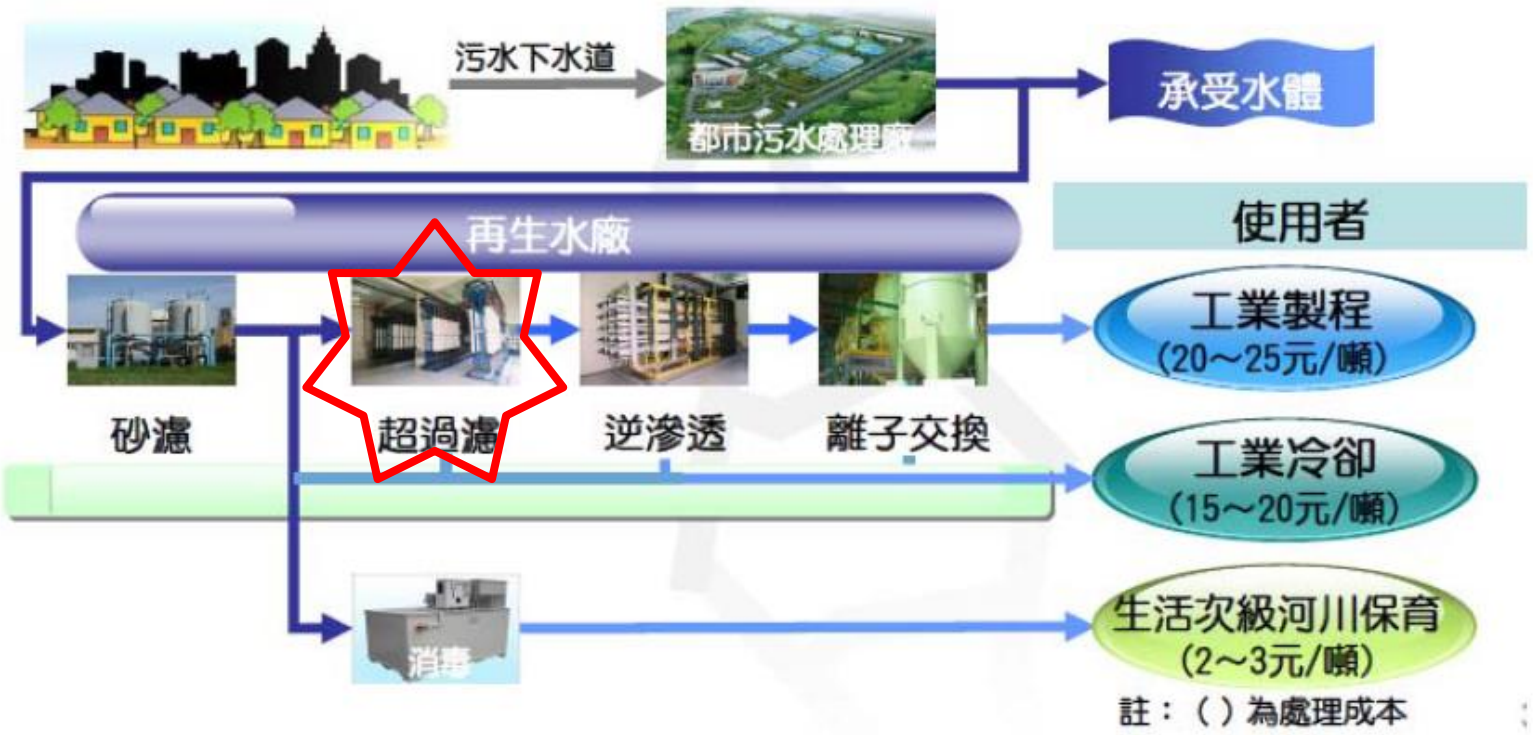
ZISEGO®

Continuous Membrane Filter

連續薄膜過濾器

集威實業股份有限公司
ZIG SHENG INDUSTRIAL CO., LTD.

水資源回收廠建議流程



67

資料來源：經濟部水利署，水資源經營管理策略，再生水利用，2017年06月16日。

各種水處理單元之效能

單元 / 污染物	加藥沉澱	砂濾	超微細篩機	表面過濾	活性碳吸附	浮除	硝化脫硝	加氯	臭氧	UV殺菌	UV+雙氧水	芬頓法	MF	UF	NF	RO	離子交換樹脂	電透析	加藥軟化	奈米活性碳電極
細菌	+	O	O	O	+	O	*	+	+	+	+	+	+	+	+	+	*	+	*	*
原蟲	+	+	+	+	+	+	*	O	+	+	+	*	+	+	+	+	*	+	*	*
病毒	*	*	*	*	O	*	*	+	+	+	+	O	O	+	+	+	*	+	*	*
大於10μm顆粒	+	+	+	+	+	+	*	*	*	*	*	*	+	+	+	+	+	+	O	*
小於10μm膠體	O	O	+	+	+	+	*	*	*	*	*	*	+	+	+	+	O	+	*	*
色度	+	*	*	*	+	*	*	O	+	O	+	+	O	O	+	+	*	O	*	*
生化需氧量BOD	+	O	O	O	+	*	O	O	O	O	+	O	O	O	+	+	*	O	*	*
化學需氧量COD	+	O	O	O	O	O	O	O	+	O	+	+	O	O	+	+	O	O	*	*
氮	*	*	*	*	O	O	+	O	O	*	*	O	*	*	+	+	+	O	*	*
磷	+	O	O	O	O	O	O	*	*	*	*	*	+	+	+	+	*	+	+	*
重金屬	+	*	*	*	*	O	*	*	*	*	*	*	*	*	+	+	+	+	+	+
鹼度	O	*	*	*	*	O	*	*	*	*	*	*	*	*	+	+	+	+	*	+
二價以上離子	*	*	*	*	*	*	*	*	*	*	*	*	*	*	+	+	+	+	+	+
一價離子	*	*	*	*	*	*	*	*	*	*	*	*	*	*	O	+	+	+	*	+
溶解性有機物	*	*	*	*	+	*	*	*	+	*	+	O	*	*	O	+	*	*	*	*
微量毒性物質	*	*	*	*	O	*	*	*	O	*	+	*	*	*	O	+	*	*	*	*

Pore size classification

Microfiltration, MF : 1.4~0.05μm

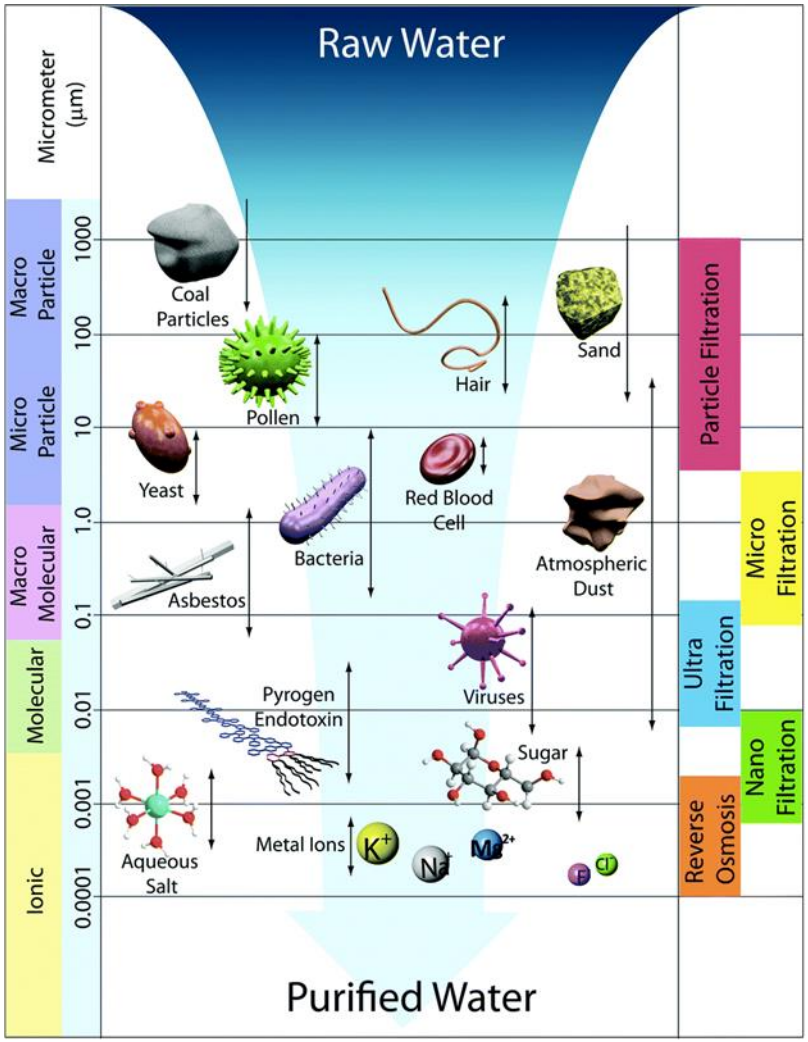
Ultrafiltration, UF : 0.1~0.01μm

Nanofiltration, NF : 0.005~0.001μm

Reverse osmosis, RO : <0.001μm

Remark : Relative sizes of Bacteria and Virus

- E. coli : W 0.4~0.8μm, L 1.0～4.0μm
- P. aeruginosa : W 0.5~0.8μm, L 1.5～3.0μm
- S. aureus : Ø 0.5~1.0μm
- Salmonel : W 0.5~1.0μm, L 2.0～5.0μm
- V. parahaemolyticus : W 0.3~0.5μm, L 1.4～2.6μm
- Chlamydia : Ø 0.3μm~0.5μm
- Mycoplasma : Ø 0.1~0.6 μm
  (the smallest bacteria)
- Flu virus : 80~120 nm (0.08~0.12μm)
- Enterovirus : 20~30 nm(0.02~0.03μm)



Company Profile

- Established in August 1969.
- Paid in capital NTD6,117,633,800. (USD191,000,000.)
- Employee > 1,300
- PA6 Global Leading supplier
- Setup Innovation R&D Center in 2004
- Started Hollow Fiber R&D in 2008
- GRS (Global Recycled Standard) v3.0 certified in 2015.

Global Recycled Standard

- Launched ZISECO® potable water filter at Aqua Taiwan 2015.

ZISECO®

- Setup HFM factory in Nov. 2016
- 2018/2/1 Passed NSF 42 certified

生產工廠

Fiber BD

3座假撚廠

假撚一廠 1969

假撚二廠 1992

假撚三廠 1998

2座紡絲廠

尼龍紡絲一廠 1999

尼龍紡絲二廠 2012

1座氣撚廠

氣撚廠 (2012)
水材廠 (2016)

Chemical Materials BD

3座聚合廠 / 1座複材廠 / 1座水材廠

尼龍聚合一廠 2000

尼龍聚合二廠 2005

尼龍聚合三廠 2013

Road Map


AsahiKASEI
TOYOBO
MITSUBISHI RAYON
'TORAY'
kuraray
UNITIKA
We Realize It!
Nitto
Sumitomo
SEKISUI
UBE
inge
heart of pure water
BASF
Multi Bore HFUF Technologies
3M
MEMBRANA
Now proudly part of 3M
DOW
DU PONT

About ZISECO®

集盛實業股份有限公司
ZIG SHENG INDUSTRIAL CO., LTD.

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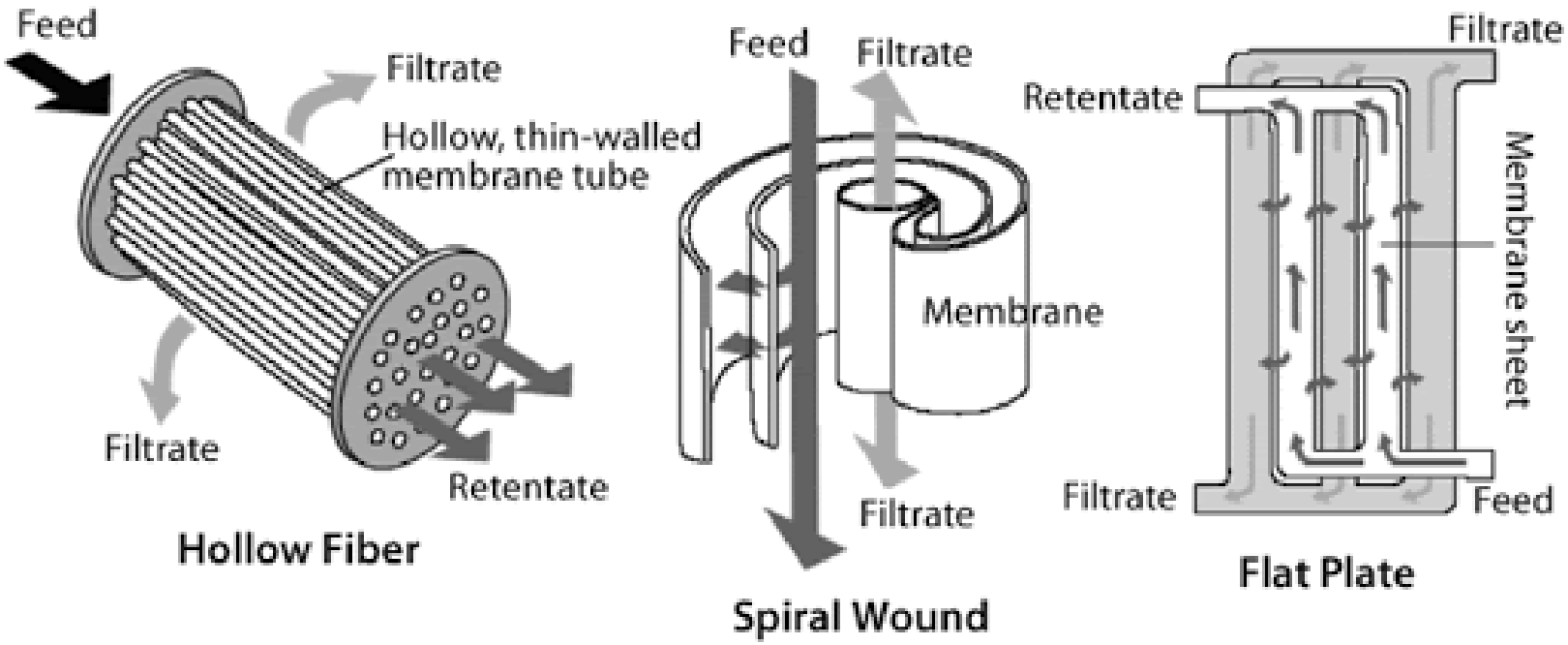
ZISECO®

ZISEGO®
MEMBRANE

Hollow Fiber Membrane

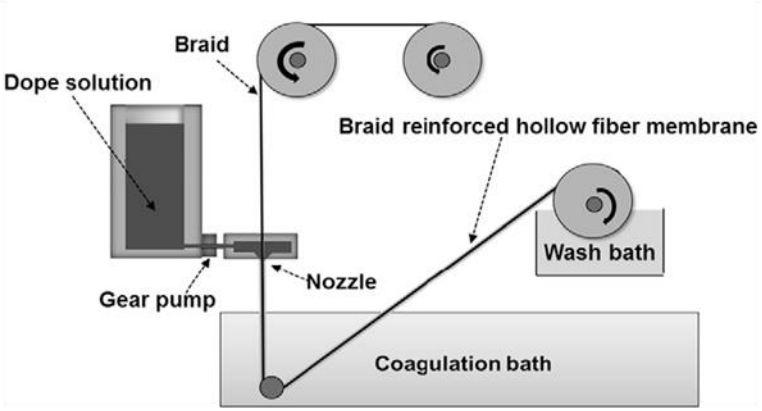
Membrane Filter Type

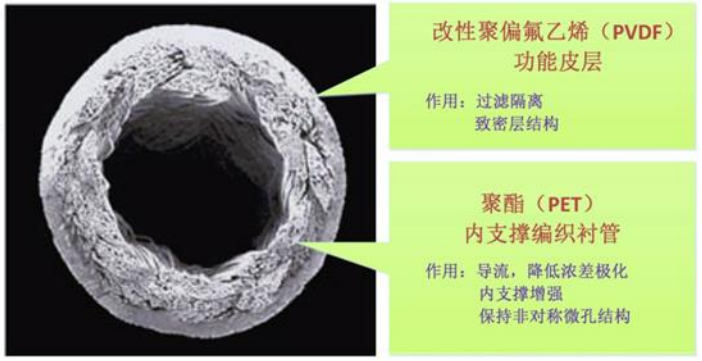


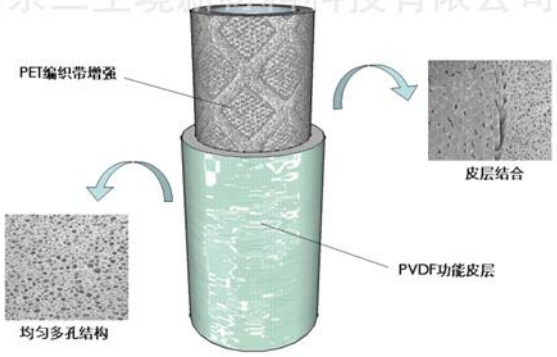
Hollow Fiber Filter

Hollow Fiber Filter

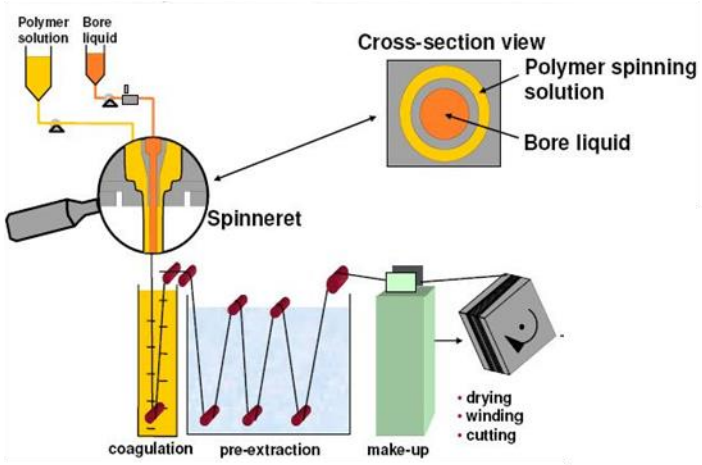
- **With braid reinforcement**

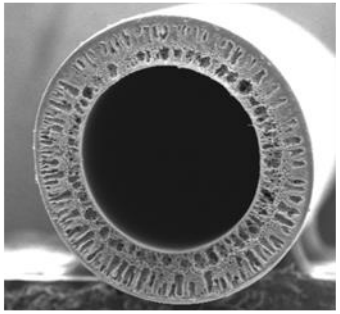






- **Pure polymer spinning**

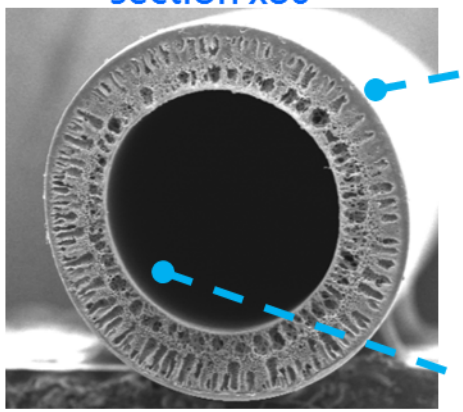




Technical Introduction

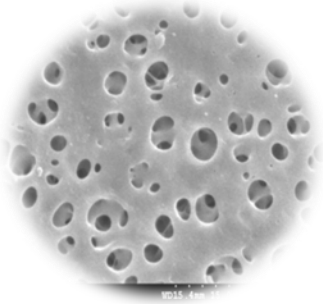
ZISEGO®

SEM photograph of cross section x80

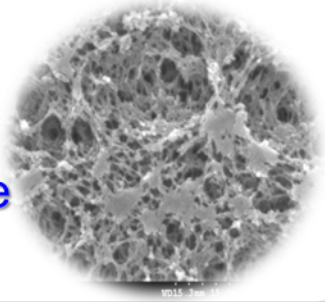


OD:1.0mm ID:0.7mm

SEM photograph of outer surface x5000



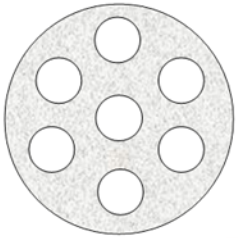
SEM photograph of inner surface x5000



High flux
Lower trans-membrane pressure
High filtration accuracy

Fiber Dimension Spec.:

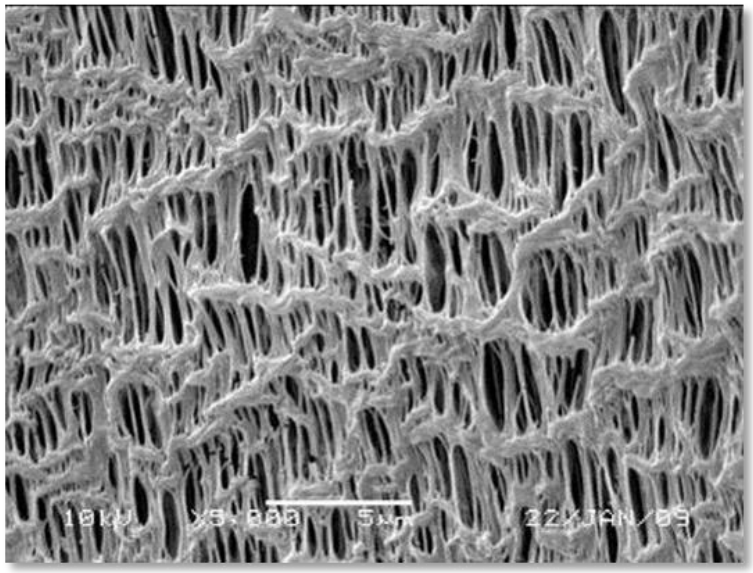
OD:1.0mm Poly sulfone
OD:1.3mm PVDF
OD:4.3mm PVDF



- Membrane/module is stored in dry condition without moisturizer (glycerin)

Technical Introduction

PP/PE membrane

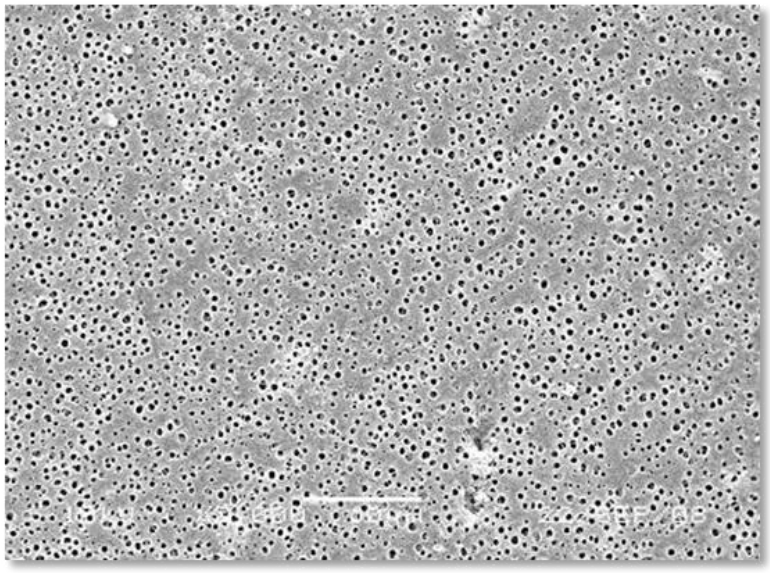


Outer surface

- The porosity of the membrane is high, but the pore size of the membrane is not uniform.

ZISEGO®

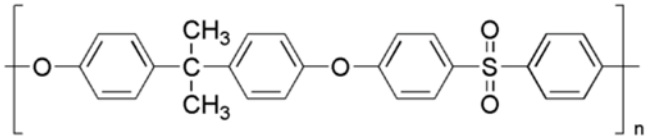
PSF/PVDF membrane



Outer surface

- Uniform pore size and high porosity.

ZISEGO® Material



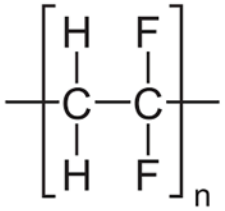
- Polysulfone (PSF or PSU)

Polysulfones are a family of thermoplastic polymers. These polymers are known for their toughness and stability at high temperatures. They contain the subunit aryl-SO_2-aryl, the defining feature of which is the sulfone group. Polysulfones were introduced in 1965 by Union Carbide. Due to the high cost of raw materials and processing, polysulfones are used in specialty applications and often are a superior replacement for polycarbonates.

FDA APPROVED

NSF Approved

Material



- PVDF

Polyvinylidene fluoride or **polyvinylidene difluoride** (**PVDF**) is a highly non-reactive thermoplastic fluoropolymer produced by the polymerization of vinylidene difluoride.

PVDF is a specialty plastic used in applications requiring the highest purity, as well as resistance to solvents, acids and hydrocarbons.

FDA APPROVED

NSF Approved

ZISEGO®
MEMBRANE

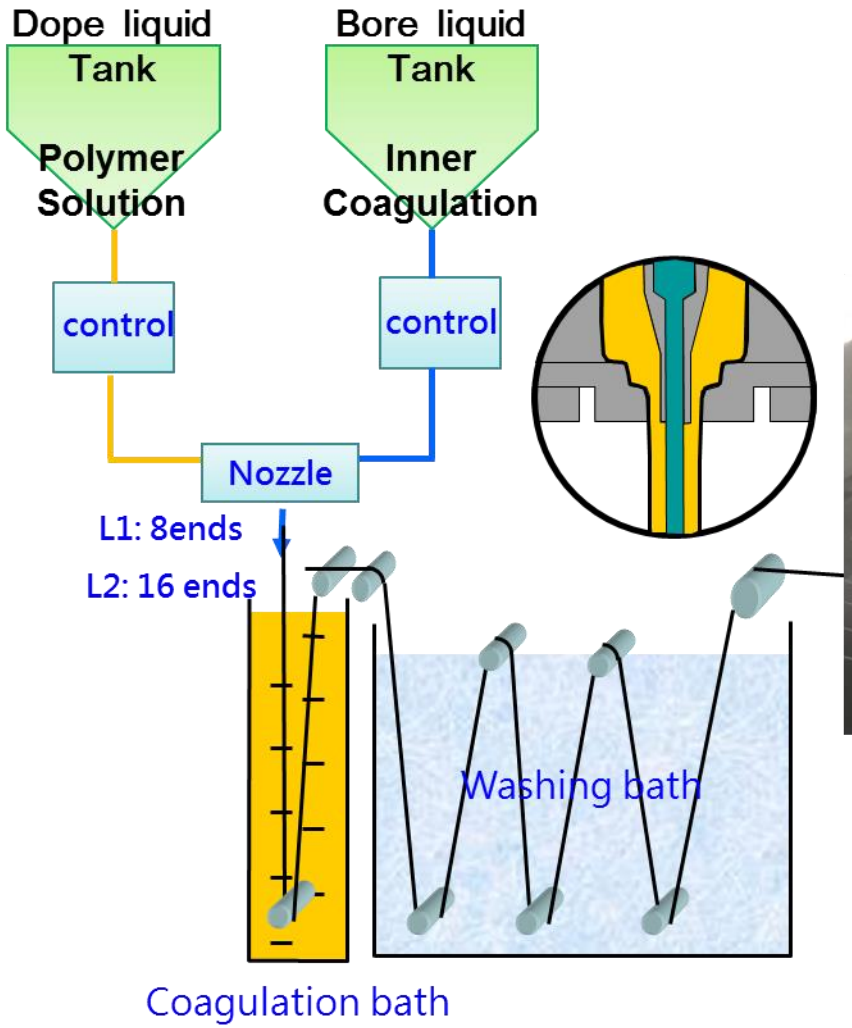
Spinning & Potting facilities

Spinning Facilities

✓**Blending & Feeding system**

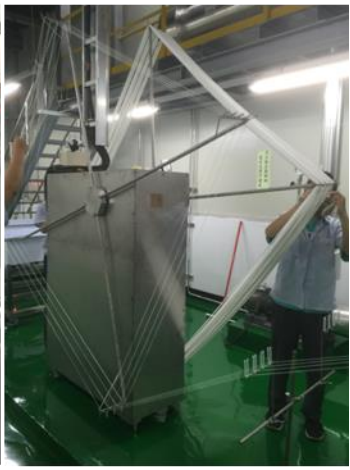
Automatic control and Monitoring with DCS.

Spinning Facilities



Coagulation bath

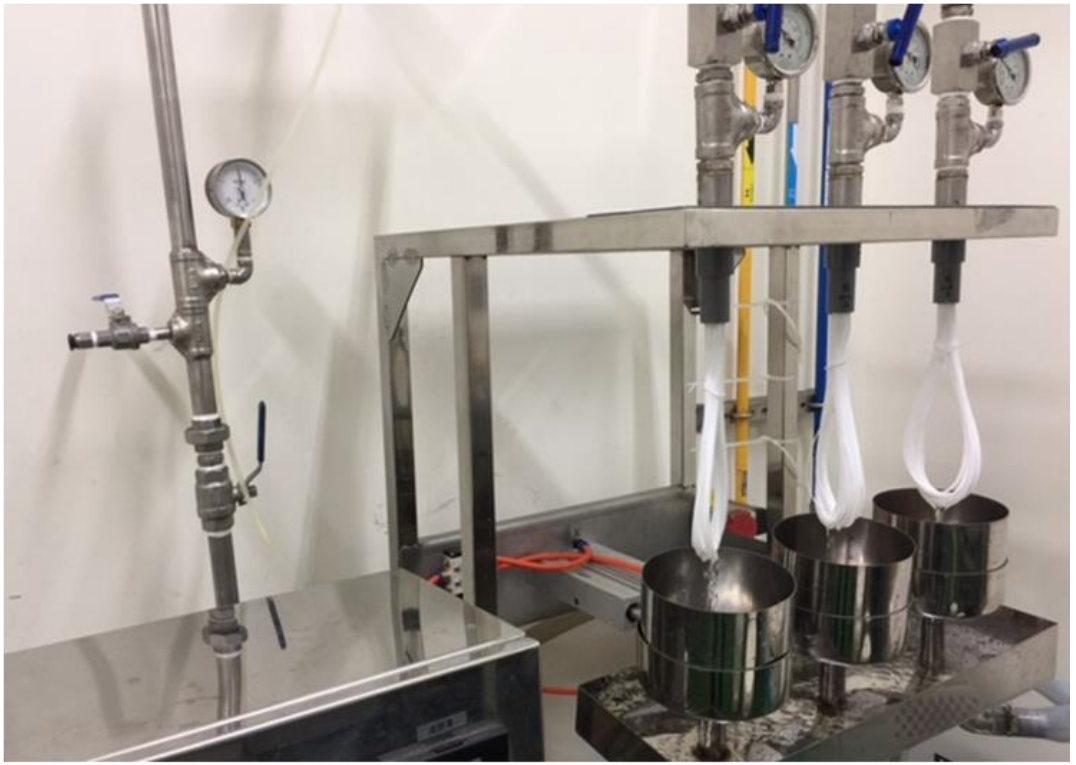
Washing bath



Winding

Quality Control process

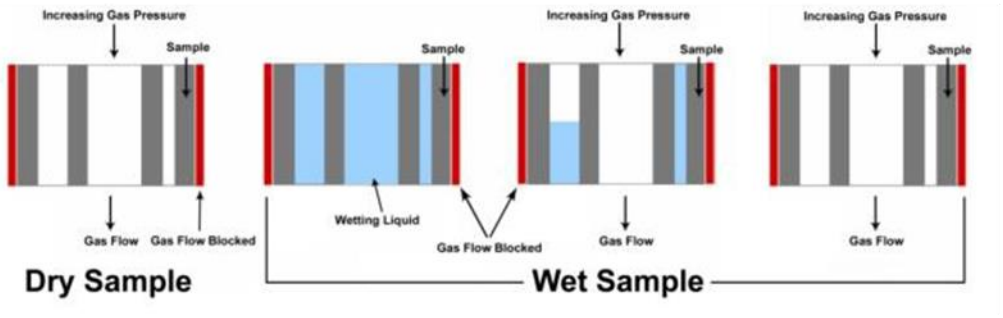
- Fiber flux Check

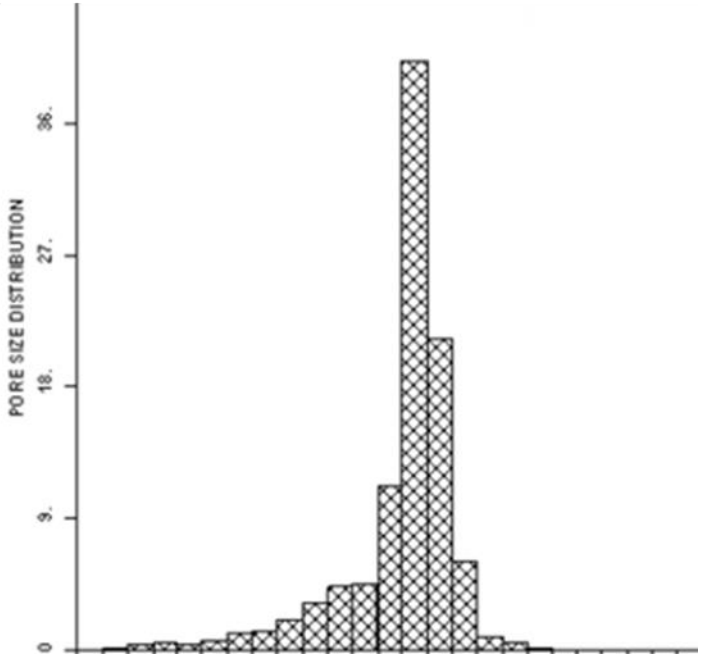


25±1 ℃@1kg/cm^2

Quality Control process

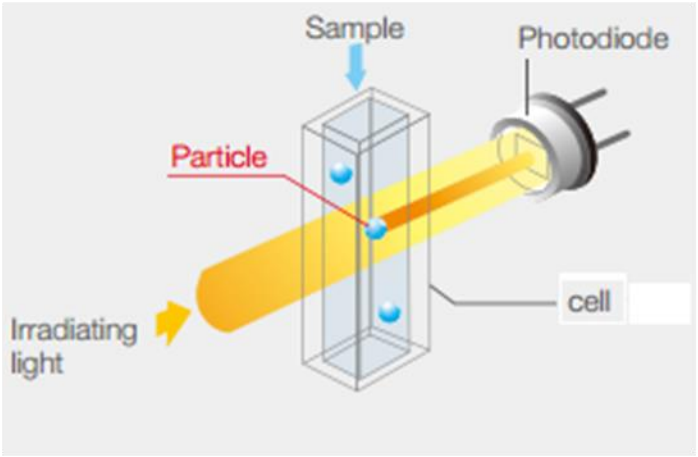
- Fiber Pore Size Check

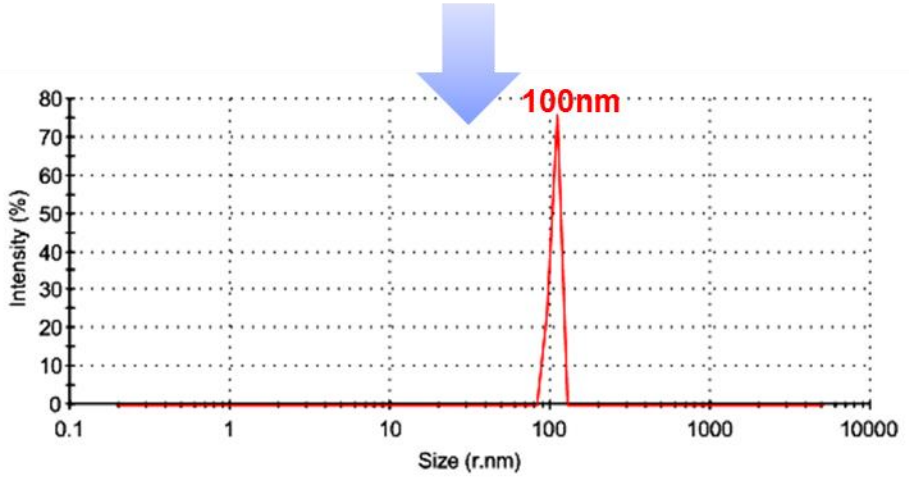




Quality Control process

- Particle Size Distribution Check



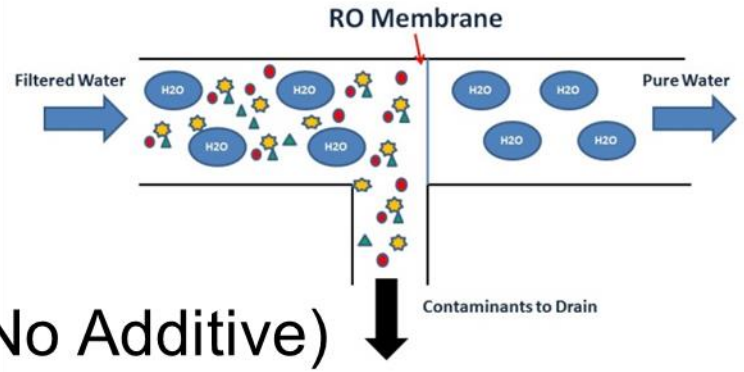


ZISEGO®

Solid/liquid separation

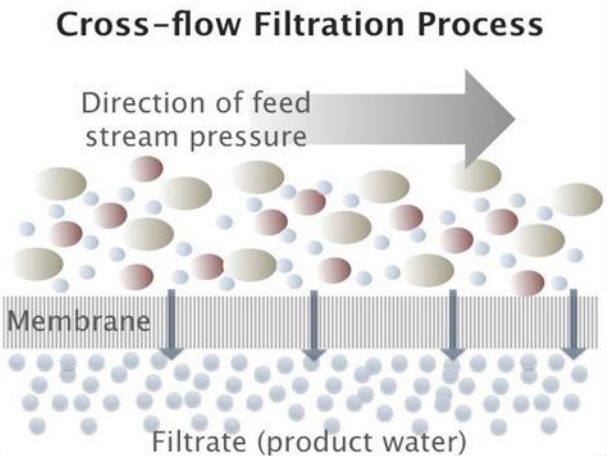
HFM filter advantage

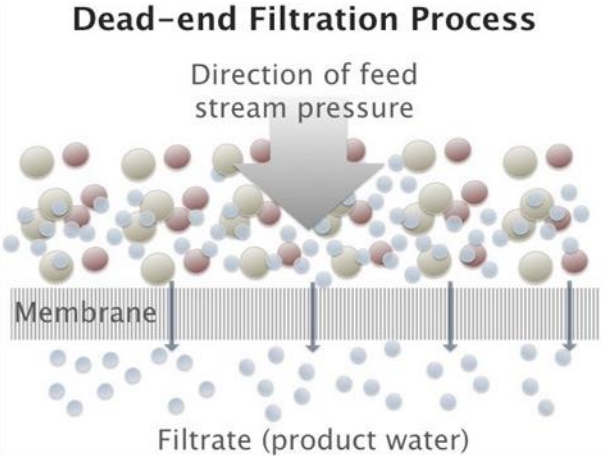
- No waste water
- No moving parts (by gravity)
- Low transmembrane pressure
- Filter bacterial, not inhibit, not kill (No Additive)
- Remain minerals
- High filtration area, high flux
- Short backwash Intermittent
- Possible to clean in place (reusable)



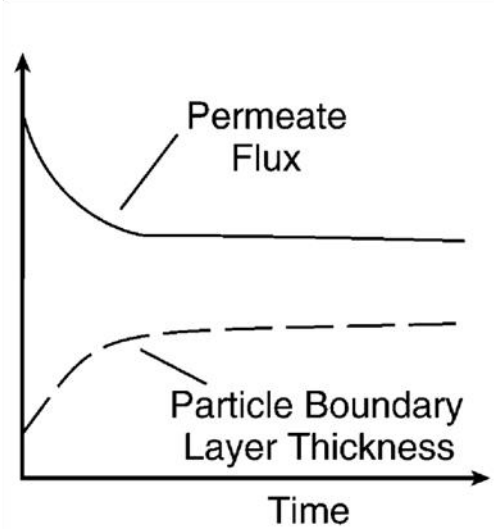
  - Replace sand filter
  - Replace sedimentation tank
  - Protect(or Replace) RO membrane
  - …

CMF System Flow Diagram

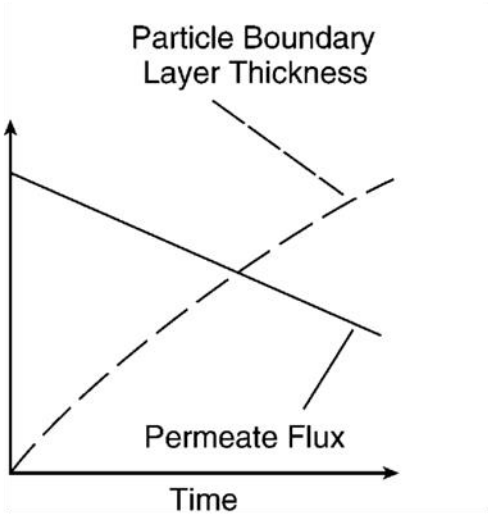




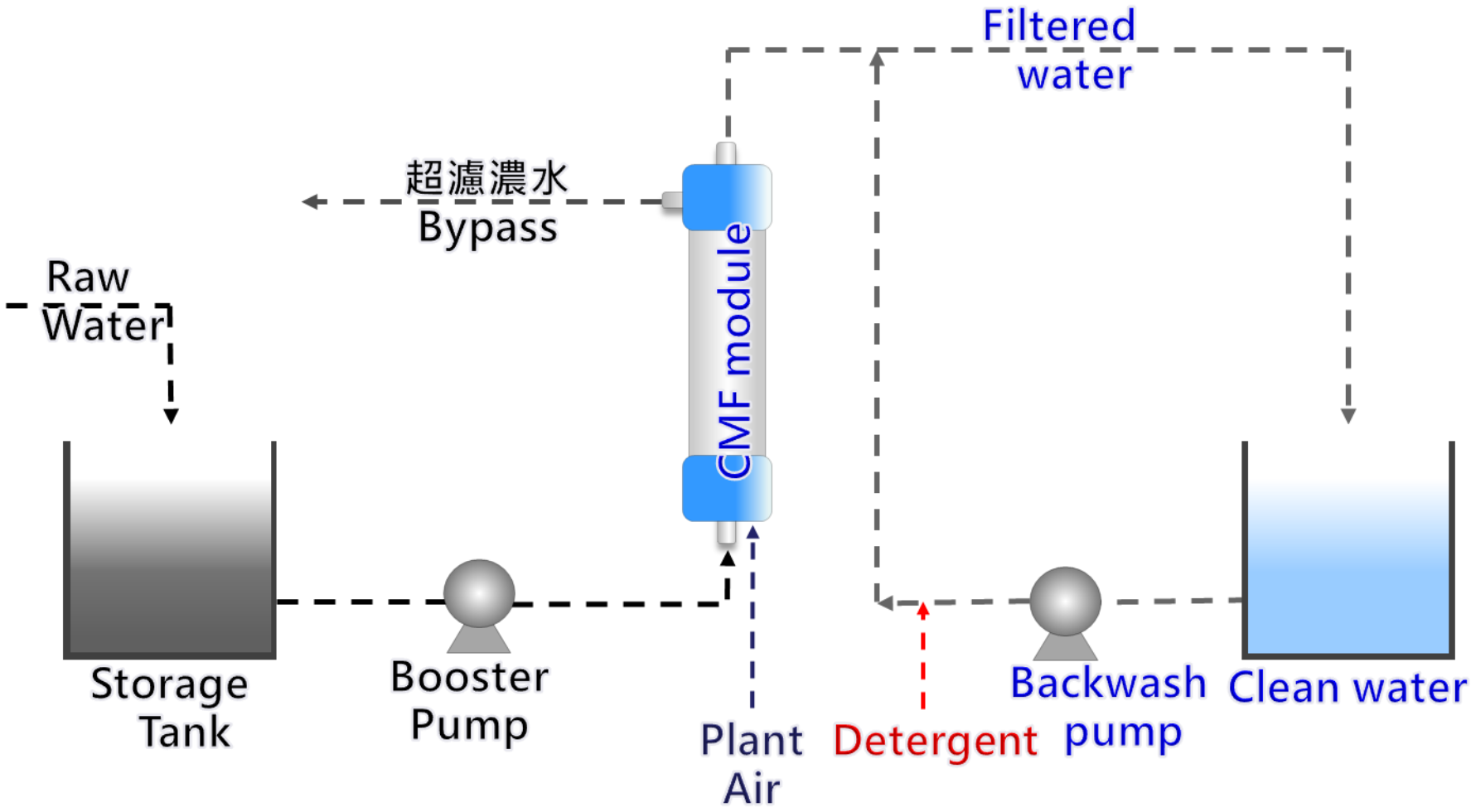
- **Concentrate solute**



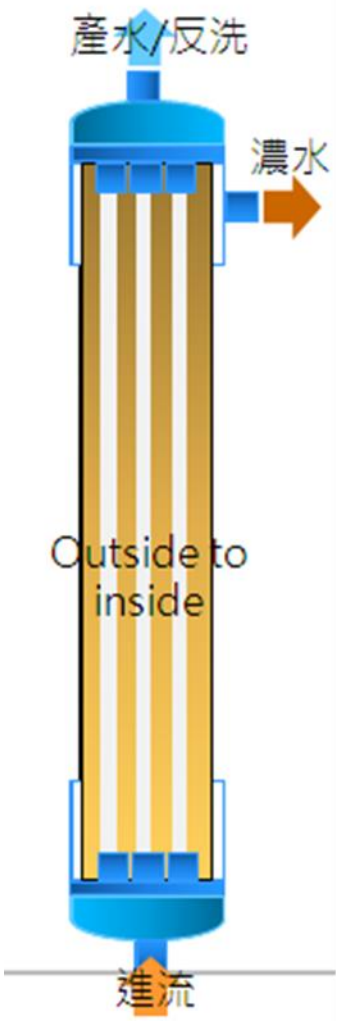
- **Reclaim solvent**



CMF System Flow Diagram

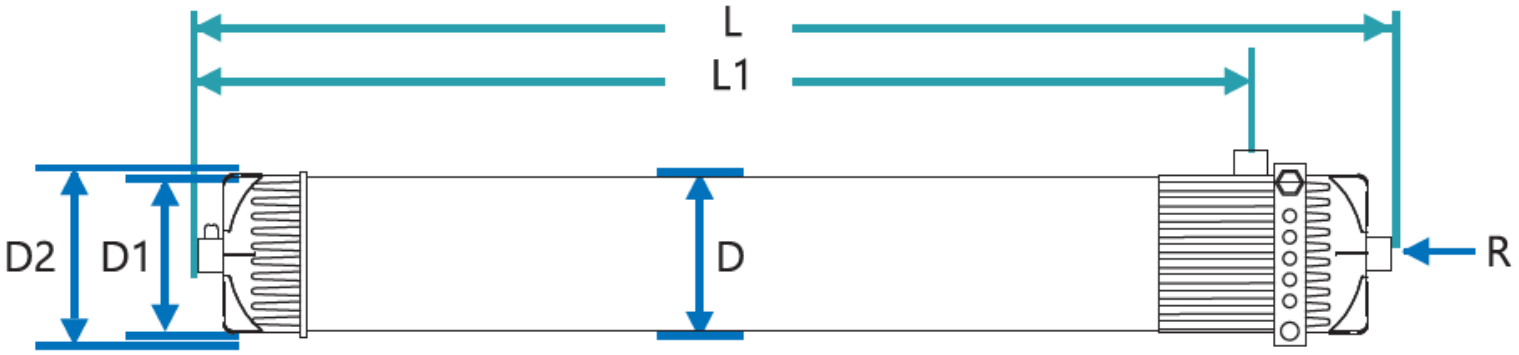


ZIS-6010



Specification	
型號 Model no.	ZIS-6010
膜材質 Material	聚偏二氟乙烯(PVDF)
過濾方式 Flow Path	外壓 Outside-In
有效過濾孔徑 Nominal Pore Size	50nm
透膜壓力 TMP	≦2.1Kg/cm^2
膜面積 Area	10m^2
設計操作通量 Designed Operating flux:	40~120 LMH(清水)
尺寸 Dimension	Φ190 mm(6") ╳H1580 mm
接頭尺寸 Union Size	1" pipe union

ZIS-6010 Outline



尺寸	L	L1	D	D1	D2	R
型號	mm					
ZIS-6010	1530	1350	160	172	188	D32

Characteristics

- 可更換式濾芯，外殼可重複使用。

Disposable filter element design, the housing can be reused.

- 低封裝密度設計，提供較佳反洗效率。

Loose bundle packing design, easy to flush clogged out.

- 預設曝氣接頭，可提昇膜絲清洗效果。

Embedded air-purge connector, improve fiber cleaning.

- 膜絲耐化性強，可適用化學藥劑清洗。

Chemical-resistant fiber, chemical washing practicable.

ZIS-8040

Specification	
型號 Model no.	ZIS-8040
膜材質 Material	聚偏二氟乙烯(PVDF)
過濾方式 Flow Path	外壓 Outside-In
有效過濾孔徑 Nominal Pore Size	50nm
透膜壓力 TMP	≦2.1Kg/cm^2
膜面積 Area	41m^2
最大操作通量 Designed Operating flux	40~120 LMH(清水)
尺寸 Dimension	Φ200(8”) x 1710 mm
接頭尺寸 Union Size	1-1/2” pipe union

Characteristics

-高封裝密度設計，提供較高單位膜積

Compact packing design, higher modular membrane area.

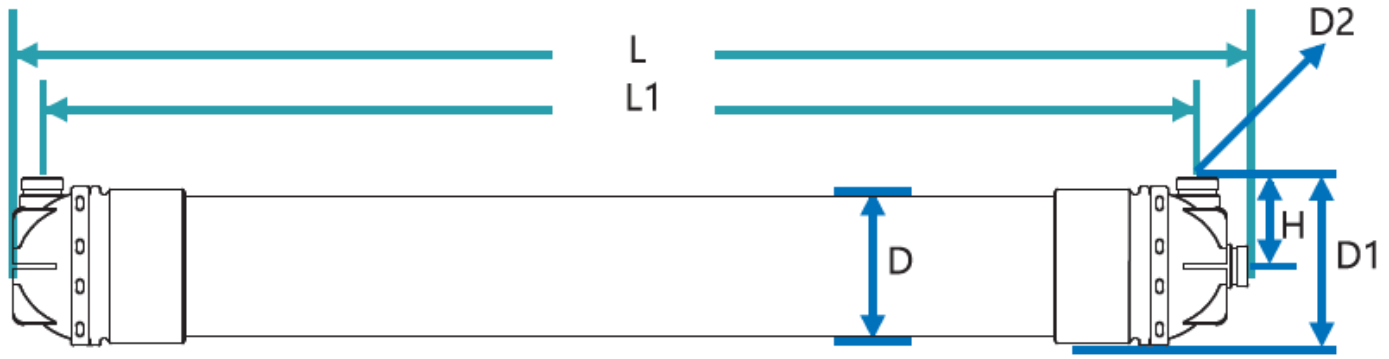
-較低初設成本，空間需求較小

Lower initial Cost, smaller footprint area.

-適合原水水質較佳之應用

Applicable for Recycle water (RO guard filter)

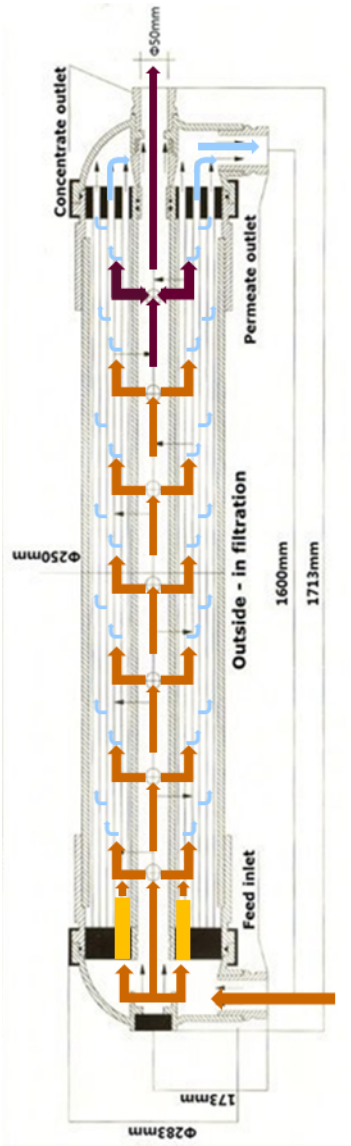
ZIS-8040 Outline



尺寸	L*	L1	D	D1	D2	H
型號	mm					
ZIS-8040	1940	1794	200	235	50	158

* 可依客戶需求訂製

Characteristics



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Compact packing design, higher modular membrane area.

- 較低初設成本，空間需求較小

Lower initial Cost, smaller footprint area.

- 適合原水水質較佳之應用

Applicable for RO guard filter.

原水

濃水

清水

ZIS-8050

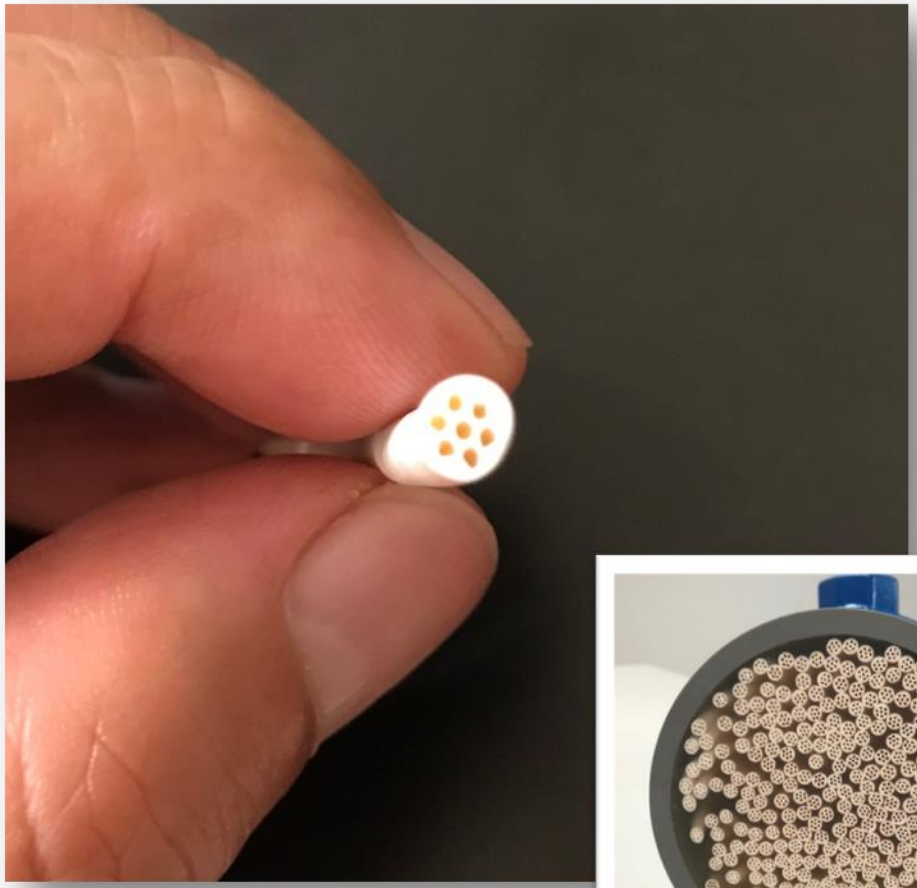
Specification	
型號 Model no.	ZIS-8050
膜材質 Material	聚偏二氟乙烯(PVDF)
過濾方式 Flow Path	外壓 Outside-In
有效過濾孔徑 Nominal Pore Size	50nm
透膜壓力 TMP	≦2.1Kg/cm^2
膜面積 Area	51m^2
設計操作通量 Designed Operating flux	40~120 LMH(清水)
尺寸 Dimension	Φ200(8”) x 1710 mm
接頭尺寸 Union Size	1-1/2” pipe union

ZIS-8050 Outline

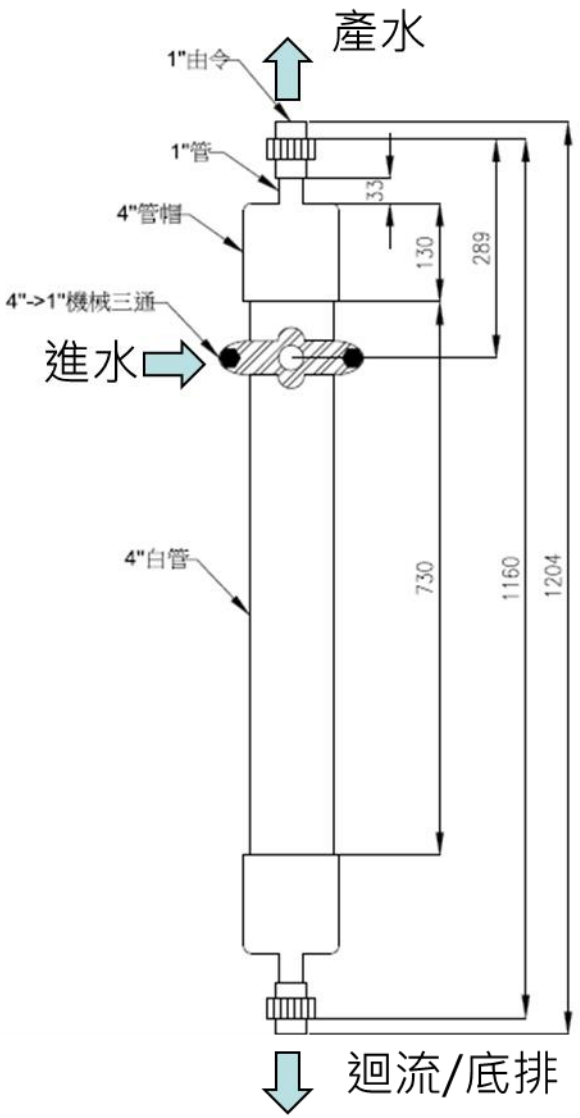
尺寸	L*	L1	L2	L3	D	D1	H
型號	mm						
ZIS-8050	1860	1820	1630	1500	225	342	180

* 可依客戶需求訂製

Multi bores CMF

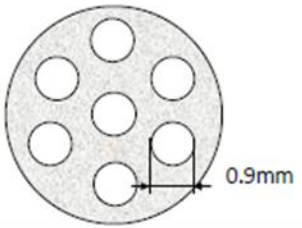


ZIS-4002-S



Specification

材　質 Material	膜絲 Membrane	-	PVDF (聚偏氟乙烯)
	封膠 Potting	-	PU
膜 面 積	Membrane Area	m^2	>2.0
膜 絲 結 構	Fiber Dimension	mm	OD 4.3 / ID 0.9



產 水 濁 度	Filtrate Turbidity	NTU	<1 (依原水水質而定)
膜 孔 徑	Pore size	um	0.07
過 濾 型 式	Flow path	-	外壓式(Outside-in)
清 水 通 量	Max. flux	LMH	200 (出水管徑 1")
操 作 壓 力	Operation Pressure	kg/cm^2	1~4
透 膜 壓 差	TMP	kg/cm^2	<1.5
反 洗 壓 力	Backwashing Pressure	kg/cm^2	2.5kg/cm2
操作溫度	Operation Temperature	℃	5~40
pH 範圍		pH	1~10
耐 氯 性	Chlorine Resistant	mg/L	<200
濾芯尺寸	Outline dimension	mm	Ø144 x L 1000
外殼材質	Housing Material	-	PVC
接頭尺寸	Connector size	-	JIS 1" pipe union

注意事項：規格若有變動，恕不另行通知。

Note: Specifications subject to change without notice.

ZISEGO®

Filtration Demo

ZISECO Outdoor Personal water filter

WATER FILTRATION

ZISECO 生命吸管	
產品規格:	Ø46*176 (m/m)
使用壽命:	可過濾900個保特瓶水量
產品初始流量:	2.7L/min

優點

方便攜帶，適合健行、露營、旅行出差等狀況使用，只需將ZISECO的一端進入未過濾之水源。並透過頂部吸管簡單吸取飲用乾淨的水即可。

✓可過濾水中，泥砂雜質細菌。

✓無氣阻，容易吸取水源。

✓產品除菌性:99.99%

Outdoor/Emergency Application

便攜式過濾器
Portable purifier

ZISECO®

Color removal test

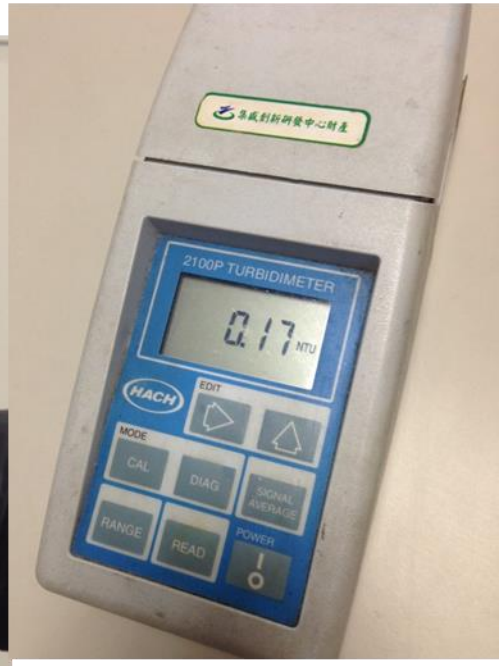
ZISEGO®

Turbidity removal test

Raw water

ZISEC®

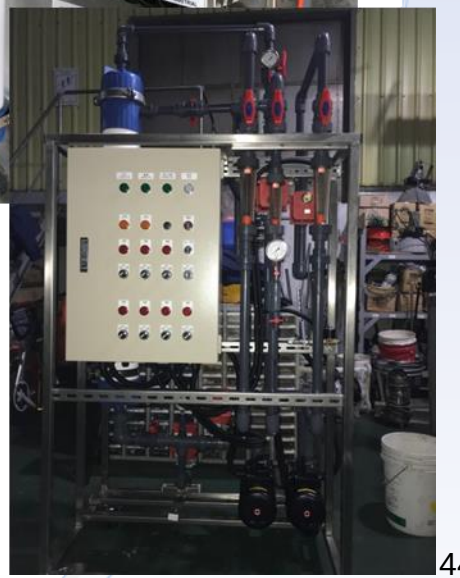
Filtered Turbidity



Continuous Membrane Filter (CMF)

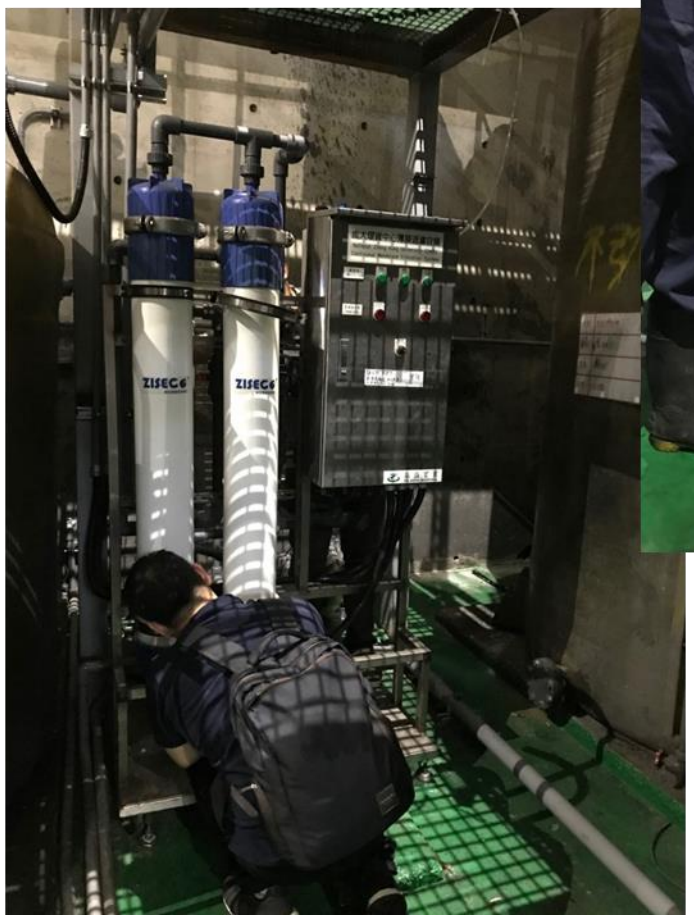
Application

- Surface water filter system



Application

- Wastewater reclaimed

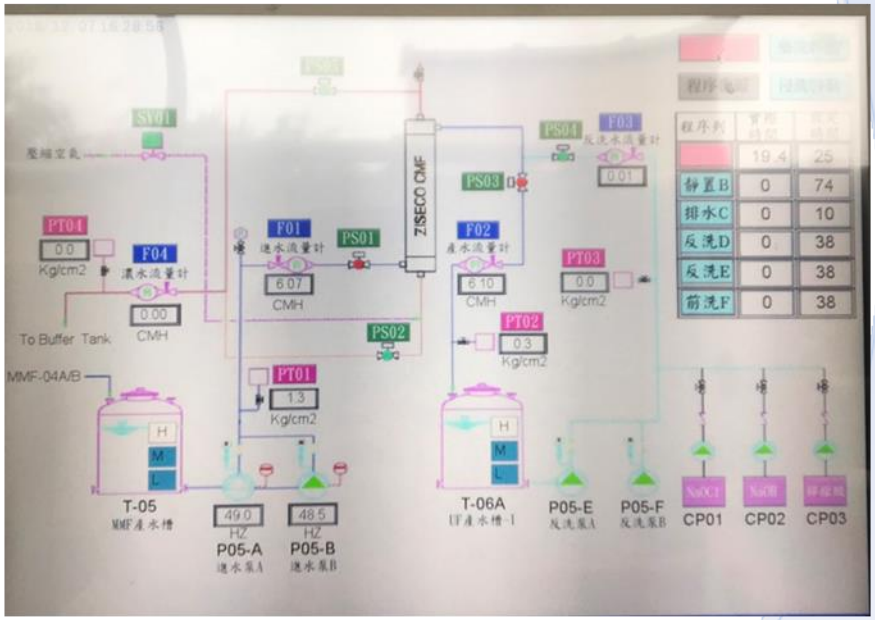


Application

- Electroplating Wastewater reclaimed

Application

- Industrial wastewater treatment plant effluent reclaimed

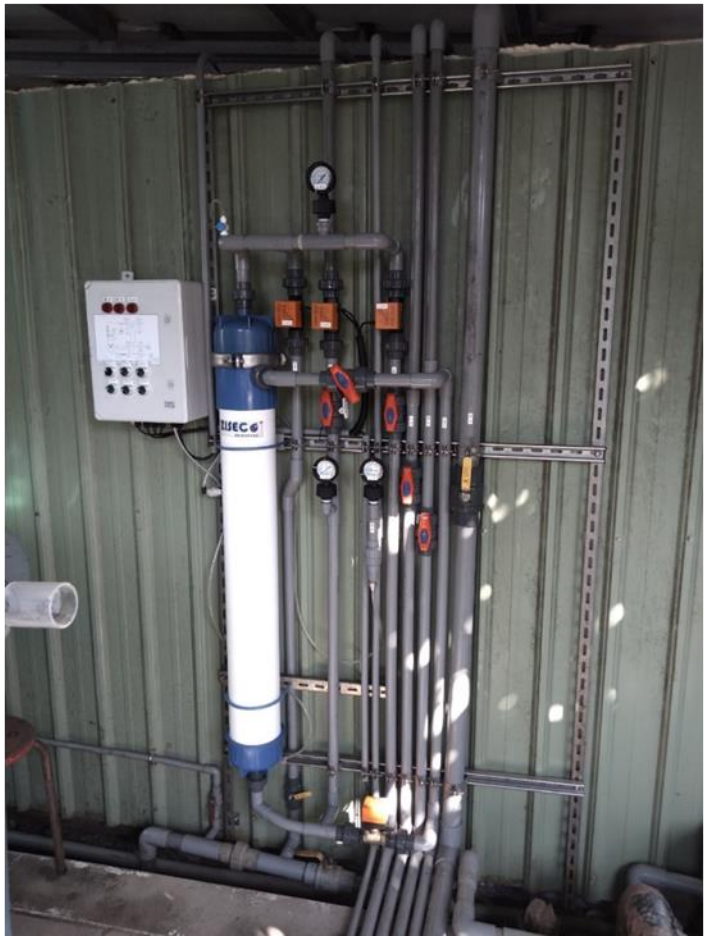


Application

- Pure water treatment system for photoresist plant

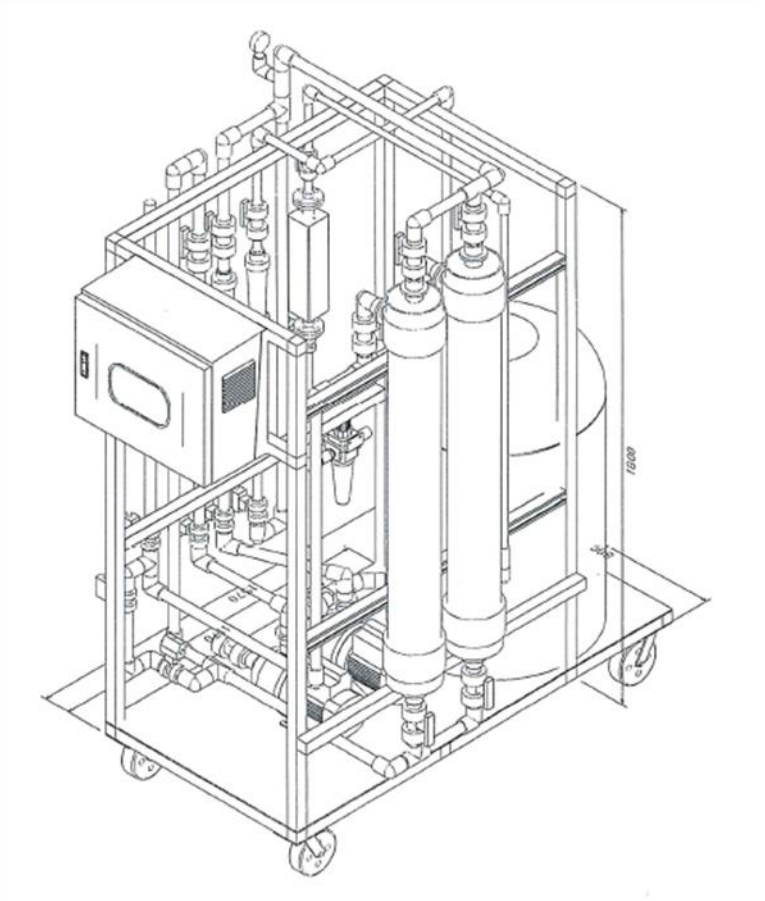
Application

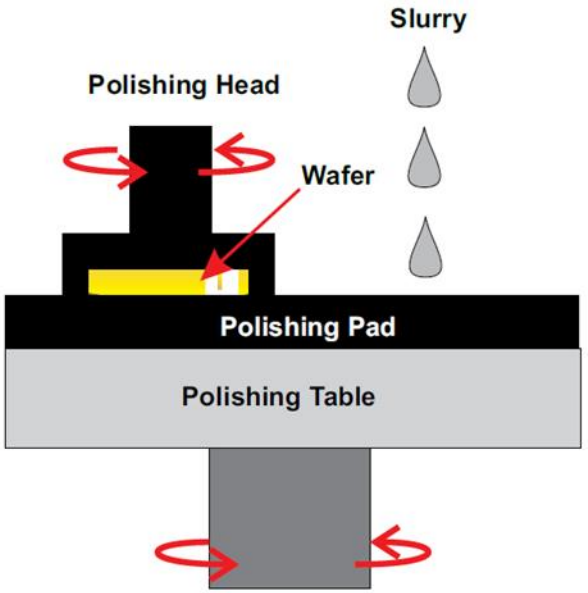
- water treatment system for aquaculture



Application

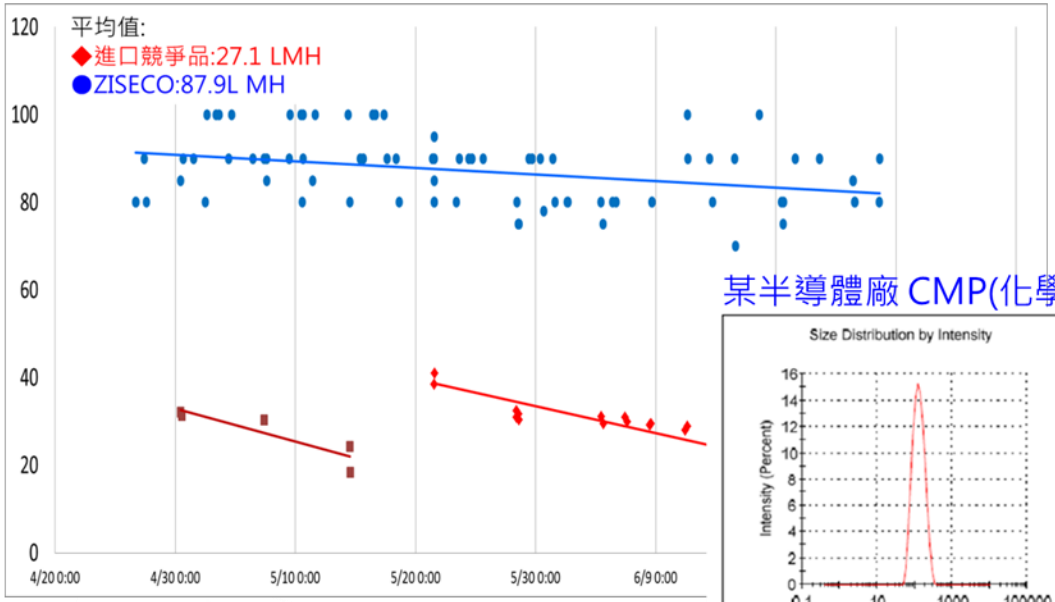
- CMP waste water reclaimed system



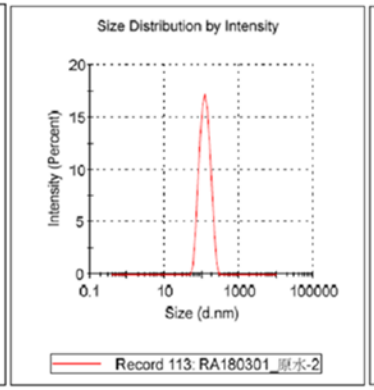


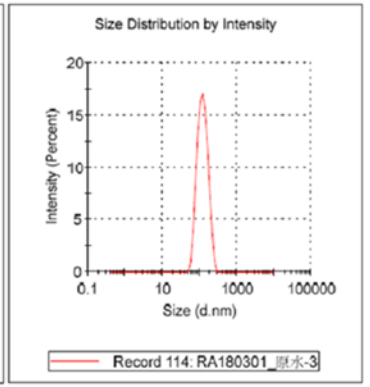
Application

- Semi-con CMP reclaimed water



某半導體廠 CMP(化學研磨)廢水





最小粒徑：58.77nm(1.2%)	最小粒徑：58.77nm(0.9%)	最小粒徑：58.77nm(0.9%)
平均粒徑：120.2nm	平均粒徑：116.5nm	平均粒徑：115.9nm
最大粒徑：342nm(0.1%)	最大粒徑：255nm(1.0%)	最大粒徑：255nm(0.1%)
Result quality：Good	Result quality：Good	Result quality：Good

原水濁度>200NTU

目標出水水質濁度<1NTU

Application

- Waste water treatment system for gravel plant

ZISEG® MEMBRANE

CMF Patent

中華民國專利證書

新型第 M590069 號

新型名稱：中空纖維膜過濾用模組

專利權人：集盛實業股份有限公司

新型創作人：施學洲、吳成湖、曾裕霖、陳韋名

專利權期間：自2020年2月1日至2029年7月25日止

上開新型業依專利法規定通過形式審查取得專利權
行使專利權如未提示新型專利技術報告不得進行警告

經濟部智慧財產局 局長 洪淑敏

中華民國 109 年 2 月 1 日

注意：專利權人未依法繳納年費者，其專利權自原繳費期限屆滿後消滅。

Vision

ZISEGO® MEMBRANE **Inside**