

**THE
MEMBRANE
SPECIALIST**



MegaVision[®]

ABOUT US

Leading membrane partner
since 1999.

MegaVision[®]

OUR STORY

A privately owned company
Careful development over 20 years

1999

- Set up Beijing MegaVision Membrane
- China's first (world's second) producer of PV membranes technologies
- In partnership with China's leading Engineering University



清华大学
Tsinghua University

2002

- Set up of Shanghai MegaVision Membrane
- National patent for advanced permanently hydrophilic membranes HYPER™ "dry membrane technology"
- Leading hollow fiber capillaries membranes R&D and industrial manufacturer

2004

- Top 3 China manufacturer of flat sheet MBR technologies
- Preferred partner for renowned international environmental companies and membrane brands
- ISO9001 Certified

OUR STORY

2008

- Exports to Europe and USA
- Advanced patented “double-wall” membrane for ultrafiltration hollow fibers

2015~2017

- Development of reinforced hollow fiber membrane for MBR
- Development of a novel flexible flat sheet membrane for MBR

2019

- Set up of Shandong MegaVision Membrane
- China’s largest integrated manufacturer of flat sheet and hollow fiber membranes for MBR, MF, UF applications

OUR SCOPE

Membrane Equipment
Manufacturer (MEM)

Over 20 years' R&D and
manufacturing

Excellent reputation



WHOLESALE PRODUCTS:

PRODUCTS

- FLAT SHEET ROLL FOR MBR, MF, UF, NF
- FLAT PLATE FOR MBR
- HOLLOW FIBER FOR MF, UF



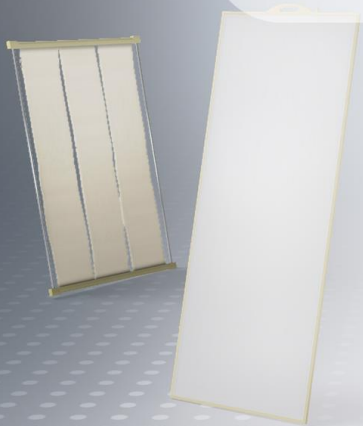
PRODUCTS

RETAIL PRODUCTS:

- FLAT SHEET MBR MODULES
- HOLLOW FIBER MBR MODULES
- UF MODULES

MEMBRANE BIOREACTOR

Flat sheet membrane
Hollow fiber membrane



UF MEGAFLUX™

Out In PVDF
In Out PS





OUR TEAM

An experienced team

- Chemical engineers
- Process engineers
- Senior manufacturing staff
- Sales & marketing
- Export & support



CERTIFICATION



Quality management system



Occupational health & safety management system

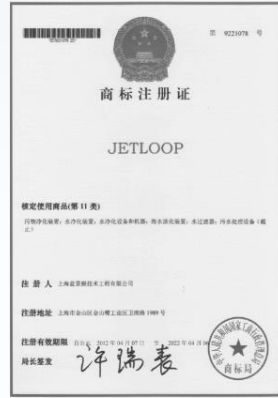


Environmental management system



American Membrane Technology Association

PATENTS



- Permanently hydrophilic polymeric membrane
- Ultrafiltration module
- Aerobic apparatus for low energy consumption



OUR NETWORK



- 2 R&D, Manufacturing and Assembly
- 5 Regional offices and Assembly
- Agents

MegaVision[®]

COOPERATE

And many more...

Hyflux



Culligan Water



OUR FACTORIES

Fully equipped laboratory

Research & Development

High quality control



OUR FACTORIES

China's largest Flat sheet membrane plant

4 million sqm per year capacity

Fully automated - Max width 1070mm

High coating precision – 2~4 micron



OUR FACTORIES

Automated welding lines

Hot & Hypersonic welding

Up to 1600 welded plates per days



OUR FACTORIES

48 capillaries hollow fiber
spinning lines

2.5 million sqm per year
capacity



OUR FACTORIES

High purity process

High capacity polymer blending

All imported raw materials (Japan,
Taiwan, EU)



HYPER™ MEMBRANE

PERMANENTLY HYDROPHILIC

The advanced hydrophilic properties of the MegaVision membranes will not be lost regardless of light exposure, drying & weather variations

Best membrane performances

- High anti-fouling
- Steady flux
- Dry technology
- High flux

HYPER™ FMBR

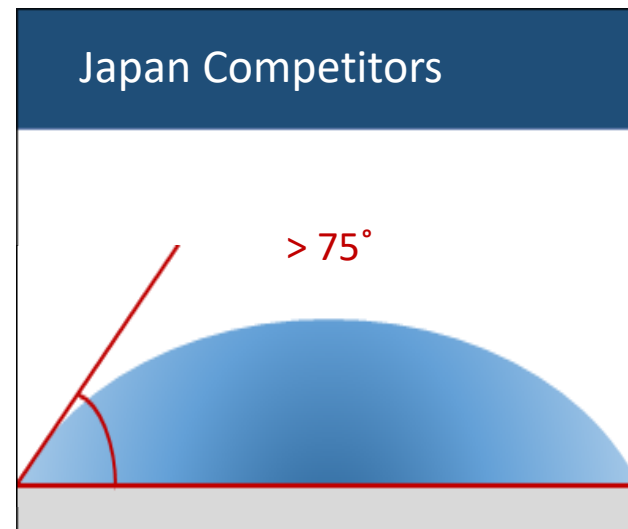
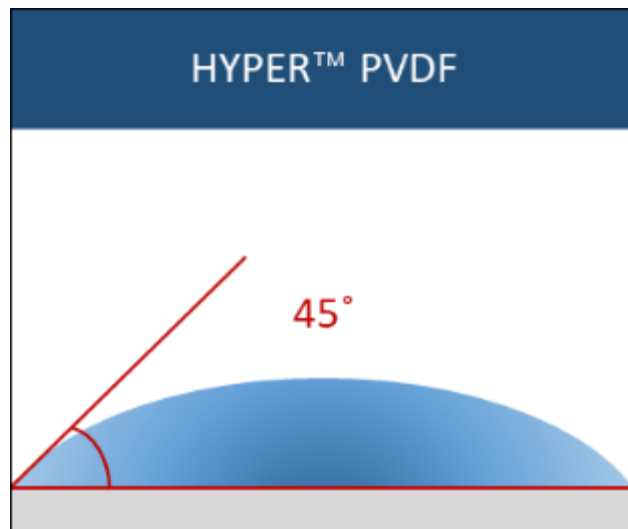
SMALL WCA = HIGH WETABILITY

MegaVision membranes boast the best water contact angle properties ensuring high flux and stability



HYPER™ FMBR

A superior material for MBR applications
High filtration performance



**Source: As tested by the European Membrane Institute (EMI - University of Twente)
– Accreditation for European public tenders.*

HYPER™ FMBR

A superior material for MBR applications

PVDF: High strength & high elongation

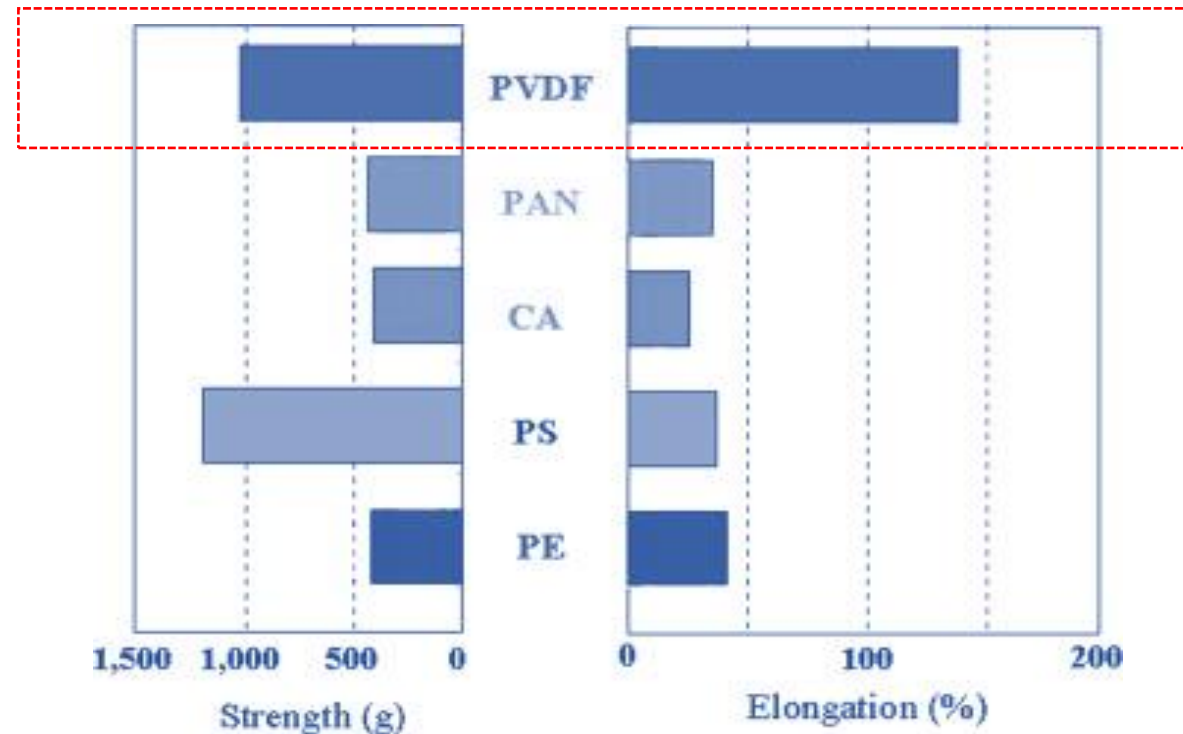
Membrane	Material	Technology	Pore Size µm	WCA °
Competitor Brand	Chlorinated PE	Wet Technology Non-permanent hydrophilic	0.4	78.4 ±4.4
MEGAVISION	PVDF	Dry Technology permanent hydrophilic	0.04 / 0.2	45 ±1.2

*Extract from Report of the European Membrane Institute (EMI - University of Twente), and Lappeeranta University of Technology.

HYPER™ FMBR

A superior material for MBR applications

PVDF: High strength & high elongation



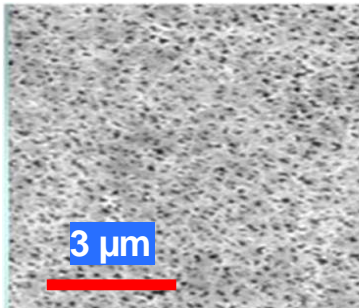
Summary of polymer properties (Pearce, 2007; The MBR Book, 2011)

HYPER™ FMBR

A superior material for MBR applications

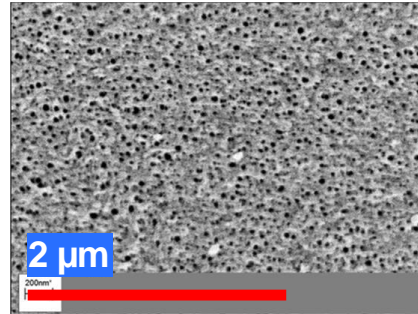
Excellent pore size distribution

MegaVision



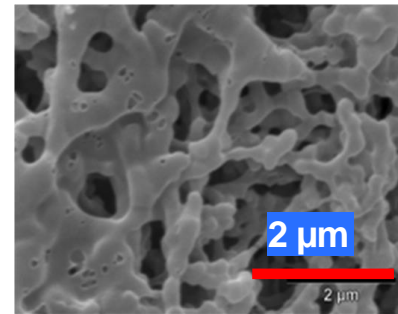
- Avg. Pore: 0.2 μm
- Avg Pore: 0.04 μm
- PVDF
- Asymmetric
- Coated on support

SUEZ



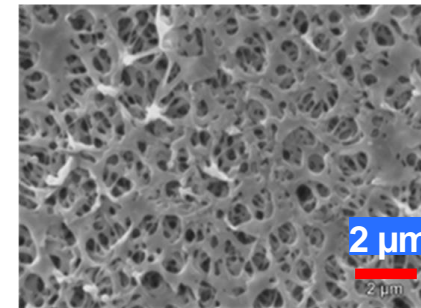
- Avg. Pore: 0.03 μm
- PVDF
- Asymmetric
- Coated on a support

Kubota



- Avg. Pore: 0.4 μm
- Chlorinated PE
- Symmetric
- Coated on support

Mitsubishi



- Avg. Pore: 0.2 μm
- PVDF
- Asymmetric
- Coated on support

A row of industrial MegaVision flat MBR membrane bioreactors in a factory setting. The units are stainless steel, rectangular, and arranged in a line. Each unit has a large, flat membrane panel on the front. The units are supported by a metal frame with diagonal bracing. The floor is green. A blue banner is overlaid on the image, containing the text 'FLAT MBR MEMBRANE BIOREACTOR' and the MegaVision logo.

FLAT MBR MEMBRANE BIOREACTOR

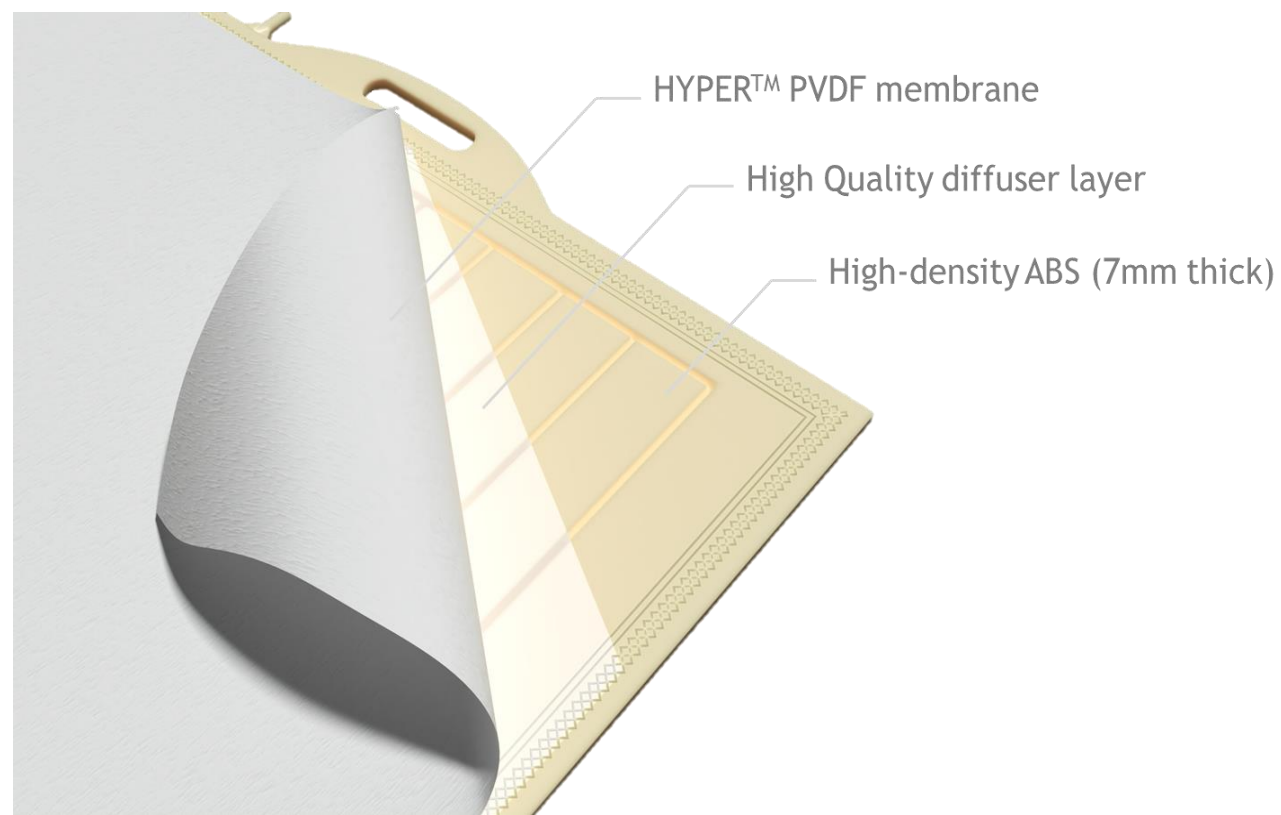
MegaVision[®]

MEGAPACK™ FMBR-A Series

PROVEN DESIGN

ROBUST ABS SUPPORT

HIGH PACKING - 7mm PLATE

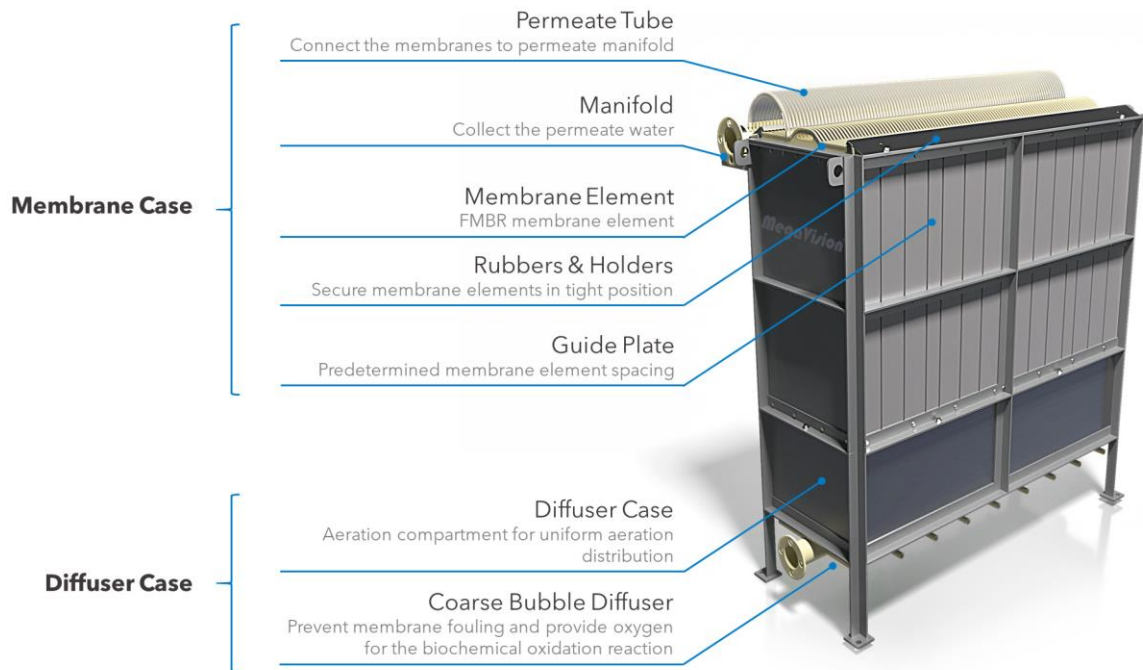


FMBR A Series

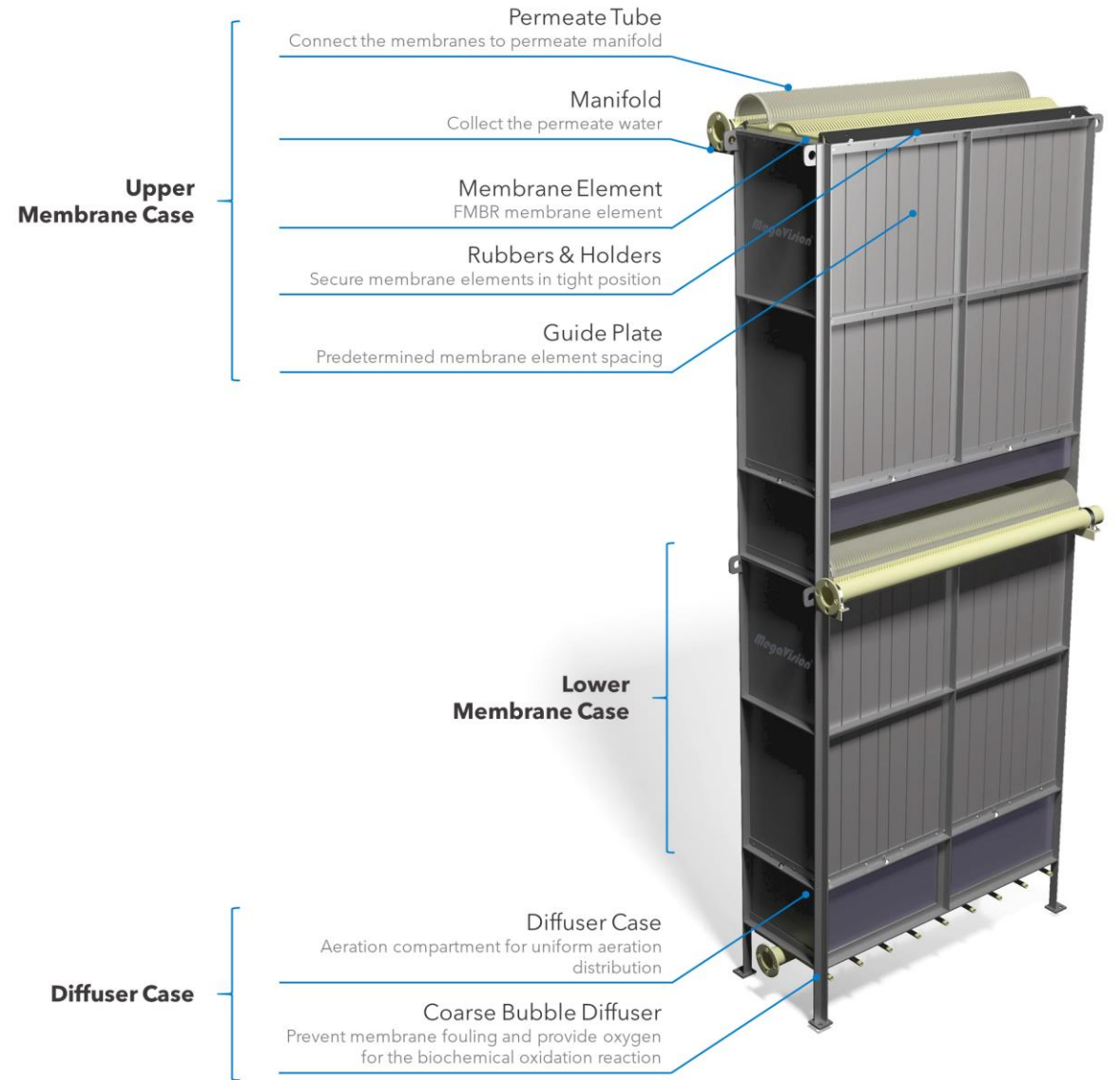


Model (Panel)	Unit	FMBR-A80	FMBR-A100	FMBR-A150
Effective membrane area	m ²	0.8	1	1.5
Dimensions w×h×t	mm	490x1,000x7	518x1,160x7	490x1,750x7
Weight	Kg	2.8	3.5	5.6
Design permeate flux*	L/Panel/day	350~480	400~600	600~900
Aeration rate**	L/Panel/min	≥8	≥10	≥12
Membrane material	-	Hyper™ PVDF / Hyper™ PES		
Membrane pore size	μm	0.22 / 0.03 (150K Da)		
Reinforcement frame	-	ABS		
pH range	-	3~12		
Temperature Range	°C	5~40		
MLSS	mg/L	5,000~15,000		
Permeate turbidity	NTU	<1		
Permeate suspended Solid	SS	≤5		

MEGAPACK™ FMBR



SINGLE DECK



DOUBLE DECK



HOLLOW MBR MEMBRANE BIOREACTOR

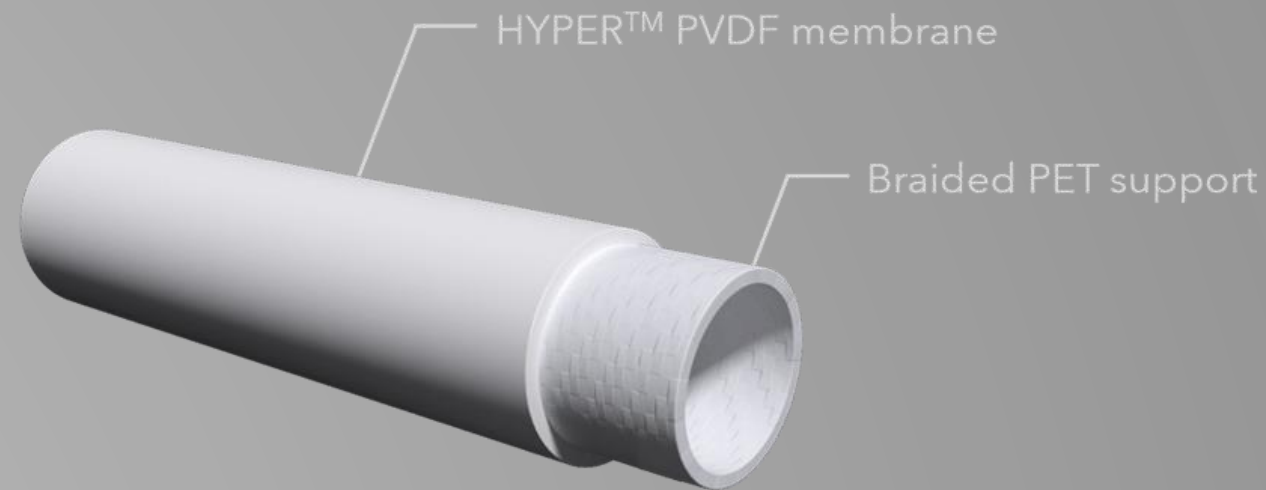
MegaVision[®]

REINFORCED HYPER™ HMBR

MAXIMUM STRENGTH

BETTER LONGEVITY

FAILURE PROOF



REINFORCED HOLLOW FIBRE

REINFORCED HYPER™ HMBR

STRENGTH > 700 Newtons

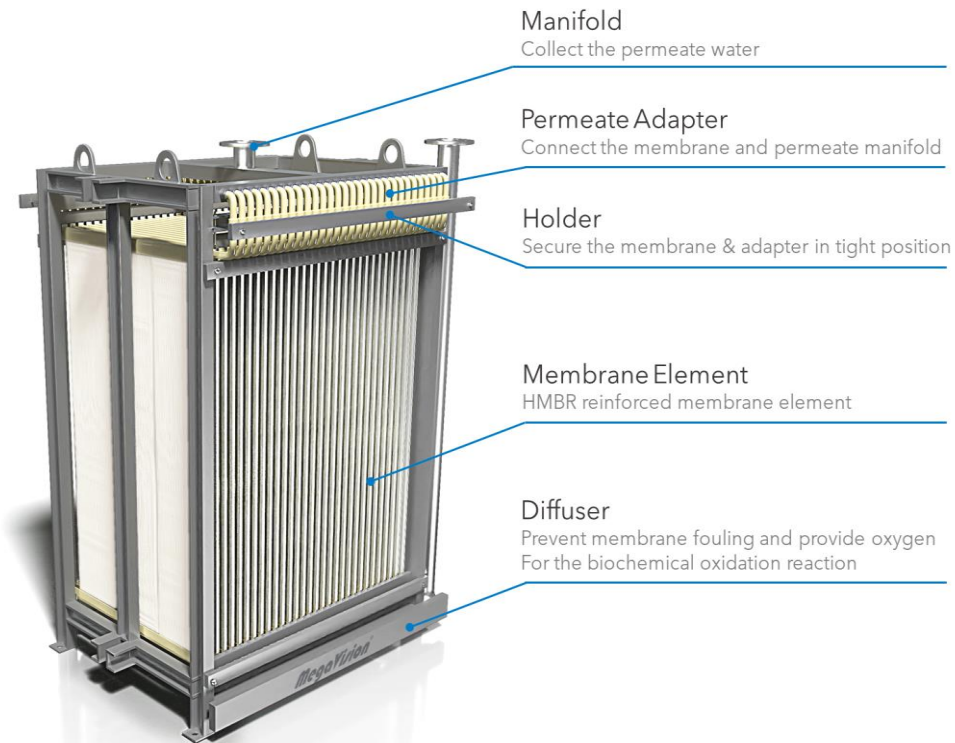


HMBR Series



Project	Unit	Specifications				
Element model	-	MB25	MB15	MA15	MA10	MA06
Nominal membrane area	m ²	25	15	15	10	6
Element size (D×W×H)	mm	30×1,250×2,000	30×1,250×1,300	45×610×2,000	45×610×1,200	45×610×800
Dry weight	kg	Approx. 15	Approx. 10.5	Approx. 8	Approx. 5	Approx. 3.8
Permeate collection pipe		φ24×2 u shape water collection		φ20.5×2 fast screw		
Design flux	m ³ /(day.pc)	5 ~ 10	3 ~ 6	3 ~ 6	2 ~ 4	1.2 ~ 2.4
Hollow fibre material	-	Hyper™ PVDF / Hyper™ PES				
Pore size	μm	0.22 / 0.03 (150K Da)				
Fibre size ID / OD	mm	2.0 / 2.5				
Collection water pipes	-	ABS				
Module	-	SUS304				
Filtration type	-	Immersion suction filtration (outside-inside filtration)□				
Operating pressure	MPa	-0.01~-0.05				
TMP	MPa	Initial pressure difference -0.015 MPa or above				
Max TMP	MPa	0.03				
Temperature	°C	5 ~ 40				
pH range	-	3 ~ 12				
MLSS range	mg/L	Recommended: 4,000 ~ 12,000 (min: 3,000, max: 15,000)				


MEGAPACK™ HMBR



MB Series – 25m²



MC Series – 30m²

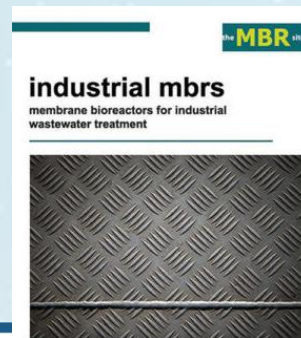
A photograph of a large industrial facility, likely a membrane manufacturing plant. The image shows a complex structure with white metal frames, yellow safety railings, and various pipes and equipment. The scene is dimly lit, suggesting an indoor industrial environment. The text 'LEADING MEMBRANE MANUFACTURER' is overlaid in large, bold, white capital letters on the right side of the image.

LEADING MEMBRANE MANUFACTURER

REFERENCES

SIMON JUDD & INDUSTRIAL MBRs

- MegaVision in the **Industrial MBRs** book. Case study on pharmaceutical MBR
- Prof. Judd joined MegaVision' China seminar on novel membranes in 2011



Simon Judd

Chapter 4 MBR technologies

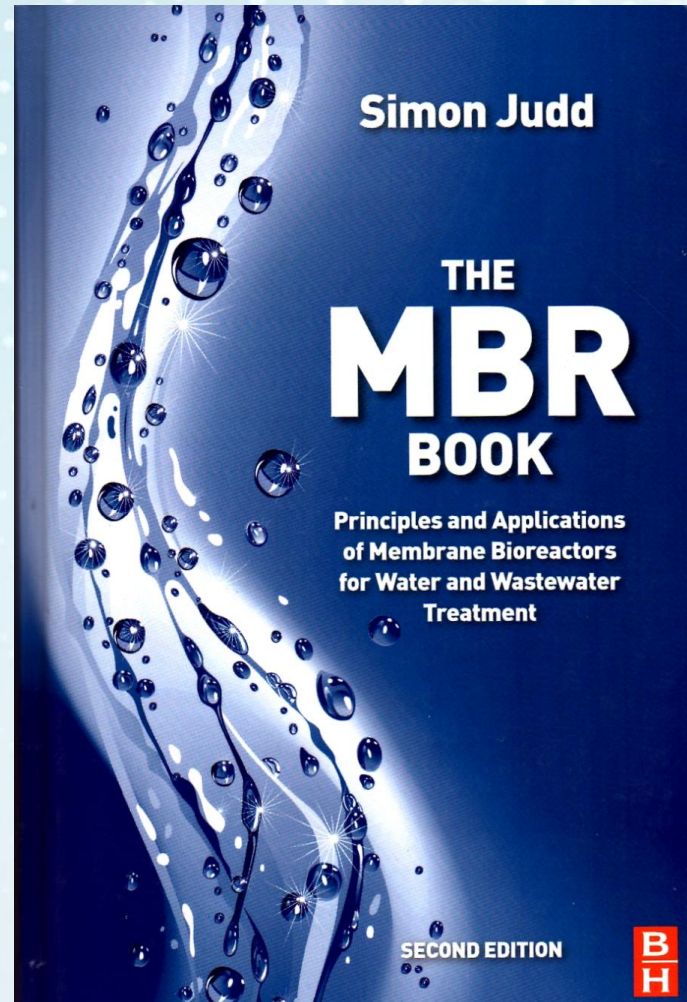
4.1.14 MegaVision

Shanghai MegaVision Membrane Engineering & Technology Co., Ltd offers both HF and FS membranes, first introducing its PVDF membrane FS panel (Table 4-14) for MBR duties in 2006. The product is based on a conventional rigid panel and has been employed for various regional industrial effluent treatment applications. The latter have included a number of pharmaceutical effluent treatment plants located in Zhejiang province, in conjunction with the *Jet-Loop System*® (of Valorsabio, Portugal) for enhanced oxygen transfer technology. **As of May 2014 the total installed capacity provided by all MegaVision FS membranes (the FMBR and RMBR ranges) was around 255 MLD, 4% of this relating to industrial installations.**



Shanghai MegaVision directors, lead engineers, Dr. Antonio Ferreira, with Prof. Simon Judd at the 1st China MBR seminar hosted by MegaVision Membrane in 2011.

THE MBR BOOK



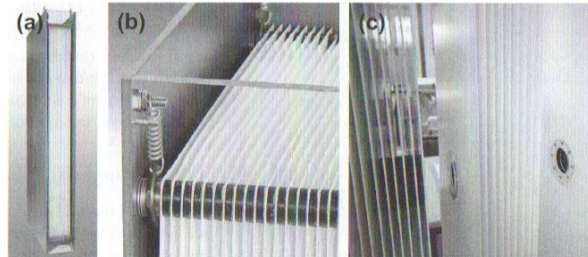


FIG. 4.15 The MICRODYN-NADIR *BIO-CEL*[®]: (a) cassette; (b) spring mounting; and (c) central ports for permeate manifold.

high. At 241 m² per m² footprint, this module provides the highest membrane area per unit area footprint of all the FS products with one of the lowest recommended SAD_m values: 0.21–0.4 Nm³/(m² h) for the *BC400* compared with 0.3–0.6 for the *BC100*.

The product has been trialled at the University of Darmstadt as well as at other sites, and a 20-MLD MBR plant at Ji'an in China is to employ the technology.

4.2.11. Shanghai MegaVision

Shanghai MegaVision Membrane Engineering & Technology Co., Ltd is a small membrane manufacturing company which commercialized its FS membrane product in 2006. The company provides a 1-m² FS membrane product based on both PVDF and PES and with pore sizes of 0.1 and 0.3 μm. The panels, which are based on a PVC frame, are 930 mm high × 610 mm wide × 16 mm thick (including the panel separation) with a single permeate extraction port. The single-deck modules (Fig. 4.16a) are available as 100 and 150 panel units, and the recommended aeration value is 0.75 Nm³/(m² h).

4.2.12. Shanghai Sinap

Shanghai Sinap was co-founded by the Shanghai Institute of Applied Physics and Shanghai Filter Co., Ltd. The company provides 0.1 μm pore size PVDF membrane panels of four different sizes, the two largest being 0.8 and 1.5 m² in membrane area. The dimensions of these two panels are 1000 mm × 480 mm × 7 mm and 1800 mm × 510 mm × 10 mm, spaced by 7 mm in the stainless steel frame module (Fig. 4.16b) which holds 150 panels. The technology, which has a minimum recommended SAD_m of 0.72 Nm³/(m² h), has

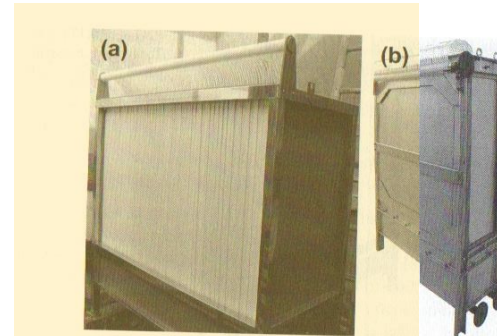


FIG. 4.16 The MBR modules of: (a) Shanghai MegaVision (b) Shanghai Sinap.

apparently been applied to oil-bearing, laundry and pharmaceutical wastewaters, as well as landfill leachate and domestic sewage with one single application employing 13,500 m² of membrane.

4.2.13. Toray

Toray is an established Japanese membrane manufacturer of some 30 years standing, specializing principally in reverse osmosis (RO) membranes for pure water applications. The company launched its FS MBR membrane product in 2004, now registered as *MEMBRAY*[®] in most regions of the world. The membrane material used is 0.08 μm PVDF, with a standard deviation of 0.03 μm. It is reinforced with a polyethylene terephthalate (PET) non-woven fibre and mounted on an ABS support, into which a number of 1–2 mm permeate channels are cut. Permeate is extracted via a single outlet tube. The panel (*TSP-50150*, Fig. 4.17a) has dimensions of 515 mm by 1608 mm, providing a membrane area of 1.4 m², and is 7.5 mm thick, with a panel separation of 6 mm. A smaller panel of 515 mm × 1059 mm also exists, its use being apparently limited to applications where height is strained (such as on board ships).

Panels are assembled in a stainless steel frame to form modules ranging from 45 m² total membrane area (50 panels, *TM90-050S* module, Fig. 4.17b) to 140 m² (100 panels, *TMR140-100S* mod). The modules can then either be doubled in width (*TMR140-200W* module) or stacked (*TMR140-200D* module) to form larger modules. The *T140-100S* module has dimensions of 1620 mm long, 810 mm wide and 21 mm high. A design flux of 33 LMH is assumed (though the quoted range is between 8.3 and 62.6 LMH for peak operation), along with a maximum MP of 0.2 bar. The

THE MBR BOOK

TABLE 4.5 Summary of commercial MBR membrane module products (adapted from Santos & Judd, 2010)

	Immersed (iMBR)	Sidestream (sMBR)
Flat sheet	Hollow fibre	Multitube/multichannel
A3 – <i>MaxFlow</i> ^{DE} Agfa-VITO ^{BE} Alfa Laval – <i>Hollow Sheet</i> ^{SE} Brightwater – <i>MEMBRIGHT</i> ^{IRL} Colloide – <i>SubSnake</i> ^{NIR} Ecologix – <i>EcoPlate</i> TM , <i>EcoSepro</i> TM CN Huber – <i>VRM</i> [®] ; <i>ClearBox</i> [®] , <i>Biomem</i> ^{DE} Hyflux – <i>Petaflex</i> ^{SG} Jiangsu Lantian Peier Memb. Co. Ltd ^{CN} LG Electronics – <i>Green Membrane</i> ^{KR} Kubota – <i>ES/EK</i> ^{JP} MICRODYN-NADIR – <i>BioCel</i> [®] DE Pure Envitech Co., Ltd. – <i>ENVIS</i> ^{KR} Shanghai Megavision Memb. Engng. and Technol.Co., Ltd ^{CN} Shanghai SINAP Membrane Science & Technology Co., Ltd. ^{CN} Toray – <i>MEMBRAY</i> [®] <i>TMR</i> ^{JP} Suzhou Vina Filter Co. – <i>VINAP</i> ^{CN} Weise Water Systems GmbH – <i>MicroClear</i> [®] DE Other developing technologies Inge – <i>Fish</i> ^{DE} IWHR ^{DE}	Asahi Kasei – <i>Microza</i> TM JP Beijing Origin Water Technology Co. CN Canpure – <i>Canfil</i> ^{CN} Ecologix – <i>EcoFlon</i> TM , <i>EcoFil</i> TM CN ENE Co., Ltd. – <i>SuperMAK</i> ^{KR} GE Zenon – <i>ZeeWeed</i> [®] US Hangzhou H-Filtration Mem. Technol. & Engng Co., Ltd. – <i>MR</i> ^{CN} Koch Membrane Systems – <i>PURON</i> [®] US Korea Membrane Separations – <i>KSMBR</i> ^{KR} (Hainan) Litree Purifying Technol. Co. Ltd. – <i>LH3</i> ^{CN} MEMOS Membranes Modules Systems – GmbH – <i>MEMSUB</i> ^{DE} Memstar Technol. Ltd – <i>SMM</i> ^{SG} Micronet Porous Fibers S.L. – <i>Micronet</i> [®] SP Mitsubishi Rayon Engng. <i>Sterapore</i> – <i>SUR</i> TM ; <i>SADF</i> TM JP Mohua Technology – <i>iMEM-25</i> ^{CN} (Tianjin) Motimo – <i>Flat Plat FPII</i> ^{CN} Philos Co. Ltd. ^{KR} SENUO Filtration Technol. Co., Ltd. – <i>SENUOFIL</i> ^{CN} Shanghai Dehong Biology Medicine Sci. & Technol. Dev. Co., Ltd. ^{CN} Siemens Water Tech. – <i>MemPulse</i> TM DE Sumitomo Electric Industries – <i>POREFLON</i> TM JP Superstring MBR Technol. Corp. – <i>SuperUF</i> ^{CN} Suzhou Vina Filter Co. – <i>F08</i> ^{CN} Zena SRO – <i>P5</i> ^{CZ}	Berghof – <i>HyPerm-AE</i> ; <i>HyPerflux</i> ^{DE} Norit X-Flow – F4385, F5385 ^{NL} Orelis Environment – <i>PLEIADEK</i> [®] , <i>KLEANSEPR</i> [®] FR MEMOS – Membrane Modules Systems GmbH – <i>MEMCROSS</i> ^{DE} Hollow fibre <i>Ultra-flo</i> [®] SG/Mann and Hummel ^{DE} Polymem – <i>IMMEM</i> ^{FR} Flat disc ceramic <i>Kerafol</i> ^{DE} Grundfos – <i>Biobooster</i> ^{DK}

AT: Austria; BE: Belgium; CN: China/Taiwan; CZ: Czech Republic; DE: Germany; DK: Denmark; FR: France; IRL: Ireland; JP: Japan; KR: Korea; NIR: Northern Ireland; NL: Netherlands; SE: Sweden; SG: Singapore; SP: Spain; US: United States
See Appendix C for other products from the Far East

The List

新兴工程 Awarded Projects (by province)

Guangzhou Paper Mill 2 100,000m³/d Awarded Dongguan (Guangdong)

Process: RO Feed: Brackish Client Type: Industrial (Paper Mill)
Signature: 2005 Operational: 2007 Developer/EPC: Xidoumen
Membranes: Tianwei

Huludao RO 50,000m³/d Awarded Huludao (Liaoning)

Process: RO Feed: Seawater Client Type: Industrial & Municipal (Undecided/
Signature: 2004 Operational: 2007 Liaoning Zhengye Group Real Estate Develop-
Membranes: Hyflux (RO) Megavision (UF) ment Co Ltd.)
CAPEX: CNY 452,000,000 m
Developer/EPC: Hyflux

Zhuanghe Power Plant RO 28,000m³/d Awarded (Liaoning)

Process: RO Feed: Seawater Client Type: Industrial (Beijing Lucency Enviro-
Signature: 2006 Operational: 2007 Tech Co., Ltd.)
Membranes: Koch

Lubei Chemical Group RO 20,000m³/d Awarded Mashanzi Town, Wuli County (Shandong)

Process: RO Feed: Seawater Client Type: Industrial (Shandong Lubei Chemi-
4 Unit x 5,000m³/d Known equipment: Spiral Wound Membrane
Signature: 2006 Operational: 2007 CAPEX: CNY 120,000,000 m
Membranes: Beidouxing Developer/EPC: Xidoumen
ERD: ERI HPP: Grundfos PV: ROPV

Dagang RO 150,000m³/d (incl. 2nd phase 50,000m³/d) Awarded Tianjin (Tianjin)

Process: RO Feed: Seawater Client Type: Industrial & Municipal (Dagang
Signature: 2004 Operational: 2007 District)
Membranes: Hyflux (RO) Megavision (UF) CAPEX: CNY 720,000,000 m
Developer/EPC: Hyflux
ERD: Calder

The PLAYERS

MegaVision

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Diana Dou
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Nancy Tao
Director
+86 13916218991
nancy@china-membrane.com

Membranes Produced:

MF: no UF: yes
NF: no RO: no

Sizes:

4": yes 8": yes 16": no

Other products: no

Solutions/EPC: no
Produces in China: yes
Market Entry: 2001
Certifications:

Desalination Clients
Industrial: yes
Municipal: yes
References: Hyflux RO (UF Pre-Treatment)
Ownership: private local

MegaVision is a Shanghaiese hollow fibre membrane maker with application in the MBR sector for sewerage treatment. Also produces pervaporation membranes (PV) for ethanol processing. The company has a research partnership for the development of membrane technology with Tsinghua University in Beijing and Sichuan University.

They export to Latin America, Singapore, Indonesia. Their production facility has a capacity of 1Mm². Revenues for UF sales are RMB10m. Nadir once tried to buy them out but the owner refused to loose management control. Instead they plan to make JV with the German company. Megavision expects 200% annual growth in sales. They supply Hyflux with UF membranes for their desalination projects but do not want to get involved in RO which they find too difficult. Like everyone else, they import membrane raw materials from the US, Japan and Germany.

Pall

Pall Filter (Beijing) Co. Ltd.

Membranes Produced:

MF: yes UF: yes
NF: no RO: yes

REFERENCES: FLAT SHEET MBR



REFERENCES: FLAT SHEET MBR

Shipyard wastewater – Hebei, China

Treatment method: FMBR-1.0-100

Objective: Treatment of wastewater

Treatment volume: 1,500m³/day

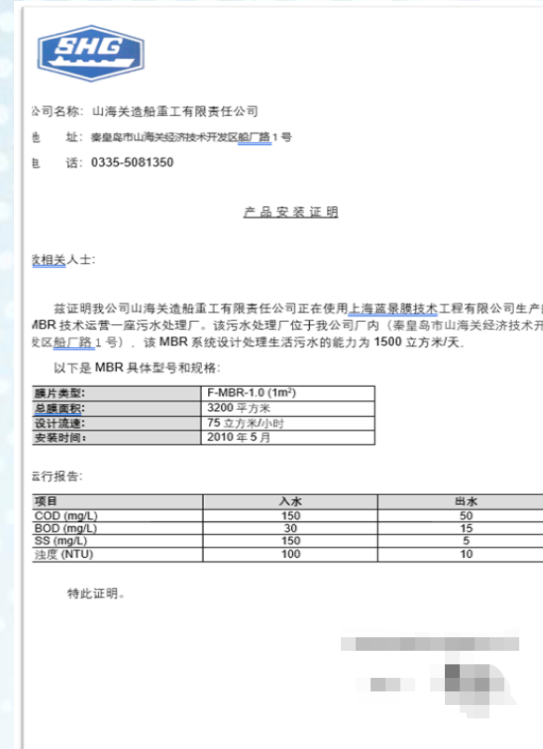
Effective area: 3,200m²

Start of operation: 2009

2017: shipyard replacement: 1,100m² replacement. Reason for replacement: 2017 budget spending allocation requirements. Old membranes still performing well.

2019: shipyard replacement: 900m² replacement. Reason for replacement: 2019 budget spending allocation requirements. Old membranes still performing well.

Ref: <https://www.thembrsite.com/directories/case-studies/shanhaiguan-shipbuilding-yard/>



REFERENCES: **FLAT SHEET MBR**

Industrial wastewater – Hisun Pharmaceutical

Treatment method: FMBR-1.0-100

Objective: Treatment of wastewater

Treatment volume: 500m³/day

Effective area: 1,300m²

Start of operation: 2011



Ref: <https://www.membracon.co.uk/global-process-systems-partners-water/case-study-china-beijing/>

REFERENCES: **FLAT SHEET MBR**

Wastewater treatment facility at an industrial plant

Treatment method: FMBR-A-150

Objective: Strict compliance with the emission requirements

Treatment volume: 15,000m³/day

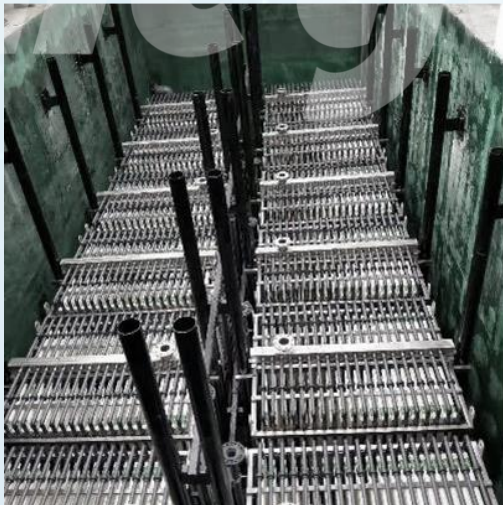
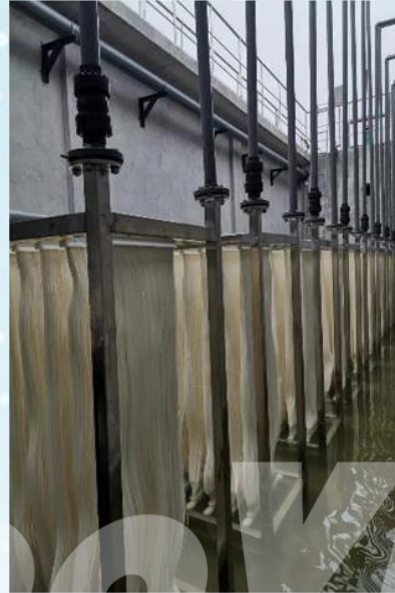
Effective area: 30,000m²

Start of operation: 2019

Item	Type	
	Inflow water	Treated water
BOD (mg/L)	750	<20
COD _{cr} (mg/L)	230	<30
T-N (mg/L)	60	<25



REFERENCES: HOLLOW FIBER MBR



REFERENCES: UF MEMBRANES



REFERENCES: UF MEMBRANES



REFERENCES: **FLAT SHEET MBR**

ODM - Spain

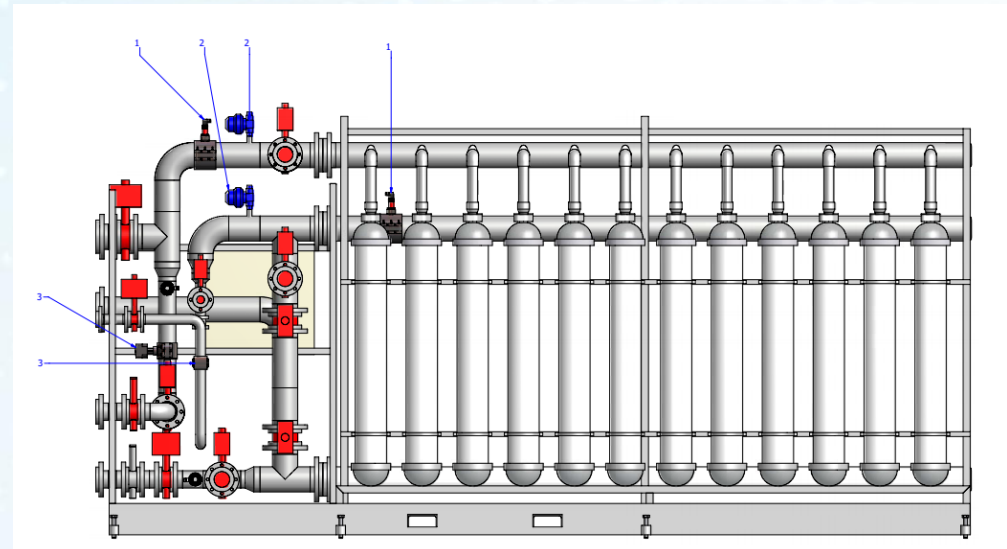
Treatment method: UFH-PSS-1060 (ID 1.2, MWCO 50K)

Treatment volume: 2,976m³/day

Effective area: 4,320m²

Start of operation: 2016

Achievement: SDI <2



REFERENCES: **FLAT SHEET MBR**

Top 3 Semiconductor manufacturer - Taiwan

Treatment method: UFH-PSS-1060 (ID 1.2, MWCO 50K)

Effective area: 2,016m²

Start of operation: 2011~2017

Achievement: SDI <2



REFERENCES: **FLAT SHEET MBR**

Chengdu Industrial Park

Treatment method: UFH-PSS-1060 (ID 1.2, MWCO 50K)

Objective:

Treatment volume: 12,000m³/day

Effective area: 10,800m²

Start of operation: 2018

Achievement: SDI <2



CONTACT



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