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Serenambiente®

MITSUBISHI CHEMICAL AQUA SOLUTIONS

SERENACEL MCAS STERAPORE™

MBR membrane modules

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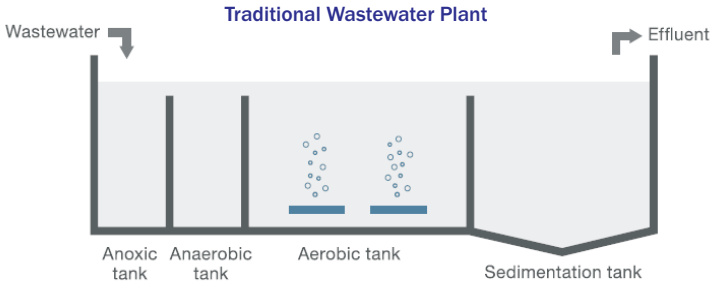
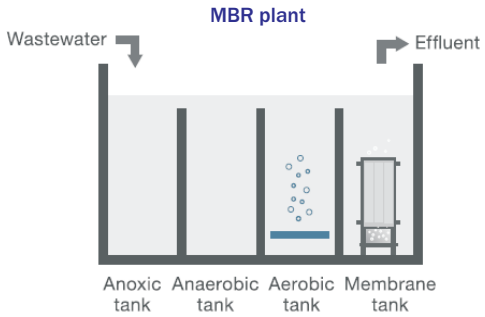
MBR PLANTS

Membrane bioreactors (MBR) offer an efficient and advanced biological treatment process compared to the conventional approach with primary and secondary clarifiers. The submerged membrane modules concept provide a long term and strong alternative in terms of process simplicity, space savings, civil works minimization and better effluent quality.



ADVANTAGES OF THE MBR PLANTS

- No clarifies (no bulking and sludge rising problems)
- Smaller biological treatment process tank (high MLSS concentration)
- High quality water discharge
- Lower sludge production



SERENACEL

SERENACEL module is a skid mounted system consisting of several elements containing hollow fiber membranes STERAPORE™ 5600-5700 Series.

The Ultrafiltration membranes STERAPORE™ 5600-5700 Series are made by MITSUBISHI CHEMICAL AQUA SOLUTIONS.

MITSUBISHI CHEMICAL AQUA SOLUTIONS has installed STERAPORE™ membranes in over 5,000 MBR plants around the world: some of these exceed the capacity of 90,000 m^3/day.

COMPONENTS

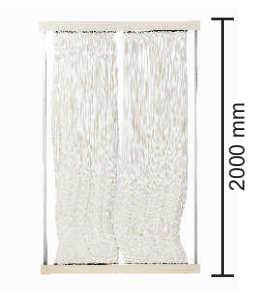
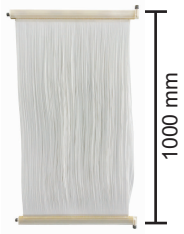
Hollow fiber membrane

The membranes are grouped in elements each of 5 or 40 m^2 each

Integrated air diffusers system in Stainless Steel AISI304 or AISI316 or SAF2205

Stainless steel AISI304 or AISI316 or SAF2205 frame

STERAPORE™ 5600-5700 Series: Elements

	5600 Series	5700 Series
Membrane Material	PVDF	
Membrane Type / Pore Size	UF / 0.05 µm	
Application	MBR, Tertiary Treatment	
Membrane Surface Area	40 m^2/element	5 m^2/element
	400-2400 m^2/module	50-200 m^2/module
Flux*	up to 33 LMH	up to 40 LMH
Outer Diameter	1.65 mm	
SADm	0.11 $m^3/m^2/h$	0.27 $m^3/m^2/h$
Storage Condition	Dry	
Photo		

STERAPORE™ 5600-5700 Series: Benefits

EASY STORAGE

- Hydrophilic membrane surface under dry condition
- Easy handling and system start-up
- Storage up to 36 months

NO NEED TO DRAIN MEMBRANE TANK

- High permeate structure for back pulse chemical solution
- Only CIP without drain membrane tank

NO NEED FOR BACKWASH

- Low fouling structure
- Only filtration and relaxation
- Simple system and high recovery rate

INTEGRATED MBR SYSTEM

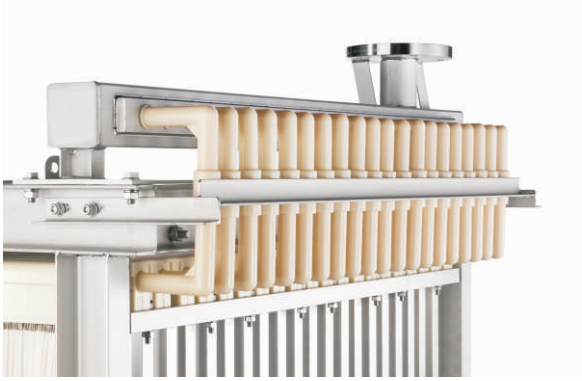
- MBR Module or Integrated MBR System are available
- Simple system with reduced aeration demand and RAS pump

SERENACEL MODULE SPECIFICATIONS

Model	SC-50	SC-100	SC-150	SC-200	SC-400	SC-800	SC-1200	SC-1600	SC-2400
Membrane surface [m^2]	50	100	150	200	400	800	1200	1600	2400
Number of elements	10	20	30	40	10	20	30	40	60
Length [mm]	675	970	1245	1520	940	1390	1870	2320	3420
Width [mm]	670	670	670	670	1525	1525	1525	1525	1525
Height [mm]	1600	1600	1630	1630	2800	2800	2800	2800	2800
Dry weight [kg]	80	110	145	175	400	600	800	1000	1550
Permeate connection	Rc 1"	Rc 1"¼	Rc 2"	Rc 2"	2 x 65A	2 x 65A	2 x 65A	2 x 65A	2 x 65A
Air connection	80A	80A	80A	80A	80A	80A	80A	80A	80A
Min. water height [mm]	1700	1700	1700	1700	3000	3000	3000	3000	3000

GENERAL FEATURES

Pore size	0,05 µm
Membrane type	hollow fiber
Max Temperature	< +40°C
pH range	5 - 9
Max content of TSS	3 - 15 g/l



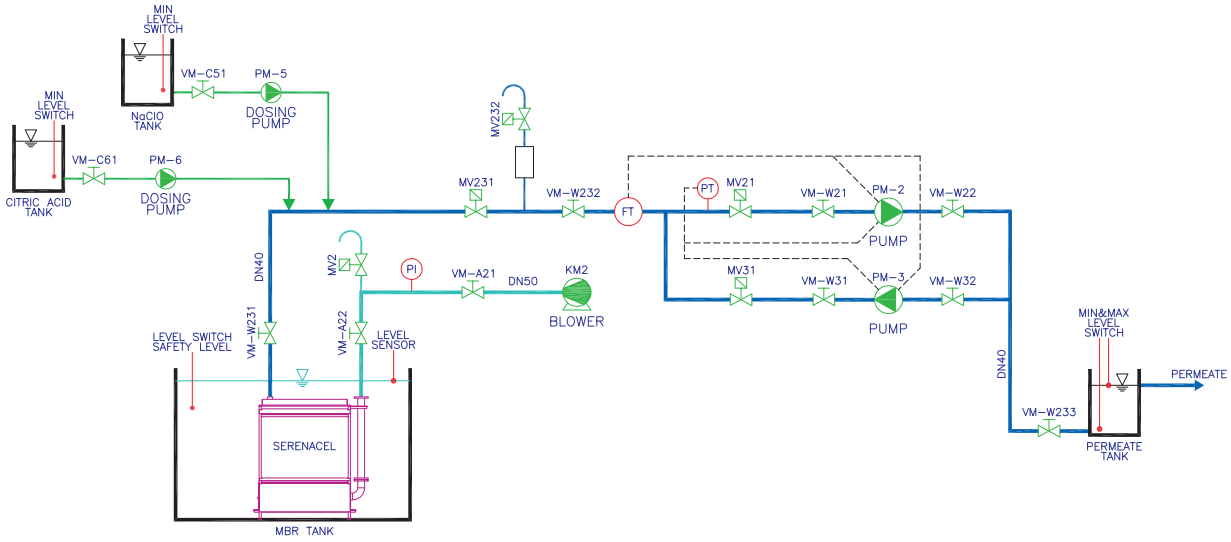
MATERIALS

Module frame	AISI304 - AISI316 - SAF2205
Elements	ABS - AISI 304
Membrane polymer	PVDF
Permeate pipe	Stainless Steel/ PVC
Air pipe	Stainless Steel/ PVC

DESIGN AND OPERATE PARAMETERS

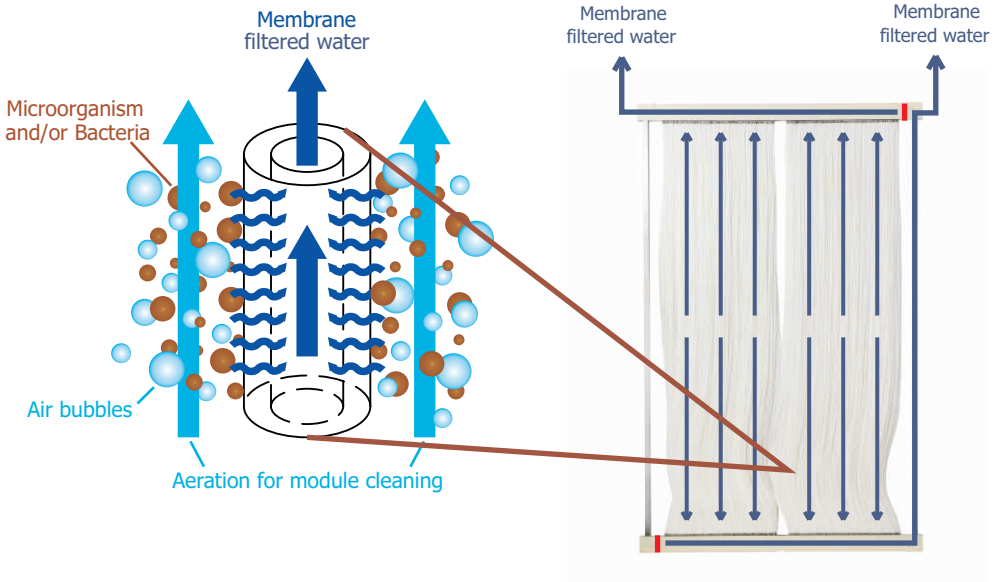
Average permeate flux [l/m^2h]	8.3 ÷ 41.7
Filtration cycle / Pause [min]	7 / 1
Operation TMP [mbar]	50 ÷ 300
Operation Temperature [°C / °F]	5 ÷ 40 / 41 ÷ 104
Max. oil and grease concentration [mg/l]	150

Typical Schematic Diagram



Filtration and Relaxation Mode

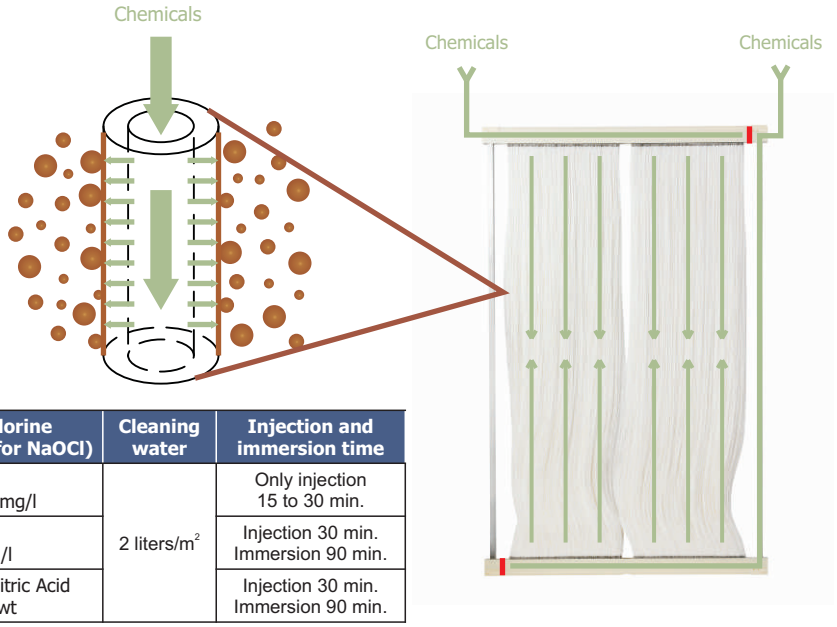
- Membrane surface is cleaned by the flow of water and impact caused by bubbles
- The thin and wide bundle of fibers with slack moves laterally in the scouring air flow for effective membrane surface cleaning



CIP Mode

Normally, NaClO is used as the chemical solution for cleaning MBR systems, as clogging is primarily caused by organic matter.

However, as clogging caused by inorganic matter increases gradually when the system is used for long periods, acid cleaning using acidic chemicals should be performed when necessary.



Type of cleaning	Cleaning frequency	Effective chlorine Concentration (for NaOCl)	Cleaning water	Injection and immersion time
Maintenance cleaning (NaOCl)	Every week (flux>0.4 m/d)	NaOCl 300 to 500 mg/l	2 liters/m^2	Only injection 15 to 30 min.
Recovery cleaning (NaOCl)	Every 3 months	NaOCl 3000 mg/l		Injection 30 min. Immersion 90 min.
Recovery cleaning (Acid)	Every 1 year	Oxalic Acid or Citric Acid 1 to 2 %wt		Injection 30 min. Immersion 90 min.

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Management System
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