

Betafine[®] XL



Absolute-Rated Pleated Polypropylene Filter Cartridges

Featuring
Advanced Pleat Technology™
for Extra Long Life and
Reduced Total Filtration Costs

- Fewer cartridges used
- Reduced cartridge change-out frequency
- Reduced downtime and product waste
- Reduced labor and disposal costs



Betafine XL Filter Cartridges

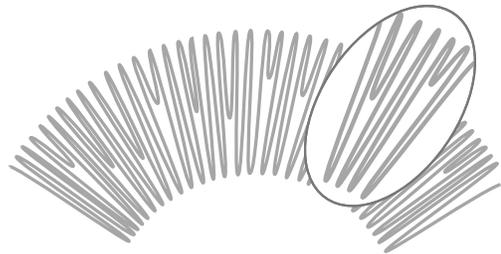
Providing Reduced Total Filtration Costs and Predictable Filtration Performance

The Betafine XL filter represents a major advance in pleated filter technology. Building on Cuno's history of filter design innovation, this absolute-rated, 100% polypropylene, pleated cartridge features a patent pending 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 to provide:

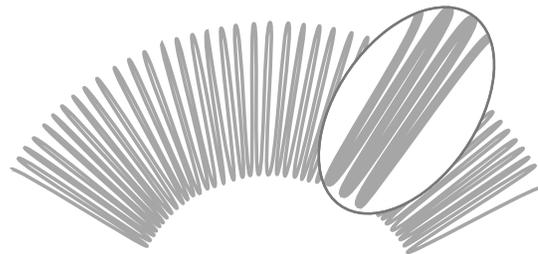
- + **Reduced Total Filtration Costs** - Fewer cartridges used, reduced cartridge change-out frequency, reduced downtime and product waste, and reduced labor and disposal costs.
- + **Predictable filtration performance** - Reduced quality checks, reduced product rejects and rework, and increased productivity and plant capacity

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 to right) where the pleats are packed most tightly. The Betafine XL cartridge is manufactured using a patent pending 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.



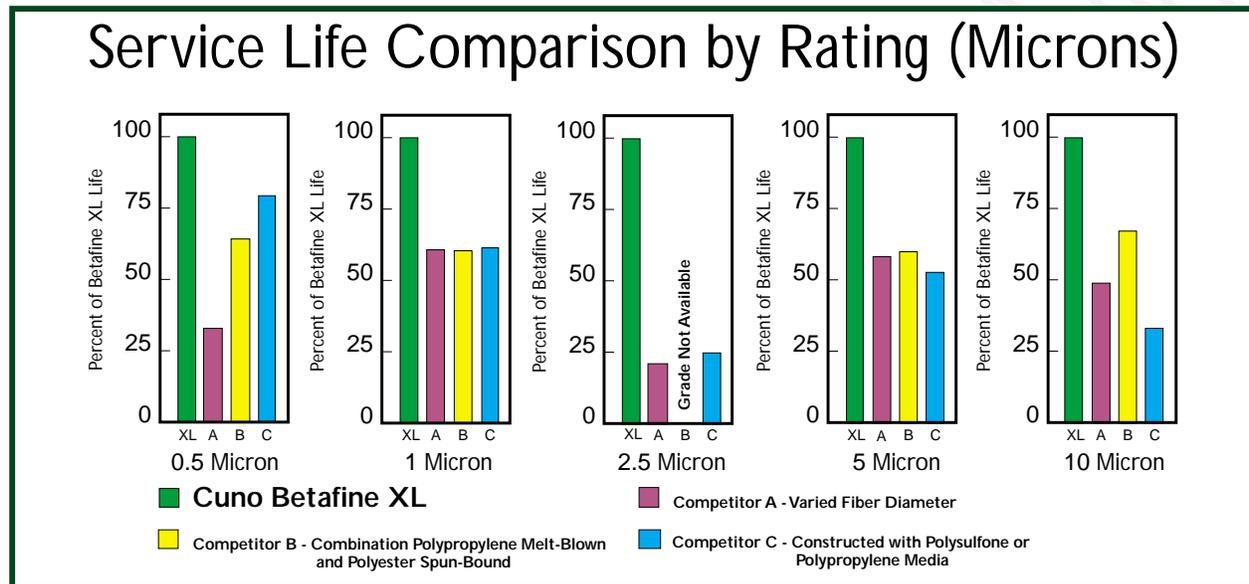
Betafine XL Advanced Pleat Technology utilizes a unique configuration to increase the accessible surface area for significantly greater filter media use.



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.

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.

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

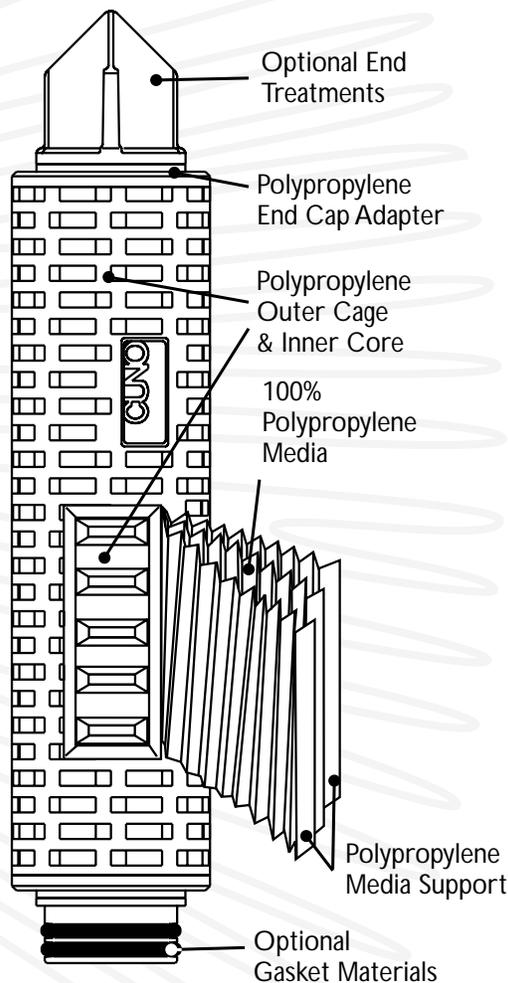
The service life of a filter has a direct impact on total annual filtration costs. To illustrate how great an impact can occur, the following example is provided. The example is based on a model system with a flow rate of 250 gpm using 18 (30" long) filter cartridges with a change-out frequency of one 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 US)	936	\$ 70,200	468	\$ 35,100
Required labor (1 hour per filter change-out at \$ 40/hr US)	52 hrs	\$ 2,080	26 hrs	\$ 1040
Estimated disposal (56 cartridges per drum at \$ 50/drum US)	17 drums	\$ 850	9 drums	\$ 450
Process Downtime	52 hrs	?	26 hrs	?
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 Filters

Betafine XL Absolute Filter Ratings	
Cuno Designation	Rating (microns)
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 CFR 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 CUNO distributor or the factory for more information.

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

Betafine XL Applications

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

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.

- + Disc drives and compact discs
- + Printed circuit boards
- + Flat panel displays

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 fine 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





Cuno Filter Housings

Cuno 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 Cuno has a filter housing to suite 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.

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 Cuno distributor for brochure **LITCHSE1**.

CTG-Klean® Filter Housing - A unique 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 Cuno distributor for brochure **LITCCK001**.

DC & SD Filter Housings - DC and SD filter housings offer a cost effective alternative for low volume filtration. Constructed from reliable 304L stainless steel (Model DC) or 316L stainless steel (Model SD), systems are available for a wide range of flow rates and applications. For more information, ask for literature **LITHSDC1** and **LITHSSD1**. For other style housings, contact your local Cuno Distributor.

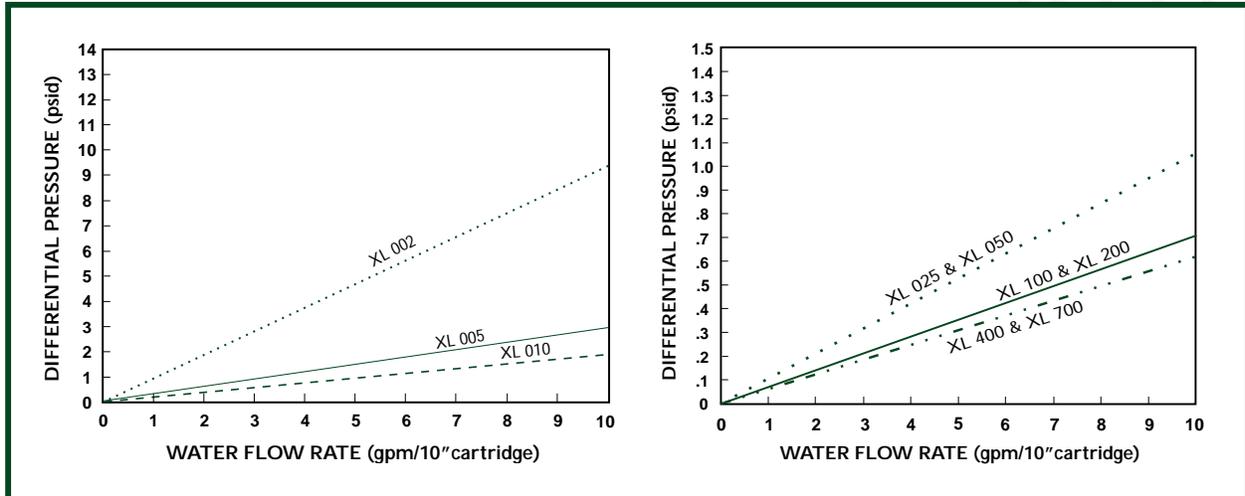


Scientific Application Support Services (SASS)

Dedicated technical support teams comprised of Cuno 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 Cuno's advanced laboratories, the SASS staff frequently performs on-site testing at customer's facilities. Contact your Cuno 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.



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 Cartridge Specifications

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

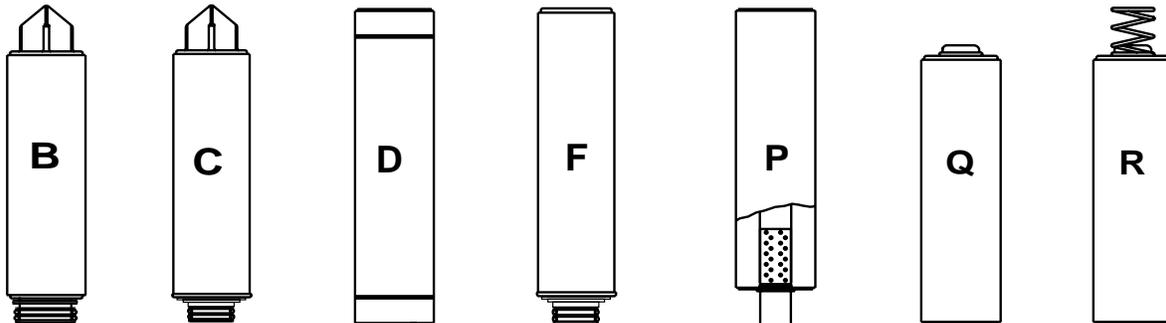
Regulatory Status

CFR Compliant	Filter components are FDA listed for food contact per CFR 21, Parts 170-199
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Betafine XL Series Ordering Guide

Cartridge	Length		Material	Rating		End Style	Gasket/O-Ring
	Code	Inches		Code	Micron		
XL - Betafine XL	09*	9 ¼	PP - Polypropylene	002	0.2	B0 - 226 - O-ring & Spear No Reinforcing Ring	A - Silicone
	10	10		005	0.5	B1 - 226 - O-ring & Spear Polysulfone Ring	B - Fluorocarbon
	19*	19 ½		010	1	B2 - 226 - O-ring & Spear Stainless Steel Ring	C - EPR
	20	20		025	2.5	C0 - 222 O-ring & Spear No Reinforcing Ring	D - Nitrile
	29*	29 ¼		050	5	C1 - 222 O-ring & Spear Polysulfone Ring	G - Polyethylene (end styles D, P, Q, & R only)
	30	30		100	10	C2 - 222 O-ring & Spear Stainless Steel Ring	
	39*	39		200	20	D - Double open end (DOE)	K - PTFE Encapsulated Viton O-Ring
	40	40		400	40	F0 - 222 O-ring & Flat Cap No Reinforcing Ring	
				700	70	F1 - 222 O-ring & Flat Cap Polysulfone Ring	
						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 steel spring			

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



WARRANTY

Seller warrants its equipment against defects in workmanship and material for a period of 12 months from date of shipment from the factory under normal use and service and otherwise when such equipment is used in accordance with instructions furnished by Seller and for purposes disclosed in writing at the time of purchase, if any. Any unauthorized alteration or modification of the equipment by Buyer will void this warranty. Seller's liability under this warranty shall be limited to the replacement or repair, F.O.B. point of manufacture, of any defective equipment or part which, having been returned to the factory, transportation charges prepaid, has been inspected and determined by Seller to be defective. THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR USE, OR ANY OTHER MATTER. Under no circumstances shall Seller be liable to Buyer or any third party for any loss of profits or other direct or indirect costs, expenses, losses or consequential damages arising out of or as a result of any defects in or failure of its products or any part or parts thereof or arising out of or as a result of parts or components incorporated in Seller's equipment but not supplied by the Seller.

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