



© All images in this catalogue are copyrighted by Plum Membrane Technology Co., Ltd.  
Reproduction, copying, or scanning without permission is prohibited.

© Plum Membrane Technology Co., Ltd ALL RIGHTS RESERVED

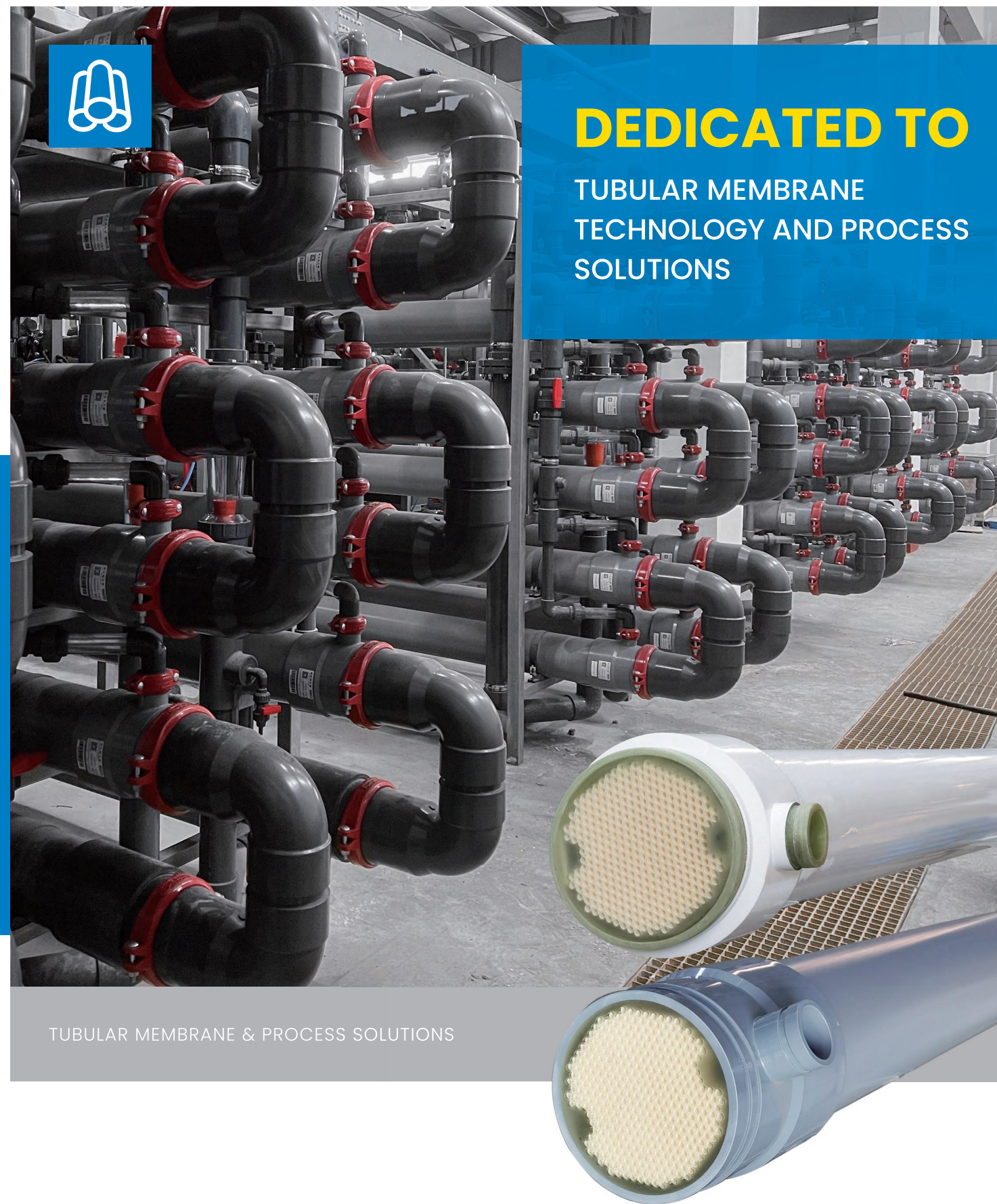
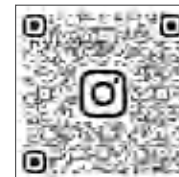
## Plum Membrane Technology Co., Ltd

E-mail: [plum@plummembranes.com](mailto:plum@plummembranes.com)

Tel: 0551-62586156

Web: [www.plummembranes.com](http://www.plummembranes.com)

Address: NO.55 Wuliu Road, Hefei, Anhui, China



Plum Membrane Technology Co., Ltd  
[www.plummembranes.com](http://www.plummembranes.com)



## COMPANY INTRODUCTION

Plum Membrane Technology Co., Ltd. was founded in 2004 and is located in the Xinzhan High-tech Zone of Hefei, Anhui Province. The company occupies 20,000 m<sup>2</sup> of land with 50,000 m<sup>2</sup> of building area. We specialize in the development and application of membrane technology, offering services that cover membrane component R&D, complete membrane system manufacturing, process design, installation, commissioning, and after-sales support. Today, Plum Membrane has grown into one of China's leading professional membrane technology enterprises.

2004

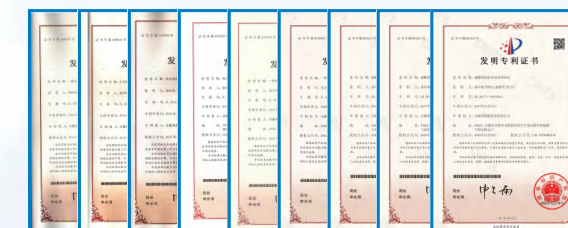
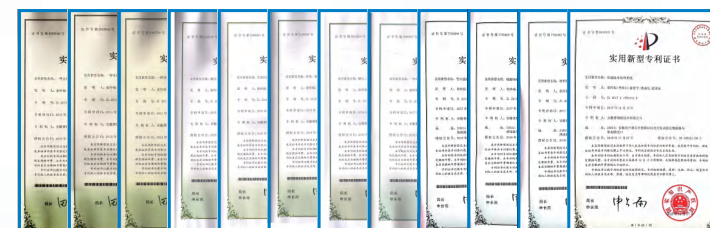
Founded in 2004

500+

500+ Projects

100+

100+ Patents



Plum Membrane holds over 100 independent intellectual property rights, including 40 invention patents, and is ISO9001:2015 certified for quality management. As a council member of the China Membrane Industry Association and a recognized national high-tech enterprise, we are also qualified for environmental engineering and electromechanical project contracting. Over the years, we have received multiple innovation funding grants and honors, including recognition as a specialized and innovative enterprise by Anhui Province and a first-class technological advancement award from China Energy Investment Corporation.

In 2011, we established our tubular membrane research and manufacturing center, focusing on the R&D, production, and application of tubular membranes. Our facility includes multiple automated production lines covering PVDF, PES, and PEK membranes. We successfully developed the industry's first proprietary PEK tubular membrane, a breakthrough solution for the separation and treatment of challenging industrial fluids. We have also launched a series of advanced process solutions based on PEK tubular membranes, addressing issues such as hardness removal, oil removal, impurity removal, fluorine and silicon removal, and heavy metal removal—widely applied in various industrial wastewater scenarios.



# INTRODUCTION TO TUBULAR MEMBRANE

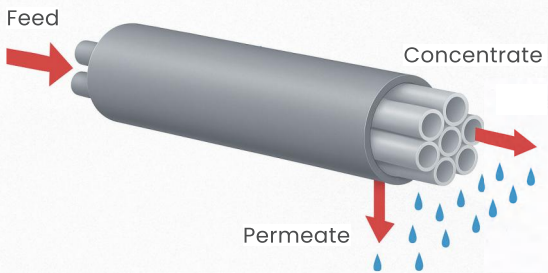
## Product Overview

Tubular membranes are high-efficiency filtration modules featuring porous tubular structures for ultrafiltration (UF) and microfiltration (MF) applications. Using cross-flow filtration technology, they effectively process challenging fluids including high-viscosity liquids, high-suspended-solid (SS) solutions, and oily wastewater, with available channel sizes of 6mm, 8mm, and 12.5mm.

PEK tubular membranes deliver superior performance with outstanding chemical resistance and high-temperature stability, making them ideal for extreme conditions such as corrosive wastewater, high-SS mixtures, and oily solutions. Compared to conventional tubular membranes, PEK versions offer enhanced durability, improved fouling resistance, and easier cleaning, providing more reliable solutions for demanding separation and filtration applications.

## Working Principle

Tubular membranes operate on cross-flow filtration principle. The feed liquid flows rapidly through the membrane tube under pressure, allowing water and small molecules to permeate while retaining suspended solids, microorganisms and macromolecules in the concentrate. The membrane structure consists of a filtration layer and support layer, providing excellent mechanical strength and chemical stability. This design enables processing of high-concentration, high-viscosity liquids with advantages of anti-clogging, easy cleaning and stable operation. Widely used in challenging industrial wastewater treatment, biological fermentation broth clarification, and fluid separation in food/pharmaceutical industries.



## Typical Applications

- External MBR systems
  - Treatment for fluoride,silica,and hardness removal
  - Oily wastewater treatment
- Clarification and sterilization of fermentation broths
  - Heavy metal removal in electroplating wastewater
  - Food and beverage purification & concentration

## Performance Parameters

| Parameters                | Unit       | Membrane Material |           |      |      |                               |           |
|---------------------------|------------|-------------------|-----------|------|------|-------------------------------|-----------|
|                           |            | PVDF              | PEK       |      |      | PEK (Composite Support Layer) | PK        |
| Pore Size / MWC0          | /          | 30nm              | 0.2um     | 50nm | 10nm | 30nm                          | 0.1um     |
| Pure Water Flux           | LMH/100kPa | 900               | 2000      | 1200 | 300  | 1000                          | 1500      |
| Operating Pressure        | kPa        | -50~800           | -100~1000 |      |      | -50~800                       | -100~1000 |
| Max Operating Temperature | ℃          | 60                | 60        |      |      | 50                            | 50        |
| pH Range                  | /          | 2~10              | 0~12.5    |      |      | 0~14                          | 1~11      |
| Chlorine Resistance       | ppm·h      | 250000            | 300000    |      |      | 300000                        | 200000    |

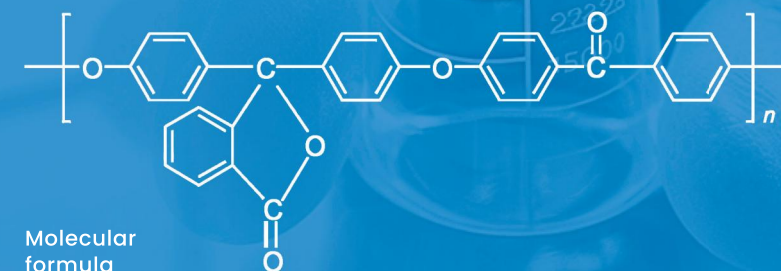
Note: These are partial standard performance parameters. For customized models and updated parameters, please contact us.



# CORE TECHNOLOGY

## PEK TUBULAR MEMBRANE SERIES

Polyetherketone (PEK) is a high-performance specialty industrial material successfully developed and industrialized in the 1980s. Its comprehensive performance rivals that of polyetheretherketone(PEEK), featuring wear resistance, mechanical properties such as ease of chemical stability and high-temperature resistance. It is widely used in advanced manufacturing fields like aerospace, energy industry, transportation, and electronic information.



In our new manufacturing model using PEK material, its excellent chemical resistance and thermal strength make it suitable for the separation process of high pollution, high concentration, and highly corrosive fluids. Compared with conventional PVDF tubular membranes, PEK tubular membranes not only operate stably in harsh environments, but also have significant advantages in durability, anti pollution, and easy cleaning, providing a reliable choice for efficient separation and filtration.

### Material Features

**High Temperature Resistance:** Glass transition temperature (T<sub>g</sub>) up to 230°C

**Outstanding Mechanical Strength:** Tensile strength 102 MPa; Flexural strength 132 MPa

**Strong Acid & Alkali Resistance:** Resistant to 50% sulfuric acid, 36% hydrochloric acid, 30% nitric acid, 20% hydrofluoric acid, 30% sodium hydroxide, and 10% sodium hypochlorite

#### Reinforced Structure

Non-woven support layer with double-sided welding enhance mechanical durability and long-term performance.

#### Suspended Solid Tolerance

Directly handles 30–50 g/L suspended solids without additional pretreatment.

#### Exceptional Chemical Stability

Stable operation across pH 0–14; resistant to extreme corrosive environment.

#### Superior Anti-Fouling & Easy Cleaning

Anti-clogging design supports CIP or hot water cleaning, ideal for oily, high-COD, or high-TSS fluids.

#### Long Service Life

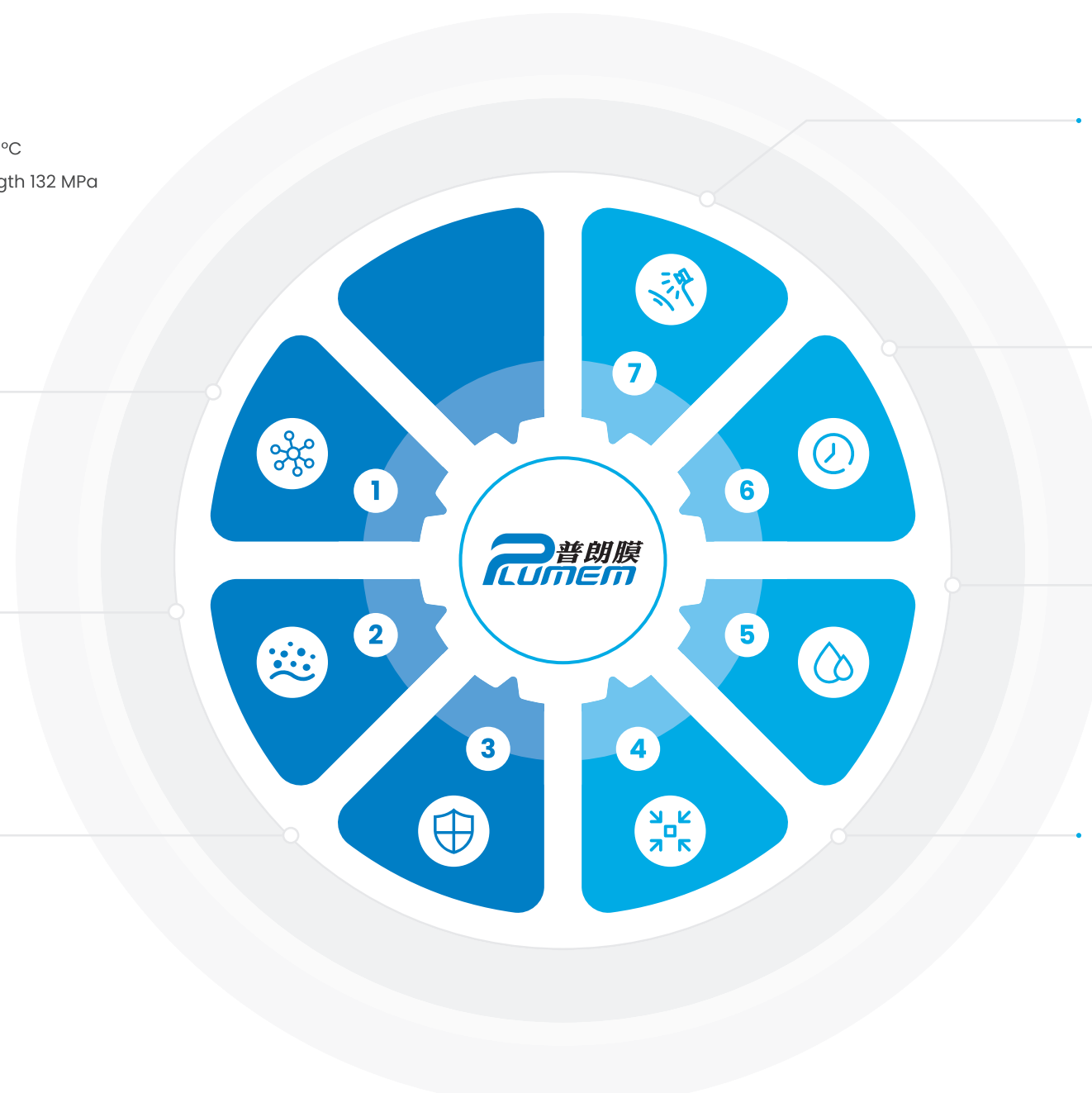
Typical lifespan of 5–10 years reduces maintenance and replacement costs.

#### Excellent Filtrate Quality

Permeate turbidity <0.5 NTU; SDI <3, suitable for downstream processes like RO/NF.

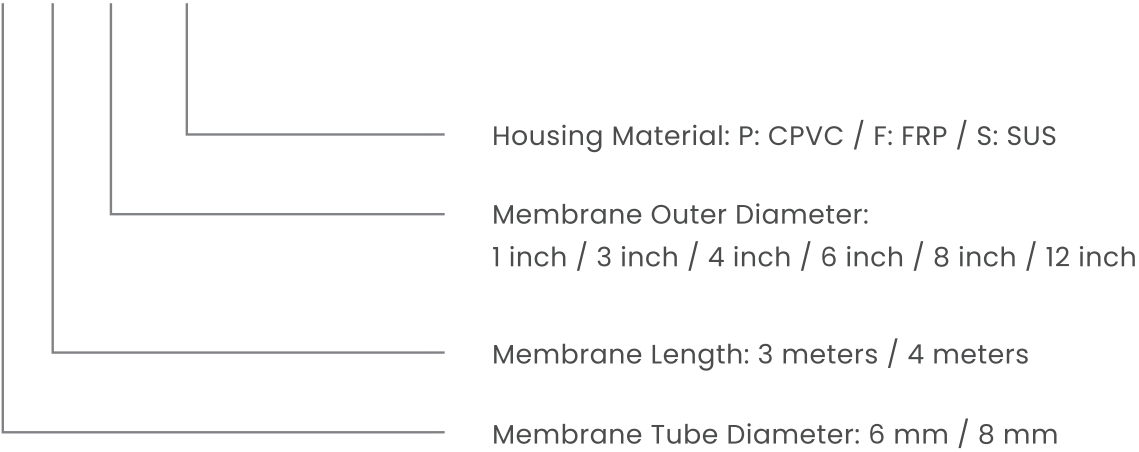
#### Compact & Space-Saving

Modular, high-flux design reduces system footprint and lowers operating costs.



Naming Rules

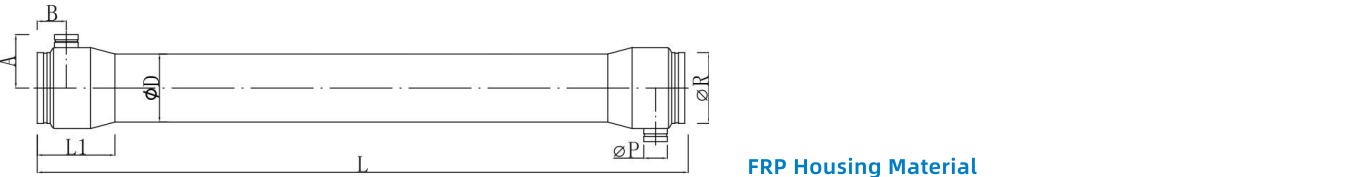
PL-G-XXX-X



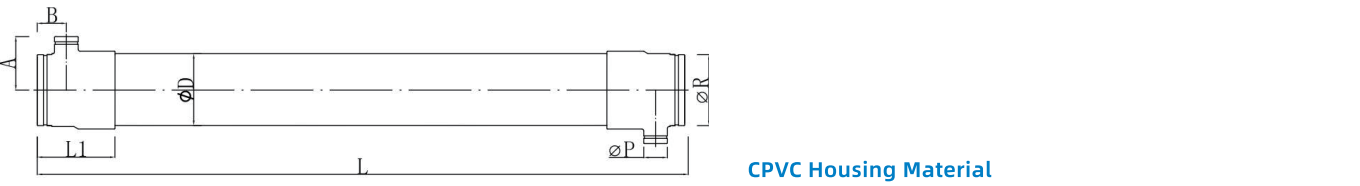
Specification and Model

| Model        | Tube Diameter (mm) | Module Length (mm) | Module Outer Diameter (inch) | Membrane Area (m²) | Housing Material |
|--------------|--------------------|--------------------|------------------------------|--------------------|------------------|
| PL-G-6410-F  | 6                  | 4000               | 10"                          | 69                 | FRP/CPVC         |
| PL-G-8410-F  | 8                  | 4000               | 10"                          | 53                 | FRP/CPVC         |
| PL-G-6310-F  | 6                  | 3000               | 10"                          | 51                 | FRP/CPVC         |
| PL-G-8310-F  | 8                  | 3000               | 10"                          | 40                 | FRP/CPVC         |
| PL-G-648-F/P | 6                  | 4000               | 8"                           | 47                 | FRP/CPVC         |
| PL-G-848-F/P | 8                  | 4000               | 8"                           | 34                 | FRP/CPVC         |
| PL-G-638-F/P | 6                  | 3000               | 8"                           | 33                 | FRP/CPVC         |
| PL-G-838-F/P | 8                  | 3000               | 8"                           | 27                 | FRP/CPVC         |
| PL-G-636-F/P | 6                  | 3000               | 6"                           | 18                 | FRP/CPVC         |
| PL-G-836-F/P | 8                  | 3000               | 6"                           | 15                 | FRP              |
| PL-G-634-F   | 6                  | 3000               | 4"                           | 8.5                | FRP              |
| PL-G-834-F   | 8                  | 3000               | 4"                           | 6.4                | FRP              |

Dimension Parameters



| Model       | A(mm) | B(mm) | D(mm) | L(mm) | L1(mm) | P(mm) | R(mm) |
|-------------|-------|-------|-------|-------|--------|-------|-------|
| PL-G-X34-F  | 98    | 80    | 107   | 3000  | 180    | 48    | 114.3 |
| PL-G-X36-F  | 125   | 90    | 157   | 3000  | 220    | 60    | 168.3 |
| PL-G-X38-F  | 165   | 90    | 214   | 3000  | 230    | 73    | 219   |
| PL-G-X48-F  | 165   | 90    | 214   | 4000  | 230    | 73    | 219   |
| PL-G-X310-F | 180   | 150   | 264   | 3000  | 310    | 88.9  | 273   |
| PL-G-X410-F | 180   | 150   | 264   | 4000  | 310    | 88.9  | 273   |



| Model      | A(mm) | B(mm) | D(mm) | L(mm) | L1(mm) | P(mm) | R(mm) |
|------------|-------|-------|-------|-------|--------|-------|-------|
| PL-G-X38-P | 165   | 90    | 214   | 3000  | 240    | 73    | 219   |
| PL-G-X36-P | 125   | 90    | 160   | 3000  | 230    | 60    | 168.3 |

Note: Customization available upon request

Calculation of Cross Flow Rate

| Model        | Tube Diameter (mm) | Number of Tube (pcs) | Cross-flow Rate (m³/h) |
|--------------|--------------------|----------------------|------------------------|
| PL-G-6310-F  | 6                  | 970                  | 98 ·v                  |
| PL-G-8310-F  | 8                  | 562                  | 102 ·v                 |
| PL-G-638-F/P | 6                  | 655                  | 65 ·v                  |
| PL-G-838-F/P | 8                  | 365                  | 69 ·v                  |
| PL-G-636-F/P | 6                  | 359                  | 36 ·v                  |
| PL-G-836-F/P | 8                  | 210                  | 37 ·v                  |
| PL-G-634-F   | 6                  | 163                  | 16 ·v                  |
| PL-G-834-F   | 8                  | 91                   | 16 ·v                  |

Calculation of Membrane Pressure Drop

| Tube Diameter (mm) | Membrane Pressure Drop ΔP [kPa] at 1m/s | Membrane Pressure Drop ΔP [kPa] at above 2m/s |
|--------------------|-----------------------------------------|-----------------------------------------------|
| 6                  | 1.0×L <sub>0</sub> ×V                   | 3.2×L <sub>0</sub> ×V <sup>1.75</sup>         |
| 8                  | 0.5×L <sub>0</sub> ×V                   | 2.1×L <sub>0</sub> ×V <sup>1.75</sup>         |

Note: V=Surface velocity [m/s] ; L<sub>0</sub>=Membrane modules length[m]



# TUBULAR MEMBRANE PROCESS SOLUTIONS

## MBR Process Solutions

### External MBR

Efficient and pollution-resistant membrane bioreactor

### Air Lift MBR

A membrane bioreactor with low energy consumption and efficient operation

### AnMBR

Efficient treatment of high-concentration organic wastewater to assist in resource utilization

### Suspended Solids Removal Solutions

Efficient removal of suspended solids to optimize downstream processes.

### PEK-Based Softening Solutions

Effectively remove fluorine, silicon, and hardness to enhance system operational stability.

### Heavy Metal Removal Solutions

Efficient removal of heavy metal ions to ensure environmentally compliant discharge.

### Oil Removal Solutions

Efficient removal of oil and emulsified oil to improve wastewater treatment system stability.

### Fluid Membrane Separation Solutions

Efficient clarification, impurity removal, and purification for natural extracts, bio-fermentation liquids, functional sugars, and condiment/beverage industries.



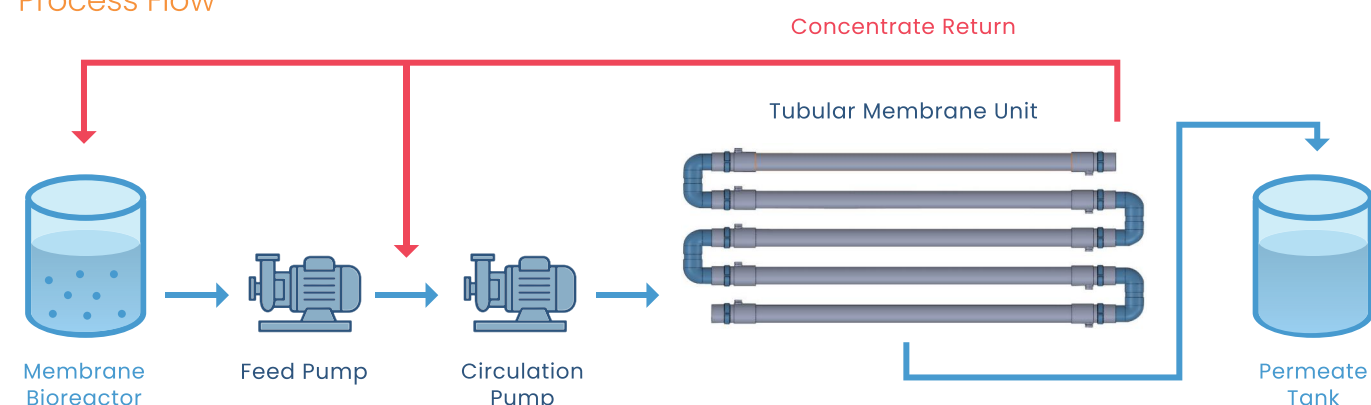
# External MBR

High-efficiency membrane bioreactor with superior fouling resistance

## Introduction to Process Solution

The external MBR process package adopts a combined configuration of "front-end biochemical tank + tubular membrane external filtration unit," integrating high-load organic pollutant biodegradation capabilities with high-flux cross-flow membrane separation technology. It is particularly suitable for treating high-concentration organic wastewater. The system features strong anti-fouling performance, long operational cycles, and stable membrane flux, making it widely applicable in complex conditions such as high suspended solids, high COD/BOD, and oily wastewater.

## Process Flow



## Core Advantages

- Adaptable to high-concentration activated sludge systems (MLSS 12,000–40,000 mg/L); no secondary settling tank, compact footprint, simplified process
- Strong anti-fouling membrane material ensures stable flux and long service life
- Low energy consumption (70–150 LMH, operating energy <1.5 kWh/m³), reducing operating costs
- High resistance to hydraulic: membrane surface flow 3–5 m/s, effectively prevents sludge

## Application Scenarios

- Food & Beverage:** Beer, dairy, juice production wastewater
- Pharmaceutical & Chemical:** High-salinity wastewater, biopharmaceuticals, fine chemicals
- Petroleum & Petrochemical:** Refinery, oilfield reinjection water, oily wastewater
- Livestock & Agriculture:** Poultry/livestock farming, slaughterhouse wastewater, high-chlorine/ammonia wastewater
- Landfill Leachate:** High COD, high ammonia nitrogen, highly corrosive wastewater

## Contact Us

- For detailed information or case studies of this solution, please contact the Plum Membrane team.
- Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Foshan Landfill Leachate MBR System

Wastewater Type: Landfill leachate  
Capacity: 425 m³/d  
Inlet: COD: 1500 mg/L; MLSS >15,000 mg/L  
Outlet: COD: <60 mg/L; MLSS <1 mg/L  
Flux: 60–100 LMH



### Guangzhou Landfill Leachate MBR System

Wastewater Type: Landfill leachate  
Capacity: 4000 m³/d  
Inlet: COD: 2500 mg/L; MLSS >20,000 mg/L  
Outlet: COD: 800 mg/L; MLSS <1 mg/L  
Flux: 60–100 LMH



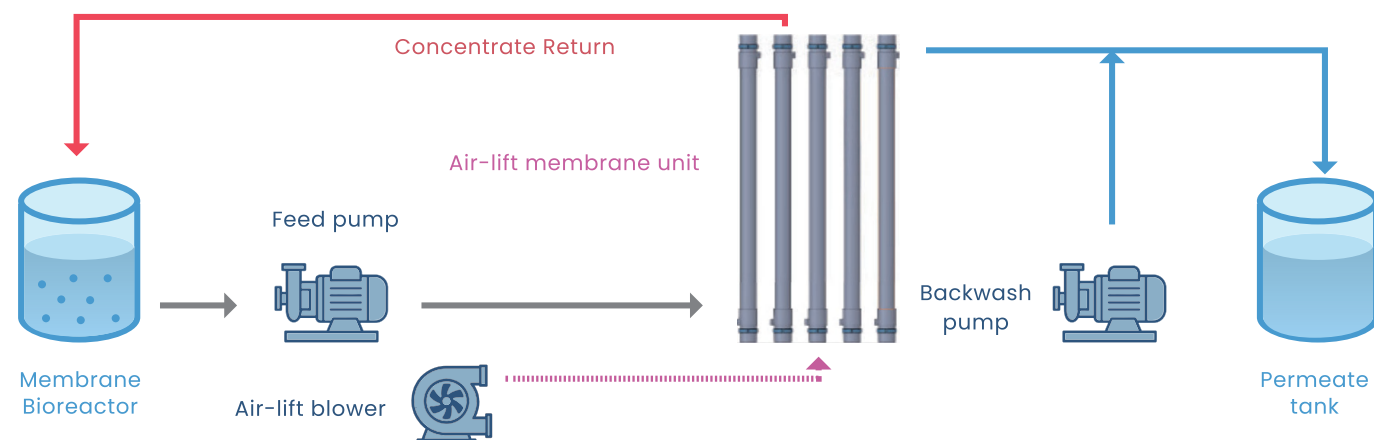
# Air-lift MBR

Air-lift driven membrane bioreactor for energy-saving and efficient circulation

## Introduction to Process Solution

The air-lift MBR adopts Air Lift technology, using the shear force generated by rising air bubbles to drive water circulation inside the membrane modules. Achieving synergy between sludge thorough mixing, biodegradation, and membrane separation. The system not only provides sufficient dissolved oxygen to enhance microbial activity but also reduces membrane fouling, improving operational stability.

## Process Flow



## Core Advantages

- Energy-efficient operation: Air-lift circulation reduces pumping needs, maintaining cross-flow velocity at 0.4-0.8 m/s, with energy consumption under 0.5 kWh/m³.
- Ideal for MBR systems with MLSS 8,000-12,000 mg/L, ensuring stable operation.
- High-efficiency separation: Membrane flux reaches 30-60 LMH, providing consistent effluent quality meeting discharge standards.
- Reduced fouling: Air-lift turbulence inhibits fouling, minimizes scaling, extends membrane life, and reduces cleaning.
- Easy installation/maintenance: External design suits new and retrofit projects, with simplified membrane replacement and capacity expansion.

## Application Scenarios



**Food and Beverage Industry**  
Beer, dairy products, brewing, fruit juice wastewater



**Industrial Park Wastewater Treatment**  
Medium-to-high concentration organic wastewater



**Municipal Sewage Treatment**  
High-efficiency and energy-saving renovation and upgrading



**Aquaculture and Livestock Breeding Wastewater:** Low energy consumption and high-efficiency treatment of organic pollutants

## Typical Cases



### Cigarette Factory Wastewater Treatment Plant

Treatment capacity: 1100 m³/d  
Wastewater type: Tobacco processing wastewater  
Inlet water: COD 600-1000 mg/L, MLSS 8000-10000 mg/L  
Outlet water: COD < 100 mg/L, MLSS < 1 mg/L  
Operating flux: 30-50 LMH



### Wastewater Treatment for Chemical Enterprise

Treatment capacity: 1100 m³/d  
Wastewater type: chemical wastewater  
Inlet water: COD 400-800 mg/L, MLSS 6000-8000 mg/L  
Outlet water: COD < 100 mg/L, MLSS < 1 mg/L  
Operating flux: 40-60 LMH



## Contact Us



For detailed information or case studies of this solution, please contact the Plum Membrane team.



Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

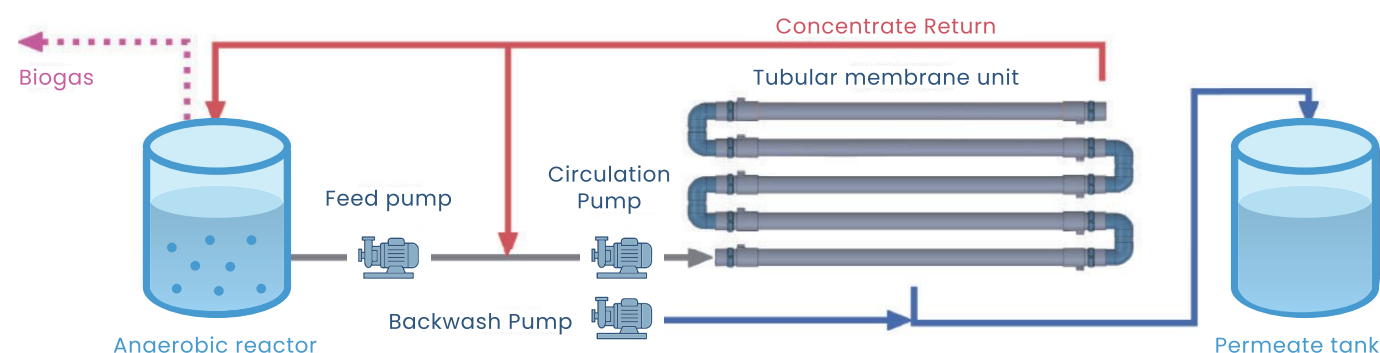
# Anaerobic MBR (AnMBR)

Anaerobic MBR for high-strength organic wastewater treatment with energy recovery and resource reuse

## Introduction to Process Solution

The AnMBR solution combines anaerobic biological reactors with external tubular membrane systems, enabling efficient degradation of organic matter while producing high-quality effluent. It is suitable for high-COD organic wastewater, especially for industries such as dairy, fermentation, and pharmaceuticals. The system operates under low sludge production and energy consumption, while enabling biogas recovery for energy utilization. With a compact and modular design, it ensures flexible operation and excellent long-term stability under harsh conditions.

## Process Flow



## Core Advantages

- Excellent COD removal: Achieves 95–99% COD removal, meets discharge standards or reuse requirements
- Energy recovery: 1 kg COD  $\approx$  0.35 Nm<sup>3</sup> CH<sub>4</sub>  $\approx$  3.7 kW·h, applicable for biogas-fueled power generation
- Low sludge production: Generates only 20%–30% of the sludge compared to conventional processes, reducing disposal cost
- No DAF pre-treatment required: Capable of processing high-oil/high-TSS wastewater with simplified pre-treatment
- External membrane system: Eliminates air scouring needs, enabling automated membrane cleaning, reducing operational complexity
- Rapid start-up & strong shock load resistance: Ideal for industries with highly variable production conditions

## Application Scenarios

- Alcohol distillation & brewing:**  
High-strength organic wastewater (COD >100,000 mg/L), ideal for anaerobic biogas production
- Fruit/vegetable & sugar mill wastewater:**  
High sugar content, easily fermentable, suitable for resource recovery
- Bio-fermentation & enzyme production:**  
Complex organics with high biodegradability, requiring stable effluent quality
- Pharmaceutical & slaughterhouse:**  
Highly fluctuating loads; anaerobic MBR provides robust buffering and removal

## Contact Us

- For detailed information or case studies of this solution, please contact the Plum Membrane team.
- Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Henan Biochemical Industry AnMBR Project

Wastewater source: Biochemical wastewater  
Capacity: 500 m<sup>3</sup>/d  
Influent quality: COD: 15,000–20,000 mg/L, Ammonia: 1200 mg/L, MLSS: 12,000–16,000 mg/L  
Effluent quality: COD < 250 mg/L, Ammonia < 40 mg/L  
Flux: 35–45 LMH  
Cross-flow velocity: 2.0 m/s  
Membrane area: 45 m<sup>2</sup>  
Biogas production: Approx. 0.8 Nm<sup>3</sup>/m<sup>3</sup> wastewater



### Brewery Wastewater AnMBR Project

Wastewater source: pulping black liquor  
Capacity: 700 m<sup>3</sup>/d  
Influent quality: COD: 30,000–35,000 mg/L, pH 9.5  
Effluent quality: COD < 300 mg/L, removal efficiency > 98%  
Flux: 40–60 LMH  
Cross-flow velocity: 1.8–2.0 m/s  
Membrane flux: 28–38LMH  
Biogas production: Approx. 0.7 Nm<sup>3</sup>/m<sup>3</sup> wastewater, CH<sub>4</sub> content > 60%



# Suspended Solids Removal Process Solution

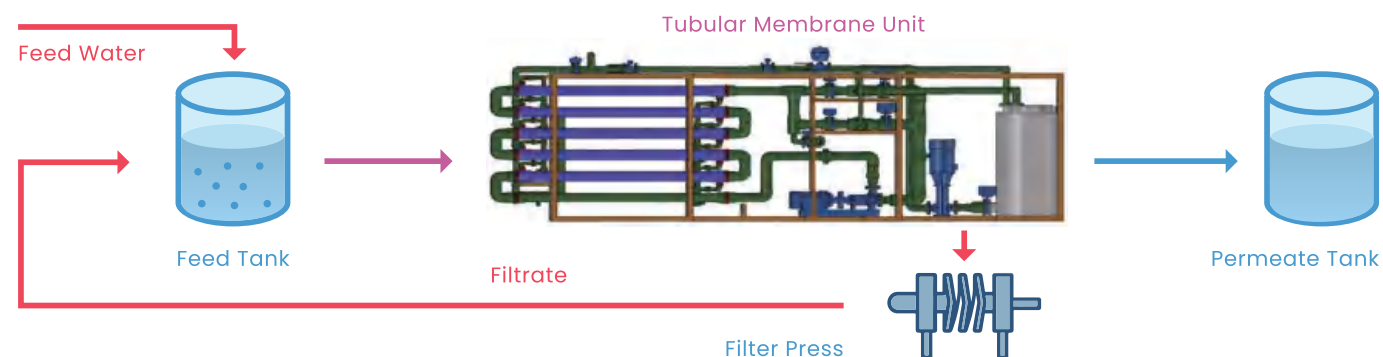
Enhancing membrane process stability through efficient removal of high suspended solids

## Introduction to Process Solution

This solution adopts PEK tubular membranes with strong anti-fouling capabilities and is suitable for treating fluids with suspended solids (SS) concentrations as high as 30–50 g/L. It features excellent pollutant resistance and compatibility with chemical cleaning. The system operates without backwashing and is especially suitable as a pretreatment step for nanofiltration (NF) or reverse osmosis (RO) membrane processes.

Typical applications include solid-liquid separation and clarification in biological fermentation, natural product extraction, food & beverage production, and resource recycling scenarios.

## Process Flow



## Core Advantages

- Anti-fouling Performance:** Membrane recovery rate exceeds 99% after cleaning.
- Adapted for Ultra-High SS Conditions:** Handles suspended solids concentrations up to 30–50 g/L; resistant to clogging and fouling.
- High Product Water Clarity:** Permeate turbidity < 0.5 NTU, SDI<sub>15</sub> < 3, ensuring stable operation of downstream membrane systems.
- No Need for Chemical Pretreatment:** Simplifies system design by eliminating reliance on coagulants and fine cartridge filters.
- Enhanced Downstream Membrane Stability:** Reduces pollution risk for NF/RO systems and extends membrane lifespan.
- Strong Chemical Resistance:** PEK membranes tolerate strong acids and strong oxidizing cleaners; excellent flux recovery.

## Application Scenarios

- Industrial wastewater:** High suspended solids (SS) & particulate-laden streams
- Municipal wastewater advanced treatment:** SS removal & reclaimed water quality enhancement
- New energy sector:** Lithium battery production & recycling wastewater
- Biopharma & fermentation:** Microbial biomass/protein separation & process water optimization
- Food & beverage:** High-solid streams like juice, starch processing effluent

## Contact Us

- For detailed information or case studies of this solution, please contact the Plum Membrane team.
- Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Biopharmaceutical Company Fermentation Broth Pretreatment

Wastewater source: Fermentation broth  
Capacity: 40 m³/h  
Inlet SS: 1000–5000 mg/L  
Outlet SS: <1 mg/L, suitable as NF/RO feed water  
System advantages: Excellent filtration efficiency, stable performance, and high-quality treated output



### Amino Acid Plant Suspended Solids Removal System

Wastewater source: Amino acid wastewater  
Capacity: 20 m³/h  
Inlet SS: 300–500 mg/L  
Outlet SS: <1 mg/L, suitable as RO/NF feed  
System advantages: Reduced chemicals and operating costs, low energy consumption



### Functional Sugar Producer Wastewater Treatment

Wastewater source: Saccharified liquid  
Capacity: 110 m³/h  
Inlet SS: 500–1000 mg/L  
Outlet SS: <1 mg/L  
System advantages: Excellent filtration efficiency, stable performance, and high-quality treated product.



# PEK Softening Process Solutions

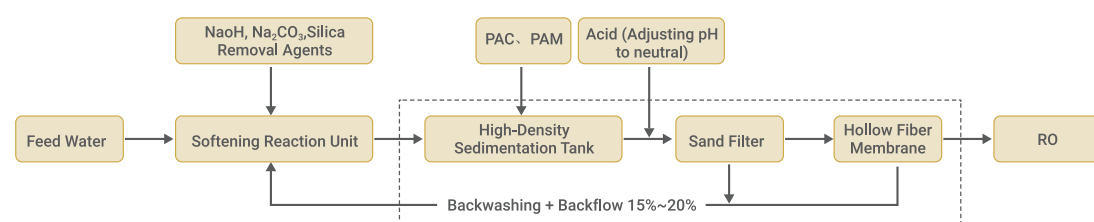
Efficient removal of hardness, silicon, and fluoride to ensure the stable operation of membrane systems under high-load conditions

## Introduction to Process Solution

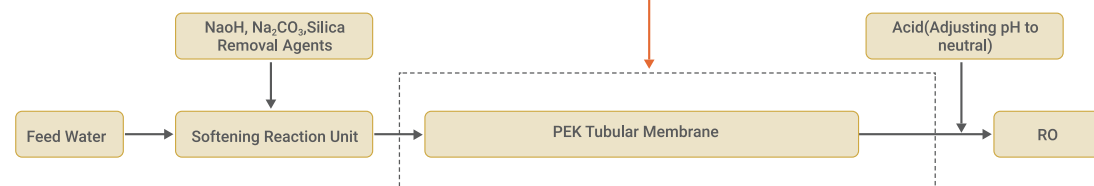
The PEK softening solution integrates chemical precipitation reactions under high pH conditions with advanced filtration using PEK tubular membranes, enabling the effective removal of calcium, magnesium, silicon, fluoride, and heavy metal ions from raw water. This process is suitable for treating highly alkaline or high-salinity water sources. It is especially applicable for pretreatment of high-hardness, high-silica industrial wastewater, improving the stability of nanofiltration (NF) and reverse osmosis (RO) systems, while reducing membrane scaling and cleaning frequency.

## Process Flow

### Conventional Softening Process



### PEK Tubular Membrane Softening Process



## Core Advantages

- High-flux operation (100-300 LMH), suitable for medium and high hardness systems with low fouling risk
- Alkaline-resistant operation (pH ≥11.5) for hardness removal without acid adjustment
- Effluent quality: Hardness <50 mg/L, total silicon <10 mg/L, fluoride <1 mg/L, ensuring downstream membrane stability
- Replaces traditional softening + sedimentation + sand filtration with compact footprint, shorter process, and high automation
- No coagulant or flocculant required, reducing chemical usage by >30% and operational costs

## Application Scenarios

- Reclaimed Water Reuse:** Municipal and industrial wastewater softening
- Industrial Wastewater:** High-hardness, high-silica, high-fluoride streams
- Power/PV/Coal Chemical Cooling Water:** Scaling inhibition & reuse rate enhancement
- RO Brine Softening Pretreatment:** Scaling prevention & recovery rate improvement
- High-Silica/Fluoride Groundwater Pretreatment:** Scaling risk reduction & water stabilization
- Nonferrous Metallurgy Wastewater:** Hardness & heavy metal removal

## Contact Us

- For detailed information or case studies of this solution, please contact the Plum Membrane team.
- Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Chemical Plant Reclaimed Water Softening & Silicon Removal System

Wastewater Type: Municipal reclaimed water  
Capacity: 235 m³/h reclaimed water; 105 m³/h freshwater  
Influent Quality: SS: 300 mg/L; Hardness: 200-500 mg/L; Silicon: 50-70 mg/L  
Effluent Quality: SS <1 mg/L; Hardness <50 mg/L; Silicon <10 mg/L  
System Advantages: Process flow diagram; High-efficiency collaborative management; Silicon removal; Impurity removal



### Chemical Plant Circulating Blowdown Water Softening System

Wastewater Type: Cooling circulating water  
Capacity: 52 m³/h  
Influent Quality: SS: 150 mg/L; Hardness: 500-1000 mg/L  
Effluent Quality: SS <1 mg/L; Hardness <50 mg/L  
System Advantages: Reduces scaling risk in pipelines; Improves cooling efficiency; Lowers chemical dosage



### Coal Mine Pit Water High-SS Treatment System

Wastewater Type: Coal mine drainage water  
Capacity: 150 m³/h  
Influent Quality: SS: 100 mg/L; Hardness: 800 mg/L  
Effluent Quality: SS <1 mg/L; Hardness <50 mg/L  
System Advantages: No flocculant/coagulant required; Reduces chemical costs; Lowers transportation expenses



### Thermal Power Plant FGD Wastewater ZLD System

Wastewater Type: Power plant desulfurization wastewater  
Capacity: 10 m³/h  
Influent Quality: Hardness: 16,000-20,000 mg/L  
Effluent Quality: SS <1 mg/L; Hardness <50 mg/L  
System Advantages: Minimizes scaling risks; Enhances operational stability



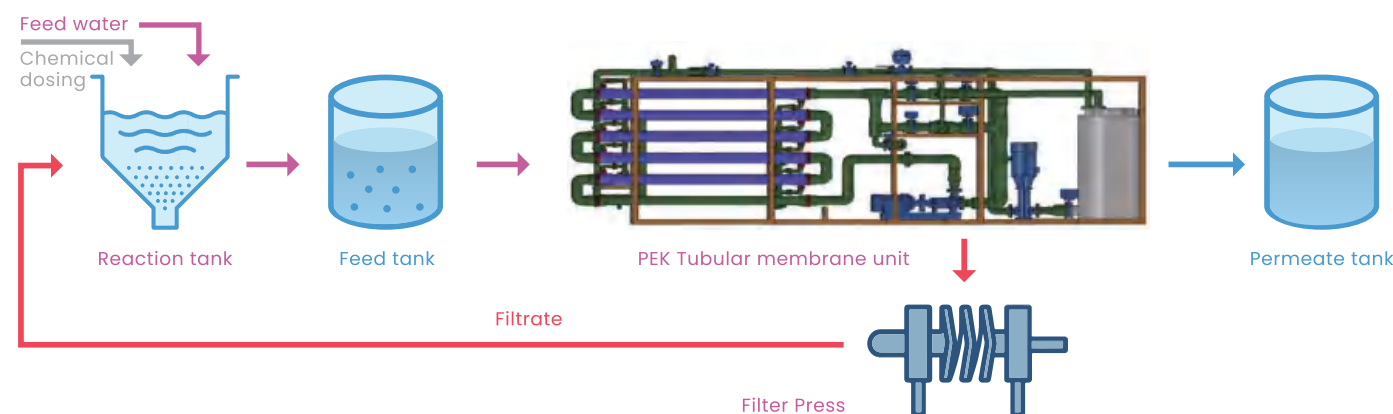
# Heavy Metal Removal Process Solution

Efficient Heavy Metal Removal for Compliance with Environmental Regulations

## Introduction to Process Solution

Heavy metals are often found in wastewater from electroplating, electronics, chemical, and PCB industries. Without proper treatment, direct discharge poses significant environmental and health risks. This solution uses PEK tubular membranes in combination with chemical precipitation and multi-stage separation to efficiently remove Cu, Ni, Zn, Pb, Cr, Cd, and other heavy metal ions from wastewater. It achieves deep purification and ensures treated water meets discharge or reuse standards.

## Process Flow



## Core Advantages

- Efficient removal of multiple heavy metal ions, applicable for  $\text{Cu}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Cr}^{3+}$ ; removal rate exceeds 95%
- High Concentration Treatment, Wide Adaptability: Capable of stably treating wastewater with heavy metal concentrations
- Stable process and excellent product water quality: The concentration of heavy metals in the product water can be as low as 0.1mg/L
- Low membrane fouling, low cleaning frequency: Front-end dosing reaction treatment, reducing the risk of membrane fouling
- Modular design and small footprint, a preferred pre-RO or standalone treatment option for many industrial plants

## Application Scenarios

- Electroplating and PCB industries:**  $\text{Cu}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Zn}^{2+}$ -containing wastewater
- Electronics manufacturing:** Wastewater from chip and semiconductor fabrication
- Metallurgy and mining:** Smelting, refining, and metal processing wastewater
- Chemical industry:** Catalyst, pigment, and battery-related wastewater
- High-concentration wastewater reuse:** For resource recovery and environmental discharge

## Contact Us

- For detailed information or case studies of this solution, please contact the Plum Membrane team.
- Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Steel Plant Hydrochloric Acid Pickling Wastewater Treatment Project

Wastewater Type: pH-adjusted and oxidized iron-containing wastewater  
Capacity: 1,350 m³/d  
Influent Quality: Iron 500-1,000 mg/L  
Effluent Quality: Heavy metal removal rate >99%; Heavy metal ions <0.5 mg/L  
System Advantages: Stable operation; Reduced chemical consumption;



### Steel Plant Sulfuric Acid Pickling Wastewater Treatment Project

Wastewater Type: pH-adjusted and oxidized iron-containing wastewater  
Capacity: 1,200 m³/d  
Influent Quality: Iron 1,000-3,000 mg/L  
Effluent Quality: Heavy metal removal rate >99%; Heavy metal ions <0.5 mg/L  
System Advantages: Stable operation; Reduced chemical consumption;



### Aluminum Industry Wastewater Treatment Project

Capacity: 2,400 m³/d  
Wastewater Type: Aluminum ions + heavy metal complex wastewater  
Influent Quality: SS 100-300 mg/L; Heavy metal ions 300-500 mg/L  
Effluent Quality: SS <1 mg/L; Heavy metal ions <0.5 mg/L  
System Advantages: High-efficiency heavy metal removal; Stable flux operation; Compact footprint



### PCB Manufacturing Wastewater Treatment Project

Capacity: 3,600 m³/d  
Wastewater Type: Mixed wastewater containing copper ions and other heavy metals  
Influent Quality: SS 500-2,000 mg/L; Heavy metal ions 200-300 mg/L; COD ~300 mg/L  
Effluent Quality: SS <1 mg/L; Heavy metal ions <0.5 mg/L  
System Advantages: High-efficiency heavy metal removal; Stable flux operation; Compact footprint



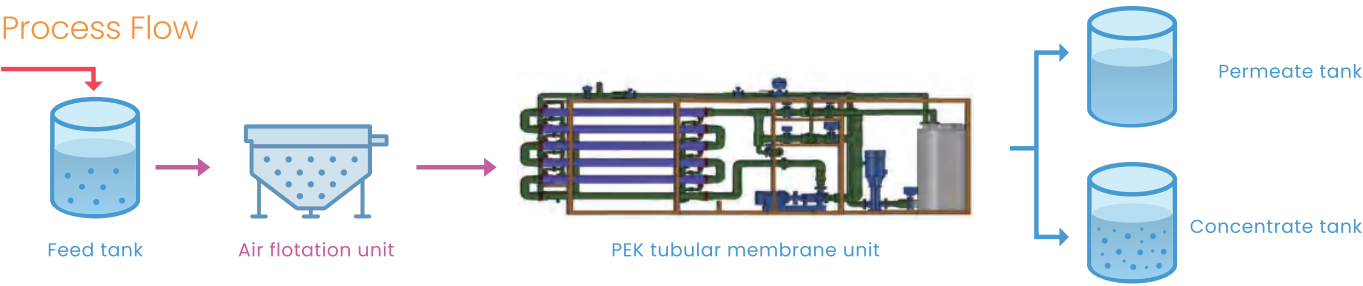
# Oil Removal Process Solutions

Efficient oil and emulsified oil removal for improved operational stability

## Introduction to Process Solution

Oily wastewater commonly originates from industries such as petroleum extraction, oil refining, petrochemical, steel rolling, and oilfield reinjection. It often contains high concentrations of free oil and emulsified oil, with high turbidity and poor separability. Traditional treatment methods struggle with such characteristics. Plum Membrane's PEK tubular membrane system enables fully automated continuous filtration and separation. The system achieves stable operation even under fluctuating load, reducing effluent oil content to below 5 mg/L and achieving over 99% oil removal efficiency, significantly improving the stability and safety of downstream membrane processes.

### Process Flow



| Parameter        | Oil Content (mg/L) | Suspended Solids (mg/L) | Particle Size (μm) | Acid-Resistant Bacteria (CFU/mL) | Mesophilic Bacteria (CFU/mL) | Iron Bacteria (CFU/mL) |
|------------------|--------------------|-------------------------|--------------------|----------------------------------|------------------------------|------------------------|
| Influent Quality | < 1000             | < 1000                  | < 20               | < 1000                           | < 10000                      | < 10000                |
| Effluent Quality | < 5                | < 1                     | < 1                | < 10                             | < 100                        | < 100                  |
| Removal Rate     | 99%                | 99.9%                   | -                  | 99%                              | 99%                          | 99%                    |

## Core Advantages

-  High Oil Removal Rate:oil removal rate > 99%, effluent oil content < 5 mg/L
-  Stable Membrane Flux: Suitable for high salinity,viscosity, and high-COD oily wastewater
-  Oil and Fouling Resistance: Excellent anti-fouling properties
-  High System Integration: High degree of automation, compact footprint
-  Long Service Life: Lifespan exceeding 5 years, suitable for continuous operation systems

## Application Scenarios

- **Oilfield produced water treatment:**High oil content, high salinity, often containing emulsified oil
- **Petrochemical wastewater treatment:** Refining, storage and transportation process oily wastewater
- **Fracturing backflow liquid treatment:** Backflow liquid contains oil, high COD, and suspended solids
- **Emulsified liquid and cleaning wastewater treatment:** Mechanical processing, degreasing solution, oil-containing cleaning solution
- **Food industry oily wastewater:** Meat products, frying, seasoning wastewater

## Contact Us

-  For detailed information or case studies of this solution, please contact the Plum Membrane team.
-  Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Oilfield Produced Water Advanced Treatment Project

Capacity: 10,000 m³/d  
Wastewater Type: Oilfield produced water after oil-water separation  
Influent Quality: Oil content 50-100 mg/L  
Product Water Quality: Oil content <5 mg/L  
System Advantages: Highly efficient and stable oil removal; Reduces downstream treatment load



### Oilfield Produced Water Treatment Project

Capacity: 1,200 m³/d  
Wastewater Type: Oilfield produced water  
Influent Quality: Oil content 10-50 mg/L  
Product Water Quality: Oil content <1 mg/L  
System Advantages: Pollution-resistant system; Removes oil and microbial contamination



### Oilfield Produced Water Treatment Project

Capacity: 500 m³/d  
Wastewater Type: Oilfield produced water  
Influent Quality: Oil content 10-50 mg/L  
Product Water Quality: Oil content <1 mg/L  
System Advantages: Pollution-resistant system; Removes oil and microbial contamination



### il & Gas Field Fracturing Fluid Compliance Treatment Project

Capacity: 200 m³/d  
Wastewater Type: Oilfield fracturing fluid  
Influent Quality: Oil content 10-50 mg/L; Total hardness >20,000 mg/L  
Product Water Quality: Oil content <1 mg/L; Total hardness <1,000 mg/L  
System Advantages: Pollution-resistant system; >95% total hardness removal rate



# Tubular Membrane Case list

| No. | Location       | Capacity  | Application                                 | Process             |
|-----|----------------|-----------|---------------------------------------------|---------------------|
| 1   | Hubei          | 100 m³/d  | VB2 Crystallization Mother Liquor           | Hardness Removal    |
| 2   | Jiangsu        | 40 m³/h   | RO Brine                                    | Hardness Removal    |
| 3   | Jiangsu        | 40 m³/h   | Circulating Water Blowdown Reuse            | Hardness Removal    |
| 4   | Shanxi         | 40 m³/h   | Desulfurization wastewater gypsum recycling | Hardness Removal    |
| 5   | Jiangxi        | 50 m³/h   | Electroplating Wastewater ZLD               | Heavy Metal Removal |
| 6   | Inner Mongolia | 235 m³/h  | Reclaimed Water Reuse                       | Hardness Removal    |
| 7   | Inner Mongolia | 100 m³/h  | RO Brine ZLD                                | Hardness Removal    |
| 8   | Inner Mongolia | 6 m³/h    | Crystallization Mother Liquor Treatment     | Impurity Removal    |
| 9   | Anhui          | 5 m³/h    | Caustic Cleaning Wastewater Reuse           | Impurity Removal    |
| 10  | Shandong       | 1200 m³/d | Acid & Alkali Cleaning Wastewater Reuse     | Heavy Metal Removal |
| 11  | Shandong       | 1350 m³/d | Acid & Alkali Cleaning Wastewater Reuse     | Heavy Metal Removal |
| 12  | Anhui          | 52 m³/h   | Circulating Water Blowdown Reuse            | Hardness Removal    |
| 13  | Jiangsu        | 100 m³/h  | Electroplating wastewater ZLD               | Heavy Metal Removal |
| 14  | Inner Mongolia | 100 m³/h  | Mine Water Treatment                        | Silica Removal      |
| 15  | Sichuan        | 150 t/d   | Landfill Leachate Treatment                 | Hardness Removal    |
| 16  | Shaanxi        | 30 m³/h   | Coking Wastewater Treatment                 | Silica Removal      |
| 17  | Sichuan        | 40 m³/h   | Vanadium Ore Wastewater Treatment           | Heavy Metal Removal |
| 18  | Shaanxi        | 50 m³/h   | Oilfield Produced Water Treatment           | Oil Removal         |
| 19  | Anhui          | 300 m³/h  | Mine Water Treatment                        | Impurity Removal    |
| 20  | Anhui          | 30 m³/h   | Mine Water RO Brine Treatment               | Hardness Removal    |
| 21  | Shaanxi        | 40 m³/h   | Mine Water RO Brine Treatment               | Silica Removal      |

| No. | Location | Capacity | Application                                              | Process             |
|-----|----------|----------|----------------------------------------------------------|---------------------|
| 22  | Anhui    | 20 m³/h  | Power Plant Cooling Water Blowdown Treatment             | Hardness Removal    |
| 23  | Yunnan   | 400 m³/h | Circulating Water Blowdown Reuse                         | Hardness Removal    |
| 24  | Sichuan  | 40 m³/h  | Electroplating Wastewater ZLD                            | Heavy Metal Removal |
| 25  | Shandong | 80 m³/h  | RO Brine ZLD                                             | Impurity Removal    |
| 26  | Shandong | 10 m³/h  | 20% Hydrochloric Acid Treatment                          | Impurity Removal    |
| 27  | Shandong | 10 m³/h  | Waste Salt Resource Utilization                          | Hardness Removal    |
| 28  | Gansu    | 10 m³/h  | Desulfurization Wastewater ZLD                           | Hardness Removal    |
| 29  | Shandong | 65 m³/h  | Municipal Reclaimed Water Reuse                          | Hardness Removal    |
| 30  | Shandong | 100 m³/h | Circulating Water Blowdown Treatment                     | Impurity Removal    |
| 31  | Hebei    | 58 m³/h  | Battery Wastewater Treatment                             | Hardness Removal    |
| 32  | Zhejiang | 10 m³/h  | Electroplating Wastewater Treatment                      | Heavy Metal Removal |
| 33  | Anhui    | 20 m³/h  | Circulating Water Blowdown Treatment                     | Hardness Removal    |
| 34  | Foshan   | 425 m³/d | Landfill Leachate Treatment                              | External MBR        |
| 35  | Qingyuan | 150 m³/d | Landfill Leachate Treatment                              | External MBR        |
| 36  | Wengyuan | 100 m³/d | Landfill Leachate Treatment                              | External MBR        |
| 37  | Shaoguan | 150 m³/d | Landfill Leachate Treatment                              | External MBR        |
| 38  | Jiangxi  | 300 m³/d | Landfill Leachate Treatment                              | External MBR        |
| 39  | Shenzhen | 480 m³/d | Wafer Grinding Process Water Treatment                   | Impurity Removal    |
| 40  | Ningxia  | 168 m³/d | Monocrystalline Silicon Grinding Process Water Treatment | Impurity Removal    |
| 41  | Russia   | 100 m³/h | Oilfield Produced Water Treatment                        | Oil & Iron Removal  |

## Typical Applications of PEK Tubular Membranes in Fluid Separation Industries

Covers various processes including natural extract clarification, fermentation fluid purification, fruit & vegetable beverage filtration, and functional sugar processing.



①

Clarification and purification of natural and herbal extracts



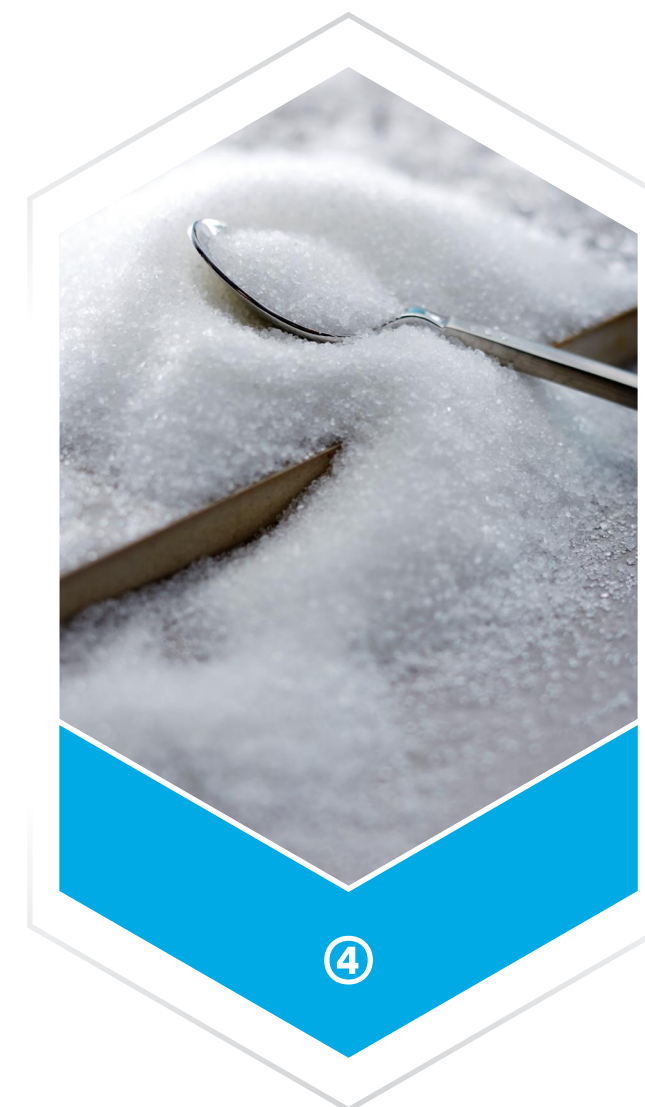
②

Sterile filtration and purification of fermentation broth and enzymatic hydrolysate



③

Clarification and impurity removal in fruit juice, condiments, and food process liquids



④

Clarification, decolorization, and purification of functional sugar solutions

# Clarification Process Solution for Natural and Herbal Extracts

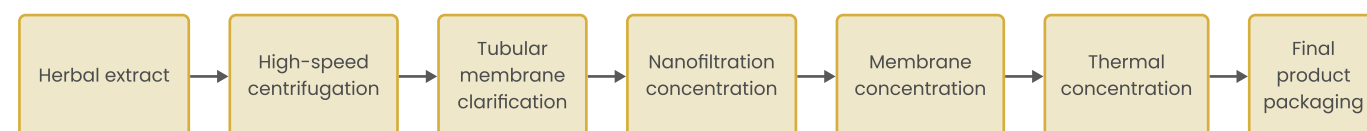
## Unlocking Clarity in Herbal Extraction

### Introduction to Process Solution

Natural product and herbal extractions often contain a wide range of active substances, such as polysaccharides, saponins, polyphenols, and proteins. Traditional clarification methods face limitations in efficiency, ease of operation, and product quality, which has led to increasing demand for more advanced separation technologies.

This clarification process solution from Plum Membrane utilizes PEK tubular membranes with excellent anti-fouling properties and high filtration precision. It effectively removes suspended solids and large molecular impurities while maintaining high permeability and chemical stability. The system enables continuous clarification and concentration, improves product quality, and ensures compliance with stringent pharmaceutical and food-grade standards. It is suitable for scenarios requiring clear appearance, high purity, and GMP compliance.

### Process Flow



### Core Advantages

-  High Flux & Robust Fouling Resistance: Cross-flow filtration design ideal for natural extracts with stable operation
-  Precision Clarification: Molecular weight cut-off range of 30000-300000D
-  Broad Temperature Adaptability: Suitable for both hot and cold extraction processes with minimal thermal loss
-  Continuous Operation: Fully automated system with <5 minutes residence time and no concentrate recirculation
-  Clean Production Process: Short workflow helps to pass GMP or food certifications

### Application Scenarios

- Clarification of Natural Extracts
- Clarification and Concentration of Herbal Extracts
- Purification of Herbal Decoctions
- Clarification and Concentration of Herbal Juice Extracts
- Clarification of Plant-Based Beverages & Functional Liquids

### Typical Cases



#### Astragalus Extraction Project

Treatment Capacity: 200 m³/d  
Fluid Type: Astragalus Water Extract  
Fluid Properties: SS content of 2-4%  
Treatment Result: Clarified product liquid with turbidity < 1 NTU



#### Cistanche Extraction Project

Treatment Capacity: 200 m³/d  
Fluid Type: Cistanche Aqueous Extract  
Fluid Properties: SS content of 2-4%  
Treatment Result: Clarified product liquid with turbidity < 1 NTU



#### Chicory and Jerusalem Artichoke Oligofructose Extraction Project

Treatment Capacity: 300 m³/d  
Fluid Type: Chicory and Jerusalem Artichoke Water Extract  
Fluid Properties: SS content of 4-10%  
Treatment Result: Clarified product liquid with turbidity < 1 NTU



#### Corn Cob Autohydrolysis Extraction of Xylo-oligosaccharides Project

Treatment Capacity: 400 m³/d  
Fluid Type: Corn Cob Explosion Enzymatic Hydrolysate  
Fluid Properties: SS content of 3%  
Treatment Result: Turbidity < 1 NTU; effective removal of suspended solids



### Contact Us



For detailed information or case studies of this solution, please contact the Plum Membrane team.



Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

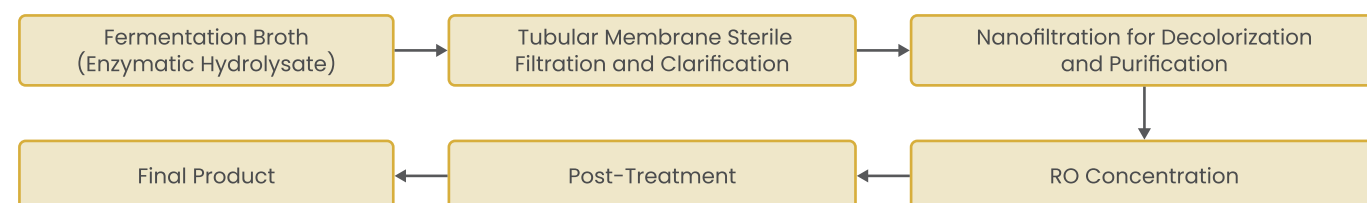
# Advanced Sterile Filtration and Purification of Fermentation and Hydrolysate Streams

Stable filtration solutions for complex fermentation systems

## Introduction to Process Solution

PEK tubular membranes effectively handle fermentation and enzymatic fluids containing amino acids, nucleotides, peptides, and oligosaccharides, achieving efficient sterilization, impurity removal and purification. Compared to conventional filtration methods, PEK membrane systems demonstrate superior fouling resistance and cross-flow filtration characteristics, making them ideal for processing high-concentration, high-viscosity fluids while ensuring continuous and stable filtration. The system features automated operation capability, effectively reducing contamination risks and improving end-product quality.

## Process Flow



## Core Advantages

- Featuring specialized PEX coating for excellent antifouling properties with 5-10 year membrane lifespan
- With strong acid/alkali resistance, withstands high-concentration chemical cleaning
- Wide MWCO range (30000-300000D) effectively removes microorganisms and suspended solids
- Handles high-load fermentation broths with SS 10-300 g/L and high COD systems
- Continuous cross-flow filtration minimizes residence time, prevents clogging and ensures stable operation

## Application Scenarios

- Biological fermentation separation: antibiotics, enzymes, amino acids, and more
- Protein hydrolysate clarification and decolorization: soy protein, corn protein
- Functional sugar production: Xylooligosaccharides, inulin, and allulose
- Vitamin purification: Vitamin C, Vitamin B fermentation solution
- Extraction of amino acid fermentation broth

## Contact Us



For detailed information or case studies of this solution, please contact the Plum Membrane team.



Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### L-Alanine Extraction Project

Treatment capacity: 1300 m<sup>3</sup>/d  
Feed type: fermentation broth  
Suspended solids: 3-10%  
Result: Clarified and transparent product  
Turbidity: < 1 NTU



### Vitamin C Extraction Project

Treatment capacity: 500 m<sup>3</sup>/d  
Feed type: fermentation broth  
Suspended solids: 4-10%  
Result: Clarified product  
Turbidity: < 1 NTU



### Leucine, Isoleucine, and Valine Bacteria Removal and Purification Project

Treatment capacity: 300 m<sup>3</sup>/d  
Feed type: fermentation broth  
Suspended solids: 3-10%  
Result: Clarified and transparent product  
Turbidity: < 1 NTU



### P-Hydroxyphenylalanine Purification Project

Treatment capacity: 100 m<sup>3</sup>/d  
Feed type: fermentation broth  
Suspended solids: 4-10%  
Result: Clarified and transparent product  
Turbidity: < 1 NTU



# Clarification and Impurity Removal Solution for Condiments and Fruit-Vegetable Beverages

Solving clarification challenges in high-viscosity, high-color, and high-impurity liquids

## Introduction to Process Solution

In the production of condiments, fruit and vegetable juice concentrates, sauces, and compound seasonings, traditional clarification methods such as standing, diatomaceous earth filtration, and centrifugation often have poor performance and limited removal efficiency, resulting in issues like turbidity, sedimentation, poor taste, and difficulty in long-term storage and transportation.

Plum Membrane has developed a PEK tubular membrane clarification solution, which delivers excellent separation performance and can meet the high demands for viscosity, color, and impurity removal. It supports fully enclosed continuous operation, effectively removes suspended solids and impurities, and significantly enhances product brightness, taste, and shelf life.



## Process Flow



## Core Advantages

- Uses high-performance PEK membranes, ideal for viscous, oily, and high-impurity fluids
- Suitable for molecular weight ranges of 30kDa–300kDa, effective for complex food fluids
- Supports fully enclosed system operation with CIP and hot water cleaning
- Ensures low-turbidity output, system operates stably
- Enhances product visual quality, stability, and shelf life

## Application Scenarios

- Clarification and impurity removal of soy sauce, vinegar, and similar seasonings
- Clarification of fruit pulp beverages
- Clarification of fruit and vegetable compound juices

## Typical Cases



### Soy Sauce Clarification Project

Treatment Capacity: 120 m³/h  
Fluid Type: Soy Sauce  
Solid Content: 20–25%  
Performance: Bright and clear output  
Turbidity: <1 NTU



### Vinegar and Fermented Liquor Clarification Project

Treatment Capacity: 3 m³/h  
Fluid Type: Vinegar concentrate  
Solid Content: 20–25%  
Performance: Bright and clear output  
Turbidity: <1 NTU



### Grape Juice Clarification and Concentration Project

Treatment Capacity: 0.5 m³/h  
Fluid Type: Grape juice concentrate  
Solid Content: 10–15%  
Performance: Bright and clear output  
Turbidity: <1 NTU



## Contact Us



For detailed information or case studies of this solution, please contact the Plum Membrane team.



Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

# Functional Sugar Clarification and Purification Solution

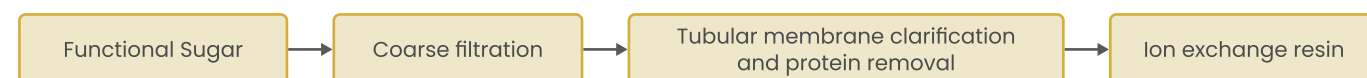
Solving challenges of high-viscosity syrup with complex impurities and filtration difficulties

## Introduction to Process Solution

In functional sugar production (e.g., fructose, glucose, trehalose), concentrated solutions often contain protein impurities, viscous polysaccharides and bacteria. Traditional methods like plate-frame filtration or activated carbon adsorption suffer from low precision, high energy consumption, discontinuous processing and hygiene risks, compromising product purity and stability.

Plum Membrane's PEK tubular membrane system combines high-flux cross-flow filtration to effectively remove colloids, particles and proteins from concentrated sugar solutions. The heat-resistant, fouling-resistant system enables continuous operation with CIP auto-cleaning and modular installation, achieving continuous filtration, automated clarification and concentrate recovery.

## Process Flow



## Core Advantages

-  The membrane pore sizes cover UF and MF, making it ideal for high-viscosity sugar solutions
-  Continuous operation with high-concentration sugar solutions (31-37°Bx), and the concentrate can be recovered
-  Featuring a low-energy design, ambient temperature operating without vacuum system
-  Suitable for high-temperature sugar solution processing (up to 70-85°C), preventing thermal degradation
-  The modular system design enables easy CIP cleaning, high automation, and user-friendly operation

## Application Scenarios

- Clarification and impurity removal of fructose syrup
- Protein removal in wine concentration process
- Trehalose concentrate clarification
- Refining and decolorization of functional sugars
- High-temperature (70-85°C) filtration for concentrated syrups
- Alternative to plate-frame/activated carbon processes for enhanced purity & stability

## Contact Us

 For detailed information or case studies of this solution, please contact the Plum Membrane team.

 Visit our website at [www.plummembranes.com](http://www.plummembranes.com) for more product information.

## Typical Cases



### Glucose Protein Removal & Purification Project

Capacity: 2500 m³/d  
Feed conditions:  
·Sugar concentration: 31%-37%  
·DX value: > 95%  
·Light transmittance: 85%  
Treatment result:  
·Clear product liquid ·Transmittance > 98%



### Fructose Protein Removal & Purification Project

Capacity: 960 m³/d  
Feed conditions:  
·Sugar concentration: 35%-38%  
·DX value: > 95%  
·Light transmittance: 85%  
Treatment result:  
·Clear product liquid ·Transmittance > 98%



### Fructose Protein Removal & Purification Project

Capacity: 1680 m³/d  
Feed conditions:  
·Sugar concentration: 35%-38%  
·DX value: > 95%  
·Light transmittance: 85%  
Treatment result:  
·Clear product liquid ·Transmittance > 98%



### Allulose Clarification & Purification Project

Capacity: 2900 m³/d  
Feed conditions:  
·Sugar concentration: 31%-37%  
·DX value: > 95%  
·Light transmittance: 85%  
Treatment result:  
·Visually clear liquid ·Transmittance > 98%



### xylooligosaccharide (XOS) Clarification & Purification Project

Capacity: 4800 m³/d  
Feed conditions:  
·Solid content: 1.5%-2.5%  
Treatment result:  
·Bright and clear product liquid ·SS < 1



# LIST OF FLUID MEMBRANE SEPARATION CASES

| Location | Application                                                   | Process                                                               |
|----------|---------------------------------------------------------------|-----------------------------------------------------------------------|
| Guilin   | Stevia, Monk Fruit Membrane Extraction & Separation           | Tubular Membrane + NF + RO                                            |
| Jiangxi  | Stevia Membrane Separation                                    | Tubular Membrane + NF + RO                                            |
| Chengdu  | Tea Extraction & Concentration                                | Tubular Membrane + NF + RO                                            |
| Chengdu  | Pine Needles, Kudzu, etc. Membrane Separation & Concentration | Tubular Membrane + Concentration                                      |
| Guangxi  | Stevia, Monk Fruit Separation, Concentration, Purification    | Membrane Separation, Decolorization, Concentration, De-alcoholization |
| Shandong | Honeysuckle Membrane Separation & Purification                | Tubular Membrane + NF Membrane                                        |
| Zhejiang | Traditional Chinese Medicine Extraction & Separation          | Membrane Separation, Concentration, De-alcoholization                 |
| Tianjin  | Pig Blood Plasma Protein Concentration                        | RO Concentration                                                      |
| Hubei    | Fluorescent Whitening Agent                                   | Membrane Separation & Concentration                                   |
| Hebei    | Fluorescent Whitening Agent                                   | Membrane Separation, Membrane Desalting                               |
| Hebi     | Xylo-Oligosaccharides                                         | Tubular Membrane, NF, RO Concentration                                |
| Hunan    | Glucose Syrup Membrane Separation & Purification              | Membrane Separation, Membrane Decolorization, Concentration           |
| Henan    | Stalk Hydrolysis Liquid Recovery of Oligosaccharides          | Tubular Membrane, Membrane Decolorization & Concentration             |
| Shandong | Straw Extraction of Xylo-Oligosaccharides                     | Tubular Membrane + UF + NF + RO                                       |
| Gansu    | Inulin, Fructooligosaccharides                                | HRCC RO Concentration                                                 |
| Shandong | Corn Cobs Hydrolysis Liquid for L-Arabinose Production        | Tubular Membrane, RO Concentration                                    |
| Shandong | Allulose Membrane System                                      | Tubular Membrane for Impurity Removal                                 |

| Location  | Application                                                                                             | Process                                                                       |
|-----------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|
| Tianjin   | Fructose Hydrolysis Liquor                                                                              | Tubular Membrane for Impurity Removal                                         |
| Shandong  | Hydrolysis Liquor Separation & Purification                                                             | Tubular Membrane + UF + NF                                                    |
| Zhejiang  | Rubredoxin, $\beta$ -Alanine, Serine, Citrulline, Glycine, etc.                                         | Tubular Membrane, NF, RO                                                      |
| Nanjing   | Nucleotide Fermentation Liquor Membrane Separation & Purification                                       | Tubular Membrane, NF Membrane, RO                                             |
| Luoyang   | Amino Acid Impurity Removal Membrane Filtration                                                         | NF Membrane for Decolorization & Purification                                 |
| Luoyang   | p-Hydroxyphenylglycine Fermentation Liquor                                                              | Tubular Membrane for Impurity Removal, NF Decolorization, RO Concentration    |
| Tianjin   | Threonine Fermentation Liquor Membrane Separation & Purification                                        | Tubular Membrane for Impurity Removal, Membrane Decolorization, Concentration |
| Shandong  | Glucuronic Acid Fermentation Liquor                                                                     | Membrane Separation, Membrane Decolorization, Concentration                   |
| Sichuan   | S-Infusion Production by Fermentation                                                                   | Membrane Sterilization, Separation, Decolorization, Concentration             |
| Guangdong | Fermented Soy Sauce, Vinegar Treatment                                                                  | Tubular Membrane for Impurity Removal                                         |
| Shandong  | Fermented Soy Sauce, Vinegar Treatment                                                                  | Tubular Membrane for Impurity Removal                                         |
| Shandong  | Lactic Acid Fermentation Liquor Extraction, Separation & Purification                                   | NF Membrane Decolorization                                                    |
| Shandong  | D-Lactic Acid Fermentation Liquor Extraction, Separation & Purification                                 | NF Membrane Decolorization                                                    |
| Longjiang | Lactic Acid NF Membrane System, Dilute Lactic Acid Concentration                                        | NF Membrane Decolorization, Membrane Concentration                            |
| Henan     | Lactic Acid Fermentation Liquor Extraction, Separation & Purification, Dilute Lactic Acid Concentration | NF Membrane Decolorization, Membrane Concentration                            |
| Guangxi   | Dextran Iron                                                                                            | NF Membrane Desalting & Purification                                          |
| Hubei     | Dextran Iron                                                                                            | NF Membrane Desalting & Purification                                          |