AQUEOUS
PRECISION IN PURIFICATION

Aqueous HF-R Series

Reinforced PVDF Hollow Fibre Membranes

1. Product Overview

The AQUEOUS HF-R SERIES comprises reinforced PVDF hollow fibre membranes engineered for mechanically demanding water and wastewater treatment applications.
The series is designed for environments characterised by high MLSS, intensive aeration, hydraulic shocks, and long operating cycles, where enhanced fibre integrity is critical.
HF-R membranes are available in microfiltration (MF) and ultrafiltration (UF) grades, enabling performance optimisation without altering system architecture.

2. Membrane Material & Reinforced Fibre Architecture

- Base polymer: Polyvinylidene fluoride (PVDF)
- Fibre configuration: Hollow fibre
- Fibre morphology: Asymmetric porous structure
- Surface property: Hydrophilic
- Filtration mode: Outside-in
- Reinforcement concept: Mechanically reinforced fibre wall architecture

The reinforced fibre design enhances tensile strength, fatigue resistance, and abrasion tolerance, while maintaining stable pore geometry and filtration performance.

3. HF-R Product Variants

Product Variant	Filtration Grade	Nominal Pore Size	Primary Application Focus
HF-R-MF	Microfiltration	~0.1 µm	High-MLSS MBR, industrial wastewater
HF-R-UF	Ultrafiltration	~0.02 µm	Reuse, tertiary filtration, challenging feeds

4. Mechanical Performance Profile

Attribute	HF-R SERIES
Tensile strength	High
Elongation resistance	Enhanced
Fatigue resistance	Enhanced
Abrasion tolerance	High
Hydraulic shock	High
Long-term stability	Extended

5. Operating Envelope

Parameter	Value
Typical operating flux	Application dependent
Operating temperature	5 – 40 °C
Operating pH range	2 – 12
Backwash compatibility	Full hydraulic backwash
Chemical cleaning agents	Oxidants, organic acids
Aeration tolerance	High
MLSS suitability	High

6. Standard Fibre Dimension Options.

HF-R fibres are available in multiple OD/ID combinations to balance **mechanical robustness, permeability, and packing density.**

Fibre Code	Outer Diameter (OD)	Inner Diameter (ID)	Wall Thickness	Typical Use Case
HF-R-23	~2.3 mm	~1.0 mm	~0.65 mm	Balanced strength & flux
HF-R-25	~2.5 mm	~1.1 mm	~0.70 mm	High-MLSS municipal MBR
HF-R-28	~2.8 mm	~1.2 mm	~0.80 mm	Industrial wastewater
HF-R-30	~3.0 mm	~1.3 mm	~0.85 mm	Severe mechanical loading

Exact fibre dimensions may be optimised based on application and module design.

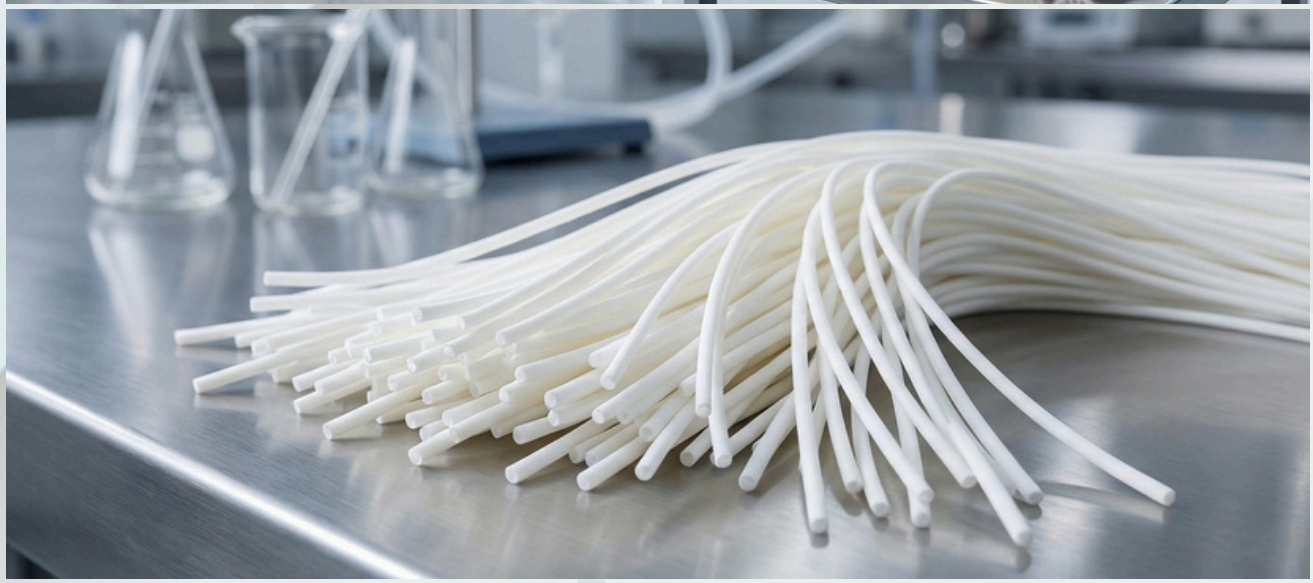
7. Design Note

HF-R SERIES membranes are engineered as high-integrity hollow fibre elements, allowing system designers to optimise module geometry, packing density, aeration intensity, and cleaning strategies while ensuring predictable long-term performance.

Fibre dimension selection should be coordinated with:

- Target flux and recovery
- MLSS concentration
- Aeration intensity
- Module packing density

AQUEOUS ITALIA provides application-specific fibre dimension recommendations during detailed engineering.



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