

## 3M™ High Flow Filters HFR Series

3M™ High Flow Filters HFR Series filters are high flow capacity, high-efficiency, inside-to-outside flow direction, liquid filtration cartridges designed for the applications listed below with large flow requirements.

3M™ High Flow Filters HFR Series Filters fit into the standard Pall Ultipleat® High Flow HFU Filter housings.

The large-diameter, pleated-depth media cartridge design permits flow rates of up to 100 m<sup>3</sup>/hr (440 gpm) in a single 152.4 cm (60") length cartridge. This results in significantly fewer filter cartridges required for a given flow as compared to standard 6.35 cm (2.5") diameter filter cartridges.

The 3M-developed polypropylene microfibre forms the basis of the filtration media utilized in the 3M™ High Flow Filters HFR Series filter. 3M's manufacturing processes allow for tightly controlled specifications resulting in a filter media with absolute-rated particle retention characteristics.

3M™ HFR Series Filter helps to remove particles and other contaminants from water, compatible industrial chemicals, and liquid food and beverage with absolute retention rating (beta ratio 1000). For more information ask for the Chemical Filtration Compatibility Guide (70-0201-8740-0 REV 1211b).

The 3M™ High Flow Filters HFR Series microfibre filter media is optimized for use in process water applications containing organic and/or biological contaminants, as well as particulate. The lofted media design helps prevent premature binding of the filter outer surface, promoting fuller utilization of the media, and resulting in an optimum combination of particle removal efficiency and contaminant-holding capability.



### Features & Benefits

#### Faster Flow Rates Compared to Conventional 2.5" Cartridges

- Fewer cartridges required at a given flow rate
- Reduced cartridge handling
- Fewer cartridge seal points, reducing chance of fluid bypass

#### 3M™ Lofted Microfibre Filtration Media

- High particle removal efficiencies throughout filter life
- High contaminant capacity
- Extended service life, especially for biological contaminants and/organic matter

#### Advanced Pleat Technology

- Increased usable filtration area
- Helps to limit binding effect of the filter media

#### FDA-Compliant

- All materials of construction used in 3M™ High Flow HFR Series filters are listed for food contact in the FDA CFR Title 21 Parts 170-199<sup>1</sup>

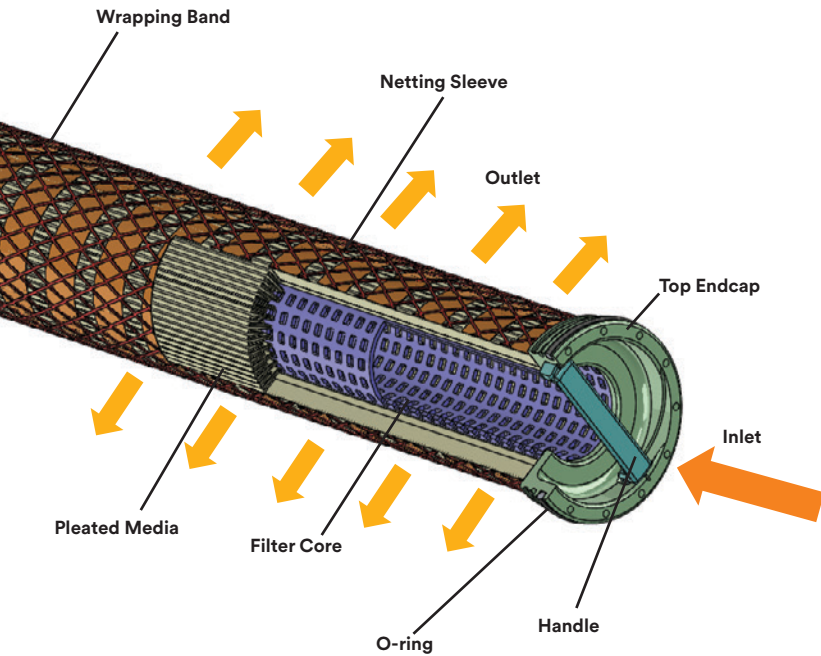
### Applications<sup>2</sup>

- Pre-RO water
- Condensing water filtration
- Process waters
- Injection & produced waters
- Ground/reclaimed/waste waters
- Refining (amine, final product)
- Coolants
- Utility water
- Part washing (OEM)
- Beverage grade water and fluids

<sup>1</sup>3M™ High Flow HFR series filters have not been evaluated or certified for compliance to EU Food Contact 1935/2004.

<sup>2</sup>3M™ High Flow HFR series filters are not qualified for use in pharmaceutical contact applications.

### Filter Cartridge Design



3M™ High Flow HFR filters, constructed of melt-blown polypropylene microfibre media, provide high particle removal efficiency. The filter media is constructed from continuous microfibres that are precisely controlled to provide a uniform matrix and consistent effluent quality. The filter incorporates a polypropylene support upstream of the media to provide optimum flow characteristics and long service life.

The cartridge components are thermally bonded – no resin or binder compounds are used. Available in three distinct micron ratings and three integral lengths of 50.8 cm (20"), 101.6 cm (40") and 152.4 cm (60") to fit common filter housing designs, 3M™ High Flow HFR cartridges are ideal for a wide variety of applications.

#### 3M™ High Flow HFR Retention Ratings (micron)\*

Grade	Absolute (>Beta 1000)
A05	5 µm
A10	10 µm
A20	20 µm

\*Tested at room temperature.

## Absolute Retention Ratings

Consistent and reproducible contaminant reduction can best be provided by the use of absolute-rated filters. 3M™ High Flow HFR series filters are absolute rated to β1000 (99.9% efficiency at its rating).

Care should be taken when comparing absolute-rated filters with nominally rated filters, as nominally rated filters have no industry standard in terms of retention.

## Advanced Pleat Technology (APT)

The service life of a pleated filter is often dictated by the accessible surface area. Conventional pleated filters may offer a large gross surface area, but when the media is packed too tightly into the cartridge, only part of the surface area is usable. This can result in both flow restrictions and limited contaminant-holding capacity.

The 3M™ High Flow HFR series filter features Advanced Pleat Technology (APT), a staggered pleat arrangement, that results in more open space between the pleats. This design increases the usable filtration area and helps to limit the binding effect of the filter media.

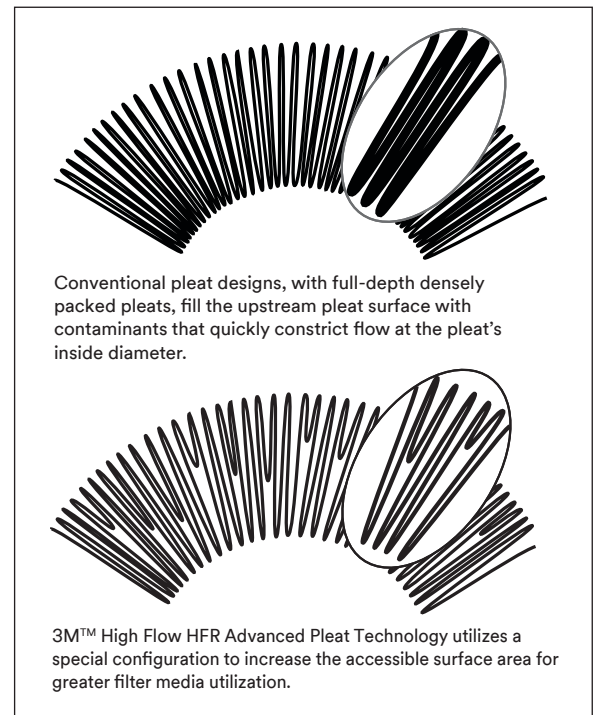
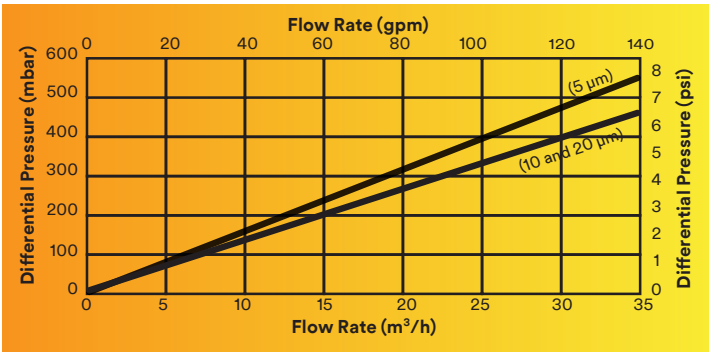


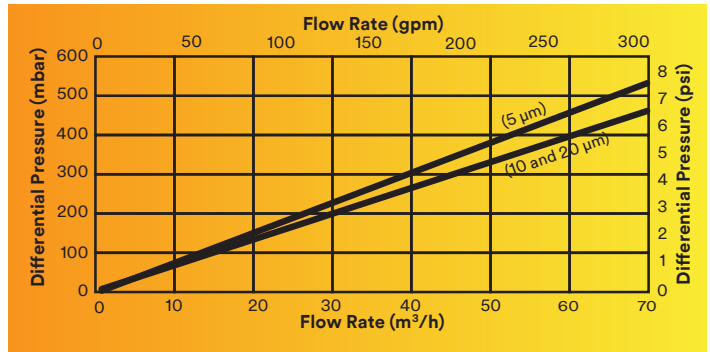
Figure 1. Conventional Pleat Design vs. Advanced Pleat Technology

Flow Rates

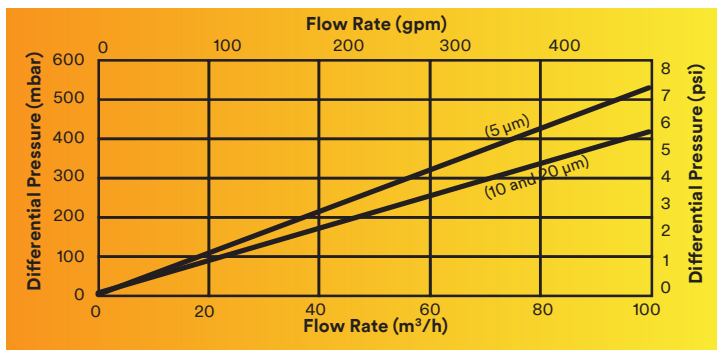
50.8 cm (20") Cartridge



101.6 cm (40") Cartridge



152.4 cm (60") Cartridge



Material of Construction	
Filter Media, Core, and End Caps	Polypropylene
Outer Sleeve	Polyethylene
Sealing O-ring Options	Nitrile, Silicone, EPDM
Operating Conditions	
Flow Direction	Inside-outside flow path
Maximum Flow Rate	100 m³/h (440 gpm) – 152.4 cm (60") 70 m³/h (310 gpm) – 101.6 cm (40") 35 m³/h (150 gpm) – 50.8 cm (20")
Maximum Operating Temperature	70°C (160°F)
Maximum Forward Differential Pressure	3.5 bar @ 20°C (50 psid @ 68°F) 1.5 bar @ 70°C (20 psid @ 160°F)
Recommended Change-out Differential Pressure	2.5 bar @ 20°C (35 psid @ 68°F)
Nominal Cartridge Dimensions	
Outside Diameter	16 cm (6.3")
Cartridge Length	152.4 cm (60") 101.6 cm (40") 50.8 cm (20")
Regulatory	
All component materials of construction are listed for food contact per FDA 21 CFR Parts 170-199. <sup>1</sup>	

<sup>1</sup>3M™ High Flow HFR series filters have not been evaluated or certified for compliance to EU Food Contact 1935/2004.

## 3M™ HFR Series Filters Ordering Guide

Filter Designation	Cartridge Length	Material (Media)	Absolute Removal Rating (Micron)	O-Ring
HFR	20 – 50.8 cm (20") 40 – 101.6 cm (40") 60 – 152.4 cm (60")	PP – Polypropylene	A05 – 5 µm A10 – 10 µm A20 – 20 µm	A – Silicone D – Nitrile E – EPDM

**PLEASE NOTE:** The Ordering Guide above is for reference only. Not all combinations are available.

Please consult with your 3M Representative to determine the appropriate part number for your application.

### Technical Information

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