

Betafine™ XL Series

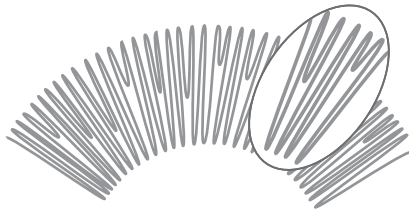
Absolute-Rated Pleated Polypropylene Filter Cartridges

The Betafine XL filter represents a major advance in pleated filter technology. Building on 3M Purification Inc.'s history of filter design innovation, this absolute-rated, 100% polypropylene, pleated cartridge features an Advanced Pleat Technology (APT) that increases the usable filtration surface area while maintaining standard industrial cartridge dimensions. The result is a filter cartridge that dramatically enhances service life.

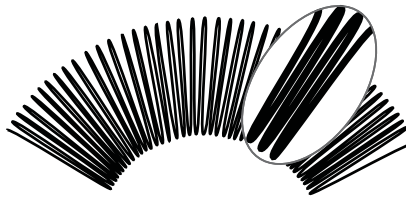
Advanced Pleat Technology

The service life of a pleated 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 too tightly into the cartridge, only part of the surface area is usable resulting in both flow restrictions and limited contaminant holding capacity. The "blind" or unusable area commonly occurs near the inside diameter (see figures below) where the pleats are packed most tightly. The Betafine XL cartridge is manufactured using a staggered pleat configuration that, when combined with a novel support material, provides more open space between the pleats.

The APT staggered pleats with increased open area allow for greater contaminant loading between pleats at the inside diameter, while the reduced length pleats take advantage of existing open space closer to the cartridge's outside diameter. The result is a fully used surface area that provides superior service life.



Betafine XL Advanced Pleat Technology utilizes a configuration designed to increase the accessible surface area for significantly greater filter media use.



Conventional pleat designs, with full-depth densely packed pleats, fill the upstream pleat surface with contaminant that quickly constrict flow at the pleat's inside diameter.

Features & Benefits

Reduced Total Filtration Costs

- Fewer cartridges used, reduced cartridge change-out frequency, reduced downtime and product waste, and reduced labor and disposal costs.

Predictable filtration performance

- Reduced quality checks, reduced product rejects and rework, and increased productivity and plant capacity



Applications

Betafine XL filters are ideal for a wide array of applications. Contact your local distributor with your specific applications. A more detailed listing of applications is on page 6.

Paint & Coatings

Industrial

Pharmaceutical, Biological, and Bioprocessing

Electronics

Food & Beverage

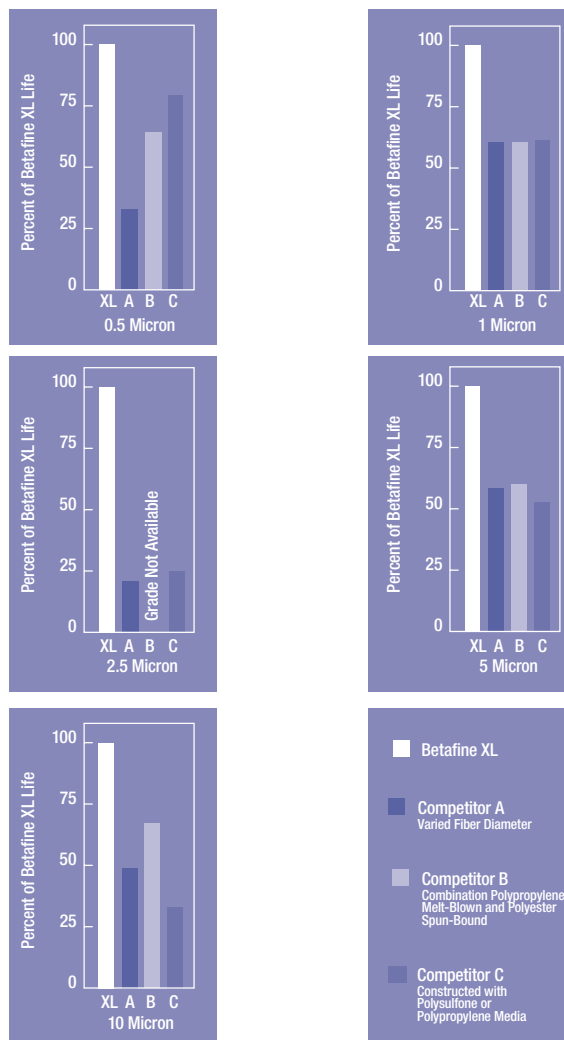
Chemical and Petrochemical Processes

Superior Service Life

Extensive testing has demonstrated that the Betafine XL filter provides service life superior to competitive pleated filters of equivalent removal ratings when subjected to the same contaminant load. The result of using filters with significantly longer service life is substantially reduced filtration costs. Betafine XL filters provide a service life improvement of up to 4.4 times greater than competitive products! (Graph 1)

Graph 1 — Betafine XL filters provide significantly enhanced service life when compared to conventional pleated filters of like published removal ratings.

Service Life Comparison by Rating (Microns)



Superior on-line service life provides significant total filtration cost reductions. From fewer filter cartridges used to a reduction in labor costs by decreasing filter change-out frequency, Betafine XL filters provide the ultimate in cost effective pleated filter technology.

The Impact of Service Life on Total Filtration Costs

The service life of a filter has a direct impact on total annual filtration costs. To illustrate how great an impact can occur, the following example is provided. The example is based on a model system with a flow rate of 250 gpm using 18 (30" long) filter cartridges with a change-out frequency of one week.

Process Requirements*	A Filter with 50% of Betafine XL Filter Service Life		Betafine XL Filter Cartridge	
	Units	Estimated Cost	Units	Estimated Cost
Estimated filter usage (annual, based on \$75 per cartridge U.S.)	936	\$70,200	468	\$35,100
Required labor (1 hour per filter change-out at \$40/hr U.S.)	52 hours	\$2,080	26 hours	\$1,040
Estimated disposal (56 cartridges per drum at \$50/drum U.S.)	17 drums	\$850	9 drums	\$450
Process downtime	52 hours	?	26 hours	?
Total Annual Filtration Cost	\$73,130		\$36,590	

* These estimates are based on conditions as noted. Your savings will vary depending on your actual costs.

Betafine XL Absolute Filter Ratings

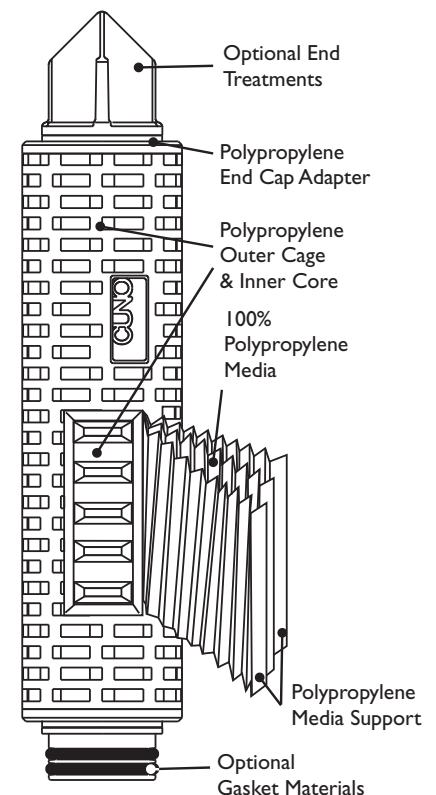
3M PI Designation	Rating (micron)
002	0.2
005	0.5
010	1
025	2.5
050	5
100	10
200	20
400	40
700	70

Absolute Ratings

The assurance of predictable and reproducible contaminant removal can best be provided by the use of absolute-rated filters. Betafine XL filters are absolute rated to Beta 1000 (99.9% efficiency at its rating) and are available in 9 distinct ratings from 0.2 micron to 70 micron. This provides a complete choice of ratings to meet the exacting filtration requirements for the most critical applications.

Filter Cartridge Construction

Betafine XL filters, constructed of 100% polypropylene, provide excellent chemical and thermal compatibility. The filter media is constructed from continuous micro-fibers that are precisely controlled to provide a uniform matrix and consistent effluent quality. Betafine XL filter incorporates a polypropylene support upstream and downstream of the media to provide optimum flow characteristics and long service life. The all-polypropylene cartridge components are thermally bonded — no resin or binder compounds are used. All materials used in the manufacture of Betafine XL filters are FDA CRF Title 21 listed for direct food contact. Available in 9 distinct micron ratings and integral lengths from 9 3/4 to 40 inches with a wide selection of end treatments to fit common filter housing designs, Betafine XL cartridges are ideal for a wide variety of applications.



Chemical Compatibility

The 100% polypropylene construction provides excellent chemical compatibility in many demanding process fluid applications. Listed in the following table are commonly requested compatibilities. Compatibility for specific fluids may vary and is influenced by operating conditions. Consult your local 3M Purification Inc. distributor or the factory for more information.

Chemical	Temperature	Chemical	Temperature
Acetic Acid 20%	175°F (80°C)	Nitric Acid 20%	100°F (38°C)
Ammonia 10%	140°F (60°C)	Potassium Hydroxide	140°F (60°C)
Bleach 5.5%	70°F (21°C)	Sodium Carbonate	100°F (38°C)
Ethylene Glycol	140°F (60°C)	Sodium Hydroxide 70%	140°F (60°C)
Alkanolamines	140°F (60°C)	Sulfuric Acid 20%	140°F (60°C)
Hydrogen Peroxide	100°F (38°C)	Sulfuric Acid 70%	100°F (38°C)
Methyl Ethyl Ketone	70°F (21°C)	Urea	140°F (60°C)
Mineral Oil	70°F (21°C)		

3M™ Filter Housings

3M Purification Inc. manufactures a wide range of filter housings. Housings that accommodate from a single filter element, to many hundreds, are available in a broad choice of materials. A flexibility of design ensures that 3M Purification Inc. has a filter housing to suit your needs. The housings provide easy access for filter change-out and the greatest assurance that Betafine XL filter cartridges are seated securely, thus eliminating the possibility of fluid bypass.

3M™ ES Series Filter Housing

The ES Series filter housing is a durable high flow filter housing constructed from 316L stainless or carbon steel. With a cartridge capacity from 12 to 480 equivalent lengths, the ES filter housing can accommodate a wide range of flow requirements. For more information, ask your local 3M Purification Inc. distributor for brochure 70-0201-8711-1.

3M™ CTG-Klean Filter Housing

The CTG-Klean Filter Housing design provides a totally enclosed system using a filter pack to isolate process fluid from the housing. This system reduces the costs involved with filter change-out while protecting the environment and operator from exposure to the process fluid. For more information, ask your local 3M Purification Inc. distributor for brochure 70-0201-8693-1.

3M™ DC & SS Filter Housings

DC and SS filter housings offer a cost effective alternative for low volume filtration. Constructed from reliable 304L stainless steel (Model DC) or 316L stainless steel (Model SS), systems are available for a wide range of flow rates and applications. For more information, ask for literature 70-0201-8757-4 and 70-0202-2106-8. For other style housings, contact your local 3M Purification Inc. distributor.



Scientific Application Support Services (SASS)

Dedicated technical support teams comprised of 3M Purification Inc. scientists and engineers are available to provide application specific recommendations for the most effective and economical filtration system. In addition to comprehensive testing and analysis conducted at 3M Purification Inc.'s advanced laboratories, the SASS staff frequently performs on-site testing at customer's facilities. Contact your 3M Purification Inc. representative for additional information.



Flow Characteristics and Sizing Options

Flow vs. differential pressure for water is depicted in the following graphs for each Betafine XL grade. A typical filter system is often sized for an initial differential pressure of 0.5 to 1 psi (0.04 to 0.07 bar). Low flow rates further extend the life of the filter system.

Chart 1

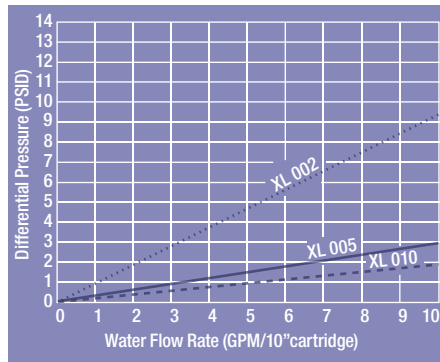
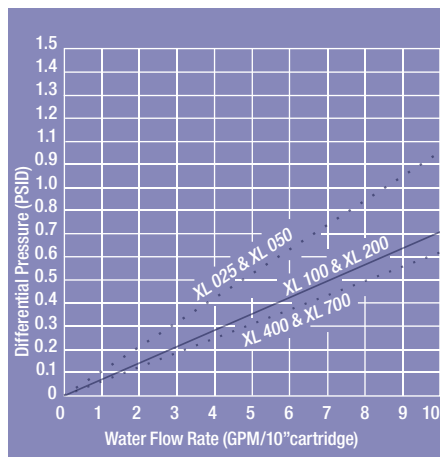


Chart 2



Reduced cartridge change-out frequency

For a given process flow rate, the increased accessible surface area decreases filter cartridge change-out frequency by 30 to 50 percent or more depending on the application.

Reduced filter housing costs

For new applications, the low pressure drops of the Betafine XL filter allow smaller or fewer housings to be required. Fewer filter cartridges and smaller housings ensure lower capital and operating costs, year after year!

Betafine XL Applications

Betafine XL filters are ideal for a wide array of applications. Contact your local distributor for assistance with your specific applications.



Paint and Coatings Applications

Betafine XL filter cartridges are well suited for the filtration of raw materials as well as final product. Betafine XL filter applications include:

- Film & paper coatings
- Photographic film
- Lens coatings & magnetic media
- Can coatings, high quality paints, & ink

Industrial Applications

Betafine XL filter cartridges are ideal for reducing overall filtration costs in a broad range of industrial applications, including:

- Machine tool lubrication, detergents, process and waste water
- Plating baths and chemicals
- Pulp & paper, and textiles

Pharmaceutical, Biological, and Bioprocessing

Betafine XL filter cartridges are ideal for clarification and prefiltration. The Betafine XL filter's polypropylene media and materials of construction meet industry standards. Betafine XL cartridges can be used in a broad range of aqueous based applications including:

- High-Purity Pharmaceutical Water Systems, Solvent & Fermentation Feed Streams
- Reagents & Buffers, Bulk Pharmaceutical Chemicals & Intermediates
- Air Prefiltration
- Toiletries and Cosmetics, Orals & Topicals

Electronic Applications

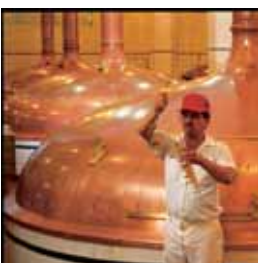
Betafine XL filters meet the needs of many electronics and electronic component filtration applications by delivering high flow rates, broad process compatibility, and easy installation in a variety of systems.

- CD and DVD media
- Printed circuit boards
- Video displays
- DI water

Food & Beverage Applications

Increased consumer emphasis on product quality, as well as increased government regulation, are driving today's food & beverage industry to ever-finer levels of filtration. Betafine XL filter cartridges meet this challenge throughout the entire service life. Typical applications include:

- Bottled water particulate and turbidity reduction
- Reverse osmosis membrane and spray nozzle protection
- Diatomaceous earth or carbon fines trap
- Beverage blending, rinsing, or wash water



Chemical and Petrochemical Processing

Betafine XL is ideally suited for demanding filtration applications within Chemical and Petrochemical production processes.

- Clarification of high purity chemicals, organic and inorganic chemical intermediates, and various acids and bases
- Production of petrochemicals from feed-stocks and intermediates, solvents, polymer solutions
- Process water for quench and flushing



Betafine XL Cartridge Specification

Materials	
Media	Pleated Polypropylene
Media Support	Polypropylene
Core, Outer Cage, End Caps	Polypropylene
Gasket & O-Ring Options	Silicone, Fluorocarbon, EPR, PTFE Encapsulated O-Ring, Polyethylene, Nitrile
Operating Conditions	
Maximum Operating Temperature	175°F (80°C)
Maximum Forward Pressure Differential	60 psi at 77°F (4 bar at 25°C)
Maximum Reverse Pressure Differential	40 psi at 77°F (2.6 bar at 25°C)
Betafine XL Cartridges can be autoclaved, steamed in place or hot water sanitized. (For cartridges with 222 or 226 o-ring end styles, order option with reinforcing ring.)	
Cartridge Dimensions	
Diameter	2.62 inches (6.6 cm)
Nominal Length	9 ¾, 10, 19 ½, 20, 29 ¼, 30, 39, 40 inches
Regulatory Status	
CFR Compliant	Filter components are FDAS listed for food contact per CFR 21, Parts 170-199



This Betafine XL series filter is tested and certified by WQA against NSF/ANSI Standard 61 for material requirements only*.

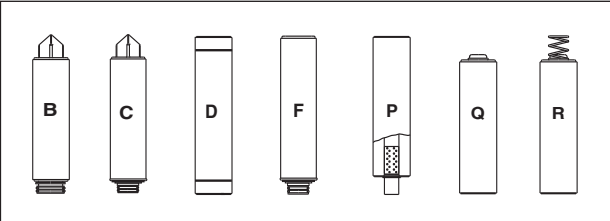
* For gasket/o-rings G, H, K, & L, please consult factory.

Cold Water Only

Install this product in accordance with the instructions provided by the housing manufacturer.

Betafine XL Series Ordering Guide

Cartridge	Length		Material	Rating		End Style	Gasket/O-Ring		
	Code	In.		Code	Micron				
XL Betafine XL	09*	9 3/4	pp Polypropylene	002	0.2	B1	226 O-ring & Spear Polysulfone Ring	A	Silicone
	10	10		005	0.5	B2	226 O-ring & Spear Stainless Steel Ring	B	Fluorocarbon
	19*	19 1/2		010	1	C0	222 O-ring & Spear No Reinforcing Ring	C	EPR
	20	20		025	2.5	C1	222 O-ring & Spear Polysulfone Ring	D	Nitrile
	20*	29 1/4		050	5	C2	222 O-ring & Spear Stainless Steel Ring	G	Polyethylene (end styles D, P, Q & R only)
	30	30		100	10	D	Double Open End (DOE)	H	Clear Silicone O-Ring
	39*	39		200	20	F0	222 O-ring & Flat Cap No Reinforcing Ring	K	PTFE Encapsulated fluorocarbon O-Ring
	40	40		400	40	F1	222 O-ring & Flat Cap Polysulfone Ring	L	PTFE Encapsulated Silicone O-Ring
				700	70	F2	222 O-ring & Flat Cap Stainless Steel Ring		
						P	DOE with Polypropylene Core Extender		
				Q	Single Open End (SOE)**				
				R	Single Open End (SOE) with stainless steel spring				
				U	222 O-ring & Flat Cap No Reinforcing Ring (One high only, shorter cartridge retrofits Mykrois™ / Millipore™ Code 0)				



* Not available in B, C, F, Q, R and U end styles.
 ** Can be used a replacement cartridge with R end style.

Important Notice

The information described in this literature is accurate to the best of our knowledge. A variety of factors, however, can affect the performance of the Product(s) in a particular application, some of which are uniquely within your knowledge and control. **INFORMATION IS SUPPLIED UPON THE CONDITION THAT THE PERSONS RECEIVING THE SAME WILL MAKE THEIR OWN DETERMINATION AS TO ITS SUITABILITY FOR THEIR USE. IN NO EVENT WILL 3M PURIFICATION INC. BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF OR RELIANCE UPON INFORMATION.**

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