

MEMBRAY TMR090 Series Specifications

Element Specifications (TSP-50100)			
Nominal Pore Size	micron	0.08	
Membrane Area	m ² (sq. ft.)	0.9 (9.7)	
Dimensions (W x H x T)	mm (inch)	515 x 1,059 x 13.5 (20.3 x 41.7 x 0.5)	
Weight (dry)	kg (lb)	3.0 (6.6)	
Membrane Material		PVDF + PET non-woven fabric	
Supporting Plate		ABS	
Module Specifications			
Module Type		TMR090-050S	TMR090-100S
Flow Capacity*	m ³ /day (gal/day)	5 – 35 (1,300 – 9,200)	10 – 70 (2,600 – 18,500)
Number of Membrane Elements		50	100
Total Membrane Area	m ² (sq. ft.)	45 (480)	90 (970)
Dimensions (W x L x H)	mm (inch)	730 x 990 x 1,470 (28.7 x 39.0 x 57.9)	730 x 1,720 x 1,470 (28.7 x 67.7 x 57.9)
Weight (dry)	kg (lb)	265 (584)	460 (1,014)
Materials	Frame and Permeated Water Manifold	304 stainless steel (316 stainless steel is available as option)	
	Diffuser	EPDM/PVC/304SS	

* These are reference values with typical municipal wastewater, not guaranteed values.
 • Specifications subject to change without notice due to technical modifications or production changes.

TORAY satisfies global water treatment needs.

Global Website: <http://www.toraywater.com/>

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About Toray

Established in 1926, Toray is a worldwide leader in chemical manufacturing and related products. Leveraging decades of experience in synthetic fibers and textiles, Toray has expanded into many other fields such as carbon fiber and its composites, plastics, fine chemicals and innovative water treatment technologies.

Toray is committed to achieving sustainable growth and environmental preservation, while meeting the diverse needs of its customers worldwide. Toray constantly strives to contribute to the countries and communities in which it operates, not only through superior products and services, but by acting as a concerned corporate citizen. In this way, Toray seeks to play its part in building a better society for all the people of the world.

MEMBRAY is a trademark of Toray Industries, Inc.



TORAY
 Innovation by Chemistry

MEMBRAY™ TMR090 Series Submerged Flat Sheet Membrane Module for MBR



TMR090-100S

TMR090-050S

TORAY MBR Technology for Sustainable Water Resources

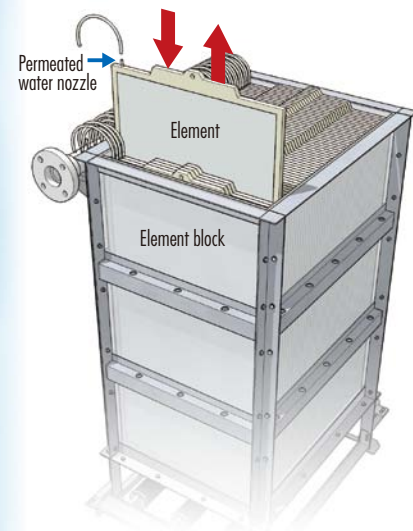
Toray Industries, Inc.

TORAY's advanced membrane separation technology and nanotechnology create better MBR modules.

New "MEMBRAY" TMR090 Series

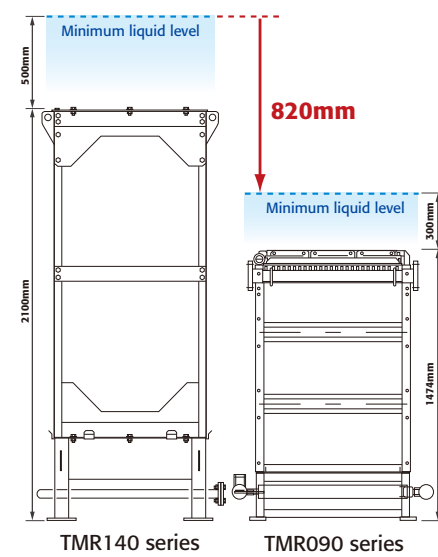
Easy replacement of elements

Each element can be easily taken out from the module individually for inspection or replacement.



Lower module height

TMR090 Series, with its height of 1,474mm, is ideally sized for containerized package systems and various applications with space (height) limitations.



Fine-bubble Air Diffusers

TMR090 Series is equipped with fine-bubble air diffusers, which significantly reduces the daily cleaning operation of air diffusers and additionally increases the oxygen dissolution efficiency.



Applications



Photo and illustration courtesy of NASTON LTD.



Cruise ships



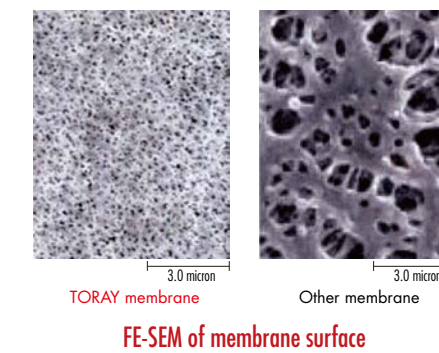
Domestic wastewater reuse in hotels and commercial buildings

Photo courtesy of KONCKIER

State-of-the-art Flat Sheet PVDF Membrane

High water permeability and high effluent quality

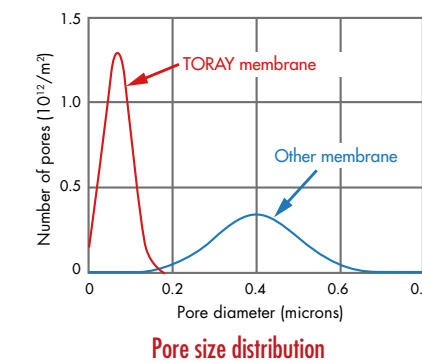
- Many 0.08 micron pores on the membrane surface effectively eliminate 0.1 micron+ particles to improve effluent quality.
- Uniform pore size results in consistently high permeability with minimal pore clogging.
- 5-log removal of fecal coliforms, and 3-log removal of virus in 50% of samples were achieved with model test.



FE-SEM of membrane surface

High fouling resistance

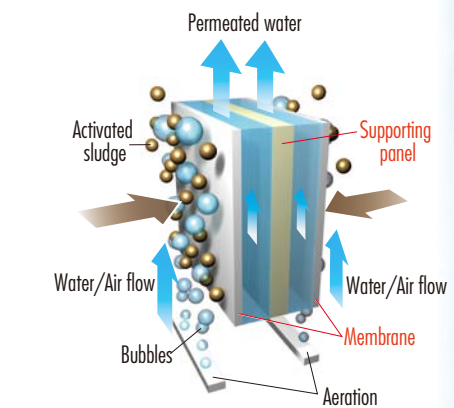
Numerous small-diameter pores are distributed evenly throughout the membrane surface with a narrow diameter distribution. This structure results in higher treated water quality, minimizes membrane fouling and pore clogging and delivers high water permeability.



Pore size distribution

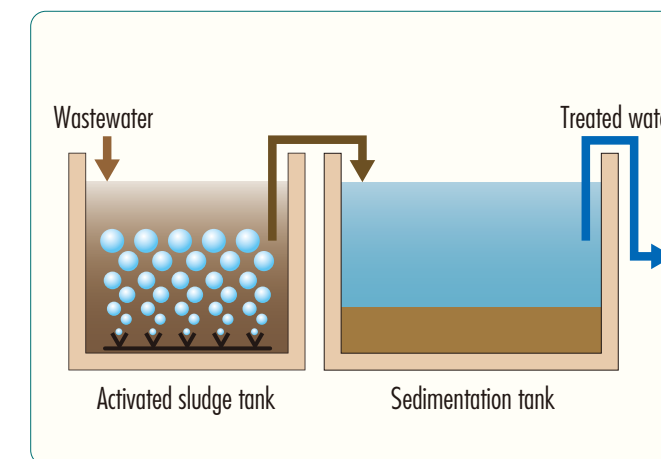
Physical strength and chemical stability

Using PVDF (polyvinylidene fluoride) for the functional layer of the membrane and PET (polyester) non-woven fabric as the base layer allows the membrane to exhibit superior physical strength and chemical stability.

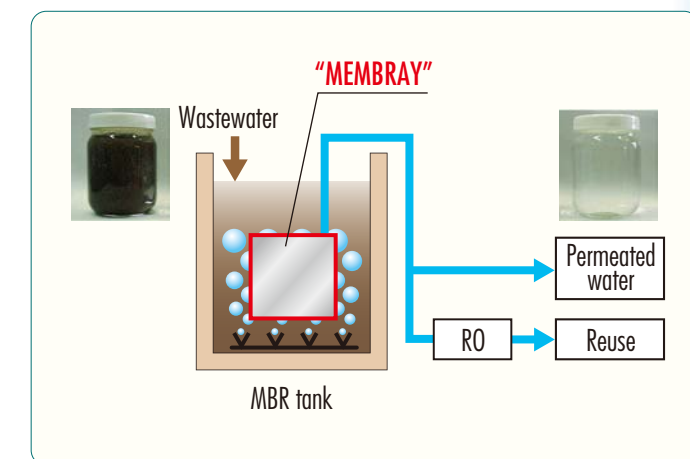


TORAY MBR Technology

Membrane Bio Reactor (MBR) is the latest technology to treat municipal wastewater as well as various industrial wastewater from around the world. TORAY's "MEMBRAY" module for MBR systems, developed over 25+ years of experience in the membrane industry, removes suspended solids (SS) and microorganisms such as Escherichia coli and Cryptosporidium from the sludge liquid much more effectively than the conventional sedimentation process, which achieves extraordinarily high effluent quality.



Conventional wastewater treatment system



MBR system using "MEMBRAY"