RO

NF

UF

MBR

'TORAY'

Innovation by Chemistry



Toray MBR

Submerged PVDF Flat-Sheet Membrane Bioreactor Module

02-G-MB2-MBR-260401

Toray MBR



60 years of Pioneering Towards Sustainable Water

Toray Industries, Inc. has been developing water treatment membranes since 1968. Today, we offer a full lineup of membranes backed by our sixty years of experience. Our advanced membrane technologies and global operations ensure the success of any project.

At the Toray Group, we consider sustainability to be the most important global issue of the 21st century. Toray's Sustainability Vision for water treatment aims to triple the water treated annually with our membranes by 2030 (compared to 2013). We will continue to provide advanced membrane technology such as RO membranes, further strengthen our technical services, and contribute to solving water problems worldwide.



Toray MBR accumulated plant capacity :

1,416,000 m³/day (March, 2026)

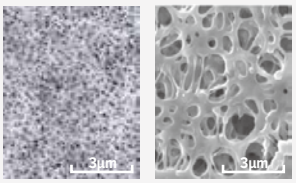
Toray MBR Characteristics

Why Flat Sheet MBR? Why Toray MBR?

Toray PVDF flat sheet membranes for MBR applications combine the best features of flat plate and hollow fiber technologies, such as durability, ease of use, less stringent screening requirement, small footprint, and low energy consumption.
The membrane's pores are small and uniform, resulting in increased smoothness of the membrane surface leading to excellent low fouling capabilities. Compared to conventional flat plate series, Toray's NHP flat sheet technology has increased the normalized membrane area by 50%, reduced module weight by 70%, and reduced energy consumption by 30%.

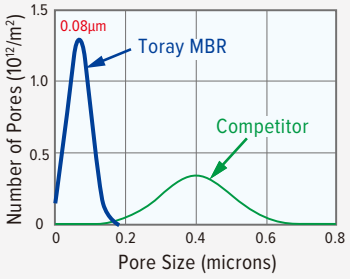
- **Simple construction**
- **Low fouling potential**
- **Less Pretreatment Required**
- **Low chemical cleaning frequency**
- **No backwash, High Recovery**
- **Low O&M costs**

FE-SEM of Membrane Surface

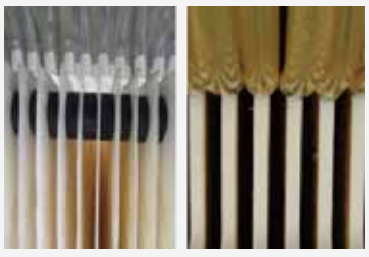


Toray MBR Competitor

Pore Size Distribution



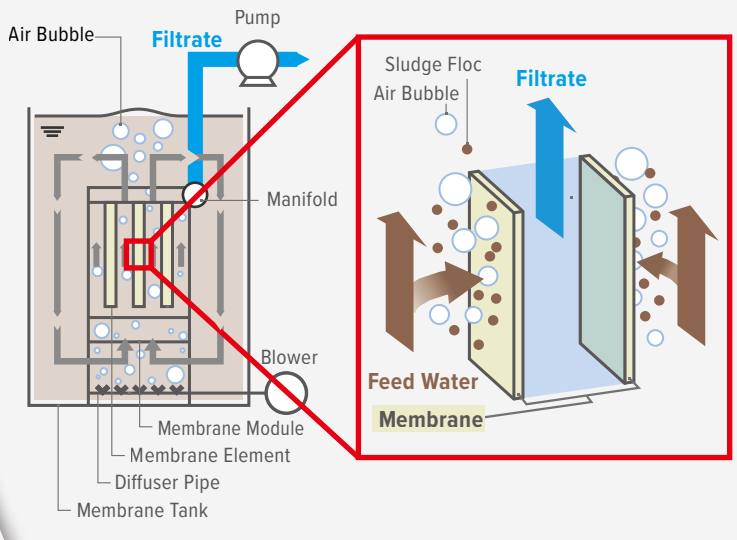
Comparision of Membrane Thickness



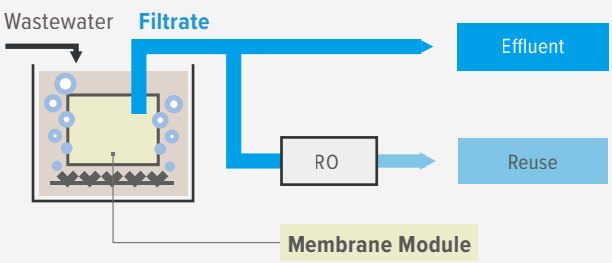
NHP/ NHPA-series 2mm

Conventional series (TMR) 6mm

Function Image of Membrane Element



Filtering Process



Materials Change Our Lives

TORAY

Specifications

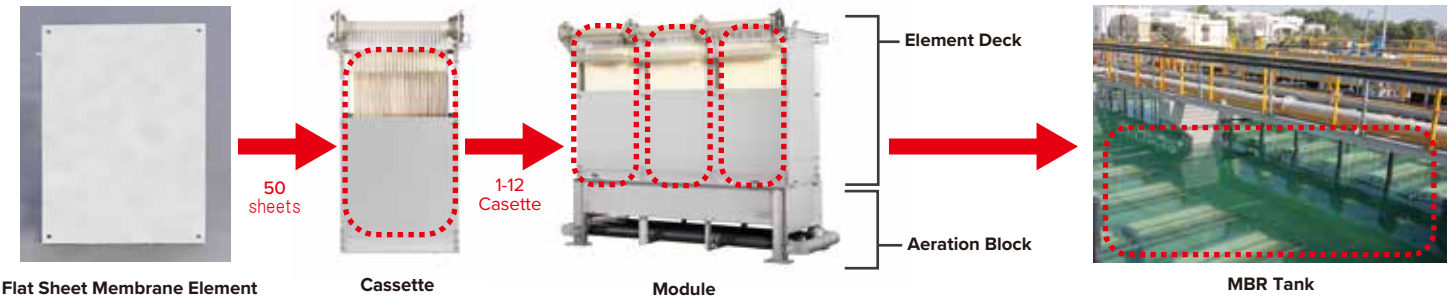
DESIGN TOOLS

Series			NHPA-series	NHP210-series
Flat Sheet Element Model			TSP-50080	
Nominal Pore Size		µm	0.08	
Effective Membrane Area		m² (ft²)	0.7 (7.5)	
Dimensions (w X l X thk)		mm (in.)	477 X 800 X 2 (18.8 X 31.5 X 0.08)	
Materials	Membrane		PVDF and PET non-woven fiber	
	Nozzle		PE	

Series			NHPA-series						NHP210-series	
Module Model			NHPA050-1C	NHPA100-1C	NHPA150-1C	NHPA150-2C	NHPA150-3C	NHPA150-4C	NHP210-300S	NHP210-600D
Scouring Air Flow Rate	NL/min/Module (ft³/min/Module)		330-670 (12-24)	670-1,340 (24-48)	1,000-2,000 (35-71)	1,000-2,000 (35-71)	1,000-2,000 (46-71)	1,000-2,000 (46-71)	1,000-2,000 (35-71)	1,000-2,000 (35-71)
Number of Membrane Elements			50	100	150	300	450	600	300	600
Cassette Structure	Cassette X Stack		1 X 1	2 X 1	3 X 1	3 X 2	3 X 3	3 X 4	3 X 2	3 X 4
Total Membrane Area		m² (ft²)	35 (377)	70 (753)	105 (1,130)	210 (2,260)	315 (3,391)	420 (4,521)	210 (2,260)	420 (4,521)
Dimensions	Width	mm (in)	738 (29.1)	738 (29.1)	763 (30.0)	763 (30.0)	763 (30.0)	763 (30.0)	763 (30.30)	763 (30.0)
	Length	mm (in)	660 (26.0)	1,130 (44.5)	1,635 (64.4)	1,635 (64.4)	1,635 (64.4)	1,635 (64.4)	1,635 (64.4)	1,635 (64.4)
	Height	mm (in)	1,404 (55.3)	1,404 (55.3)	1,404 (55.3)	2,304 (90.7)	3,204 (126.1)	4,104 (161.6)	2,175 (85.6)	3,845 (151.4)
Dry Weight	Module	kg (lbs)	70 (154)	110 (243)	170 (375)	285 (628)	400 (882)	515 (1,135)	240 (529)	440 (970)
Material	Frame		304 SS (316 SS optional)							
	Manifold		PP							
	Air Diffuser		304 SS (316 SS optional)		PP					
Connection	Manifold		ANSI 1 1/2 inch flange using M12 bolts/nuts, One flange per element deck/block (2C: 2 pcs per module, 3C: 3 pcs per module, 4C: 4 pcs per module)							
	Air Diffuser		ANSI 1 1/4 inch flange using M12 bolts/ nuts, Two flanges per aeration block		ANSI 1 1/2 inch flange using M12 bolts/nuts, Two flanges per aeration block					
Operating Temperature Range	Temperature	°C (°F)	5-40 (41-104)							
	pH of Liquid		5-10							
	MLSS	mg/L	Not higher than 18,000							
	Transmembrane Pressure	kPa (psi)	Not higher than 20 (2.9)							

Toray MBR Components

Toray MBR is comprised of a cassette containing 50 flat sheet MBR membrane elements and a module containing 1 to 12 sets of cassettes. The module consists of an element deck containing a cassette and an aeration block that holds an air diffusion pipe. Once assembled, the module is submerged in the MBR tank.



Flat Sheet Membrane Element | Cassette | Module | MBR Tank

Product Offering

Our broad lineup, now including the "NHPA-series", covers everything from small to large configurations to meet customer needs. Replacing the TMR series, or other flat plate products, is fast, easy, and significantly increases capacity within the same module volume.
Please contact us for details!



GLOBAL LOCATIONS

HEADQUARTERS Tokyo, Japan : +81-3-3245-4542

THE AMERICAS
California (TMUS) : +1-858-218-2360

EUROPE & SUB-SAHARAN AFRICA
Switzerland (TMEU) : +41-61-415-8710
Spain (TMSP) : +34-915-726-504

MIDDLE EAST
Saudi Arabia (TMME) : +966-13-568-0091
United Arab Emirates (TMME) : +971-4-392-8811

ASIA PACIFIC
China (TBMC) : +86-10-8048-5216
Singapore (TAS) : +65-6226-0525
South Korea (TAK) : +82-2-3279-1000

Toray MBR Installations

Case Studies ➡


Municipal WWT: 650m³/d


Industrial WWT : 10,000m³/d


Agrochemical WWT: 15,000m³/d


Industrial WWT: 10,000m³/d




Municipal WWT: 3,500m³/d


Municipal WWT: 15,000m³/d


Industrial WWR: 4,500m³/d


Industrial WWT : 1,000m³/d

* WWT : Wastewater Treatment
* WWR : Wastewater Reuse

Toray Group

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