LifeASSURE™ IMC
Series Filter Cartridge

LifeASSURE™ IMC filter cartridges are high efficiency naturally hydrophilic Nylon 6,6 filter elements designed to meet the exacting requirements of DI water, critical parts cleaning, and chemical applications. Utilizing multi-zone microporous membrane and Advanced Pleat Technology (APT), LifeASSURE IMC filter cartridges provide superior flow characteristics with minimal pressure drop. Increasing flow while maintaining filter efficiency results in particle specifications being achieved in less time. This decrease in processing time results in lower total filtration costs — reduced energy consumption, pump wear, and labor.

The naturally hydrophilic Nylon 6,6 membrane in an all polypropylene construction, provides low extractables, increased filter life, and superior contaminant reduction as compared to other membrane cartridges. LifeASSURE IMC filter cartridges are ideally suited for DI water, critical parts cleaning, and numerous chemical applications where high efficiency contaminant reduction at 0.1 µm, 0.2 µm and 0.45 µm is required.

Multi-zone Microporous Membrane Technology

LifeASSURE IMC filter cartridges incorporate 3M Purification's multi-zone microporous membrane technology to maximize contaminant holding capacity while maintaining particle reduction efficiency. Microporous membrane consists of a higher porosity (more open) zone on the up stream section and a lower porosity (tighter) section on the down stream side. The higher porosity zone on the up stream side provides effective pre-filtration of large particles resulting in higher contaminant reduction capacity and increased filter life time. The lower porosity zone on the down stream section provides a sharp retention cut-off at the rated pore size. As shown in SEM micro graph (Figure 1) the multi-zone structure enhances the surface area, lowers pressure drop, and increases contaminant holding capacity and filter lifetime thereby eliminating the need for more costly filters constructed with a double layer of membrane.

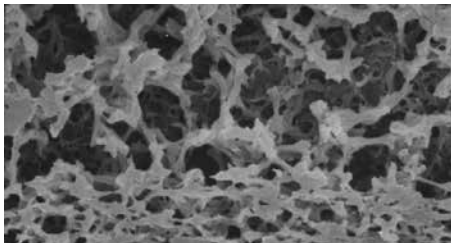


Figure 1. EM Showing the Multi-Zone Structure

Features & Benefits

Multi-Zone Naturally Hydrophilic Nylon 6,6 Membrane

- No IPA pre-wetting and system flushing required — avoids a potential source of contamination and chemical interaction, while reducing downtime and hazardous waste disposal
- Reduces potential for microbubble formation by not dewetting in outgassing fluid unlike hydrophobic membranes such as Polypropylene, Polyethylene, and PTFE
- Enhanced contaminant reduction capacity results in longer lifetime than competitive filter cartridges
- Economic alternative to PTFE filter cartridges

Advanced Pleat Technology

- Superior flow characteristics in a compact design reduces the number of require filter elements
- Increased flow rates provide faster bath clean-up and reduced energy consumption
- Provides a low differential pressure to minimize micro-bubble formation
- Increased throughput and filter lifetime which lowers cost-of-ownership

Superior Gel Reduction Provided by APT

Normally a small amount of gel particles can be found in DI water and chemicals. Their reduction 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 has been able to maximize filtration surface area, which assures a low differential pressure, making it ideal for gel reduction. The increase infiltration surface area is achieved by using the Advanced Pleat Technology.

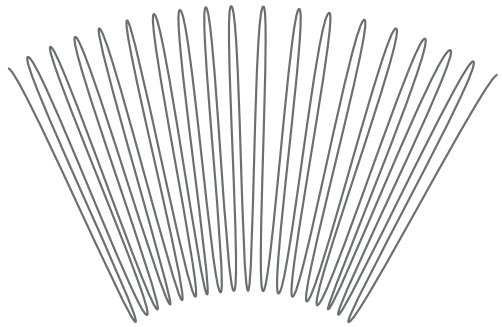


Figure 2. Conventional Pleat Design

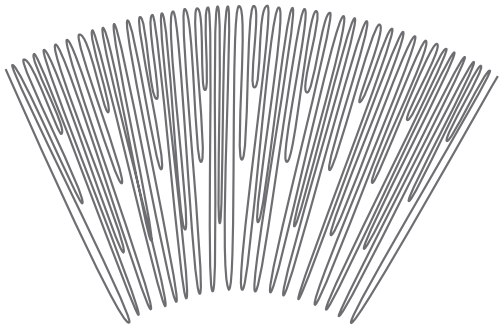


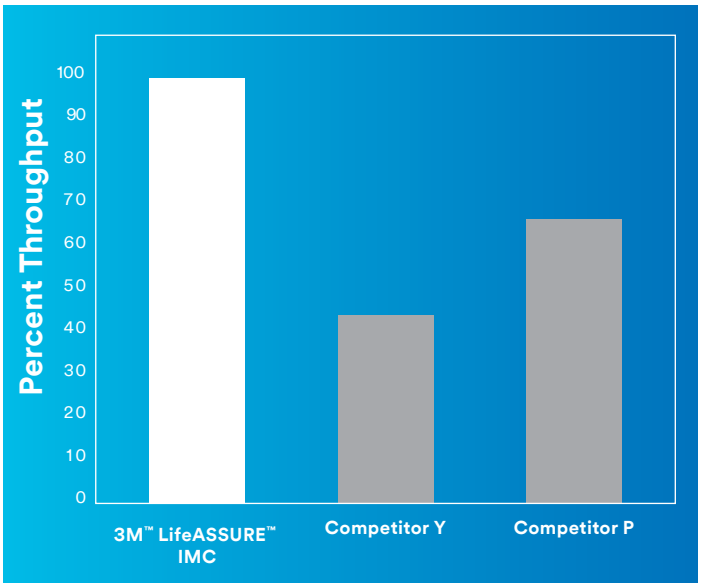
Figure 3. Advanced Pleat Technology

The service life 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 2) where the pleats are most tightly compressed. The LifeASSURE™ IMC filter cartridge is manufactured using a staggered and stepped configuration (Figure 3) which reduces the open space between the outside pleats. This novel technology maximizes 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.

Enhanced Filter Lifetime

The data in Chart 1 illustrates the through put advantage of the LifeASSURE IMC filter — indicative of both enhanced service life and greater contaminant holding capacity. When compared to competitive products, the available grades of LifeASSURE IMC allow the users to select equivalent effluent quality with vastly superior life, or, improve the effluent quality with reduced, yet competitively superior, service life. Either way the result is the same —LifeASSURE IMC filters allow significantly more through put than competitive filters and provide as much as twice the service life.

Chart 1. Comparative Throughput



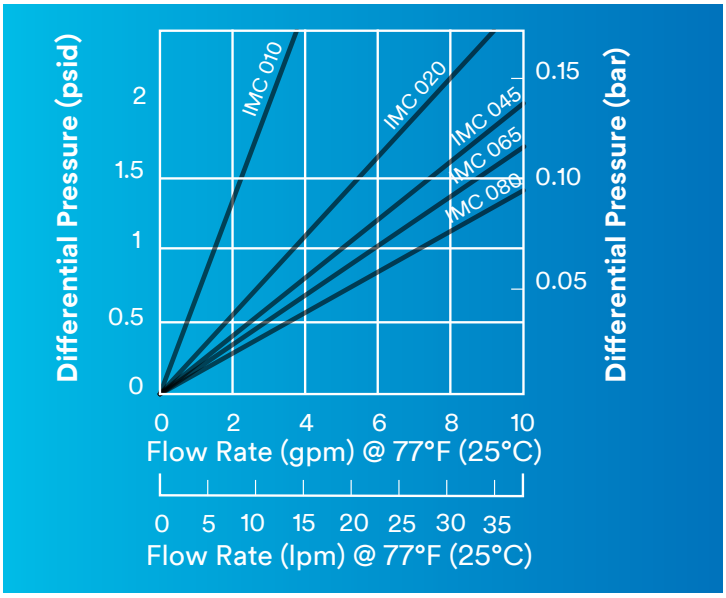
Benefits of Higher Per-Cartridge Flow Rates

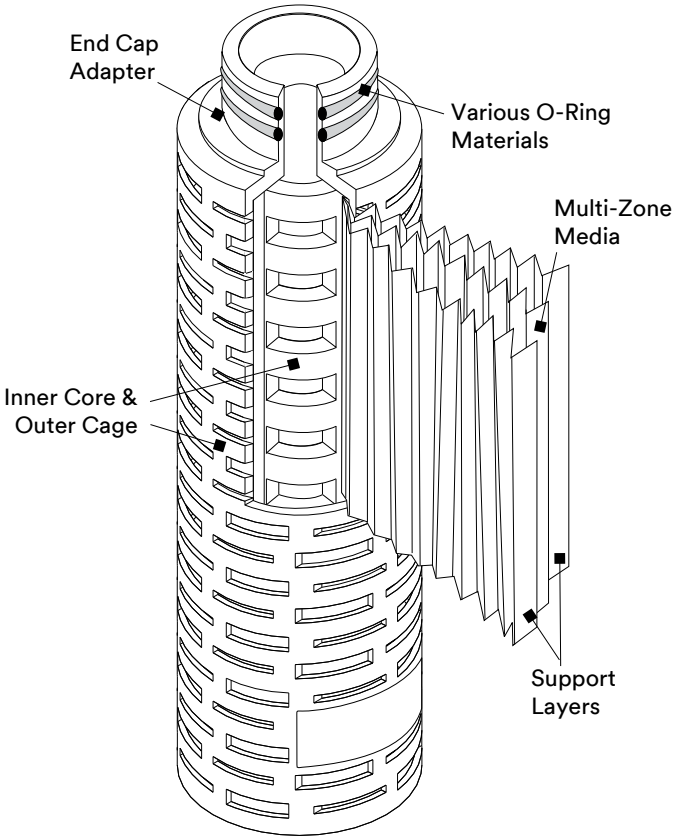
The novel construction of the LifeASSURE IMC results in a higher per cartridge flow rate at the same pressure drop as compared to competitive filters. This can reduce filtration costs two ways:

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 filters cartridges with less surface area. Since filter life time is inversely proportional to flux (lower flux = longer filter life) in most applications. LifeASSURE IMC filter cartridges provide longer life and require fewer filter cartridge change-outs.

Reduced 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 reduces initial capital investment, filter change-out time, and total cost-of-owner ship for the life of the process. Chart 2 provides the typical flow rate vs. pressure drop data for the three grades of LifeASSURE IMC (0.1 µm, 0.2 µm and 0.45 µm) available.

Chart 2. 10 in. Cartridge Typical Water Flow Rates





LifeASSURE™ IMC Cartridge Construction

LifeASSURE™ IMC filter cartridges are constructed of high efficiency, naturally hydrophilic, single layer Nylon 6,6 membrane. The cage, core, end caps, and membrane supports are made of polypropylene. No adhesives, binders, or surfactants are used in the manufacturing process. Cartridges are manufactured and bagged in a clean environment under an ISO certified quality system using advanced thermosplastic welding techniques to ensure filter integrity out of the package.

Cartridge Component	
Membrane	Multi-Zone Microporous Naturally Hydrophilic Nylon 6,6
Cage, Core, End-Caps, and Media Support Layers	Polypropylene
Cartridge Dimensions	
Filtration Surface Area	10 in. element* = 11.0 ft.^{2} (1.02m^2)
Nominal Outside Diameter	2-3/4 in. (7cm)
Nominal Length	10 in. (25.4cm), 20 in. (50.8cm), 30 in. (76.2cm)
Operating Parameters	
Maximum Operation Temperature	176°F (80°C) for 30 minutes
Maximum Differential Pressure	Forward: 80 psid @ 77°F (5.5 bar @ 25°C) 35 psid @ 176°F (2.4 bar @ 80°C)
Recommended Filter Change-out Differential Pressure	35 psid (2.4 bar)
Reduction Ratings	0.1µm, 0.2µm, 0.45µm

*For 20- and 30-inch elements, multiply by 2 and 3 respectively.

LifeASSURE™ IMC Series Filter Cartridge Ordering Guide

Cartridge	Reduction Rating (µm)	Configuration	Length (inches)	End Modification	Gasket/O-ring Material
IMC	**010** – 0.1 **020** – 0.2 **045** – 0.45	F	**01** – 10 **02** – 20 **03** – 30	**B** – 226 O-ring & Spear (Code 7) **C** – 222 O-ring & Spear (Code 8) **D** – Double Open End (10 in. length) **E** – Double Open End (9-3/4 in. length) **F** – 222 O-ring & Flat Cap (Code 3)	**A** – Silicone **B** – Fluorocarbon **C** – EPR

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.

Your local distributor:

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3M Separation and Purification Sciences Division
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