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LANXESS
Energizing Chemistry

Superior membrane chemistry – new Ultrafiltration module design

Ultrafiltration (UF) has been proven as a reliable option to ensure constant water quality. It removes particles and microorganisms from water effectively and cost-efficiently. The ultrafiltration reduces the adsorption of particles during reverse osmosis (RO) and ion exchange (IX) processes and extends the operational lifetime of the system. LANXESS cooperates in this technology with the French ultrafiltration (UF) membrane producer Polymem. Typical UF applications are as a pretreatment for RO and IX in the production of industrial water, and the treatment of wastewater or the municipal water supply.

Superior membrane chemistry

Neophil® is a uniquely modified PVDF incorporating a hydrophilic, nano-structured block copolymer anchored deeply in the polymer matrix, providing a durable, “baked in” hydrophilicity, added oxidative resistance, and mechanical strength. Neophil® does not lose its hydrophilic character over time and maintains its superior rejection performance. Even after exposing a new fiber to chlorine, the virus removal rate is still $> \log 4$. The advantages include:

- Permanent hydrophilicity to reduce fouling
- High mechanical and oxidative stability as PVDF
- Narrow pore size of $0.015 \mu\text{m}$
- Virus removal of $> 4 \log$ (after 200,000 ppm hours Cl_2)

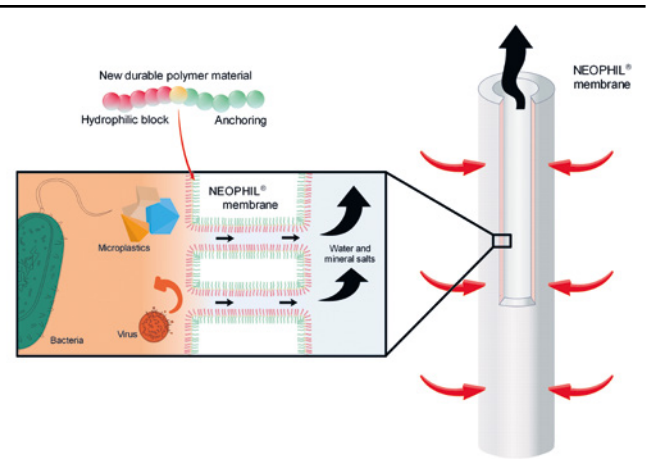


Figure showing Neophil® polymeric structure and filtration properties

A redefined module design

The Gigamem® module concept is based on a housing permanently fixed in place and exchangeable membrane cartridges. If the fiber is damaged the user can choose to repair the fiber in situ or remove the cartridge bundle for repair outside the vessel at a more convenient time. This makes maintenance very easy to perform and increases the reliability of the system. The filtration process itself operates outside-in, and has therefore a high tolerance of suspended solids. System designs are feasible for various process steps such as backwashing or air scouring.

Saving operational costs using innovative design

The compact Gigamem® UF modules reduce the operational and investment costs of the plant, which can be a limiting factor using UF. The smaller footprint reduces the amount of valves and piping needed, while the exchangeable cartridges further reduce the maintenance and replacement costs.

Worldwide references in several applications

The applications vary from the production of municipal drinking water to industrial water production or reuse. The high packing density of the Gigamem® module is recommended for compact applications, such as the treatment of seawater prior to desalination. The complete service line is offered starting from initial lab tests to pilot tests, system design, and system optimization. LANXESS offers several Gigamem® types to serve different needs and applications. Two different module sizes are available, such as the UF80G types with 73 m² (786 ft²) membrane area with PVC

housings, and the UF240 types with a 582 m² (6,265 ft²) membrane area in stainless steel housings or composite vessels for seawater applications. These modules can be loaded with polysulfone or Neophil® membrane cartridges. Double O-ring sealing of the cartridges provides for full integrity of the individual cartridges and system integrity for NSF 61 and > 6 log bacteria removal.

References	Treated water	Application
BHP Shenzi, Gulf of Mexico	30,000 m ³ /day (7,900 gpd)	Offshore water treatment
Eau de Paris, France	15,000 m ³ /day (4,000 gpd)	Municipal drinking water
Vaujany, France	6,000 m ³ /day (1,600 gpd)	Drinking water
Circuit Foil, Luxembourg	750 m ³ /day (200 gpd)	Industrial water
Consolidated Fabrics, Mauritius	800 m ³ /day (200 gpd)	Industrial water

UF module	Membrane material	Membrane area	Housing
Gigamem® UF80G S2	Polysulfone	73 m ² (786 ft ²) 7 membrane cartridges	PVC housing Diameter 225 mm (8 inch)
Gigamem® UF80G S2F	Neophil®	73 m ² (786 ft ²) 7 membrane cartridges	PVC housing Diameter 225 mm (8 inch)
Gigamem® UF240 S2	Polysulfone	582 m ² (6,265 ft ²) 56 membrane cartridges	Stainless steel Diameter 610 mm (24 inch)
Gigamem® UF240 S2F	Neophil®	582 m ² (6,265 ft ²) 56 membrane cartridges	Stainless steel Diameter 610 mm (24 inch)

Table showing Gigamem® modules LANXESS distributes

We will be happy to support your business. Please contact us for additional information: visit www.lpt.lanxess.com

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