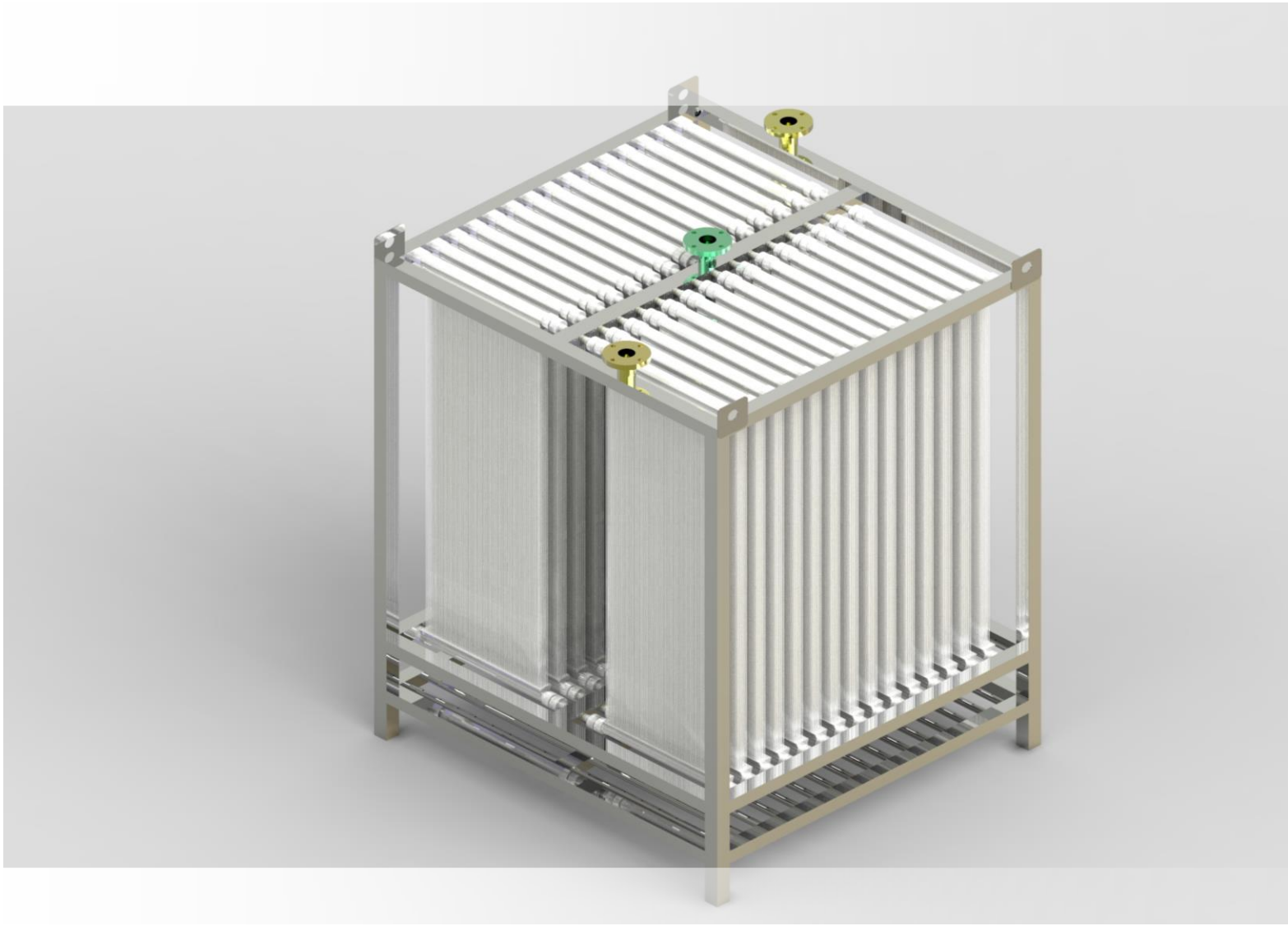
深圳君瑞环保设备有限公司
SHENZHEN DREAMEMWAY ENVIRONMENTAL PRODUCTS CO. , LTD

# Reinforced MBR Products details



## Dreamem,make your life healthier

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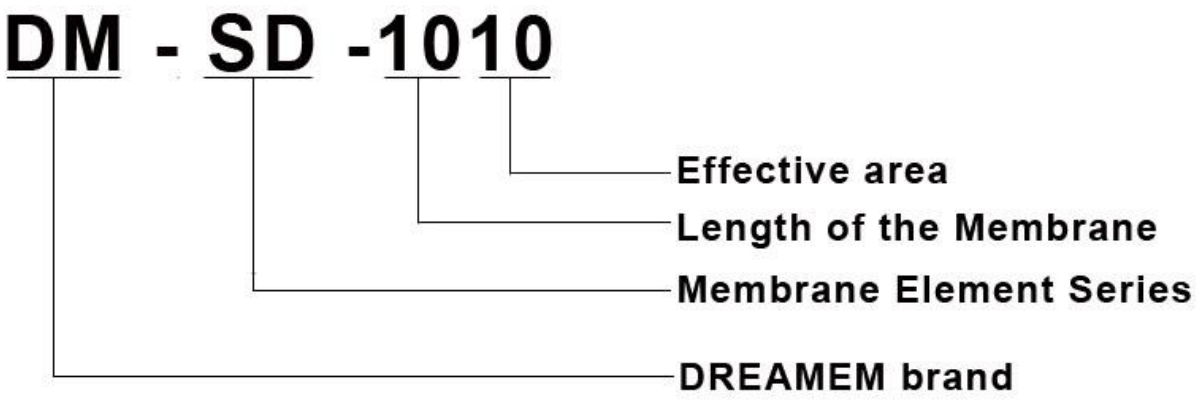
# 1.Overview

Membrane bioreactor' (MBR) is an advanced and high efficient wastewater treatment technology. It integrates membrane such as microfiltration or ultrafiltration membrane with a biological process. Thanks to the use of membrane as a filter, MBR process rejects the solid materials which are developed by the biological process, and results in a substantially clarified and disinfected effluent of high enough quality to be discharged to sensitive receiving bodies or to be reclaimed for applications such as urban irrigation, utilities or toilet flushing. Furthermore, membrane replaces the function of secondary clarifier or settlement tank for solid/liquid separation. This provides a number of advantages relating to small footprint, effectively biological removal of ammonia and phosphor, process control and product water quality.

Dreamem® is a MBR membrane module made from Dreamem reinforced braid PVDF hollow fiber membrane with distinguishes features of high mechanical strength, stable effluent quality, high flux, long service life. It is the ideal membrane module for the MBR process.

## 1.1. membrane module name

The specific naming of Dreamem MBR membrane module consists of several parts: company brand, module type, dimension of module overall and effective membrane area, as shown below:



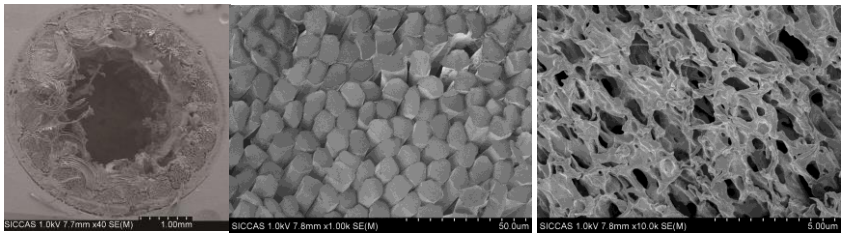

Module model description

For example, DM-SD-1010 means that Shenzhen Dreamemway Environmental Products Co., Ltd. produces a SD series a length of1.0m and a membrane area of 10$m^2$.

## 2.Dreamem® Reinforced braid PVDF hollow fiber(polyvinylidene fluoride)

### 2.1 MBR hollow fiber

2.1.1Asymmetric dense spongy structure



SEM image of MBR membranes

High flux
Antibacterial
Permanently hydrophilic

The spongy structure makes excellent performance,effect is better than other similar products from market.

2.1.2 Support-braid layer

- Strict material selection, Fiber durability
- High strength (peeling≥1MPa; tensile＞200N)
- breakage Resistance
-

The fibers are strong because of compounded of PVDF polymer and cellular woven tube.

### 2.2 Dreamem® Membrane element

MBR membrane element

- Anti-pollution
- Potting resin and Protection resin from Japan
- Long life span

  High-quality imported glue for ensure the best quality and durability of membrane elements

### 2.3 Dreamem® Module

- Space-saving;engrgy-saving
- Easy for cleaning and maintenance
- Customization for more choice

The standard diameters are 2.2 mm OD,0.85mm ID ,Other sizes are available based upon custom tooling for a specific size. Lead time is typically 12 weeks for a custom size .

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## 3.Dreamem® DM-Hifo™series MBR module

Reinforced PVDF Hollow Fiber Submerged Membrane Modules

3.1 DM-Hifo™ series MBR module


| | |
|---|---|
| Brand | DREAMEM（USA） |
| Place of Origin: | Colorado·USA |
| Place of manufacturer： | Shenzhen·China |
| Certification: | SGS/ISO 9001 |
| Series Name : | DM-Hifo |
| Membrane type: | Submerged Hollow Fiber |
| Size Custom-made | YES |
| Packaging& Shipping Terms: | |
| Neutral Packaging | Carton box |

1.DM-SD(MBR)


| | |
|---|---|
| Brand | DREAMEM（USA） |
| Place of Origin: | Colorado·USA |
| Place of manufacturer： | Shenzhen·China |
| Certification: | SGS/ISO 9001 |
| Series Name : | DM-Hifo |
| Membrane type: | Submerged Hollow Fiber |
| Size Custom-made | YES |
| Packaging& Shipping Terms: | |
| Neutral Packaging | Carton box |
| Customized element/module | MOQ≥100pcs(element) |
| Delivery Time: | 10 -45 working days |

2.DM-RSL(MBR)

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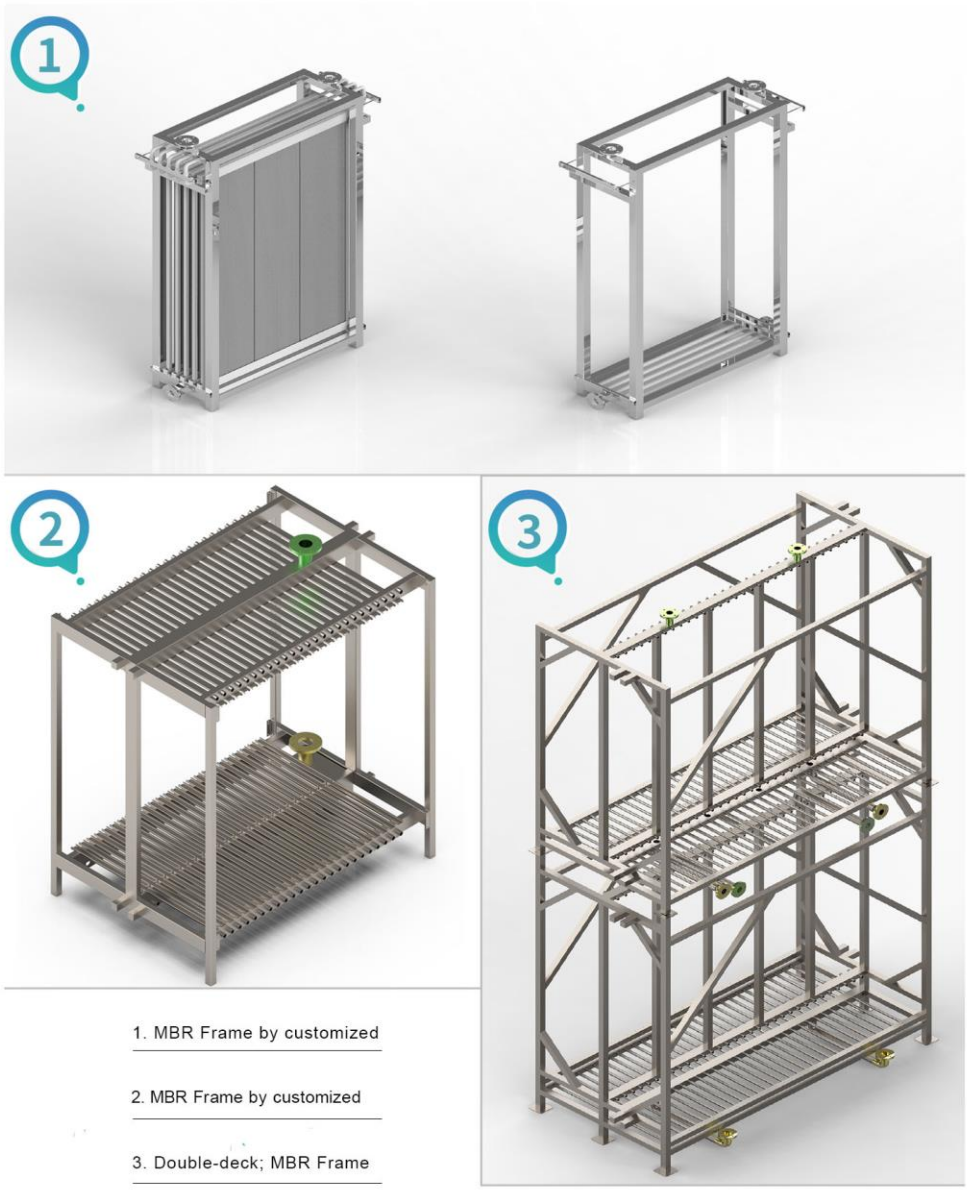
**3.2** Customized design for **frame** of Membrane Modules




Integrated skids of modules can be supplied based on customers' requirements

Basic parameters:

Module Frame material: SUS304 Stainless Steel

Running cycle :run 8-15 min; pause 1-2min.

Membrane system consists of six major parts: membrane module, membrane rack connection, collection tube, detonation system, suction pump...

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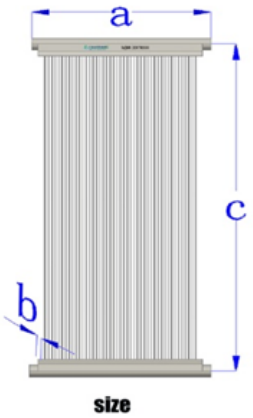
3.3 Nominal Dimension of DM-Hifo™ series MBR module




| Module NO. | Dimension（mm） | | | Effective area（m2） |
|---|---|---|---|---|
| | a | b | c | |
| DM - SD -1010 | 534 | 45 | 1025 | 10 |
| DM - SD -1515 | 534 | 45 | 1525 | 15 |
| DM - SD -1520 | 534 | 45 | 1525 | 20 |
| DM - SD -2020 | 534 | 45 | 2025 | 20 |
| DM - SD -2025 | 534 | 45 | 2025 | 25 |
| DM-RSL-1006 | 600 | 30 | 1015 | 6 |
| DM-RSL-1315 | 1250 | 30 | 1300 | 15 |
| DM-RSL-2025 | 1250 | 30 | 2000 | 25 |

| MBR fiber | MBR module |
|---|---|
| Chemistry: Ameliorate composite PVDF<br>Type: Reinforced Braid hollow fiber<br>Support Chemistry:Polyester<br>Nominal Pore Size:0.1 (μm)<br>OD(outer diameter) :2.2(mm)<br>ID(Inner diameter):0.85(mm) | Type:Submerged Membrane Modules<br>Potting resin:Polyurethane resin from Japan<br>Protection resin:Polyurethane resin from Japan<br>Permeate collecting header:ABS<br>Flux:10-30L/$m^2$.h(Depends on temperature and water quality)<br>Module Frame material: SUS304 Stainless Steel<br>Running cycle :run 8-15 min; pause 1-2min. |

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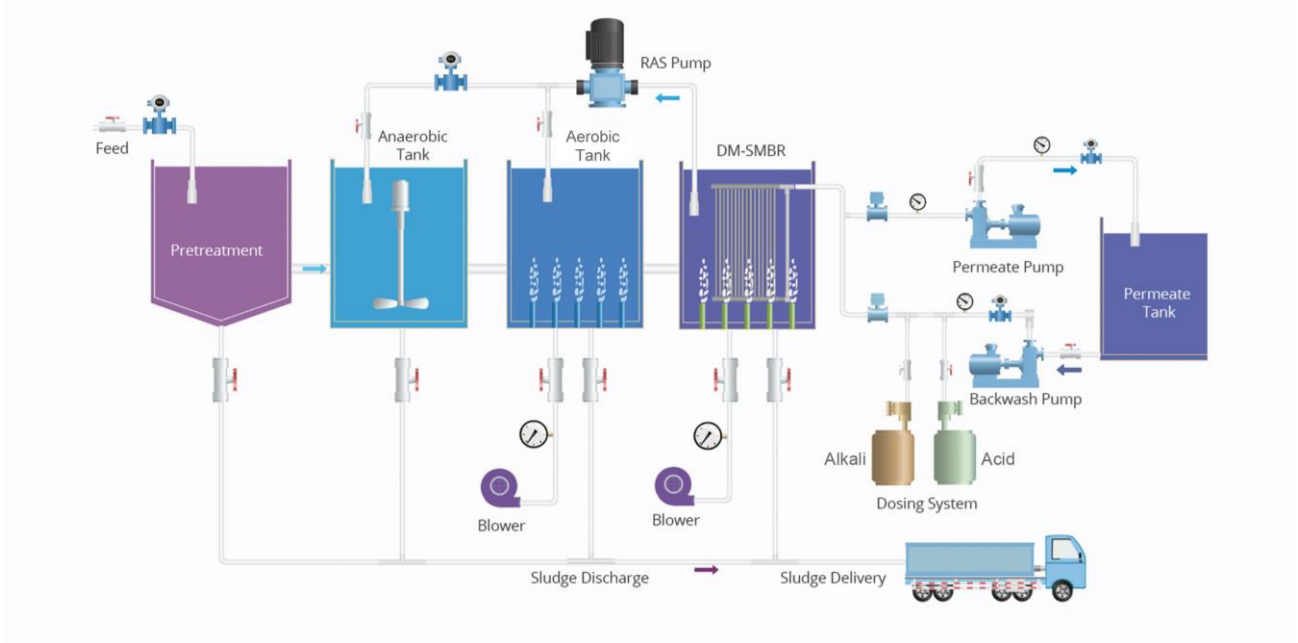
## 4. MBR PROCESS FLOW




**MBR system** is to submerge the membrane module into the active sludge reaction tank, through negative pressure extracting the clean water from the biological tank and discharging or recycling the waste sludge. For treating the municipal wastewater, the combined process (MBR) of activated sludge process and membrane filtration process generally can meet the effluent requirement.

For industry wastewater treatment, MBR is normally just one part of the complex wastewater process. **A**ccording to different feed water type and product water requirement, different biological treatment plant should be configured before MBR system; When feed water have a BOD of more than 500ppm, an anaerobic bioreactor should be added before the aerobic tank; if nitrogen removal is required, suggested to adapt the wastewater treatment system containing nitrification and denitrification process; if phosphate is required to treat in depth, chemical phosphorus removal process and reverse osmosis could be applied. These mentioned process design shall be comply with related technologies and design reference, or consulting with our technical staffs. In wastewater treatment, MBR system consists of membrane components connected in a certain form, the process flow chart shown pictured above.

# 5.Detailed parameters:

## 5.1 Performances of MBR fiber

| | |
|---|---|
| I/Outer Diameter(mm) | 0.85/2.20 |
| Nominal Pore Size(Bulk Customization) | 0.1μm/0.04μm |
| Pure water flux | ≥1600LMH |
| Bursting strength | > 0.45MPa |
| Tensile strength | > 200N |
| Max. Feed Water Chlorine | 200mg/L |
| Aeration Rate | 60-100(m³/h. ㎡ Projection Area) |
| Permeate Turbidity（NTU） | ≤0.5(MBR) |
| Bacteria Removal | ≥99.999% |
| SS(mg/L) | < 1 |
| Life span | 5-8Years（domestic sewage） |
| SDI | ≤2.5 |

## 5.2 Operating Condition

| | |
|---|---|
| Design Flux（L/㎡.h） | 10-30 |
| Filtration Mode | Negative Pressure Suction Filtration |
| Operating Pressure（MPa） | 0.01-0.05 |
| Suction pressure | -0.01~ -0.05 MPa |
| Operating Temperature(℃) | 5-45 |
| PH Range | 2-11 |
| Max. Feed Water Chlorine （mg/L) | 200 |
| Aeration Rate | 60-100(m³/h. ㎡ Projection Area) |
| Oil content (mg/L) | Natural oil < 50mg/L;Mineral oil < 3mg/L |
| Sludge concentration (mg/L) | 5000~8000 ;MLSS≤18000 |
| Running cycle | run 8-15 min; pause 1-2min (Depends on water quality) |
| Maintenance Chemical Clean | |
| Cleaning Frequency | 1-7day |
| Cleaning Duration | 30-60min |
| Cleaning Chemicals | Sodium Hypochlorite ,Citric Acid |

## 5.3 Recovery Chemical Clean

| | |
|---|---|
| Online chemical cleaning Frequency | < 3month |
| Backwash pressure（MPa） | < 0.05 |
| Offline chemical cleaning frequency | 6~12 months |
| Chemical washing reagent | Citric acid, hydrochloric acid/ sodium hypochlorite+sodium hydroxide |
| Cleaning Duration | 3-24h |
| Cleaning Chemicals | Sodium Hypochlorite、Citric Acid、NaOH |
| Cleaning Temperature | 20-40℃ |

Note:

1.The technical parameters and descriptions listed in the table are production standard values for reference. If there are special requirements, they can be adjusted accordingly;

2. The water production flow in the table refers to the design reference flux when the product is used for sewage treatment.

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## 6. Application of MBR modules:

With regard to the projects of different water sources and usages, the reinforced MBR membrane can be used independently or combined with different treatment processes.

**Dreamem** MBR membrane has been widely applied in the following field:

- Municipal sewage
- Drinking water
- Textile & Papermaking
- Chemical & Pharmacy
- Food & Beverage
- Printing & Dyeing & Painting
- Livestock farm & Aquaculture
- Desalination&Landfill leachate

# 7. Dreamem® MemeFlow™ series Integrated Equipment

## 7.1 DM-SMF (MBR)


| | |
|---|---|
| Brand Name: | DREAMEM（USA） |
| Place of Origin: | Colorado·USA |
| Place of manufacturer： | Shenzhen·China |
| Certification: | SGS/ISO 9001 |
| Series Name : | MemeFlow™ |
| Membrane type: | Integrated Equipment |
| Custom-made | YES |
| Packaging& Shipping Terms: | |
| Packaging | wooden case |
| Delivery Time: | 10 -45 working days |

## 7.2 MBR Integrated Equipment Description

### 7.2.1 Overview

The device is an underground plant which adopts the advanced Biological technology and the company's scientific research and engineering practice result, it can effectively remove BOD5,COD and NH3-N. The device is characterized by the stable performance, effective treatment, economical investment, automatic operation, convenience of maintenance and small occupying space. There is no need for plant construction, neither heating and heat preservation. The surface can be used as green land or square land.

As the most efficient sewage treatment device, it is widely used in treating the sewage in the area of senior hotels, villa districts and residential districts, etc. The water after treatment would meet the national emission standards.

### 7.2.2 Main Features

- Compact design, Small footprint
- Very good price-performance ratio
- High efficiency hollow fiber membranes by Dreamem®
- Dreamem® MBR Equipment availabe in containerized plants and different sizes
- High capacities through modular arrangement
- Easy to operate and maintain
- Energy conservation, relocating and re-use.
- From 10 to 1000 $m^3$/day per single unit

**The tank is made of carbon steel, and the service life can be up to more than 20 years.**

**MBR Integrated Equipment is able to undergo flexible configuration based on quality of raw water,ensuring wide application of the equipment.**

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## 7.3 Parameter& Available Models :

### 7.3.1 Design Parameter

| Feed Parameters | | Permeate Parameters | | Operating Parameters | |
|---|---|---|---|---|---|
| The type of water | Municipal, domestic, catering, industrial, mining, chemical and other sewage | TSS | ＜2mg/L | Operating mode | Negative pressure filtration |
| PH | 2~12 | Turbidity | ＜0.5NTU | Washing mode | Online air-washing ; Backwash |
| Dmax | ≤ 2mm | BOD | ＜10mg/L | Max.TMP | 0.05MPA |
| Max.sludge concentration | 15,000ppm | Coliform group | 100/100mL | Suction pressure | ≤0.05MPA |
| Oil | ≤ 2mg/L | NH3-N | ＜10mg/L | Operating temperature | 5~45℃ |
| BOD | ≤ 400mg/L | | | | |
| NH3-N | ≤ 50mg/L | | | | |

### 7.3.2 Dreamem® MemeFlow™series Available Models :

| Model | Capacity($m^3$/d) | Power | Dimension(L*W*H mm) | Weight（t） |
|---|---|---|---|---|
| DM-SMBR50 | 50 | 380V/50Hz/10KW | 4600×2400×3400 | 5 |
| DM-SMBR100 | 100 | 380V/50Hz/10KW | 7000×2400×3400 | 7 |
| DM-SMBR200 | 200 | 380V/50Hz/20KW | 12000×2400×3400 | 11 |
| DM-SMBR300 | 300 | 380V/50Hz/30KW | 13500×2800×3700 | 14 |
| DM-SMBR400 | 400 | 380V/50Hz/40KW | 17500×2800×3700 | 17 |
| DM-SMBR500 | 500 | 380V/50Hz/50KW | 20000×2800×3700 | 20 |

Remark:Customized products and services will be provided based on real water quality and needs of project.

### 7.4 Submerged Membrane Filtration Plant, including

7.4.1 Flash Mixers and Sedimentation Tank Equipment

Automatic Self-Cleaning Strainers

7.4.3 Membrane Equipment Consisting of:

- Membrane Modules
- Membrane Blowers
- Permeate Pumps
- Backwash Pumps
- Piping & Valves

7.4.3 Chemical Storage and Dosing System Consisting of:

- Sodium Hydroxide Storage Tank and Dosing Pumps

- Sodium Hypochlorite Storage Tank and Dosing Pumps
- Hydrochloric Acid Storage Tank and Dosing Pumps

7.4.4 Instrumentatio

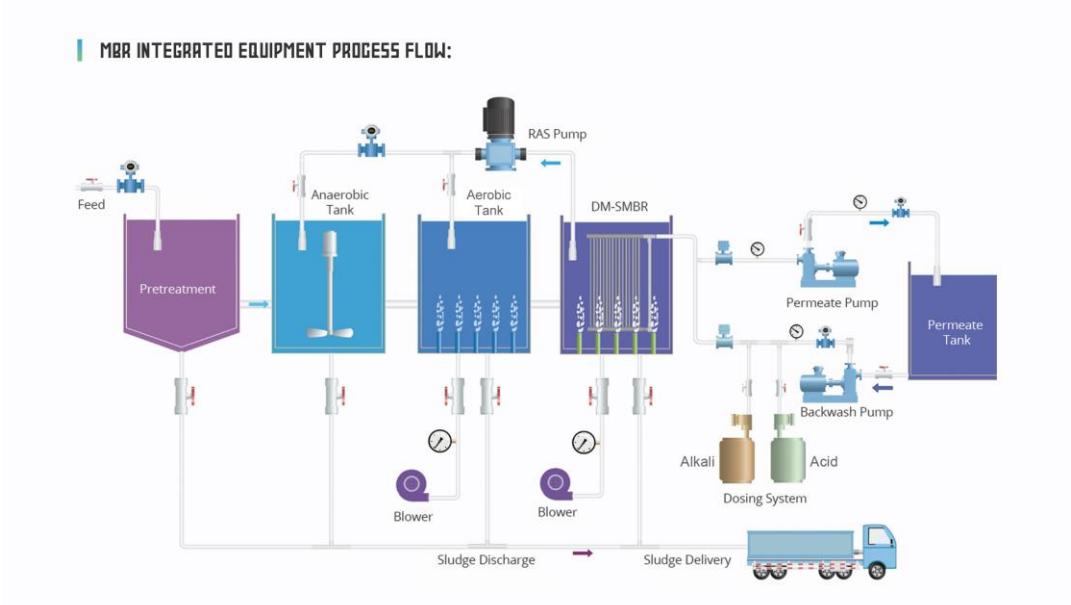
7.4.5 Membrane Filtration Control Centre Consisting of:

- Low Voltage Motor Control Centre
- Variable Speed Drives
- Programmable Logic Controller Panel
- SCADA and HMI System

**7.5 Application of MBR Integrated Equipment:**

- Municipal and domestic sewage treatment industry:
- Hospital sewage treatment and reuse;
- Domestic sewage treatment and reuse;
- Municipal sewage treatment and reuse of water;
- Residential quarters, scenic tourist areas, highways, sewage treatment, etc.;
- Industrial wastewater treatment industry:
- Landfill leachate treatment, livestock manure;
- Brewing, wastewater treatment;
- Slaughtering, food processing wastewater treatment;
- Printing and dyeing, electroplating wastewater treatment.

**7.6 MBR Integrated Equipment Process Flow:**



## 8.Application case of Integrated Equipment:

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