

Submerged UF Product Line

Memstar's submerged UF technology is ideally suited for water and wastewater clarification, especially membrane bioreactor applications.

Memstar has pioneered the development of a proprietary TIPS PVDF hollow fiber and innovative Energy Saving Air Scouring (ESAS) to minimize life cycle costs for both municipal and industrial applications. Memstar submerged technologies are currently used at over 150 sites world-wide to treat more than 4,500,000 m³/day (1.2 billion gallons/day) in both industrial and municipal water and wastewater applications.

Key Advantages:

1

Minimal Footprint

- High fiber packing density
- Double-decker skid design

2

Lower Operating Costs

- Long membrane life due to high mechanical strength and superior chemical resistance
- Lower energy consumption due to patented energy saving air scouring combined with double decker skid design
- High permeability due to permanent hydrophilicity
- Stable high flux with reduced fouling
- Symmetric TIPS PVDF technology eliminates the risk of delamination and minimizes the impact of abrasion

3

Ability to Treat Most Challenging Waters

- High mechanical strength to minimize fiber breakage
- Extreme pH and oxidant (including ozone) tolerance to remove/prevent severe fouling and restore performance

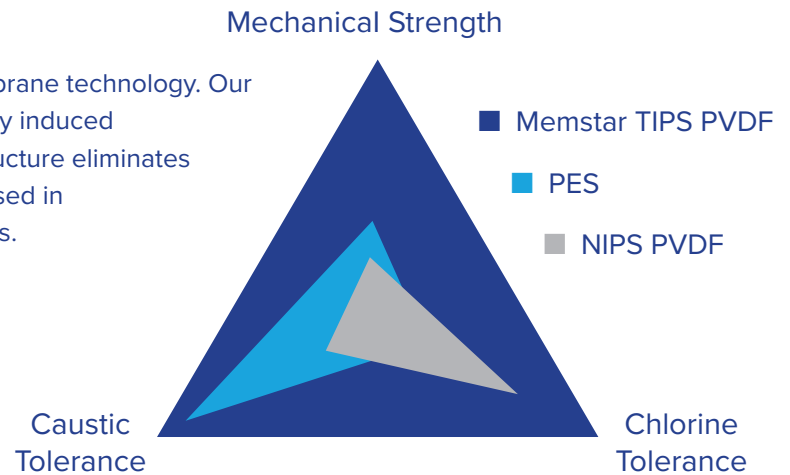


Fiber Technology

At the core of Memstar's products is the hollow fiber membrane technology. Our single layer PVDF fiber is manufactured through a thermally induced phase separation (TIPS) process. The dense crystalline structure eliminates the need for reinforcement. Other widely used materials used in ultrafiltration lack the optimal combination of characteristics.

Our TIPS PVDF membrane is:

- Several times stronger than other PVDF fibers
- Permanently hydrophilic
- Easy to clean - tolerates chemical cleaning across the full pH range



Product Offering

Our submerged UF product portfolio gives the flexibility to select the right module for any given project.

Shorter modules can be used for height limited applications. Modules can be grouped into the most appropriate skid size to meet treatment requirements.

Module Type	SMM-1015T	SMM-1522T	SMM-2030T
Filtration Surface area (m ²) [ft ²]	15 [160]	22 [235]	30 [325]
Membrane material	PVDF (TIPS)		
Pore size (µm)	0.04		
Filtration mode	Outside-In		
pH range	Operating: 1 – 12; Cleaning: 1 – 14		
Typical flux (LMH) [gfd]	8 – 30 [5-18]		



Applications and Experience

Municipal MBR – Memstar submerged UF technology is used in the world's largest MBR plants, including the 800 MLD (211 MGD) Chengdu MBR project and the 600 MLD (158 MGD) Huaifang MBR project, due to lower life cycle costs.

Industrial MBR – Unlike other PVDF products, Memstar TIPS PVDF enables the treatment of extremely challenging industrial wastewaters such as refinery, petrochemical, textile, and food and beverage.

Direct and Indirect Potable Re-Use – Memstar symmetric fiber technology allows integrity testing without risk of delamination, allowing the confirmation of removal efficiency for bacteria and virus.