as: reclaimed water, reprocessing of oilfield water, etc.
- Concentration, purification and separation of polymer solutions in the chemical, food and pharmaceutical industries, sterilization, clarification and purification of biological solutions and beverages.
- Preparation of ultrapure water and pretreatment of reverse osmosis, such as: groundwater treatment, surface water treatment, brackish water or seawater desalination pretreatment, drinking water treatment, boiler feed water treatment, etc.

TXP SUBMERGED ULTRAFILTRATION MODULE

Tianchuang Environment cooperates strategically with Dow Chemical to produce TXP submerged ultra filtration module that adopts the excellent performed hollow fiber of DOW. This product is characteristic with high permeability, low working pressure and high anti-pollution ability, which brings breakthrough to the field of municipal water and decreases greatly the operation cost and early investment for the enterprises of water recourses.

Higher operation efficiency and lower operation cost

- Upgrade greatly the recycle rate and less waste discharge by 30% at most.
- Reduce working pressure and energy consumption by 35% at most.
- Reduce washing frequency and the cost of chemical use.

Higher production rate and lower investment

- Super high flow rate. Flow rate increases by 40% at most with the same differential pressure.
- Water production efficiency increases to 120% with the same floor area.
- Reduce greatly the halting and washing time.

TXP submerged UF features



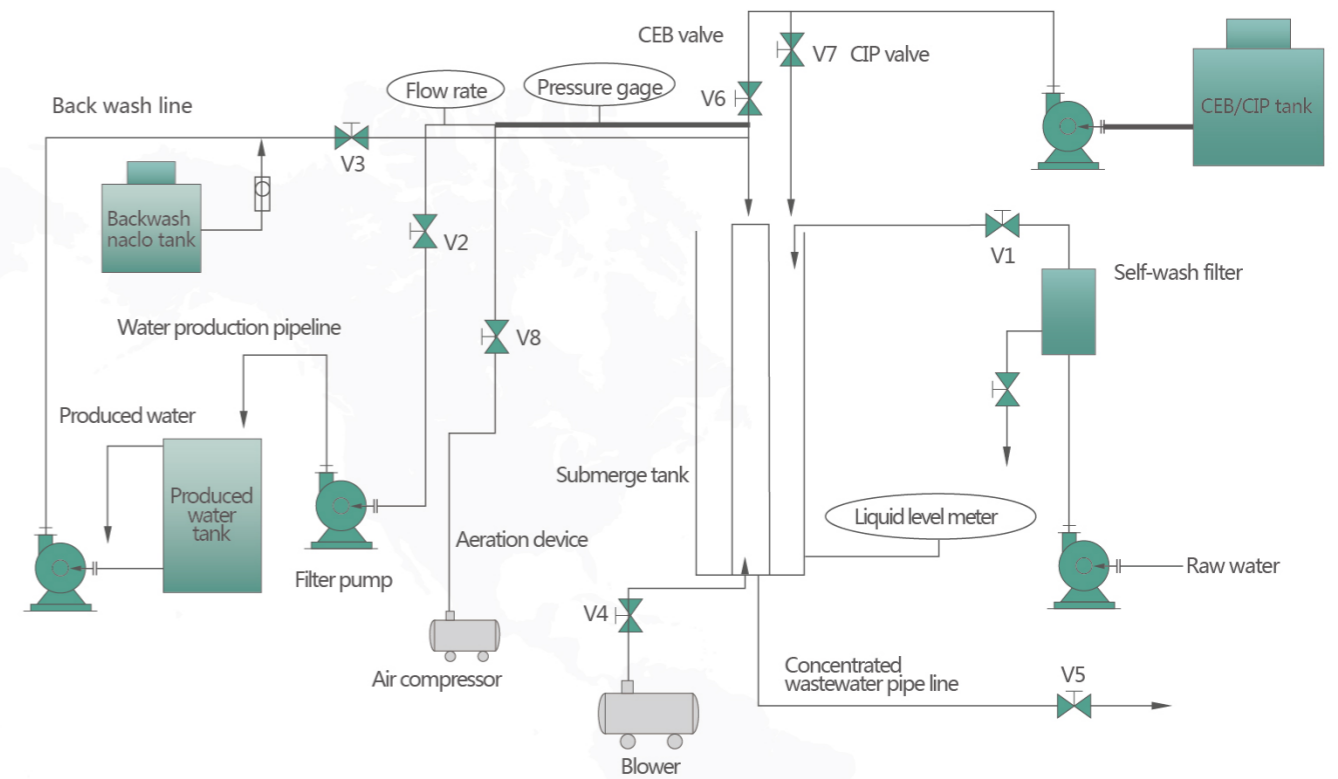
Features

- Super-high permeability and flow rate.
- Super-low permeate pressure and energy consumption. Pore size is 0.03um and distributed averagely. Water quality is guaranteed.
- Higher carrying capacity of suspended solid. Inflow water condition can be broaden.
- PVDF material. High anti-pollution performance.
- Aeration distributed averagely.
- Super-low broken rate of hollow fiber.

Structure design features

- With the pierced form of semi-open, membrane can protect from strong shaking of aeration under the complicated water environment condition.
- The damage of the hollow fiber can be avoided and the treated water quality guaranteed.
- With rhombus pierced structure that is wide horizontally and narrow vertically, the broken-rate of hollow fiber of radial direction is extremely low. Dimension of the module is gradually enlarged from the bottom foundation to the up-end cap, which makes aeration distribution more uniform. Rhombus holes of the bottom is small enough to collect the aeration together. And rhombus holes of the upper is big enough to discharge the pollutant smoothly.
- Membrane is optimized and designed with central aeration pipe, of which the shaking strength of the upper hollow fiber is magnified. Meanwhile, with the upper rhombus holes enlarged, the pollutant is easily discharged from the membrane housing.
- The rational structure design of the membrane and membrane stack makes the loading density heightened.

Standard process flow



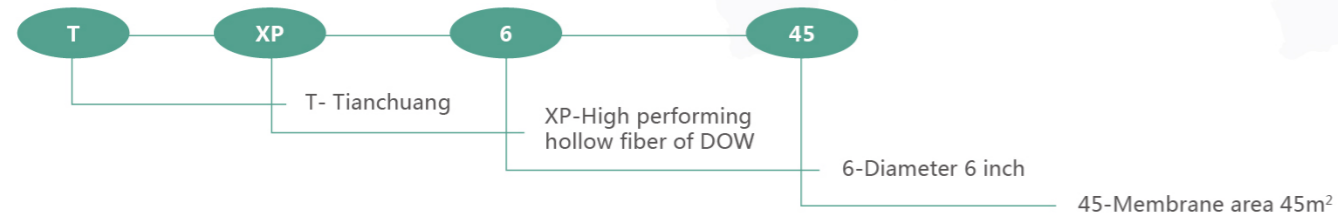
Membrane module design guideline

Raw water	Tap water	Underground water	Surface water	Surface water flocculation effluent	advanced treated industrial water	Advanced treated municipal wastewater	
Pretreatment before membrane							
300um filter screen and grid treatment							
Turbidity(NTU)	<3	1- 2	<5	5-50	1-10	2-5	
Suggested working flowrate(L/m ² ·hr)	35-55	35-55	30-50	20-40	30-50	25-35	
Operation period(min)	30-60	30-60	30-40	25-35	30-50	20-30	
Backwash air volume (Nm ³ /hr)	<2.5						
Backwash water volume (m ³ /hr)	2.0-3.5	2.0-3.5	1.5-3.5	2.0-4.0	1.5-4.0	2.0-3.0	
Maintenance wash CEB period	20-30d			1-7d			
chemical backwash dosage	2L/m ² membrane module + volume of liquid tube. Submerged in 500-900ppm NaClO						
submerge maintenance dosage	Submerged in the tank with 1000ppm NaClO solution						
recovery wash CIP period	60-90d	60-90d	60-90d	30-45d	30-60d	30-60d	
Recovery wash dosage	Chemical solution flowed into module from backwash port and meanwhile solution injected into membrane tank until membrane submerged totally.						

Specification form

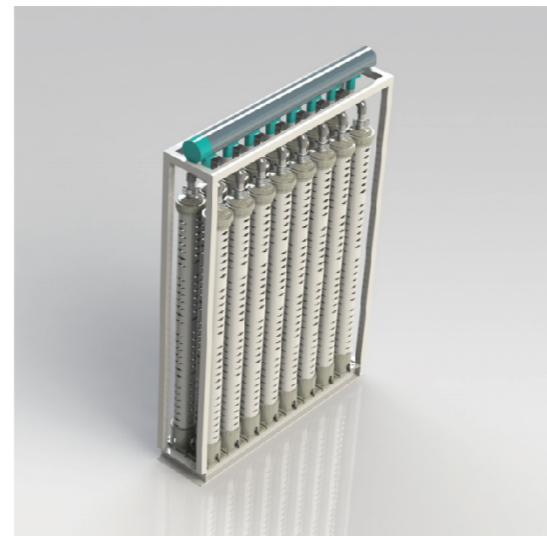
① Hollow fiber parameter			
Membrane material	PVDF	Membrane type	Out-in pressure hollow fiber
Inner/outer diameter	0.7/1.3mm	Mean pore size	0.03um
Tensile strength	≥6N		
② Module parameter			
Housing material	UPVC	End cap material	UPVC
Seal ring material	EPDM rubber	End sealing material	Epoxy resin
Area	45m ²	Dimension	Φ160xL1987
Weight (wet)	25kg		
③ Working condition			
Operation mode	Suction negative pressure	Designed flow rate	20-55L/m ² ·hr
Temperature range	5-45°C	pH range	2-11(washing1-12)
Max TMP	-80Kpa	Max backwash pressure	150KPa
Backwash flow rate	1.5-4.0m ³ /hr	Air wash flow rate	≤2.5m ³ /hr
④ Produced water quality			
Turbidity	≤0.1NTU	Produced water SDI ₁₅	≤3
Coliform	Not detected	Total bacterial	Not detected

Model no. instruction



Model no. instruction

Membrane stack	Dimension
Model-10	1400x450x3000mm
Model-16	2100x450x3000mm
Model-20	2500x450x3000mm
Model-24	3000x450x3000mm



Note

- Distance between 2 rows of membrane modules in one membrane stack is 90mm. And in the same row, 20mm between each module.
- Membrane frame structure can be customized rationally based on client's requirement.

Membrane technology

Submerged UF membrane filtration system adopts open type out-in pressure UF membrane module, which is completely submerged in the membrane tank. The liquid pressure difference is combined with the suction pump to suck the water by the negative pressure of the suction pump, and the membrane module replaces the conventional coagulation, sedimentation, filtration and other processes. It is widely used in drinking water safety, sewage treatment plant upgrading, river regulation, renewable water resources, industrial wastewater reuse, seawater desalination, etc.

Features

- The complicated pretreatment is not necessary and high concentrated suspended solid can be filtered directly by MBR that is one of the types of submerged UF that can filter the sludge with suspended solid of 10000mg/L.
- The process of submerged UF is simple and small footprint. Besides, the pipe line works cost of submerged UF is lower than the one of pressure type.
- The water produced by negative suction pressure, which is low-pressure, low energy consumption and low operation cost.
- Low-volume air-water combination backwash makes efficiency of on line backwash higher, energy consumption lower and dosage less. Besides, it can effectively remove the pollutants on the membrane surface and recovery membrane flow rate, which guarantee the stable operation.
- Modular structure and low occupation area, which is suitable for large reclaimed wastewater plant project and the promotion of pure water plant tank.



Application range

Application type	Raw water type	Produced water usage
Drinking water safety	Surface water	Drinking water purification
Large water supply plant treatment	Underground water/flocculation tank effluent	Municipal water supply treatment
Promotion of municipal wastewater	Sewage plant secondary effluent	Industry production/landscape/irrigation
Reclaimed wastewater plant	Sewage plant secondary effluent	Reclaimed wastewater
Industrial water use	Underground/surface water	Production or recycled water
RO pretreatment	Sewage plant sedimentation effluent	RO raw water

MBR HOLLOW FIBER MEMBRANE MODULE

Hangzhou E-MEM curtain-type MBR membrane is produced by NIP composite spinning technology. On the surface of the textile tube, it is the high-performance separating layer of PVDF. By optimizing the formula of separating layer and the craft of surface pretreatment, it makes the hollow fiber of MBR featured with super-high tensile strength and high separation accuracy.

High effective solid-liquid separation and interception performance

- Separation efficiency is much better than conventional sedimentation.
- Achieves absolute separation between HRT and sludge age.
- Turbidity and suspended solid value of treated water approach to zero.

Higher processing efficiency and less residual sludge.

- Remove ammonia and phosphorus by altering operation mode.
- Enhance greatly the degradation efficiency of refractory organics.
- It can achieve zero discharge of sludge theoretically.
- Decrease greatly the floor area and save more civil engineering cost.

MBR Characteristics



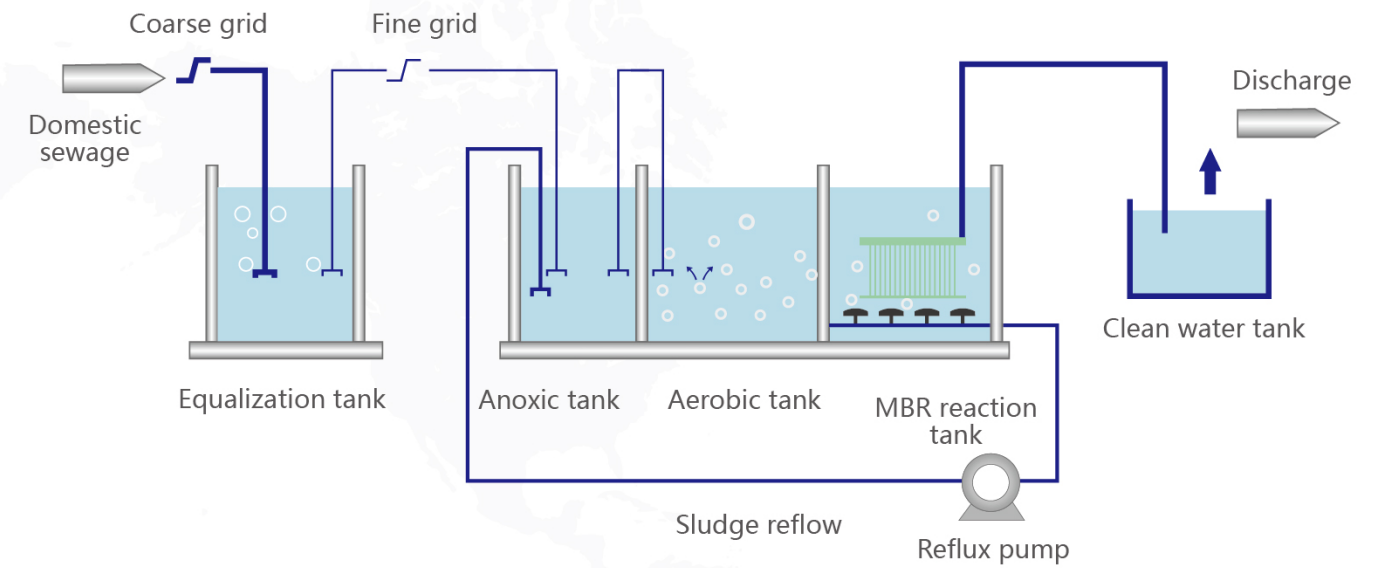
Performance features

- PVDF hollow fiber that is excellent of chemical resistance and long service time.
- Membrane pore structure is complete and distributed averagely. Excellent separation performance.
- Supporting fiber system make strength of hollow fiber greater than 200N and instant burst pressure 0.6MPa.

MBR design features

- Compact structure, easy installation and convenient application make membrane unit small footprint.
- Energy-saving design. Independent research aeration system to achieve better washing effect.
- Membrane frame is made of SUS316 stainless steel that is anti-corrosion and anti-rust.
- Various specifications are available.

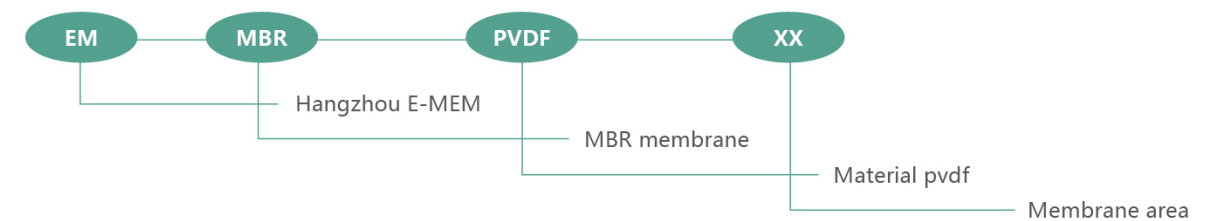
MBR Standard process flow



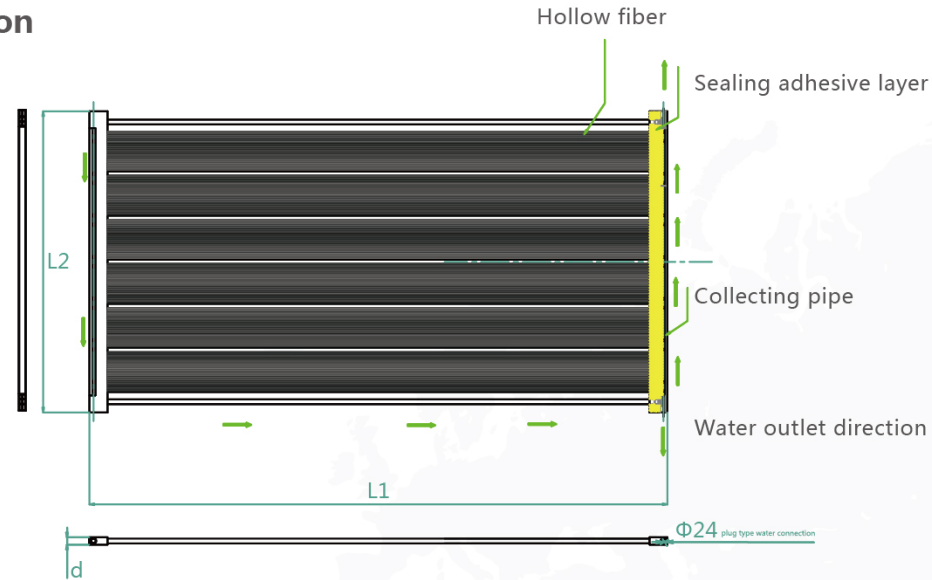
MBR design principle

Wastewater type	suggested design flowrate(L/m ² ·hr)	Note
Municipal wastewater	15-25	
Printing & dyeing, medical and other complicated industrial wastewater	8-15	
Common industrial wastewater	10-20	
Oily wastewater	10-15	< 3mg/L
Landfill leachate	5-12	pH < 8

MBR Model instruction



MBR dimension



Model(mm)	EM-MBR-15	EM-MBR-20	EM-MBR-30	EM-MBR-35
L1(mm)	1000±2.0	1200±2.0	2000±2.0	2400±2.0
L2(mm)	1250±1.0			
d(mm)	30±0.2			

MBR specification form

① Membrane specification				
Material	PVDF/PET supporting tube		Membrane type	Out-in hollow fiber
Inner/outer diameter	0.9/2.0mm		Mean pore size	0.1um
Fiber strength	>200N		Instant burst strength	>0.6MPa
② Module parameter				
Housing material	ABS		End sealing material	Epoxy glue
Pipe diameter	Φ24		Supporting pole material	SUS316
Membrane model	EM-MBR-PVDF-35	EM-MBR-PVDF-30	EM-MBR-PVDF-20	EM-MBR-PVDF-15
Effective area	35	30	20	15
Water collecting mode	Two ends collecting	Two ends collecting	Two ends collecting	Single end collecting
③ Working condition				
Operation mode	Submerged suction filtering		Working temperature	5-45°C
Max inflow water pressure	-5~-30KPa		Operating pH range	2-11
Max TMP	-50KPa		Filtration period	Depends on actual water quality
④ Produced water quality				
Turbidity	≤0.2NTU		Produced wate SDI ₁₅	≤4
Suspended solid	≤1mg/L			

MBR model instruction

Hangzhou E-MEM membrane is widely applied to enhancement of municipal sewage treatment discharge standard, printing and dyeing wastewater, medical wastewater and reclaimed wastewater reuse. E-MEM membrane center equipped with advanced test and analysis devices and owns professional technical service team, by which offer the various services like water samples analysis, technical support and fault diagnosis timely, and solve the various complicated problems for clients.

Features

- Good effluent quality, less floor area occupation and easy maintenance & installation.
- PVDF separation layer strongly combined with textile tuber to make service time longer(service time for domestic sewage can achieve 3 years). And it is cost-effective and nice appearance.
- Excellent resistance of pollution and oxidation. Easy washing. On-line washing is needed only, if the membrane maintained properly.
- MBR takes the aeration tank of conventional sewage treatment and secondary sedimentation tank as one and replaces all the process facilities of tertiary treatment, which reduce greatly the floor area and civil cost.



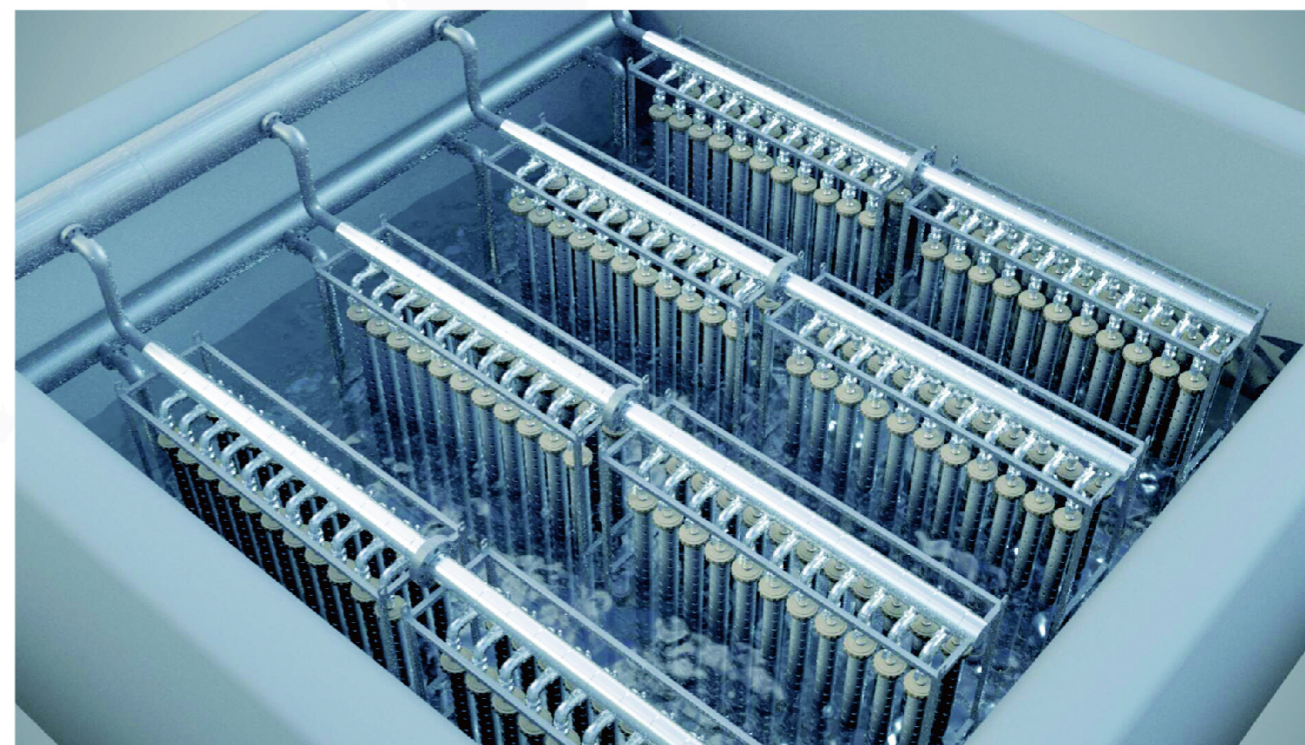
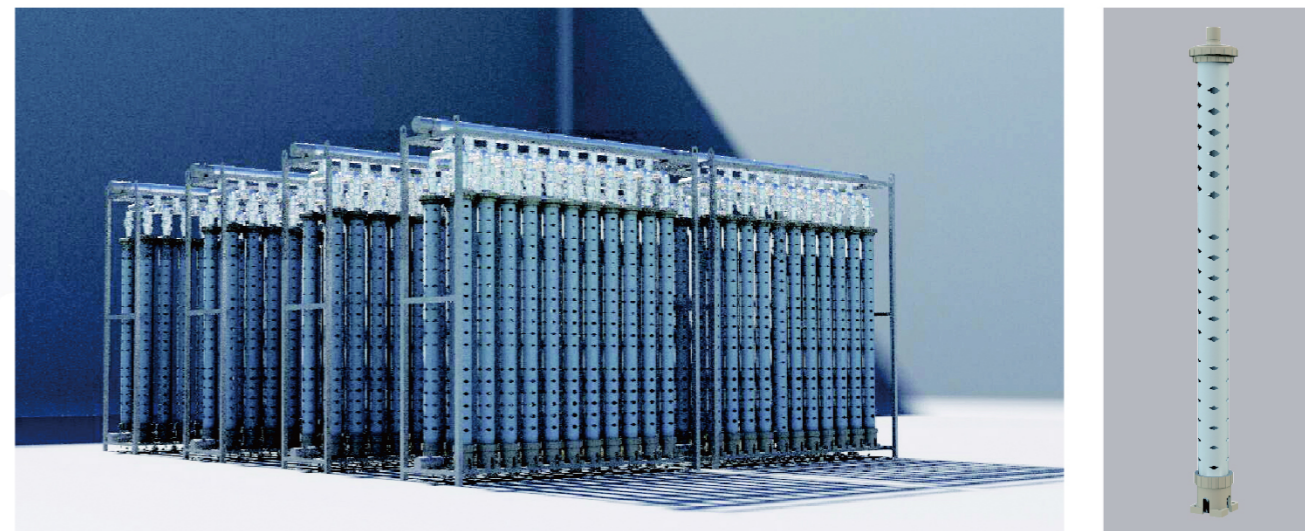
Application range

- Urban domestic sewage treatment and reuse.
- Turbidity removal from groundwater, surface water, well water, etc.
- Reverse osmosis system pretreatment.
- Industrial wastewater treatment and reuse.

Municipal wastewater treatment quality project(30,000m³/d)



Municipal water industry quality project(100,000m³/d)



Paper making industry quality project(8,000m³/d)

