

## About Us

TORAY Industries, Inc. fuses nanotechnology into its operations, using organic synthetic chemistry, polymer chemistry and biotechnology as its core technologies. In addition to the "Foundation Businesses" of fibers & textiles and plastics & chemicals, TORAY has promoted the global development of IT-related products, carbon fiber composite materials, pharmaceuticals and medical products as well. We are also involved in environment & engineering including water treatment and making progress in other pivotal business fields. While we will continue to strengthen our existing plant engineering business, the environment & engineering segment is expected to expand, especially in the water treatment business.

<http://www.toraywater.com>

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### **TORAY MEMBRANE EUROPE (MIDDLE EAST BRANCH)**

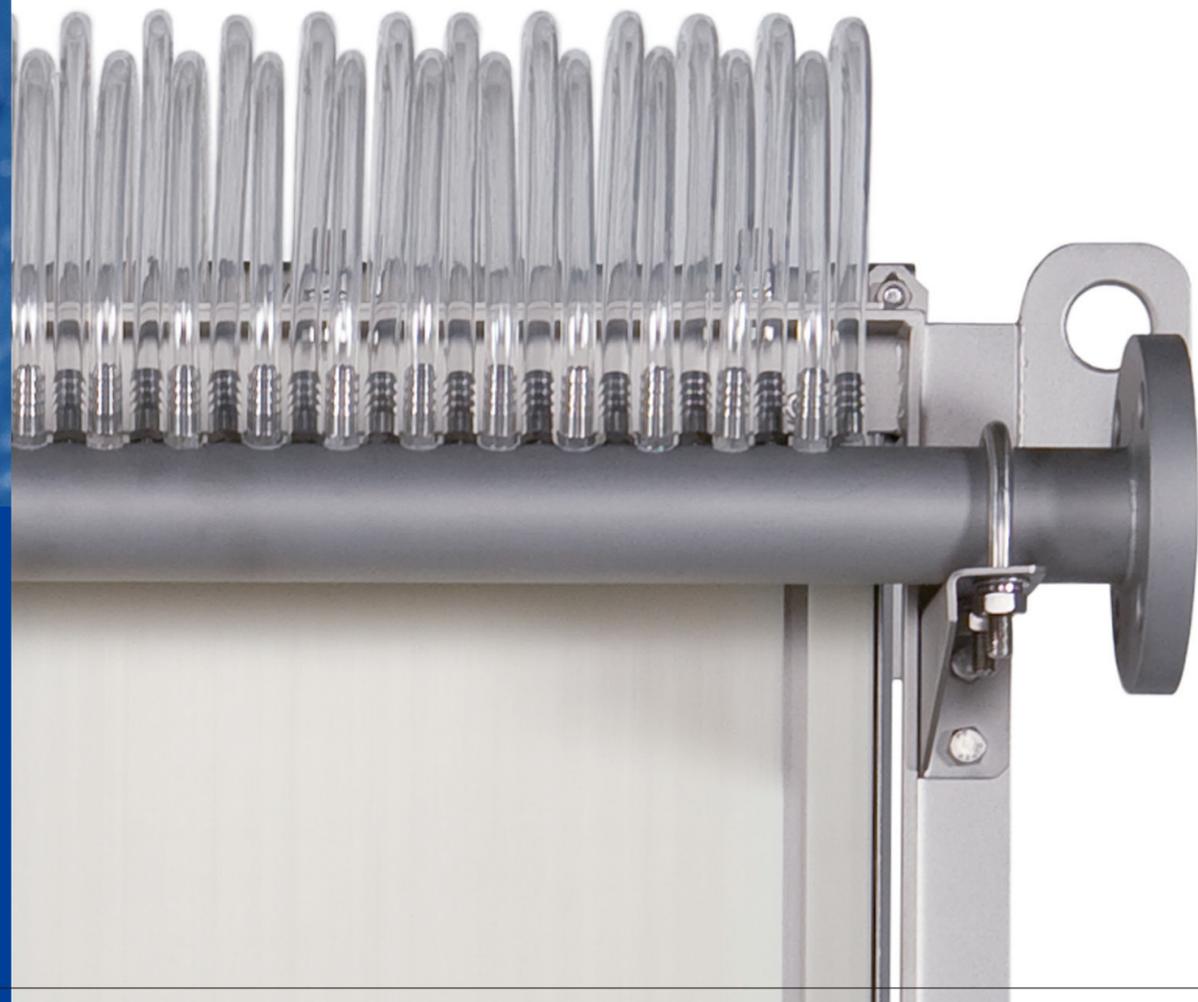
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**'TORAY'**  
Innovation by Chemistry

# MEMBRAY™

## Submerged Flat Sheet Membrane Modules for MBR



# TORAY Advanced Membrane Technology for a Sustainable Future

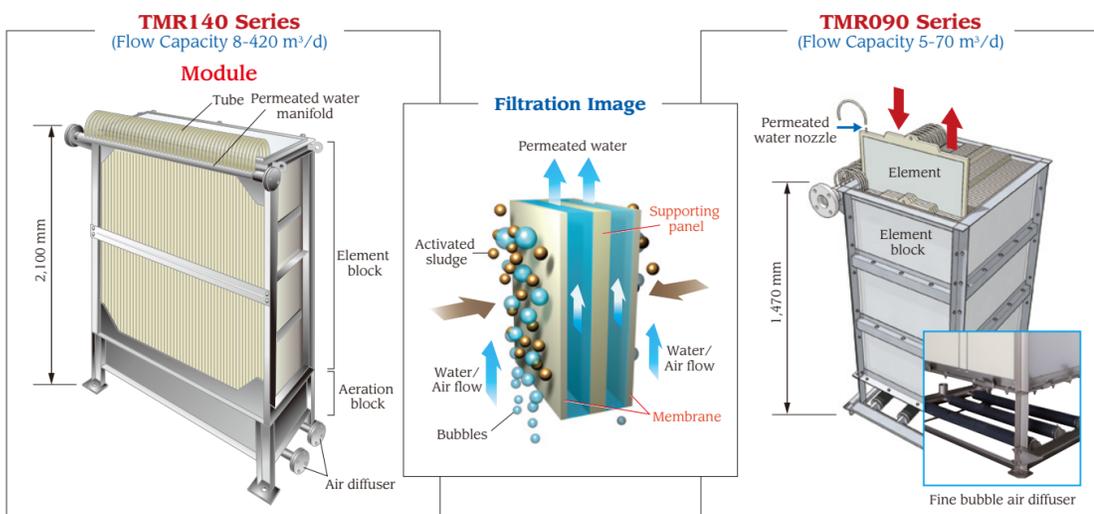
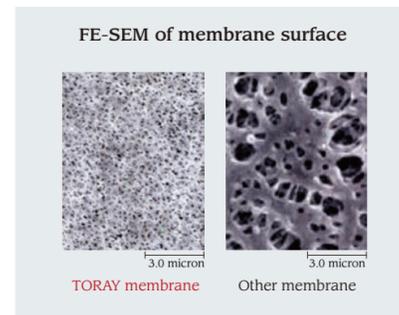
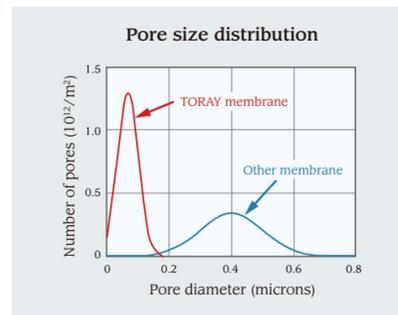
**Easy Maintenance & High Permeability. Flat Sheet "MEMBRAY" Delivers Smart MBR Process.**

## High Chemical Resistance & High Mechanical Strength

PVDF (polyvinylidene fluoride) gives the membrane superior physical strength and chemical resistance.

## High Water Permeability & High-quality Effluent

Numerous and uniform small pores (0.08 micrometer) enable higher quality of treated water and high fouling resistance.



## Why Flat Sheet Membrane?

### High Fouling Resistance

Flat sheet membrane offers superior in fouling resistance compared with hollow fiber membrane.

### Simple System & Operation

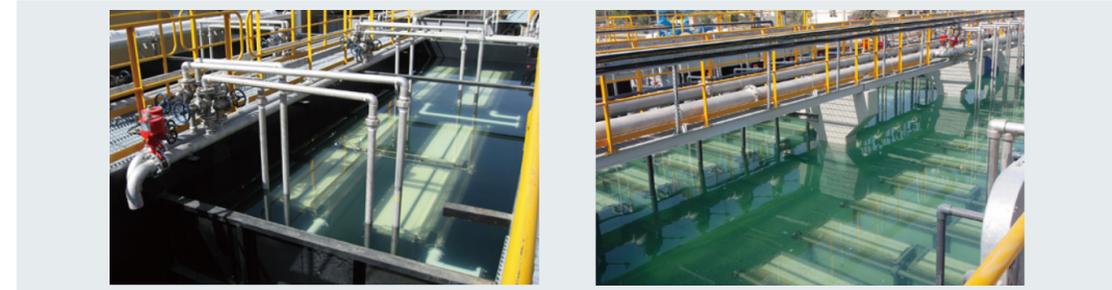
Flat sheet membrane does not require a backwash system to operate reliably.

### Easy Maintenance

Simple module design with flat sheet membrane enables easy maintenance and cost savings.

## Outstanding References Worldwide

TORAY's membrane modules provide high-quality water on a daily basis for advanced wastewater treatment, RO pretreatment, water reuse and many other applications.



## Worldwide Research & Development Organization

TORAY has been developing our innovative membrane products with polymer science and membrane fabrication technologies accumulated in our global R&D organizations for more than 30 years.

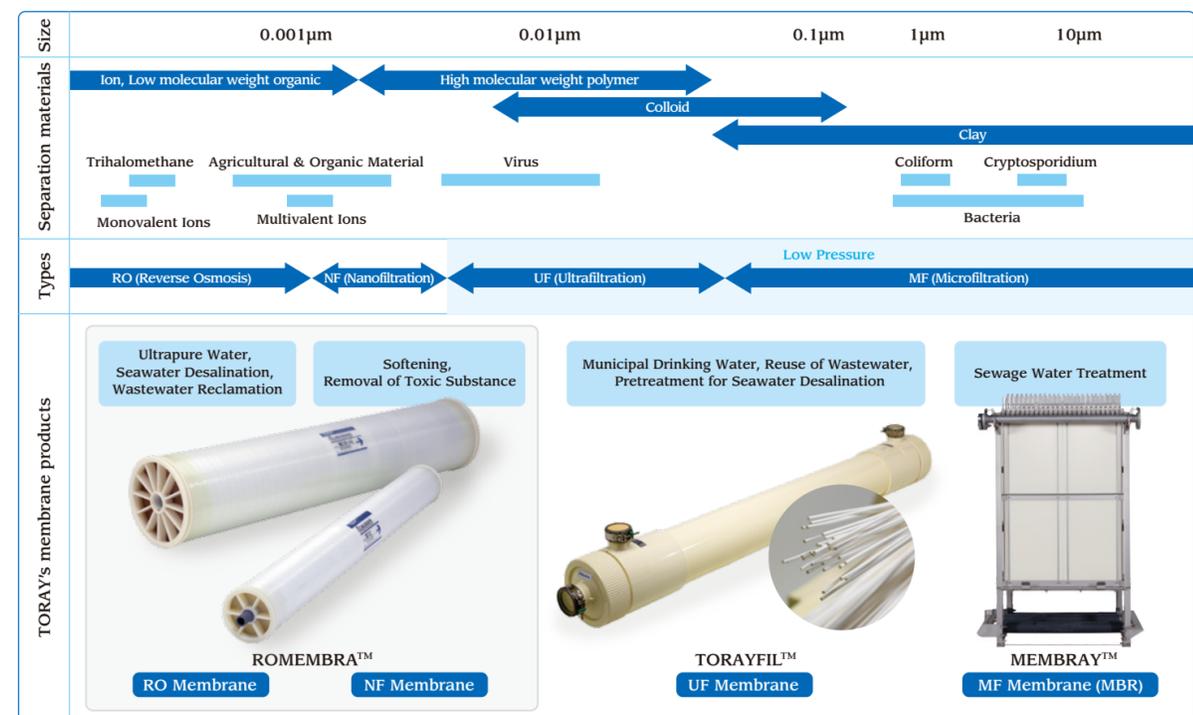


## Comprehensive Global Production Network

TORAY has a comprehensive global production network of RO, UF and MBR products. We supply high-quality full-range water treatment products worldwide.



## TORAY Membrane Products



# TORAY MEMBRAY™ Main Product List

1st June, 2015

Series		TMR140 Series					TMR090 Series		
Element Model & Specification	Model	TSP-50150					TSP-50100		
	Effective Membrane Area (m <sup>2</sup> )	1.4					0.9		
	Nominal Pore Size	0.08 micrometer							
	Dimensions (mm)	515 x 1,608 x 13.5 (Thickness)					515 x 1,059 x 13.5 (Thickness)		
	Material	Membrane	PVDF (polyvinylidene fluoride) + PET non-woven fabric						
Supporting Panel		ABS resin							
Model		TMR140-050S	TMR140-100S	TMR140-200W	TMR140-200D	TMR140-400DW	TMR090-050S	TMR090-100S	
Design Flow	m <sup>3</sup> /day	8 - 53	15 - 105	30 - 210	32 - 210	60 - 420	5 - 35	10 - 70	
	gal/day	2,100 - 14,000	4,000 - 27,700	7,900 - 55,500	7,900 - 55,500	15,900 - 111,000	1,300 - 9,200	2,600 - 18,500	
Number of Membrane Elements		50	100	200	200	400	50	100	
Total Membrane Area	m <sup>2</sup>	70	140	280	280	560	45	90	
	sq.ft.	750	1,510	3,010	3,010	6,030	480	970	
Dimension	Width	mm	810	810	840	810	840	730	730
		inch	31.9	31.9	33.1	31.9	33.1	28.7	28.7
	Length	mm	950	1,620	3,260	1,620	3,260	990	1,720
inch		37.4	63.8	128.3	63.8	128.3	39.0	67.7	
Height	mm	2,100	2,100	2,100	4,160	4,160	1,470	1,470	
	inch	82.7	82.7	82.7	163.8	163.8	57.9	57.9	
Weight (dry)*1	kg	400	695	1,430	1,365	2,690	265	460	
	lb	882	1,532	3,153	3,009	5,930	584	1,014	
Material	Frame	316L stainless steel*2							
	Permeated Water Manifold	316L stainless steel*2	Polypropylene*3				316L stainless steel*2	Polypropylene*3	
	Diffuser	316L stainless steel*2	Polypropylene*3				EPDM/PVC/Stainless steel		
	Element fixing gasket	EPDM Rubber							
Connection flange	Permeated Water Manifold	ANSI 1 1/2 inch	ANSI 2 inch	ANSI 3 inch	ANSI 2 inch	ANSI 3 inch	ANSI 1/1/2 inch	ANSI 2 inch	
	Diffuser	ANSI 1 1/4 inch	ANSI 1 1/2 inch	ANSI 2 inch	ANSI 1 1/2 inch	ANSI 2 inch	NTP 1 1/2 inch Screw	NTP 1 1/2 inch Screw	
Operating Range	Temperature	5 - 40 degree C							
	pH*4 of liquid	5 - 10							
	MLSS	Not higher than 18,000 mg/l							
	Trans-membrane pressure	Not higher than 20 kPa (200 mbar)							

Note: Specifications subject to change without notice.

\*1. Weight of the heaviest stainless steel manifold & diffuser model, slightly lighter when applying Polypropylene.

\*2. 304 stainless steel is available as option.

\*3. 304 stainless steel and 316L stainless steel are available as option.

\*4. Except when the chemical cleaning with the designated chemical agents.