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Betafine™ PBG Series Polypropylene Pleated Filter Cartridges

Polypropylene pleated graded-density filter cartridges featuring APT Construction for Extended Filter Lifetime

3M Purification's Betafine PBG Series filter cartridge, formerly known as PolyPro XL, represents a major advance in pleated polypropylene filter design and performance. Advanced Pleat Technology (APT) construction combines:

- up to 50% more filter media (surface area) than competitive filters,
- graded-density media for optimum contaminant holding,
- new cartridge design for increased flow and reduced pressure drop.

The result is a filter cartridge that lasts longer, performs better and saves money.

Betafine PBG Series filters for food and beverage applications are available in the following versions:

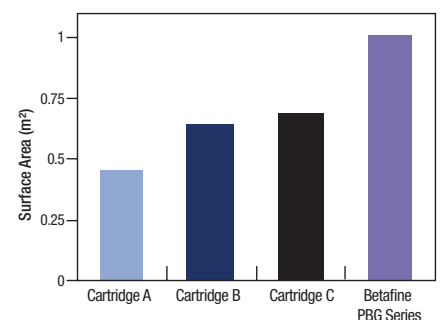
- model PEG: without stainless steel insert
- model PBG: with stainless steel insert
- model PTG: with factory certified integrity testing
- model PBP: (multi-layers) for final filtration or for membrane protection

The APT Advantage

Surface area dictates just how long a filter will last and how it will perform. However, increasing surface area without considering the flow path between the media's pleats could result in flow restrictions and early media blinding. To achieve the optimum between surface area and performance, 3M Purification has designed Betafine PBG Series so that the pleating process and media support materials work together to provide enhanced flow characteristics and longer service life.



Figure 1: Surface Area Comparison



Features and Benefits

Advanced Pleat Technology construction for extremely high surface area

- Higher product throughputs for extraordinarily long service life
- Lower total filtration operating costs
- Lower pressure drops for higher flow rates

Absolute-rated filter performance

- Consistent and reproducible contaminant removal
- Higher product quality and yields

Graded-density multi-layer filter media

- Selective entrapment of contaminant throughout the filter media to maximise filter life
- Higher contaminant holding capacity

Polypropylene cartridge components free of adhesives and surfactants

- Very low extractable levels for optimum filtrate purity
- Broad chemical compatibility for most aggressive process applications

100% integrity tested versions available

- Pre-qualification and assurance in critical applications
- Suitable for final filtration in many applications

Robust polypropylene cartridge construction

- Extends service life and compatible with a wide range of solvents and cleaning solutions

3M

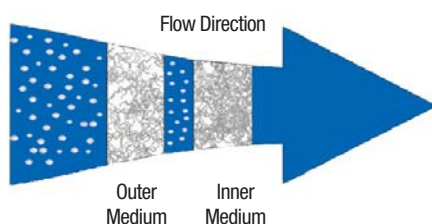
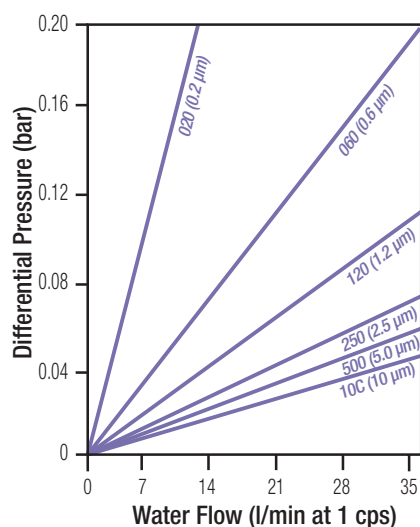
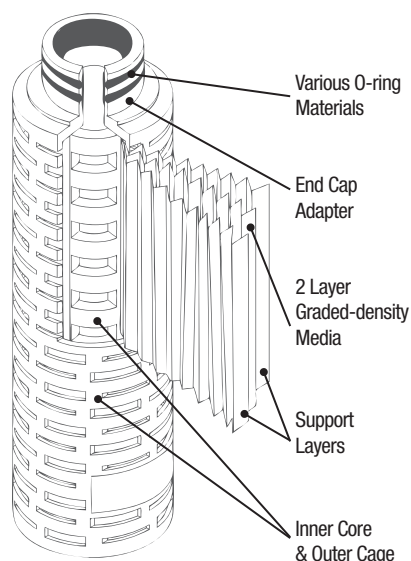


Figure 2: Flow vs. Differential Pressure

Clean Water Flow per 10 Inch Cartridge at Ambient Temperature (20 °C)



Standard Cartridge



Graded-Density - the key to longer life

The Betafine PBG Series filter's graded-density media structure removes particles sequentially by size - the larger particles by the more open, outer medium and the smaller particles by the tighter, inner medium. The outer medium acts as a prefilter, while the inner provides the absolute removal specified by the cartridge rating. This construction effectively spreads the contaminant through the depth of the filter media resulting in extremely high contaminant capacity with lower pressure drop for longer service life.

Chemical Compatibility

Polypropylene construction provides chemical compatibility in many demanding process fluid applications. Compatibility is influenced by process operating conditions. In critical applications, cartridges should be tested under actual conditions to ensure correct selection.

Flow Characteristics and Sizing Options

Reduced cartridge change-out frequency

For a given process flow rate, the graded-density structure and maximum filter area decrease 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 PBG Series filter allow smaller or fewer housings to be specified. Fewer filter cartridges and smaller housings provide lower capital and consumables costs, year after year.

Ideally, filter systems should be sized at an initial differential pressure of 0.04 to 0.07 bar. Low flow rates further extend the life of the filter system. In most applications, doubling the filter area (reducing the flow rate per unit area by one-half) results in two and one-half times the throughput.

Betafine PBG Series Cartridge Specifications	
Materials	
Media	Graded-Density Pleated Polypropylene
Supports	Polypropylene
Core, Cage, End Caps	Polypropylene
Gasket and O-ring Options	Silicone, Fluorocarbon, Ethylene Propylene, Nitrile
Operating Conditions	
Maximum Operating Temperature	60 °C continuous 80 °C short term
Maximum Forward Pressure Differential	4 bar at 25 °C
Maximum Reverse Pressure Differential	4 bar at 25 °C
Cartridge Dimensions	
Media area versions	1 m ² 10 micron cartridge has media area of 0.6 m ²
Diameter	7 cm
Length	Nominal 10", 20", 30" and 40"

Quality System ISO 9001:2000

Betafine PBG Series filter cartridges are manufactured under an ISO 9001:2000 certified quality system. The quality system ensure that appropriate standards are met or exceeded to provide consistent, high quality products.

The Betafine PBG Series Filtration Advantage

Today's demanding beverage consumer insists on high quality, turbidity-free juices, teas and fruit drinks. Blending water needs to be free of microscopic particulate that can cause haze and undesirable cloudiness in the final beverage. With 1 m² of filtration area per cartridge, the Betafine PBG Series absolute rated filter provides substantially lower filtration costs as compared to competitive offerings.

Betafine PBG Series Filters - Engineered for Food & Beverage

Betafine PBG Series filter cartridges meet the requirements for today's food and beverage processing needs. All material used to construct the filter are FDA CFR Title 21 listed and are safe for food contact applications. The filter cartridge can be autoclaved, steamed-in-place (*in-situ*) and sanitised with hot water. The rugged polypropylene construction and extra large surface area provide excellent performance in all food and beverage filtration applications.

- **Backflushable** - Betafine PBG Series filter applications can be designed with a variety of methods to extend service life. Combined with hot water sanitation or other in-line cleaning procedures, backflushing Betafine PBG Series systems can extend service life significantly.

Protection of Final Membranes

Beverage bottlers frequently employ membrane cartridge filters, such as 3M Purification's LifeASSURE BA, BNA & BDA filter, to achieve microstability without heat pasteurisation. Typical retention ratings for the final filter are 0.45 µm or 0.65 µm. The Betafine PBG Series filter's absolute retention, graded-density structure and extra large surface area are ideal for prefiltration protection of final sterilising membranes. By removing contaminants before the final filter, the life of expensive membrane filter cartridges are extended significantly.

Betafine PBG Series cartridges can be used for finale filtration when a sterile membrane is not essential. A filtration with 0.2 or 0.6 µm Betafine PBG Series assure a greater protection.

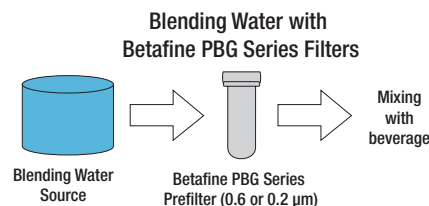
Applications

Betafine PBG Series filter cartridges are recommended for the broad range of prefiltration and clarification applications where reliability and economy are critical. Suggested applications include:

- Protection and Life Extension Of Expensive Membrane Final Filters
- Final Product Clarification
- Food Fermentation Feeds, Intermediates and Fermentation Clarification
- Blending Water Filtration
- Cleaning Fluids
- Solvents Streams
- Air & Gas Prefiltration and Final Filtration

Applications Support - SASS

3M Purification's Scientific Applications Support Services (SASS) is staffed by scientists and engineers, with state-of-the-art laboratory facilities. The SASS staff, familiar with a wide range of filtration and separation applications, work closely with the customer to recommend the most effective and economical 3M Purification filtration systems.



Betafine PBG Series Filter Cartridge Ordering Guide

Model	Absolute Rating***	Configuration	Nominal Length	End Modification	Gasket/O-ring Material
PEG	020 * : 0.2 µm	B - Cartridge 2.8" (7.1 cm)	01 : 10"	B - 226 O-ring with spear	A - Silicone
PBG	060 : 0.6 µm		02 : 20"	C - 222 O-ring with spear	B - Fluorocarbon
PTG *	120 : 1.2 µm		03 : 30"	D - DOE flat gasket (10")	C - EPR
PBP **	250 : 2.5 µm		04 : 40"	E - DOE flat gasket (9 ¾")	D - Nitrile
	500 : 5.0 µm			F - 222 O-ring with Flat Cap	H - Clear silicone
	10C : 10.0 µm				

* PTG020 not available with D & E end modifications.

** Available in 060 (0.6µm) and 120 (1.2µm) ratings only.

*** Retention ratings determined by modified ASTM STP 975. The 0.2 micron rating has been extrapolated. For more information, contact your 3M Purification representative.

Note: Betafine PBG Series is the new name for Polypro XL FB.

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