

TORAY



RO | NF | UF | MF

SUBMERGED FLAT SHEET MEMBRANE MODULE
MEMBRAY™

NHP SERIES

MEMBRANE BIOREACTOR

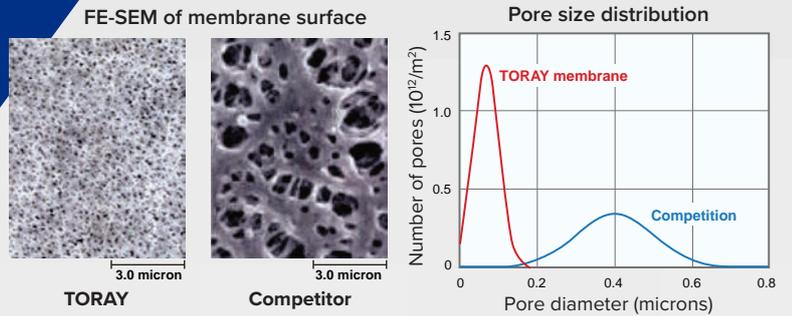


NHP IS NEW HIGH PERFORMANCE

The NHP membrane bioreactor (MBR) module by Toray is an effective barrier against solids, bacteria, and viruses to help meet increasingly stringent water quality requirements and turn wastewater into a viable water source. Toray's advanced PVDF membrane sheets have been engineered to be densely packed into element blocks to improve productivity at reduced footprint and cleaning efficiency at reduced energy demand. *Toray, solutions for a sustainable future.*

TORAY ADVANCED MEMBRANE TECHNOLOGIES

Toray's PVDF (polyvinylidene fluoride) membrane has numerous pores with uniform sizes evenly distributed across the membrane surface. This arrangement allows for the following advantages: increased durability against chemicals and foulants, superior physical integrity, and the ability to produce effluent consistent in quality at high capacities.



Product Dimensions



How are NHP modules made?

- 1  0.7 m² of membrane area per flat sheet
- 2  50 flat sheets per element block
- 3  Six (6) element blocks per NHP210-300S* unit
- 4  Two modules can be stacked to form one NHP210-600D** module

*NHP210-300S unit has same dimensions as TMR140-100S for **EASY RETROFIT**

**420 m² of membrane area and compatible with TMR140-200D

NHP210-600D vs. Hollow Fiber MBR

PACKING DENSITY
(m² membrane/m² footprint)

OPERATION CAPACITY
(m³/day/m² module footprint)

AIR SCOURING PER MEMBRANE
AREA (L/min/m² module footprint)

DRY WEIGHT
(kg/m² module footprint)

509
▲20%

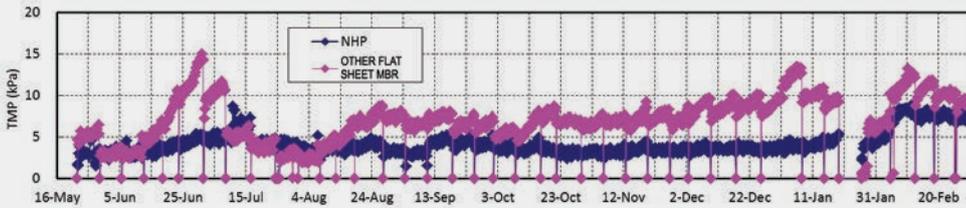
305
▲20%

8.0
▼67%

230
▼67%

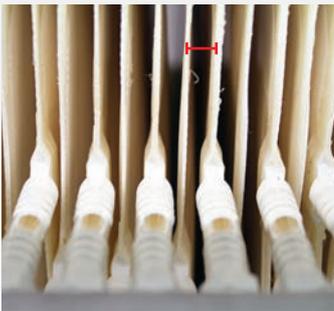
*The NHP has similar packing density close to a hollow-fiber module, while maintaining excellent features of a flat sheet MBR module.

FIELD TEST RESULTS / NHP210-300S vs. OTHER FLAT SHEET MBR

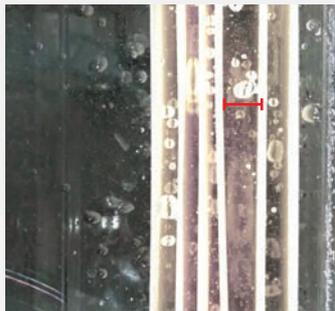


NHP series was more stable at equal flux operation, with 50% increase in capacity at same footprint, and lower air scouring.

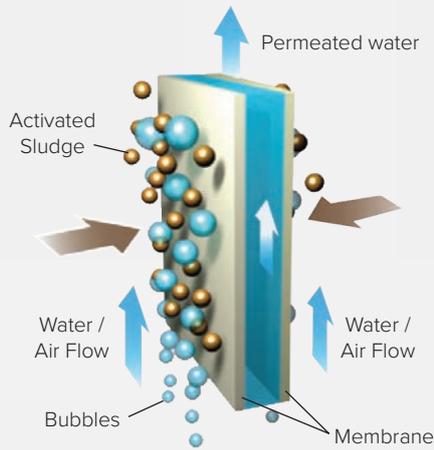
MEMBRANE SHEET SPACING



DURING OPERATION



The thin membrane sheets have better flexibility and allows for more space between the each of the flat sheets. This increases the range of movement and vibrations during air scouring, helping to dislodge sludge and improve cleaning efficiency all with **less energy consumption.**



FILTRATION PROCESS

TORAY INDUSTRIES, INC.

1-1, Nihonbashi-Muromachi 2-chome,
Chuo-ku, Tokyo 103-8666 JAPAN
tel: +81-3-3245-4542 • fax: +81-3-3245-4913

'TORAY'

Additional plants and sales offices located in: Japan (headquarters), Korea, China, Brazil, Switzerland, Spain, Saudi Arabia, U.A.E., and Singapore. Please visit our website to learn more out about our locations throughout the world.

Toray offers integrated solutions for water and wastewater treatment needs.

Our goal is to help our customers improve their plant performance and competitiveness. We are one of few manufacturers with expertise across the entire spectrum of membrane products and services for reverse osmosis (RO), nano-filtration (NF), ultra-filtration (UF), micro-filtration (MF), membrane bio-reactor (MBR) and forward osmosis (FO).

Creating value for our customers drives our product development and it is the basis on which we strive to build our leadership in the membrane treatment sector.



'TORAY' Innovation by Chemistry

©2018 All Rights Reserved.
ROMEMBRA™, TORAYFIL™, and MEMBRAY™ are trademarks of
Toray Industries. For corporate information please visit www.toray.com

WWW.TORAYWATER.COM

TORAY MEMBRAY NHP MBR MODULE MC-MB2NHP-1808