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LifeASSURE™ MFE Series

Membrane Cartridge Filters

High flow rates and low hold-up volume filtration

Enhanced Flow Design

LifeASSURE MFE filter cartridges, formerly known as Microfluor E, have been specially designed to provide the highest flow rates and lowest hold-up volumes for ultra-high purity chemicals used in the electronics industry. LifeASSURE MFE filter cartridges are able to deliver superior flow characteristics, longer filter life and a lower hold-up volume by utilising 3M Purification's Advanced Pleat Technology (APT) construction. Increasing flow, while maintaining filter efficiency, results in particle specifications being achieved in less time. This decrease in processing time lowers total filtration costs by reducing energy consumption, pump wear and labour.

Constructed to Perform

The hydrophobic PTFE membrane in an all virgin polypropylene construction provides excellent chemical resistance, low hold-up volume, fast start-up times, increased filter life and superior contaminant removal as compared to other PTFE membrane cartridges. LifeASSURE MFE filter cartridges are ideally suited for acids, bases, solvents, photoresists, DI water, glass substrates and video display applications where superior flow rates and high efficiency contaminant removal is required.



Features and benefits

PTFE and Polypropylene Materials of Construction

- Robust materials provide excellent resistance in aggressive chemicals and dynamic pressure applications

Advanced Pleat Technology construction

- Increased flow rates provide faster bath clean-up, reduced energy consumption and reduced pump wear
- Provides a low differential pressure to minimise bubble formation
- Increased throughput and filter lifetime
- Reduces the number of required filter elements

Compact Design

- Delivers higher flow rates than larger diameter competitive filters
- Low hold-up volume reduces the waste of expensive chemicals

Rinsed with 18 Megohm-cm DI Water

- Reduces system start-up time
- Excellent downstream cleanliness out of the box

Applications

Acids

Bases

Solvents

Photoresists

Anti-Reflective Coatings

Plating Solutions

O.L.E.D.s

Glass Substrates

Video Displays

CD / DVD

Figure 1: Conventional pleat design



Figure 2: APT Construction



Superior Gel and Particle Removal

Normally a small amount of gel contaminants can be found in DI water, photoresists and chemicals. Their removal from these fluids is highly dependent on differential pressure across the filtration system. Since these gels are deformable, they can extrude through a filter at high differential pressures. At low differential pressures, the forces that would deform gels are correspondingly lower and the gels are retained by the membrane media. 3M Purification maximises filtration surface area, using APT construction, to ensure both a low inlet pressure to the pump and low differential pressure - ideal for gel removal.

The lifetime of a pleated filter cartridge is often dictated by the accessible surface area. Conventional pleated filters may offer a large gross surface area, but when the media is packed into the cartridge, only part of the surface area is used resulting in both flow restrictions and limited contaminant holding capacity. The “blind” or unused area commonly occurs near the inside diameter (Figure 1) where the pleats are most tightly compressed. The LifeASSURE MFE filter cartridge is manufactured using a staggered and stepped configuration (Figure 2) which reduces the open space between the outside pleats. This technology maximises capacity by increasing the open area which allows for greater particle loading at the inside diameter, while the shorter stepped pleats take advantage of existing open space closer to the outside diameter of the cartridge. The result is a fully used surface area that provides superior filter life.

Increased Filter Cartridge Flow Rates

The innovative construction of the LifeASSURE MFE results in a higher per cartridge flow rate at the same pressure drop as compared to competitive pleated and stacked disk type filters. This can reduce cost-of-ownership in the following three ways:

- **Less Frequent Filter Change-outs**

For existing applications at a given flow rate, filter cartridges with more surface area per cartridge have a lower flux (flow per unit surface area) than those filters cartridges with less surface area. Since filter lifetime is inversely proportional to flux (lower flux = longer filter life) in most applications, LifeASSURE MFE filter cartridges provide longer life and require fewer filter cartridge change-outs.

- **Lower Filter Housing Costs**

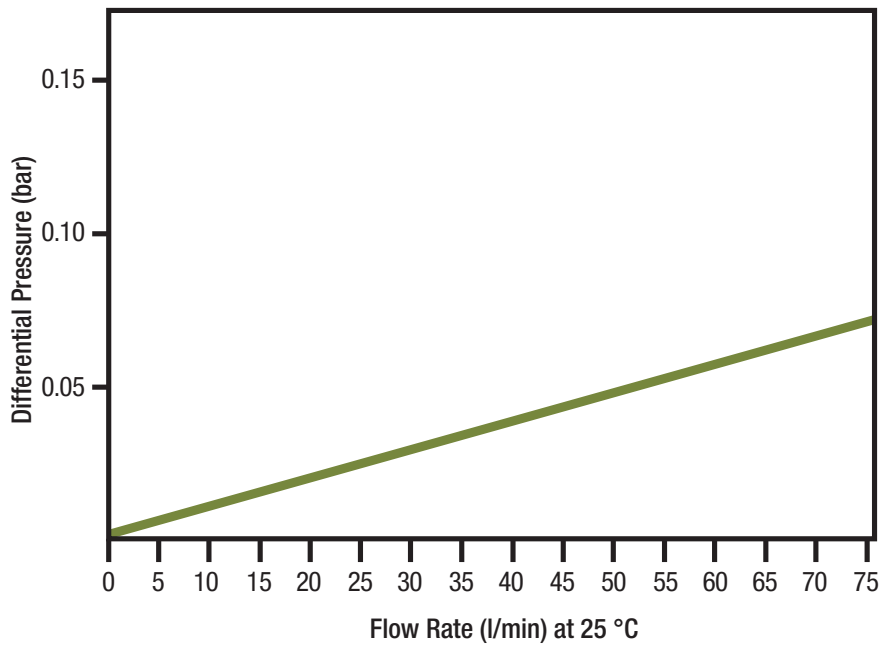
A filter cartridge that can deliver a higher flow rate at the same pressure drop when compared to competitive products will reduce filtration costs because fewer filters are required for the system. This in turn allows for the use of smaller and less costly filter housings which reduce initial capital investment, filter change-out time and hold-up volume for the life of the process.

- **Lower Waste of Expensive Chemicals**

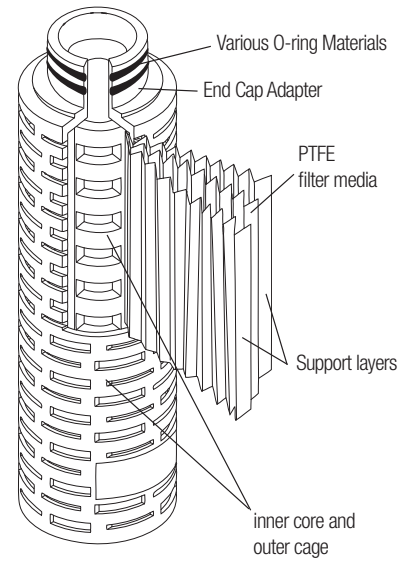
A filter cartridge that combines high flow rates and a low pressure drop with a reduced foot print as compared to competitive products will reduce hold-up volume and the waste of expensive chemicals.

Chart 1 provides the flow rate vs. pressure drop data for the 1.0 µm grade LifeASSURE MFE filter.

Chart 1 - 10" Cartridge Typical Water Flow Rates



Standard Cartridge Construction



LifeASSURE MFE Filter Cartridge Construction

LifeASSURE MFE filter cartridges are constructed of high efficiency hydrophobic PTFE membrane. The cage, core, end caps and membrane support layers are made of virgin polypropylene and no adhesives, binders, or surfactants are used in the manufacturing process.

Cartridges are manufactured and double bagged in a clean environment under an ISO certified quality system using the most advanced thermoplastic welding techniques to ensure filter integrity and excellent downstream cleanliness.

All LifeASSURE MFE filters are rinsed with 18 megohm-cm DI water and integrity tested to assure that your 3M Purification filter will perform quickly and consistently each and every time out of the box.

Specifications	
Membrane Material	Hydrophobic PTFE
Cage, Core, End Caps and Membrane Support Layer	Virgin Polypropylene
Filtration Surface Area	0.85 m ²
Outside Diameter	7 cm nominal
Length	Nominal 5, 10, 20, 30 and 40 inches (Nominal 12.7, 25.4, 50.8, 76.2 and 101.6 cm)
Maximum Forward Differential Pressure	5.5 bar at 25 °C 1.7 bar at 80 °C
Maximum Operating Temperature	80 °C
Removal Ratings	1.0 µm
Filter Cartridge Rinse	18 Megohm-cm DI water
Filter Cartridge Integrity	100 % Tested

LifeASSURE MFE Filter Cartridge Ordering Guide

Type	Removal Rating	Configuration	Length	End Modification	Gasket / O-Ring Material
MFE	100 – 1.0 µm	F	50 – 5" * 01 – 10" 02 – 20" 03 – 30" 04 – 40"	B - 226 O-Ring & Spear C - 222 O-Ring & Spear D - Double Open End (10") E - Double Open End (9 ¾") F - 222 O-Ring & Flat Cap J - 226 O-Ring & Flat Cap	A - Silicone B - Fluorocarbon C - EPR D - Nitrile H - Clear Silicone** K - PTFE Encapsulated Fluorocarbon (TEV)**

* Available in F end modification only.

** Available in B, C, F, and J end modifications only.

Note: LifeASSURE MFE is new name for Microfluor E.

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3M Purification MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Since a variety of factors can affect the use and performance of a 3M Purification product in a particular application, some of which are uniquely within the user's knowledge and control, user is responsible for determining whether or not the 3M Purification product is fit for a particular purpose and suitable for user's method of application.

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