

3M Purification

Product brochure

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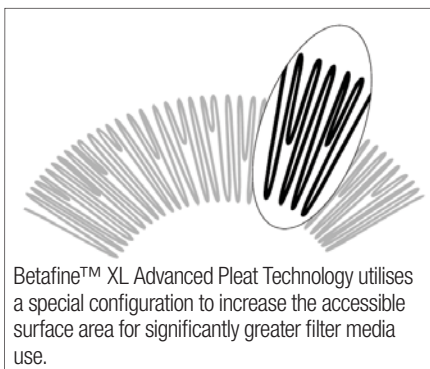
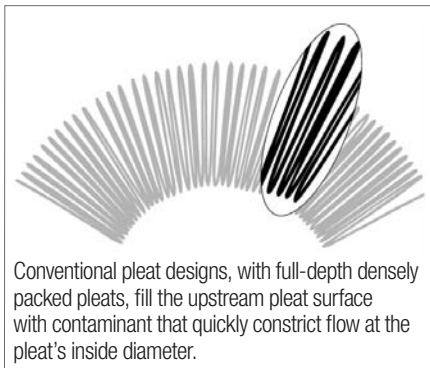
Betafine™ XL

Filter Cartridge Series

Absolute-rated pleated polypropylene filters

- ✓ 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 labour and disposal costs

3M



Providing reduced total filtration costs and predictable filtration performance

The Betafine™ XL filter represents a major advance in pleated filter technology. Building on 3M Purification's history of filter design innovation, this absolute-rated, 100% polypropylene, pleated cartridge features the 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
- Reduced labour and disposal costs

Predictable filtration performance

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

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 figure on the left) where the pleats are packed most tightly.

Advanced Pleat Technology: the Betafine XL advantage

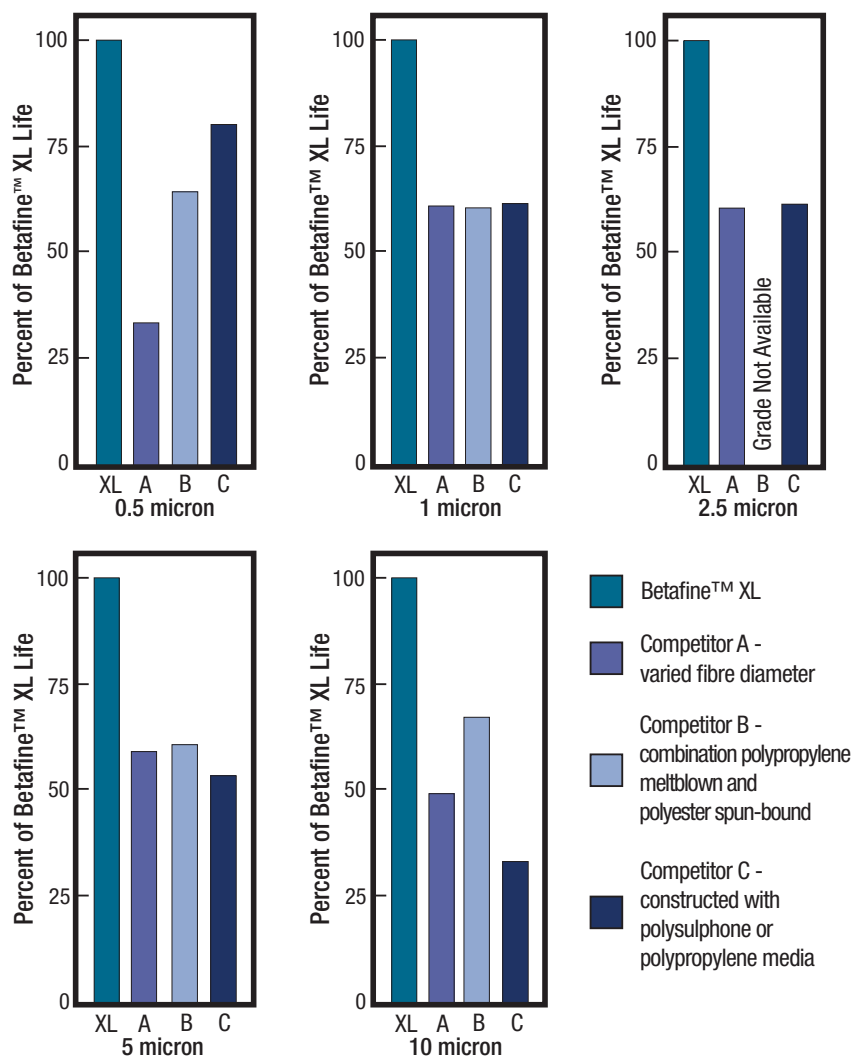
Betafine XL cartridges are manufactured using a staggered pleat configuration that, when combined with a support material, provides more open space between the pleats. The APT staggered pleats with increased open area allow for greater contaminant loading between pleats at the inside diameter, while 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.

The impact of service life on total filtration costs

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 (see graph 1).

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

Graph 1: Service life comparison by rating (micron)



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

Superior Service Life

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 55 m³/h using 18 filter cartridges (30" long) 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 € 100 per cartridge)	936	93 600 €	468	46 800 €
Required labour (1 hour per filter change-out at € 40/h)	52 h	2080 €	26 h	1040 €
Estimated disposal (56 cartridges per drum at € 50/drum)	17 drums	850 €	9 drums	450 €
Process Downtime	52 h	?	26 h	?
Total Annual Filtration Cost		96 530 €		48 290 €

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

Betafine™ XL Absolute Filter Ratings	
3M Purification 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.

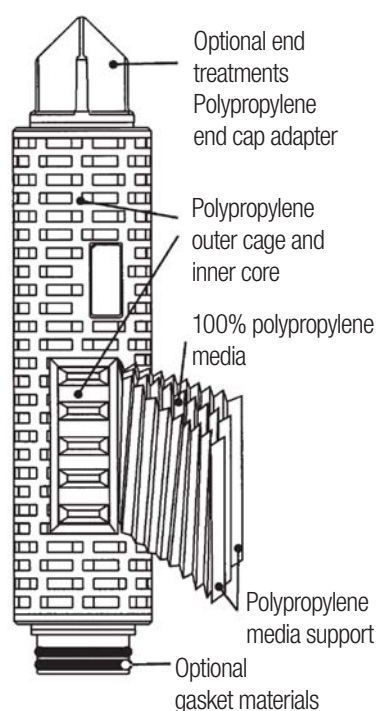
Filter cartridge construction

Betafine XL filters, constructed of 100% polypropylene, provide excellent chemical and thermal compatibility. The filter media is constructed from continuous micro-fibres 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. Available in 9 distinct micron ratings and integral lengths from 9 ¾ 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.

Your benefit: total filtration cost reduction

The Betafine XL filter's performance and superior life advantage allow direct cost savings by reducing the number of filters used. In addition, the resulting reduction in filter change-out frequency decreases direct labour and filter disposal costs. Betafine XL filter cartridges - providing performance and value.



Betafine XL applications

Betafine XL filters are ideal for a wide array of applications. Contact your local 3M Purification sales office for assistance with your specific applications.



Food and 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
- Suitable for use with aqueous, alcoholic, acidic and dairy foodstuffs

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

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

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

Industrial Applications

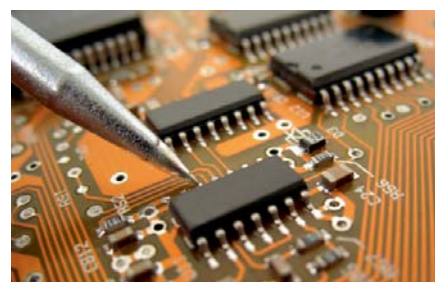
Betafine XL filter cartridges are ideal for reducing overall filtration costs in a broad range of industrial applications, including:

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

Special 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
- Lens coatings & magnetic media
- Photographic film
- Can coatings, high quality inks





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 sales office for more information.

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

Filter housings

3M Purification manufactures a wide range of filter housings. Housings that accommodate from a single filter element, to many hundreds, available in a broad choice of materials, and a flexibility of design ensure that 3M Purification has a filter housing to suit your needs.

CH Series filter housing

The CH Series filter housing is a durable high volume filter housing constructed from 316L or 304 stainless steel. With a cartridge capacity from 3 to 116 cartridges (from 3 EQSL to 464 EQSL), the CH filter can accommodate a wide range of flow requirements. For more information or special housings, ask your local 3M Purification sales office.

CTG System filter housing

The design provides a totally enclosed system using separate pressure vessel and filter pack to isolate process fluid from the housing. This system virtually eliminates 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 sales office.

DS Series filter housings

DS filter housings offer a cost effective alternative for low volume filtration. Constructed from reliable 316L stainless steel, systems are available for a wide range of flow rates and applications. For more information, ask your local 3M Purification sales office.

Scientific Application Support Services (SASS)

Dedicated technical support teams comprised of 3M Purification 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's advanced laboratories, the SASS staff frequently performs on-site testing at customer's facilities. Contact your 3M Purification representative for additional information.

Cartridge specifications

Materials	
Media	pleated polypropylene
Media support	polypropylene
Core, outer cage, end caps	polypropylene
Gasket & O-ring options	silicone, fluorocarbon, ethylene propylene, PTFE-encapsulated fluorocarbon, polyethylene, nitrile
Operating Conditions	
Maximum operating temperature	80 °C
Max. forward pressure differential	4 bar at 25 °C
Max. reverse pressure differential	2.6 bar at 25 °C
Betafine™ XL cartridges can be autoclaved, steamed in place or hot water sanitised. (For cartridges with 222 or 226 O-ring end styles, order option with reinforcing ring.)	
Cartridge dimensions	
Diameter	66 mm
Nominal length (inches)	9 ¾, 10, 19 ½, 20, 29 ¼, 30, 39 and 40
Regulatory compliance	
Betafine™ XL Series cartridges comply with the requirements of Regulation (EC) 1935/2004 for their intended food contact applications. All materials of construction comply with the requirements of the Food and Drug Administration's (FDA) Code of Federal Regulations (CFR), Title 21 parts 170-199 for contact with food. The filters meet the requirements of USP for the Biological Test for Plastics, Class VI. Contact 3M Purification for further information.	

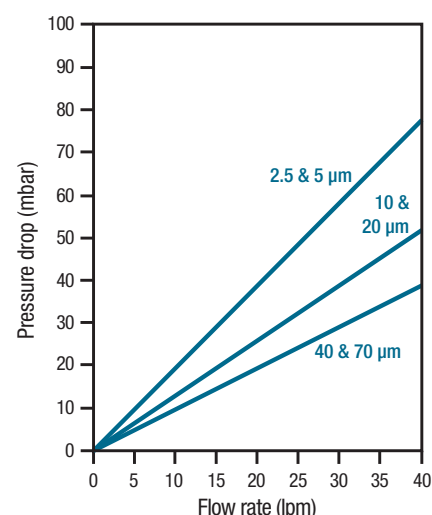
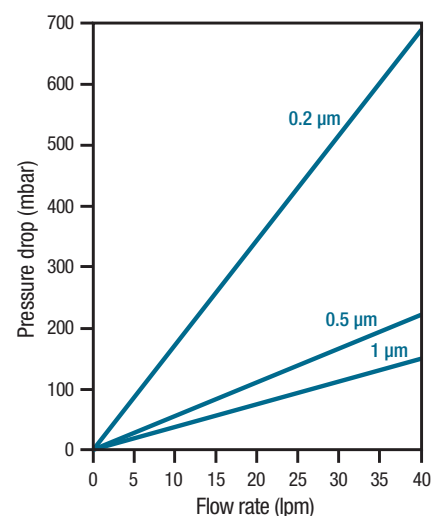
Flow Characteristics and Sizing Options

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 40 - 70 mbar. Low flow rates will further extend the life of a 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 % 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 Water Flow Rates



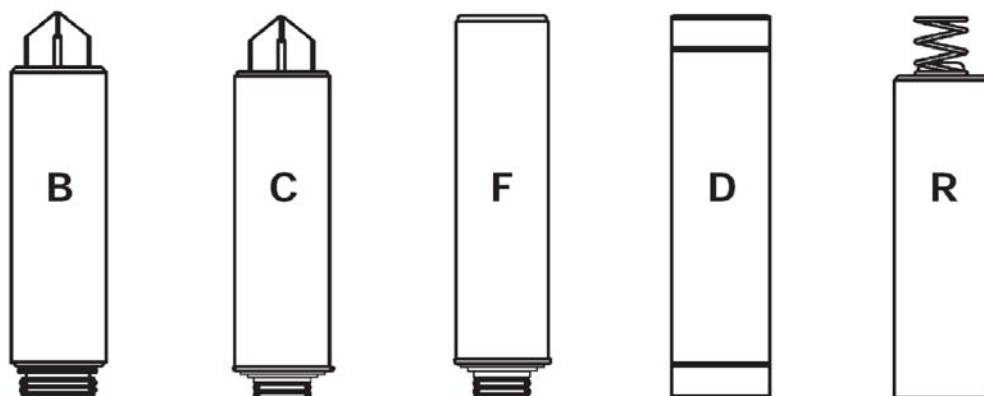
Betafine™ XL Series filter cartridges - Ordering guide

Cartridge	Length		Material	Rating		End style	Gasket/O-ring
	Code	inches		Code	micron		
XL = Betafine™ XL	09*	9 3/4"	PP = Polypropylene	002	0.2	B0: 226 O-ring and spear, no reinforcing ring	A: Silicone (MVQ)** B: Fluorocarbon (FPM)** C: EPDM (EPDM)** D: Nitrile (NBR)** K: PTFE-encapsulated fluorocarbon
	10	10"		005	0.5	B1: 226 O-ring and spear, polysulphone ring	
	19*	19 1/2"		010	1	B2: 226 O-ring and spear, stainless steel ring	
	20	20"		025	2.5	C0: 222 O-ring and spear, no reinforcing ring	
	29*	29 1/4"		050	5	C1: 222 O-ring and spear, polysulphone ring	
	30	30"		100	10	C2: 222 O-ring and spear, stainless steel ring	G: Polyethylene (end styles D and R only)
	39*	39"		200	20	F0: 222 O-ring and flat cap, no reinforcing ring	
	40	40"		400	40	F1: 222 O-ring and flat cap, polysulphone ring	
				700	70	F2: 222 O-ring and flat cap, stainless steel ring	
						D: Double open end (DOE)	
						R: Single open end (SOE) with steel spring	

* Not available in B, C, F and R end styles.
Ex : XL 20 PP005 B0A

** ISO Designation

Available end styles



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 BE RESPONSIBLE FOR DAMAGES OF ANY NATURE WHATSOEVER RESULTING FROM THE USE OF OR RELIANCE UPON INFORMATION.

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