



'TORAY'



SUBMERGED FLAT SHEET MEMBRANE MODULE
MEMBRAY®

NHP SERIES

MEMBRANE BIOREACTOR



NHP IS NEW HIGH PERFORMANCE

The NHP Membrane Bio-Reactor module is an effective barrier against solids, bacteria and viruses to deliver high-quality effluent for municipal and industrial treatment needs. Toray's advanced PVDF membranes, that have consistent nominal pore size (0.08 μm) and uniform distribution of pores, are densely packed into element blocks. This unique construction increases efficiency and decreases energy use during aeration. *Toray, solutions for a sustainable future.*

BENEFITS OF MBR VERSUS CONVENTIONAL WASTEWATER TREATMENT

Smaller footprint, elimination of clarifier

More consistent quality in effluent

Ability to operate at high MLSS making MBR ideal even for sludge thickening applications

Better discharge quality to meet regulations

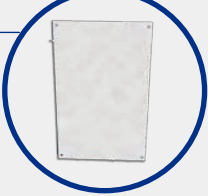

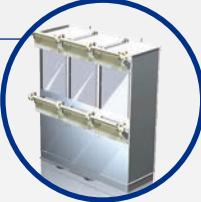

Flat sheet membrane does not require a backwash system to operate reliably

More durable, easier maintenance, and product longevity

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 **SIMPLE 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%

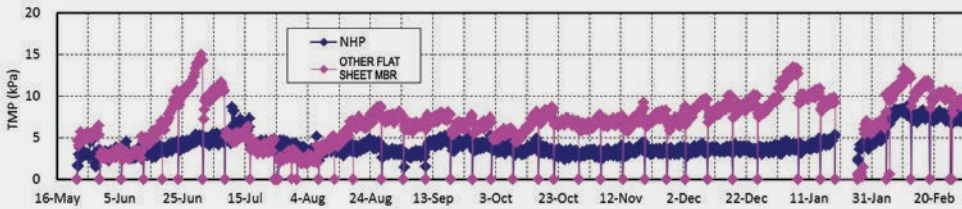
305
▲20%

8.0
▼67%

230
▼67%

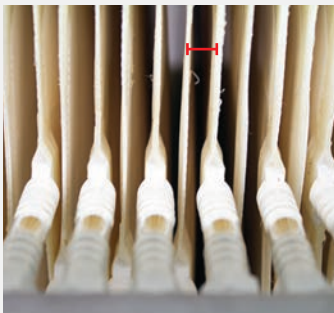
*The NHP has similar packing density close to a hollow fiber module, while maintaining excellent features of a flat sheet MBR module.

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

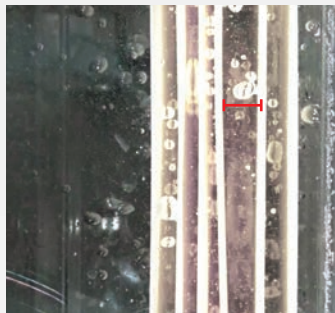


NHP series was more stable at equal flux operation, with 50% increase in capacity at same footprint, and lower air scouring.

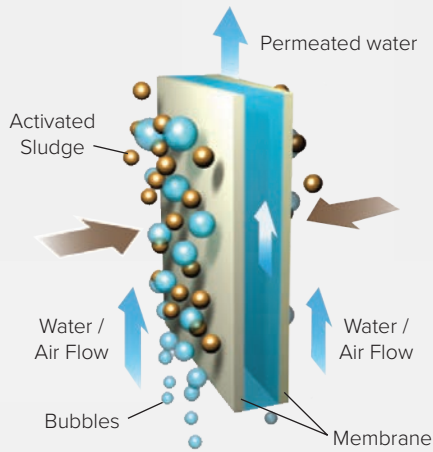
MEMBRANE SHEET SPACING



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 MEMBRANE EUROPE AG

Sales and warehousing of RO, SPECIALTY, MF/UF, MBR Products and ROPUR Antiscalants:

Grabenackerstrasse 8b, Muenchenstein 1 CH-4142, Switzerland

Tel: +41 61 415 8710 / E-mail: info@toraywater.com

www.toraywater.com

www.ropur.com (ROPUR Antiscalants)

www.csmfilter.com (CSM products)

'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

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TORAY MEMBRAY® NHP MBR MODULE MC-MB2NHP-1709