

## Ecologix Flat Sheet module

MBR module is **the core product** of MBR system

**Correct module selection, the MBR system will be 99.9% success!**



**Ecologix Technologies Asia Pacific, Inc**

An Ecologix company, Since 1992  
Leader of flat sheet membrane module manufacturer in South east Asia

## What is MBR ?

MBR is to install the membrane module in the sewage tank, integrate the previous traditional sewage treatment process - aeration, sedimentation, disinfection, etc. into a single process, so MBR can perform stable filtration function and simultaneously retain activated sludge, **enhance MLSS to 15,000 mg/L, to carry out the high-efficiency decomposing biological characteristics.** Not only improve the quality of the effluent, but also reduce 1/2 area of sewage treatment plant and 1/2 of the waste sludge.

## MBR Advantages:

- High quality effluent, typically removal coliforms(> 6log) and virus(>4 log)
- If use Ecologix Package MBR plant, Module easily expandable, additional tanks or membrane units can be easily added for future flow increases
- Low sludge production, Equates to a 60% reduction in sludge disposal costs.
- Sludge age around 40 days.
- Ecologix's experience and record, Very long membrane life if use German PVDF UF membrane, expected life up to 10 years. but only for inserting Ecologix membrane cassette, there is a design to prevent the sludge sticking, caked on the membrane surface.

Ecologix Flat sheet module Assembly > installation > operation > Permeate high quality effluent



PVDF membrane cartridge(element)



Element cassette and insert track



Ecologix MBR module  
Plus non-clogged air diffuser



High quality effluent



MBR in operation



MBR tank + MBR modules

# Ecologix - the process of fully committed and successful manufacture the flat sheet membrane modules

Since 2000, more than 10 years of experience in operation and maintenance of various brands of MBR modules in Taiwan and overseas, including flat sheet modules and hollow fiber modules-Kubota, Toray, Sumitomo, Asahi Kasei, BioCel, **In depth understanding of their design structure and found the troubles of follow-up operation and maintenance!**



Accumulating many years of experience, then cooperation with the world's leading Membrane manufacturer in Japan, and also signed a contract to import the PVDF membranes from Germany MicroDYN, then packing PVDF membrane cartridge (element) and assembly Ecologix immersed MBR module (cassette) in Taiwan.



# Tripartite Cooperation

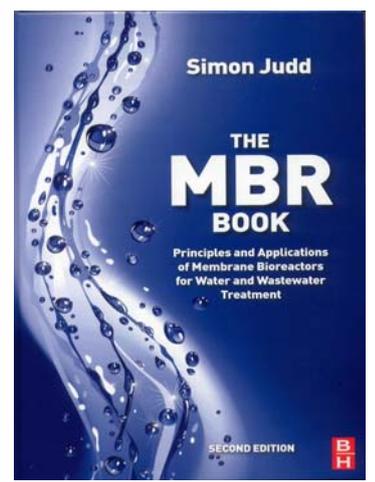
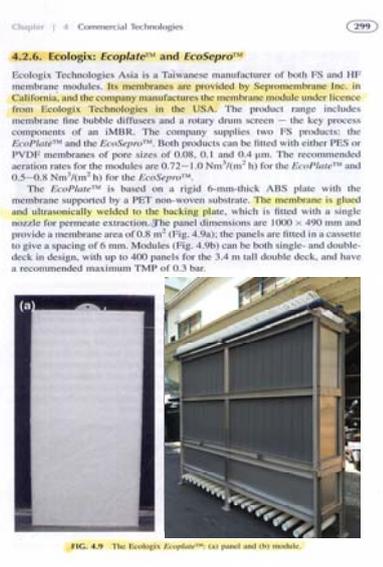
Via Germany, Japan, Taiwan research and after eliminating the shortcomings of another brands MBR module, **ECOLOGIX flat sheet module<sup>2.0</sup>** was succeed and produced in Taiwan. Superior product quality, has been listed as one of the MBR module international bidding brand since 2019.



- Via Japanese membrane element packaging machine, Membrane module assembly technology and often instructs in the Taiwan factory, so that the Ecologix flat sheet MBR module has a highest quality.
- Improve the module's aeration diffuser clogged easily, cooperation with Jager GmbH in Germany, installed non-clogging coarse bubble tube diffuser In MBR module. With this performance, Ecologix offer "membrane prevent sludge sticking and caking design" in all series of Ecologix MBR modules. With this Unique feature, the Ecologix MBR module fast access to the global markets.
- Ecologix module's aeration design: There is no need like other brands to do the in-effectively clean up the sludge blockage of the aeration pipe once a day!



## Ecologix Flat sheet module and Case study in THE MBR BOOK and industrial mbrs



# Based on the loyalty and Responsibility for the Membrane module production:

Ecologix send staff to Cranfield College in the UK to study MBR By Research, including MBR planning, installation, commissioning, education/training, and cooperate with domestic and foreign environmental engineers and engineering consulting.

**Cranfield**  
UNIVERSITY



Membrane surface prevent sludge Caking design: Only Ecologix

Special aeration design and Rigid insert track

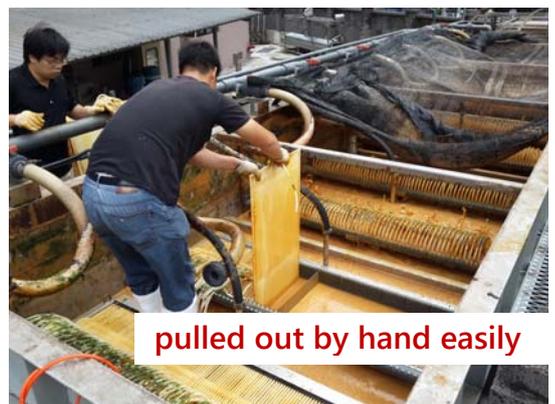


☞ non-clogging and backflow preventing membrane tube diffuser, plus Rigid element insert track design

Non-clogging diffuser: pushing the coarse bubble into the space 6mm of each membrane cartridge, continuously have a disturbance in the 6mm space, preventing the sludge sticking on the membrane surface.



MLSS 15000mg/L



pulled out by hand easily

Continuous operation in MLSS 15000mg/L for 3 years, without aeration pipe cleaned during the period. Each cartridge still maintained 6mm, and **the cartridge could be pulled out by hand easily**, confirm that Ecologix "membrane surface preventing sludge sticking design" success and clearly highlighting its design features

# Ecologix MBR module<sup>2.0</sup> Specification



EK single deck

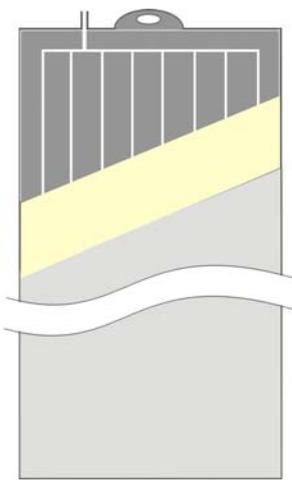


EW single deck

## Specification

- Membrane PVDF, 0.05µm; MicroDyn-Nadir, Germany)
- Membrane cPVC, 0.2µm; YUASA, Japan, same as Kubota
- Transmembrane Pressure (TMP): ~20kPa
- Design flux: 0.4–0.65m<sup>3</sup>/m<sup>2</sup>/day
- Operating temp.: 5–40 °C
- pH: 6–8
- Scouring air rate: 0.35~0.5Nm<sup>3</sup>/h/m<sup>2</sup>
- MLSS: 7000mg/L ~ 18,000mg/L
- DO: 1.0–2.0 mg/L

### Membrane plate (Element)



### Membrane cartridge (element):

- EK-08/PVDF and ■ EK-08/cPVC:  
Size: W 490mm x H 1,000mm x t. 6mm  
(same as Kubota #510, #7-510)  
membrane area: 0.86m<sup>2</sup>

**Total of about 80,000 of EK-08/PVDF (PVDF membrane) have been delivered to the world, replacing KUBOTA #510 #7-510 element (cPVC membrane)**

- EW-14:  
Size: W 490mm x H 1,500mm x t. 6mm  
membrane area : 1.33m<sup>2</sup>

## Module data

- Flux rate •municipal sewage: 0.65m<sup>3</sup>/m<sup>2</sup>/day •industrial sewage: 0.35–0.5m<sup>3</sup>/m<sup>2</sup>/day

Recommended flux rate: Under STD operating conditions, consider stabilizing permeate high quality effluent, membrane life, and reduce the frequency of chemical In-line CIP

Single deck module	EK-60S	EK-80S	EK-100S	EK-120S	EK-150S	EK-180S	EK-200S
Membrane area, m <sup>2</sup>	51.6	68.8	86.0	103.2	129.0	154.8	172.0
Size: L x W x H, cm	94 x 59 x 173	122 x 59 x 173	150 x 59 x 173	178 x 59 x 173	220 x 59 x 173	262 x 59 x 173	290 x 59 x 173

Single deck module	EW-60S	EW-80S	EW-100S	EW-120S	EW-150S	EW-180S	EW-200S
Membrane area, m <sup>2</sup>	79.8	106.4	133.0	159.6	199.5	239.4	266.0
Size: L x W x H, cm	94 x 59 x 223	122 x 59 x 223	150 x 59 x 223	178 x 59 x 223	220 x 59 x 223	262 x 59 x 223	290 x 59 x 223

Double deck module	EK-120D	EK-160D	EK-200D	EK-240D	EK-300D	EK-360D	EK-400D
Membrane area, m <sup>2</sup>	103.2	137.6	172.0	206.4	258.0	309.6	344.0
Size: L x W x H, cm	94 x 59 x 306	122 x 59 x 306	150 x 59 x 306	178 x 59 x 306	220 x 59 x 306	262 x 59 x 306	290 x 59 x 306

Double deck module	EKEW-120D	EKEW-160D	EKEW-200D	EKEW-240D	EKEW-300D	EKEW-360D	EKEW-400D
Membrane area, m <sup>2</sup>	131.4	175.2	219.0	262.8	328.5	394.2	438.0
Size: L x W x H, cm	94 x 59 x 356	122 x 59 x 356	150 x 59 x 356	178 x 59 x 356	220 x 59 x 356	262 x 59 x 356	290 x 59 x 356

Double deck module	EW-120D	EW-160D	EW-200D	EW-240D	EW-300D	EW-360D	EW-400D
Membrane area, m <sup>2</sup>	159.6	212.8	266.0	319.2	399.0	478.8	532.0
Size: L x W x H, cm	94 x 59 x 406	122 x 59 x 406	150 x 59 x 406	178 x 59 x 406	220 x 59 x 406	262 x 59 x 406	290 x 59 x 406

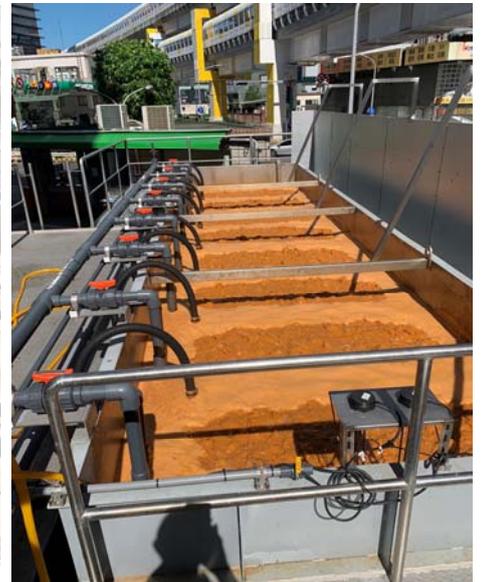
- Custom size of module available. (It can be meet the existing tank or the membrane area requirements)

# Ecologix Skid Mounted Package MBR Plant-EcomemXpress

Easy installation and quick start up!

## Applications

- General Food
- Dairy and Cheese
- Meat and Protein Recovery
- Poultry and Further processing
- Groundwater and Construction Water
- Remediation Water
- Municipal, Sewer
- mining and Blackwater
- School, Hospital
- General Industrial



## Instllation List, from 2006: Ecologix MBR module and Package MBR plant

### By Ecologix directly

- Food processing plant, 400CMD: EcomemXpress-400cmd skid mounted MBR plant
- Food processing plant, 600CMD: EcomemXpress-600cmd skid mounted MBR plant
- Food processing plant, 400CMD: EcomemXpress-400cmd skid mounted MBR plant
- Hospital, 500CMD: Module EK-120 x 10 units, membrane PVDF, 0.05μm
- Restaurant center, 1200CMD: EcomemXpress-600cmd skid mounted MBR plant x 2 plants
- CN university, 500CMD: Module EK-130 x 4 units, membrane PVDF, 0.05μm
- Food processing plant, 400CMD: EcomemXpress-400cmd skid mounted MBR plant
- Land fill plant, 4800CMD: Module EK-180 x 80 units, membrane PVDF, 0.05μm
- Meat Refinery plant, 200CMD: EcomemXpress-200cmd skid mounted MBR plant
- Meat Refinery plant, 350CMD: EcomemXpress-350cmd skid mounted MBR plant
- Petrochemical, 5400CMD: Module EW-200 x 48 units, membrane PVDF, 0.05μm
- Chemical plant, 500CMD: EcomemXpress-500cmd skid mounted MBR plant

Total around 220 plants in the world through Distributors



The consultant company excluded the hollow fiber module, and then competed with BioCEL, Kubota, Toray, Ecologix was recommended to provide 6 million US dollars of Flat sheet membrane modules to the Middle East Petrochemical MBR sewage plant, which has been operating normally since 2014. The membrane surface has never occurred sludge sticking and caking, permeate high quality effluent, welcome confirm.



- Pictures: Meeting in Ecologix with end user and MBR design consultant, also review the quality of Flat sheet modules

# Pretreatment equipment made by Ecologix Since 1993

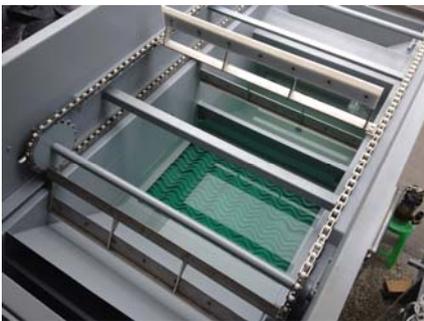
Rotary Drum Screen: External-fed & Internal-fed



Pipe flocculator: Capacity from 10-400 m<sup>3</sup>/hr



Lamella DAF



120m<sup>3</sup>/hr  
(TOYOTA Mexico plant)



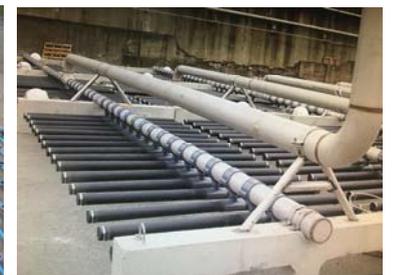
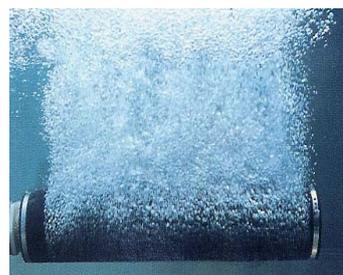
250m<sup>3</sup>/hr  
(TT River clarification)



Fine bubble diffuser, disc & tubing



Pulp/paper, 20000m<sup>3</sup> & 30000m<sup>3</sup> aeration tank



Welcome Contact Us !

## Appendix 1 : Operation, Maintenance, Improvement Records-Hollow Fiber

A food factory uses Japanese hollow fiber membranes. After half a year of operation, the negative pressure (TMP) suddenly increased and the water output dropped sharply. We Ecologix were entrusted to design an "external hanging soaking agent set equipment" to carry out regular external hanging cleaning of the membrane group every 3 months, which cost a lot of money. The cost of hoisting works and manual cleaning is huge.



In this project begin, V-A company in Singapore emphasized that it can operate under the condition of high concentration sludge MLSS 15000mg/L to carry out high-efficiency decomposition of biological characteristics (degradation of COD, BOD).

However, in the field experience, the hollow fiber membrane can't permeation water smoothly at the concentration 15000mg/l of MLSS, under negative pressure, which will quickly absorb the sludge, and the diffuser bubbles of the module cannot rush into the hollow fiber bundle cluster to remove the sticking sludge (as shown in the photo above), so the water output drops sharply, and the TMP rises rapidly, so it must be cleaned by hanging outside of MBR tank.



Half year later, client visited Ecologix MBR factory and found that the existing Japanese hollow fiber module with Ecologix 10 units of flat sheet module. Client immediately buying and installation, the MBR systems operate in-line cleaning each time per three months!



High quality effluent

Ecologix contracted maintenance and replacement: installed Ecologix flat sheet module, replace Japanese Hollow fiber

## Appendix 2: Operation, Maintenance, Improvement Records: K brand, Japan

Ecologix repaired K brand module for membrane plate (element) replacement in the Netherlands, Dubai, India, Palau and Taiwan, etc., and found that their "aeration system" was seriously blocked (even if the daily cleaning was carried out) which causes the membrane plate at the upper end without air bubbles to absorb the sludge instantly and squeeze each other into a "corpse block", which causes the water output to drop sharply and the negative pressure (TMP) of water absorption to increase. must periodically lift out the module (cassette), clean up the sludge caking and repair the air diffuser.



K-Brand



K-Brand



K-Brand



Sludge caking on the membrane plate(element), K-brand

Ecologix element inserts to K-brand module

The aeration system at the bottom of the K brand membrane cassette is very easy to clogged by mixing sludge, so that the membrane plate quickly sticking the sludge! Even according to the K module manual, clean the air diffuser every day, the blockage still cannot be cleared. Must lift out the module from MBR tank, insert to squeeze out the sludge from air diffuser tube holes



# Membrane prevent sludge sticking and caking design

Only Ecologix in the market

in the following case, the superior function is clearly highlighted

Ecologix MBR module operating in food processing factory, MLSS in 15000-mg/l and without air diffuser cleaning every day after running 2.5 years, the membrane cartridge (element) still kept the 6mm distance, without sludge sticking and caking! Easy to pull out by hand.



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