solventum

Industrial Filtration
Product brochure

Separation and Purification Solutions



Experience high flow capability in a compact design

3M™ High Flow HF and HFM Series Filter Systems feature filters from 70 micron all the way down to 0.5 micron, making them ideal for those who need filtration efficiency in a sustainable, ergonomic design.



3M high flow series filter system
single round filter system range

Meeting your needs with high performance media in an innovative design

High flow capability

The 3M high flow series filter system is designed to accommodate flow rates of up to 500 gpm (113 m³/hr) in a single 60" (1,524 mm) length filter cartridge.

The result? Fewer filter cartridges to maintain your process flow requirements. In fact, 3M high flow series filter systems require as few as one-tenth the number of filter cartridges as conventional 2.5" (63.5 mm) outer diameter (OD) filter systems where flow rates are 200 gpm (45 m³/hr) or higher (see Figure 1 on page 5).



Compound radial pleat design

Lower capital investment costs and compact design

Fewer required filter cartridges combined with an outside-to-inside flow path reduces the size of housing required for your application. The 3M™ High Flow Series Filter Housing takes up as little as one-half the size of conventional 2.5" (63.5 mm) OD filter cartridge housings for a given flow rate.



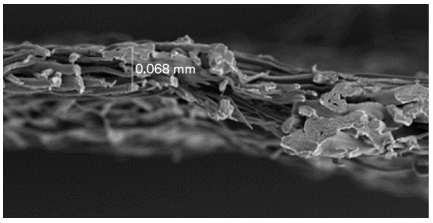
'Twist-to-lock' cartridge seating mechanism

Ease of use and ergonomic design

This 3M high flow series filter system is designed with ease-of-use in mind. From a user-friendly, ergonomically designed handle that makes cartridge installation and removal easier without the use of special tools or other hardware, to a 'twist-to-lock' cartridge seating mechanism that provides a positive seal, the 3M high flow filter system facilitates easy operation and maintenance of your filters.

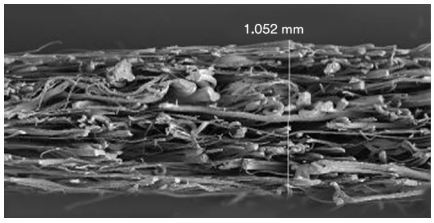
3M™ High Flow Series Filter Cartridges are available in two types of system designs

3M™ High Flow HF Series Filter Cartridges



These 3M high flow series filter cartridges offer great particulate removal and surface filtration for a variety of industrial applications.

3M™ High Flow HFM Series Filter Cartridges



Featuring thick media, these high flow filters are designed to filter deformables and organics. They also help prevent premature blinding of the filter's outer surface, promoting fuller utilization of the media for an optimal combination of particle removal efficiency and contaminant holding capability.

Features	Benefits
High flow capability per cartridge (vs. conventional 2.5" (63.5 mm) OD cartridges)	Fewer cartridges required, resulting in: • Reduced cartridge handling and disposal • Reduced filter change-out time • Less individual cartridge seal points, reducing chance of fluid bypass
Compound radial pleat design using blown microfiber polypropylene media	• High filter loading capacity • Reproducible filter effluent quality throughout life of filter • Broad chemical compatibility
Compact system design	• Smaller housing minimizes capital expense requirements • Reduces housing diameter • 10" version is ideal for lower process flows, batch applications, and modular systems
Easy to use	• No special tools or hardware required for filter change-out • 'Twist-to-lock' cartridge seating mechanism provides positive seal • Ergonomic designed handle facilitates cartridge installation and removal

Approved for food contact use	• Certain 3M high flow series filter cartridges are compliant with:
	  • US FDA 21 CFR
	  • EU food contact regulation (EC) 1935/2004
	  • China Food Safety Law
	  • Japan MHLW - Food Sanitation Act
	  • Other food contact regulations
	• Contact your Solventum representative for detailed declaration of compliance information for food contact applications

Applications:

Industrial: Municipal water, RO prefiltration, reclaimed water, metal working coolants, nozzle protection, boiler condensate, process water

Chemical: Quench water, aqueous salt solutions, final products

Petrochemicals: Waterflooding, produced water, enhanced oil recovery, completion fluids, amine sweetening, final products

Electronics: RO prefiltration, process cooling water

Food & beverage and bottled water: Process and blending water, D.E. trap filtration, barrel char removal, spring site filtration, membrane protection

The 3M™ High Flow Series Filter Cartridge 0.5µm provides these additional benefits:

- Microbial reduction for yeast and cryptosporidium
- Up to 30% total cost of filtration reduction
- Greater efficiency gained at high capacity with the tighter micron rating

These benefits mean the 3M high flow series filter cartridge 0.5µm can provide excellent downstream membrane filter protection.

3M™ High Flow Filter Cartridges — designed to help you increase efficiency

Ease of use

An ergonomically designed handle facilitates fast and easy insertion and removal without the use of special tools. Cartridges are simply inserted over a built-in guide tube. Fewer cartridges mean filter change-outs are quicker and easier.

Polypropylene construction

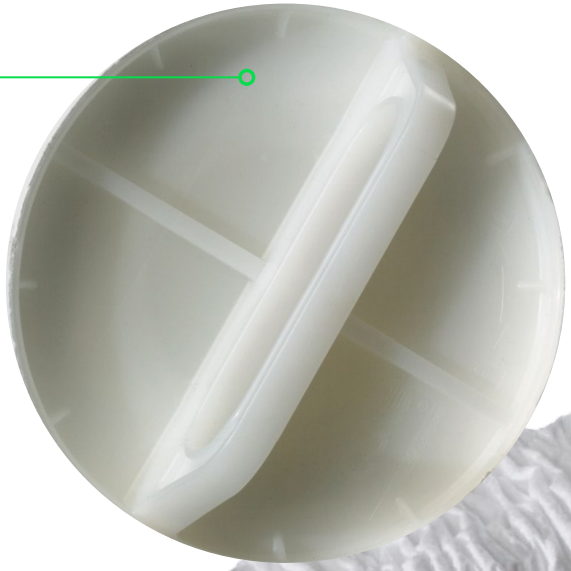
Provides a wide range of compatibility with various fluids.

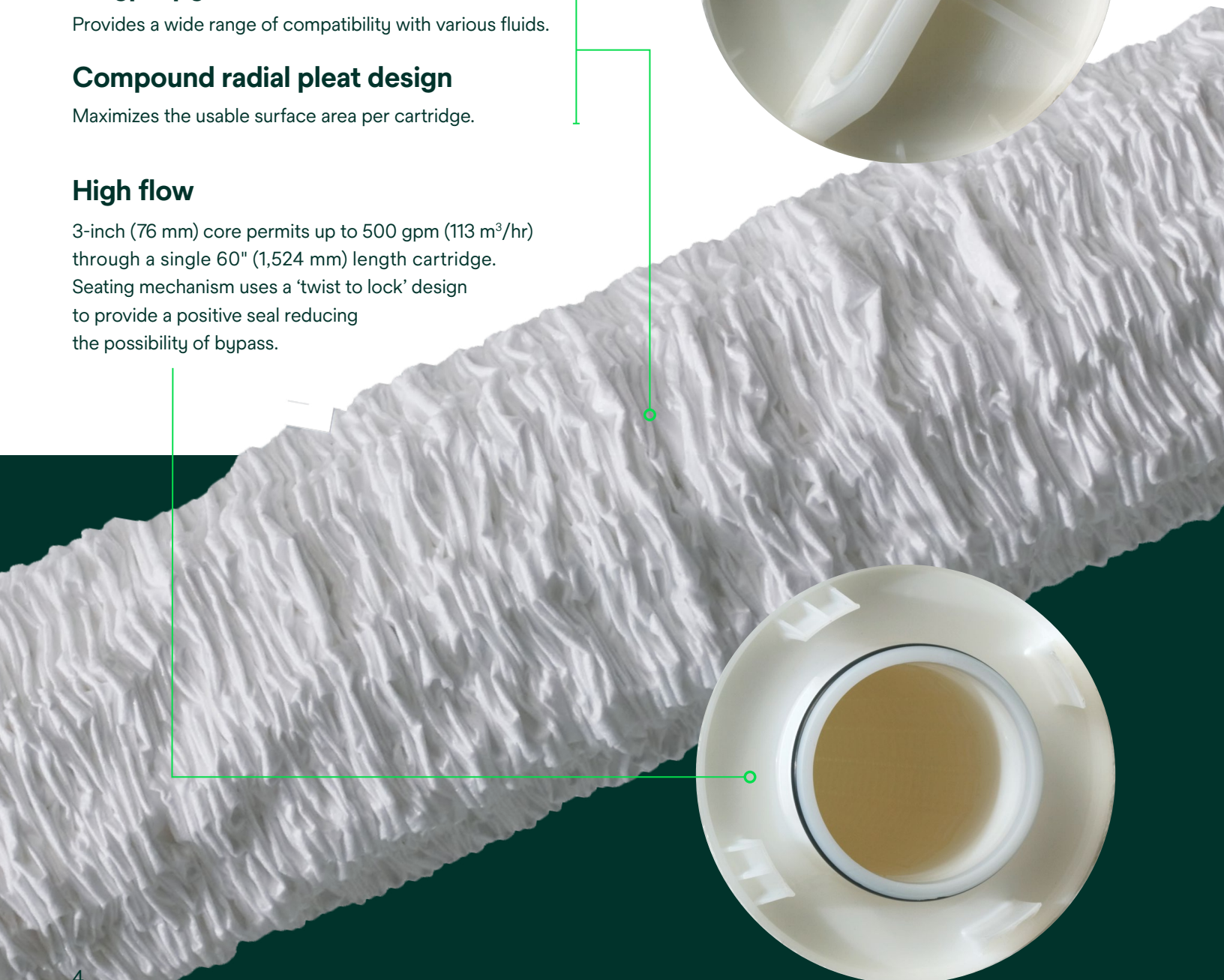
Compound radial pleat design

Maximizes the usable surface area per cartridge.

High flow

3-inch (76 mm) core permits up to 500 gpm (113 m^3/hr) through a single 60" (1,524 mm) length cartridge. Seating mechanism uses a 'twist to lock' design to provide a positive seal reducing the possibility of bypass.



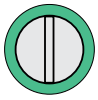
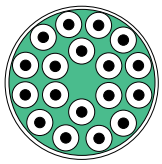
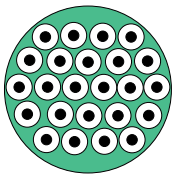


3M™ High Flow Series Filter System vs. conventional filter system

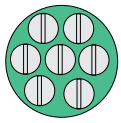
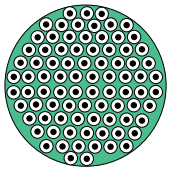
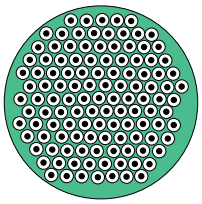
The 3M high flow series filter system family also has a supporting family of filter housings that meet most standard applications with the option to engineer custom solutions depending on the requirements. Solventum offers housings with 1, 3, 5, and 7 round variations for the 40" (1,016 mm) and the 60" (1,524 mm) versions and a 1 round for our 10" (254 mm) filters in 316 stainless for food and beverage applications. For more information on 3M™ High Flow Series Filter Housing options, see our brochure or contact your local Solventum sales representative or distributor.

Figure 1: Comparison of required 40" (1,016 mm) length filter cartridges and their housing diameter

350 gpm (80 m³/hr) System

3M high flow series filter system	2.5" (63.5 mm) pleated cartridges	2.5" (63.5 mm) depth filters
		
1 cartridge in a housing with a 8.6" (218 mm) diameter	18 cartridges in a housing with a 14" (356 mm) diameter	24 cartridges in a housing with a 16" (406 mm) diameter

2,000 gpm (454 m³/hr) System

3M high flow series filter system	2.5" (63.5 mm) pleated cartridges	2.5" (63.5 mm) depth filters
		
7 cartridges in a housing with a 24" (610 mm) diameter	85 cartridges in a housing with a 30" (762 mm) diameter	120 cartridges in a housing with a 36" (914 mm) diameter

The bottom line for systems with over 200 gpm (45 m³/hr):

- The 3M high flow series filter system requires **90%** fewer cartridges than conventional 2.5" (63.5 mm) OD cartridge systems
- 3M high flow series filter housings are **33% to 50%** smaller than filter housings for conventional 2.5" (63.5 mm) OD cartridges
- Fewer filters and a user-friendly housing design mean easier and faster filter change-outs

3M™ High Flow Series Filter Housings

Solventum can provide housings to meet global applications and specifications and is supported by a global engineering team

Housing specifications	
Materials of construction	Wetted: 316 (castings and forgings) 316L (sheet plate and bar). Non-wetted: typically 304 & 304L (legs and mountings). Other grades of steel are also possible.
ASME standard	Section VIII Div2 U-stamp
Australian standard	AS 1210 Pressure Vessel
Pressure equipment directive 2014/68/EU	Article 4.3 'Sound Engineering Practice'
ATEX directive 2014/34/EU	II 2 GD c IIC/IIIC
Food contact compliance	316 and 316L stainless steel construction (wetted parts). Seal options available and compliance varies based on use application; contact your Solventum representative.
Maximum recommended flow rate for a single cartridge	10" (254 mm): 85 gpm (19.3 m³/hr), 40" (1,016 mm): 350 gpm (80 m³/hr), 60" (1,524 mm): 500 gpm (113 m³/hr)

3M™ High Flow Filter Cartridge specifications

Materials of construction

Filter media: Each grade of 3M high flow series filter cartridges is manufactured from food contact compliant meltblown polypropylene microfiber media, providing high particle removal efficiency with broad chemical compatibility. No adhesives, binders or silicone are used in the manufacturing process. All support layers are constructed with polypropylene.

O-rings: O-rings are available in a variety of materials to suit your application including the standard nitrile, ethylene propylene rubber (EPR), silicone and fluorocarbon.

Construction	
Filter micron rating (microns)	HF Series: 0.5, 1, 2, 5, 10, 15, 25, 40, 70 µm absolute rated HFM Series: 5, 10, 20, 40 µm Absolute, 5 µm Nominal* *Also rated at 70 µm Absolute
Filter media, center core, end caps, outer sleeve	Polypropylene
Sealing O-ring options	Nitrile, Silicone, Fluorocarbon and EPR
O-ring size	338 (3.0"/76.2 mm)
Cartridge dimensions	
Inside diameter (nominal)	3" (76.2 mm)
Outside diameter (nominal)	6.5" (165 mm)
Cartridge length (nominal)	10" (254 mm), 40" (1,016 mm), 60" (1,524 mm)
Operating conditions	
Maximum recommended flow rate in water (@20° C)	85 gpm (19.3 m^3/hr), 350 gpm (80 m^3/hr), 500 gpm (113 m^3/hr)
Maximum continuous operating temperature	160° F (71° C)
Maximum hot water sanitisation temperature	185° F (85° C)
Maximum forward differential pressure	50 psid @ 68° F (3.4 bar @ 20° C)
Recommended change-out differential pressure	35 psid @ 68° F (2.4 bar @ 20° C)
Clean pressure drop	See page 7

Microbial Control

The 3M™ High Flow HF Series Filter 0.5 µm and 1 µm media demonstrates excellent microbial reduction as presented below.

3M™ High Flow Series Filter media grade	Microorganism used for challenge	Challenge level	Organisms in filtrate	LRV
0.5 µm	Saccharomyces cerevisae (ATCC-36026)*	1.3 x 10^7 CFU/cm^2 of media	0 CFU	>8.1
1 µm	Saccharomyces cerevisae (ATCC-36026)*	1.3 x 10^7 CFU/cm^2 of media	20 CFU	6.8
0.5 µm	Microspheres as a surrogate for Cryptosporidium Oocyst**	3,286 microspheres / 100 ml	9 microspheres / 100 ml	2.6

Challenge conditions used in these tests: *Microbial concentration 3x10^5 – 5x10^5 organisms/ml, Flow Rate 0.25 gpm/ft^2 (10 L/min/m^2)
**Microspheres, Flow Rate 55 gpm / HF10 filter, Terminal Differential Pressure 35 psid

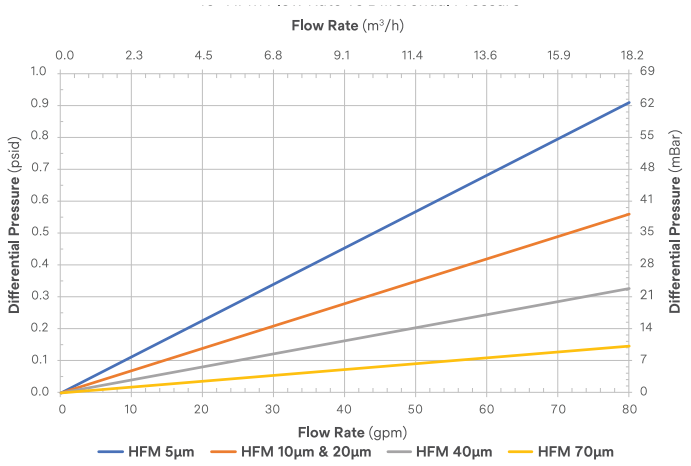
Fluid compatibility

Chemical	Temperature	Chemical	Temperature	Chemical	Temperature
Acetic acid 20%	71° C	Hydrogen peroxide	38° C	Sodium carbonate	71° C
Alkanolamines	60° C	Methyl ethyl ketone	21° C	Sodium hydroxide 70%	71° C
Ammonium hydroxide	71° C	Mineral oil	21° C	Sulphuric acid 20%	71° C
Bleach 5.5%	49° C	Nitric acid 20%	49° C	Sulphuric acid 70%	71° C
Ethylene glycol	71° C	Potassium hydroxide	60° C	Urea	71° C

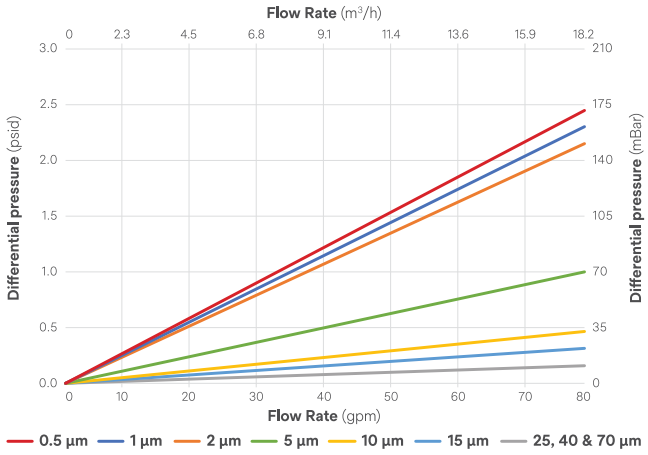
NOTE: The thermal and chemical resistance data presented in this brochure is for guidance only. Factors such as duration of exposure, O-ring material, fluid concentration and temperature should also be considered. Thermal and chemical resistance should also be considered when choosing all materials exposed to fluids.

3M™ High Flow Series Filter Cartridge specifications (continued)

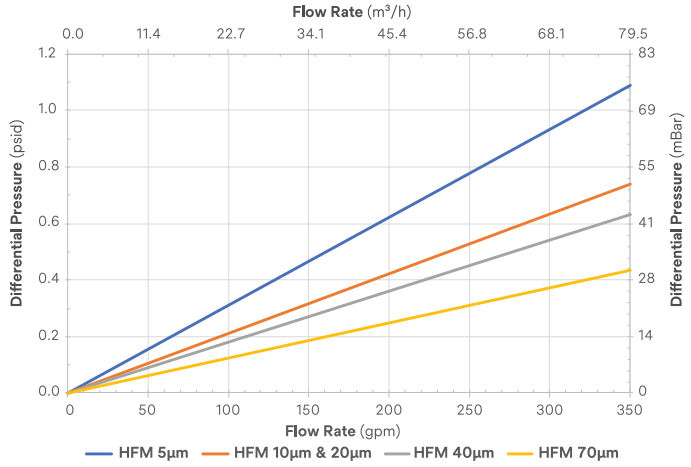
3M™ High Flow HFM Series Filter 10" flow rate vs differential pressure



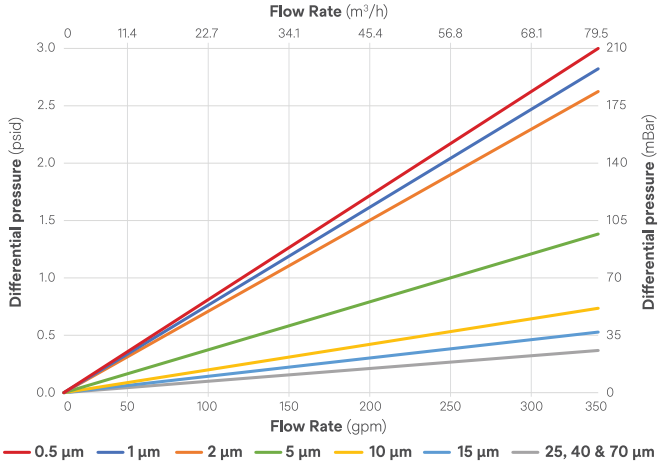
3M™ High Flow HF Series Filter 10" flow rate vs differential pressure



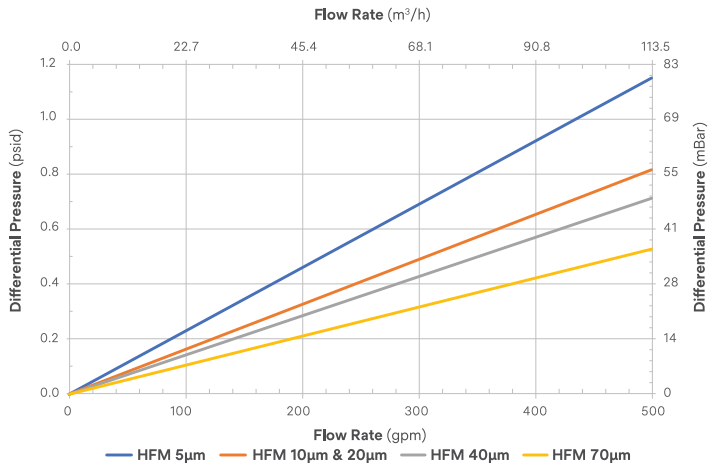
3M™ High Flow HFM Series Filter 40" flow rate vs differential pressure



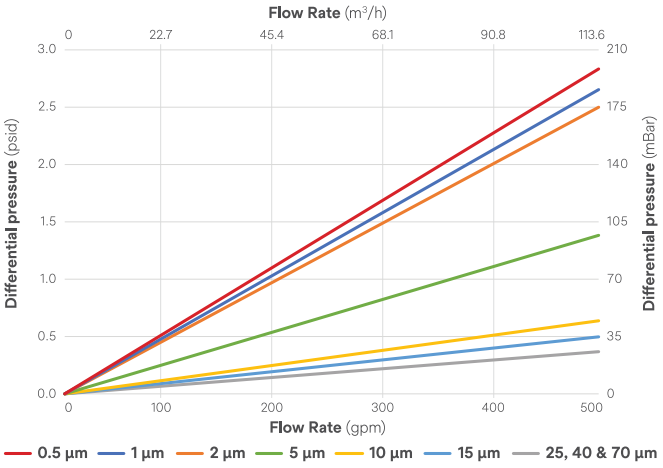
3M™ High Flow HF Series Filter 40" flow rate vs differential pressure



3M™ High Flow HFM Series Filter 60" flow rate vs differential pressure



3M™ High Flow HF Series Filter 60" flow rate vs differential pressure



These data plots are provided for reference only and these graphs represent the pressure drop of the filters only.

Ordering guides

3M™ High Flow Filter Cartridges

Model	Cartridge length	Material of construction	Absolute micron rating	O-ring material	Packaging
3M™ High Flow HF Series Filter Cartridges	10 – 10" (254 mm) 40 – 40" (1,016 mm) 60 – 60" (1,524 mm)	PP – Polypropylene	0005 – 0.5 µm 001 – 1 µm 002 – 2 µm 005 – 5 µm 010 – 10 µm 015 – 15 µm 025 – 25 µm 040 – 40 µm 070 – 70 µm	A – Silicone B – Fluorocarbon[1] C – EPR D – Nitrile[2]	01 – 1 Pack
3M™ High Flow HFM Series Filter Cartridges	10 – 10" (254 mm) 40 – 40" (1,016 mm) 60 – 60" (1,524 mm)	PP – Polypropylene	A05 – 5 µm A10 – 10 µm A20 – 20 µm A40 – 40 µm N05 – 5 µm (Nominal)* *Also rated at 70 µm absolute	A – Silicone C – EPR D – Nitrile[2]	

[1]Fluorocarbon O-rings not available in the 3M™ High Flow Series Filters 0.5 µm or the 3M™ High Flow HFM Series Filters

[2]Nitrile O-rings are not compliant for edible oil and dairy applications

For more information contact your Solventum customer service representative by calling **1-800-630-0778**, option 2.

Certain 3M high flow series filter cartridges are certified by WQA to meet NSF/ANSI/CAN 61. For full product listing visit www.wqa.org.

Certified to NSF/ANSI 419
NSF/ANSI 419 certification applicable for 3M high flow series filters 0.5 µm only

Intended Use: 3M high flow HF and HFM series products are intended for use in industrial, chemical, electronics and food and beverage filtration applications in accordance with the product instructions, specifications and where materials of construction are compatible. Certain 3M high flow HF and HFM series products are compliant for use in Food and Beverage applications. For specific details regarding use or limitations please contact your Solventum representative for more information. Since there are many factors that can affect a product's use, the customer and user remain responsible for determining whether the Solventum product is suitable and appropriate for the user's specific application, including user risk assessments and evaluation of the Solventum product in the user's application.

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3M Purification is now part of Solventum

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