

3M™ High Flow HFR Series Filters

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

The large diameter, pleated depth media filter design permits flow rates of up to 100 m³/hr (440 gpm) in a single 60" length filter. This results in significantly fewer required filters for a given flow as compared to standard 6.35 cm (2.5") diameter filters.

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

The 3M™ High Flow HFR Series Filter helps to remove particles and other contaminants from water, compatible industrial chemicals, and liquid food & beverage fluids with absolute retention rating.

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

The 3M™ High Flow HFR Series Filter has not been evaluated or certified for compliance to EU Food Contact Regulation 1935/2004, and is NOT intended for Food and Beverage applications in the European Union. Use in any other applications, such as pharmaceutical applications, have not been evaluated by 3M and may lead to an unsafe condition.



Features and Benefits

Faster Flow Rates Compared to Conventional 6.35 cm (2.5") Filters

- Fewer filters required at a given flow rate
- Reduced filter handling
- Fewer filter 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 fluids with a mixture of particles and deformables

Advanced Pleat Technology

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

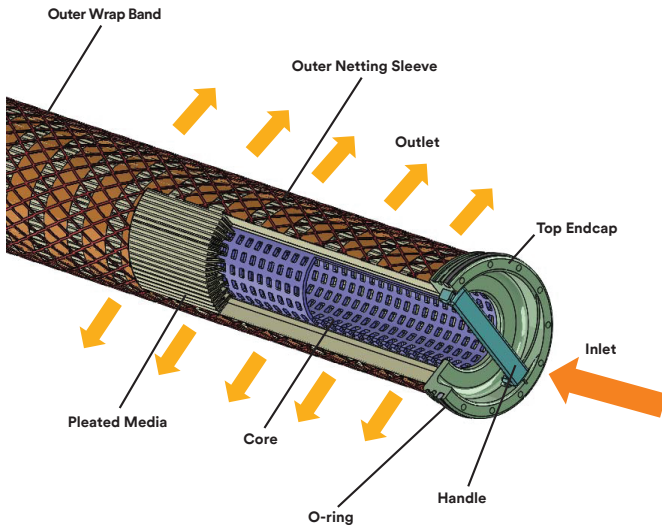
FDA Compliant Materials

- All materials of construction used in the 3M™ High Flow HFR Series Filter are listed for food contact in the US FDA 21 CFR Parts 174-186.

Applications

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

Figure 1. Filter Design



Filter Construction

3M™ High Flow HFR Series Filters, constructed of polypropylene microfibre media, provide high particle removal efficiency. The filter media is constructed from continuous microfibrils 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 filter components are thermally bonded to provide a structurally integral filter without the use of resins, binders or adhesives. Available in six distinct micron ratings and three integral lengths of 50.8, 101.6 and 152.4 cm (20, 40 and 60 inches) to fit common filter housing designs, 3M High Flow HFR Series Filters are ideal for a wide variety of applications.

Table 1. 3M™ High Flow HFR Series Filter Ratings

Grade	Absolute Rating (µm)*
A05	5
A10	10
A20	20
A40	40
A70	70
A100	100

*Tested at ambient temperature.

Absolute Retention Ratings

Consistent and reproducible contaminant reduction can best be provided by the use of absolute-rated filters. The 3M™ High Flow HFR Series Filter absolute ratings are based upon the particle size (x) providing a Beta Ratio (β_x) = 1000. At this Beta Ratio, the removal efficiency is equal to 99.9%. The 3M™ High Flow HFR Series Filter ratings are provided in Table 1.

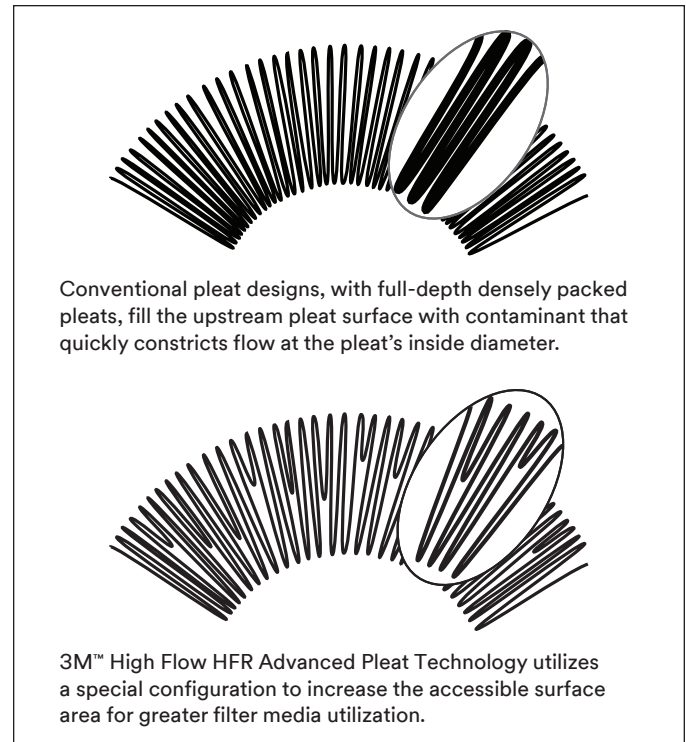
Care should be taken when comparing absolute rated filters with nominally rated filters, as nominally rated filters have no industry standard in terms of retention.

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 filter, only part of the surface area is usable. This can result in both flow restrictions and limited contaminant holding capacity.

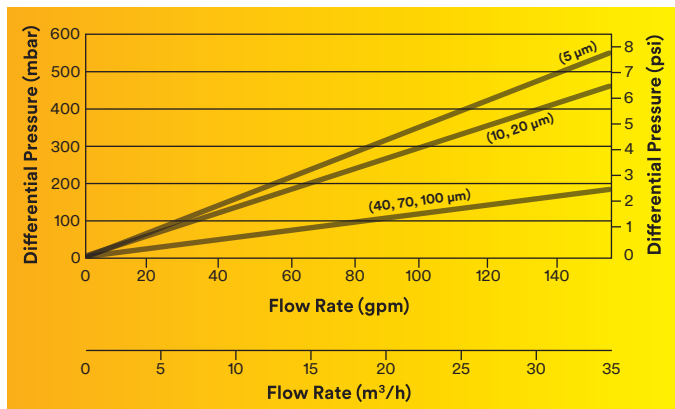
The 3M™ High Flow HFR Series Filter features Advanced Pleat Technology (APT), a staggered pleat arrangement, that results in more open space between the pleats. This design increases the usable filtration area and helps to limit blinding effect of the filter media.

Figure 2. Conventional Pleat Design vs. Advanced Pleat Technology

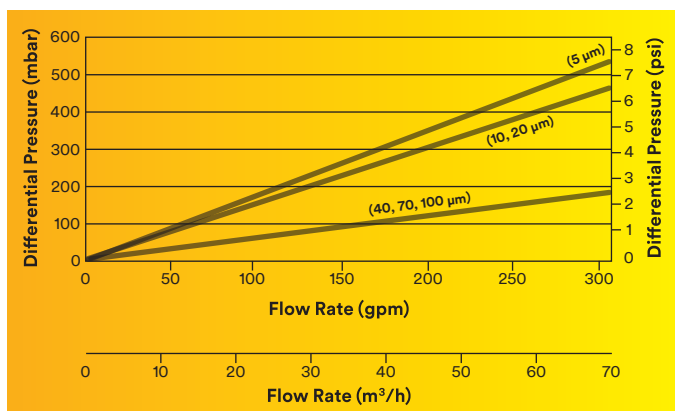


3M™ High Flow HFR Series Filter Flow Rates

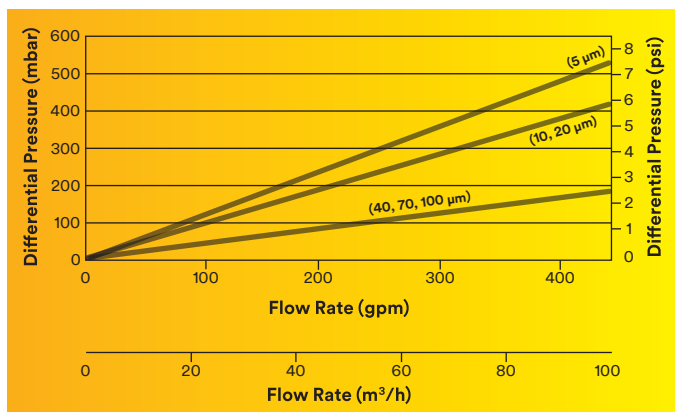
Graph 1. 50.8 cm (20 inch) Cartridge



Graph 2. 101.8 cm (40 inch) Cartridge



Graph 3. 152.4 cm (60 inch) Cartridge



Material of Construction

Filter Media, Support Materials, Core and End Caps	Polypropylene
Outer Sleeve	Polyethylene
Outer Wrap Band	Polyethylene and Polypropylene
Handle	Polyphenylene ether and Polystyrene blend with glass fibre
O-ring	Nitrile, Silicone or EPDM

Operating Conditions

Flow Direction	Inside-outside flow path
Maximum Flow Rate	100 m³/h (440 gpm) – 60 in 70 m³/h (310 gpm) – 40 in 35 m³/h (150 gpm) – 20 in
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	160 mm (6.3 in)
Cartridge Length	1524 mm (60 in) 1016 mm (40 in) 508 mm (20 in)

Regulatory

All materials of construction are listed for food contact in the US FDA 21 CFR Parts 174–186.

Chemical Compatibility

The 3M™ High Flow HFR Series Filter is primarily composed of polypropylene and polyethylene materials of construction, which offer broad chemical compatibility. Note that compatibility is always a function of time, operating temperature and chemical concentration. Consult 3M Purification Inc. or your local technical representative for more information.

3M™ High Flow HFR Series Filters Ordering Guide

Filter Designation	Cartridge Length	Material (Media)	Absolute Removal Rating	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 A40 – 40 µm A70 – 70 µm A100 – 100 µm	A – Silicone C – EPDM D – Nitrile

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.

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