



RO



NF



UF

MBR

TORAY

Innovation by Chemistry

NHP SERIES

MEMBRAY™

SUBMERGED PVDF FLAT-SHEET
MEMBRANE BIOREACTOR MODULE



NHP IS NEW HIGH PER- FOR- MANCE



The NHP membrane bioreactor (MBR) module by Toray is an effective barrier against solids, bacteria, and viruses to help meet water quality requirements of wastewater reclamation plants. Toray's advanced PVDF membrane sheets boast high durability to chemicals and foulants, physical integrity, and permeability. These sheets are densely packed in each element blocks for improved productivity at the lower footprint, and cleaning efficiency at reduced energy demand — **Toray, solutions for a sustainable future.**

FEATURES

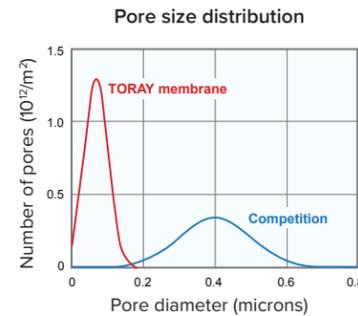
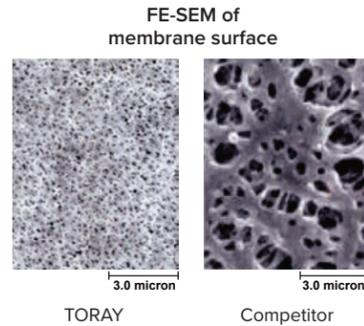
NHP210-300S vs. TMR140-100S

ELEMENT THICKNESS (mm)	NO. OF ELEMENTS	MEMBRANE AREA (m ²)	DRY WEIGHT (kg)
1.8 vs. 6	300 vs. 100	210 vs. 140	235 vs. 695
Improved cleaning and fouling resistance	50% higher packing density per module	More permeate with less energy	66% lighter as a module

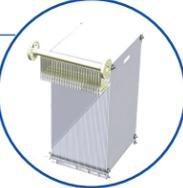
NHP210-600D vs. TMR140-200D

PACKING DENSITY (m ² membrane/m ² footprint)	OPERATION CAPACITY (m ³ /day/m ² module footprint)	ENERGY CONSUMPTION for air scrubbing @ 24 l/mh (kWh/m ³ filtrate)
509 vs. 339	305 vs. 204	0.2 vs. 0.3

Toray's PVDF (polyvinylidene fluoride) membrane has uniform pore sizes evenly distributed across the membrane surface.

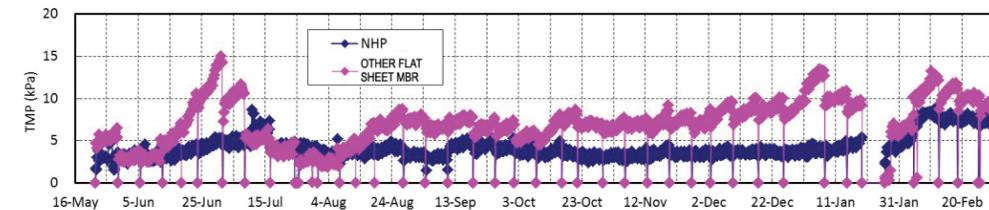


How are NHP modules made?

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

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

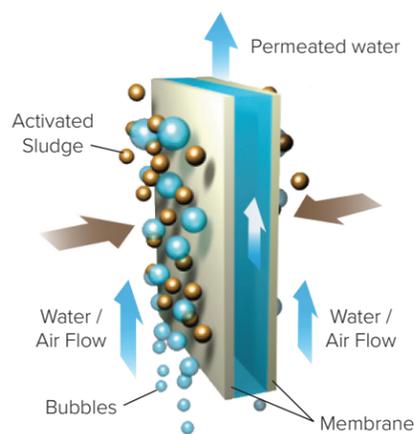
FIELD TEST RESULTS / NHP210-300S vs. TMR140-100S



AIR SCOURING PER MEMBRANE AREA (L/min/m²)
8.1 vs. 12.1
30% lower power consumption kWh/m³ filtrate

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

MBR FILTRATION PROCESS



Thinner membrane sheets are incorporated into the NHP module, which allows for more space between each of the flat sheets. This property increases the range of movement and vibrations during air scouring, helping to dislodge sludge and improve cleaning efficiency, all with **less energy consumption.**

* The NHP210-300S unit has same dimensions as the TMR140-100S for **SIMPLE RETROFIT**

For detailed specifications, please request product datasheets



NHP is ideal for wastewater treatment, sludge thickening processes, and water reuse in various industrial and municipal applications

Advantages of NHP Membrane Bioreactor Systems

- Easy retrofit
- Increased filtration capacity
- Durable PVDF membrane
- High permeate quality
- Energy-efficient
- Various configurations available
- Reliable technical support

In 1968 TORAY began its membrane development program for water treatment. Fifty years later, the name endures as a leading innovator of membrane technologies continuing to add new solutions for a sustainable future. To experience lasting growth, partner with a company that has, for decades, adapted to the changing needs of the market and looks to the horizon for the next big challenge.

TORAY, A NAME YOU CAN TRUST.

TORAY

www.toraywater.com

TORAY MEMBRANE USA, INC.

Regional office for the Americas

🌐 13435 Danielson Street, Poway, CA 92064, U.S.A.

☎ +1 (858) 218-2360 📠 +1 (858) 218-2380

✉ innovation@toraymem.com

GLOBAL LOCATIONS

HEADQUARTERS

Japan: +81-3-3245-4540

EUROPE & SUB-SAHARAN AFRICA

Switzerland (TMEu): +41-61-415-8710

MIDDLE EAST

Saudi Arabia (TMME): +966-13-568-0091

United Arab Emirates (TMME): +971-4-392-8811

ASIA PACIFIC

China (TMBC): +86-10-8048-5216

Singapore (TAS): +65-6226-0525

Korea (TAK): +82-2-3279-7000



 **Toray Group**

©2020 All Rights Reserved.

The names of products or services indicated with a TM mark are trademarks of Toray Industries, Inc. For corporate information, please visit www.toray.com.

MC-MB2NHP-2008