

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

3M Purification's Betafine PPG 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 PPG Series filters for Pharmaceutical and Biotechnology applications are available in the following versions:

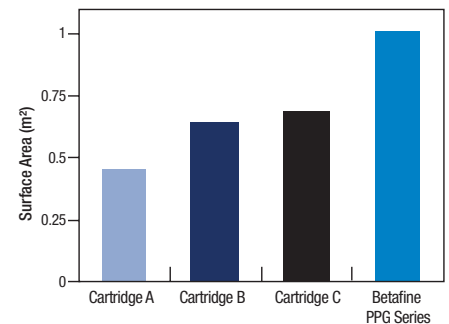
- model PPG, delivered with quality control certificate (pH, extractables, LAL,...)
- model PTG with factory certified integrity testing

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 PPG 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

- Assurance of safety and regulatory compliance in pharmaceutical, bioprocessing and biological filtration
- 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

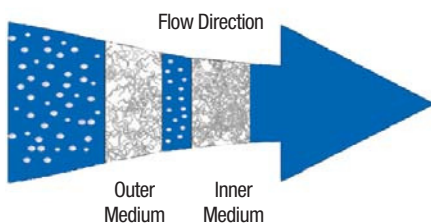
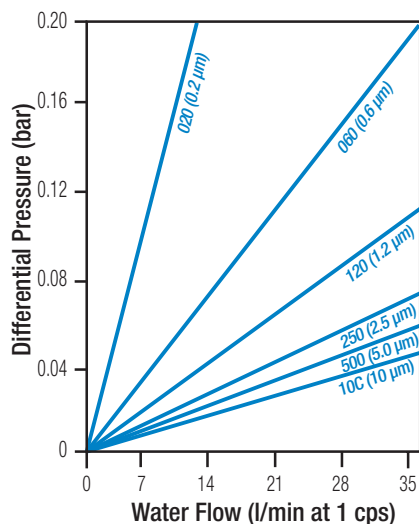
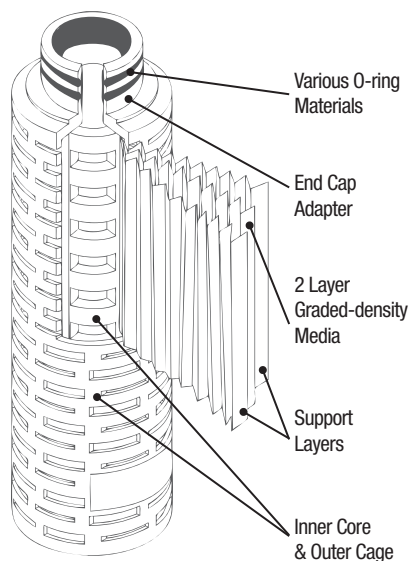


Figure 2: Flow vs. Differential Pressure
Clean Water Flow per 10 Inch Cartridge at Ambient Temperature (20 °C)



Standard Cartridge



Graded-Density - the key to longer life

The Betafine PPG 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 PPG 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 PPG 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 PPG 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 PPG Series Filtration Advantage

In applications such as biological feed streams, serial filtration is often employed for economical filterability. A typical configuration could be a 0.6 µm Betafine PPG Series prefilter upstream of a 0.2 µm rated sterile membrane filter cartridge. In those instances where greater membrane protection is required, a 0.6 µm or a 0.2 µm rated Betafine PPG Series filter will provide longer final membrane life than competitive 0.6 µm rated products. The high surface area of Betafine PPG Series filters coupled with graded-density construction allows the process to run for extended periods of time before filter plugging and change-out.

Betafine PPG Series Filters - Engineered for Pharmaceuticals and Bioprocessing

Constructed from polypropylene media and support materials, the Betafine PPG Series series has ultra-low extractable levels and broad fluid compatibility, providing an ideal choice for a broad range of pharmaceutical applications. Betafine PPG Series filters can be used for general prefiltration, clarification or as a final filter in appropriate applications. All component materials meet the requirements of USP Class VI Biological Tests for Plastics. Betafine PPG Series cartridges may be autoclaved or steamed-in-place (*in-situ*). Two versions of the pharmaceutical grade Betafine PPG Series filters are available - models PPG and PTG. Both are supplied with Certificates of Quality detailing the product attributes and qualification testing. Model PTG is integrity tested prior to shipment for applications where “factory integrity tested” provides added assurance.

- **Safety** - All component materials meet the requirements of USP Class VI Biological Tests for Plastics
- **Sterilisable** - may be autoclaved or steamed-in-place (*in-situ*)
- **Certificate of Quality** details the product attributes and qualification testing

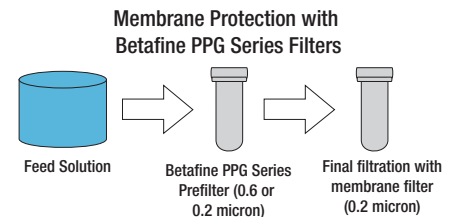
Pharmaceutical, Bioprocess and Biological Applications

Betafine PPG Series filter cartridges serve a broad range of prefiltration and clarification applications in pharmaceutical, biological and bioprocess manufacturing where economy and reliability are critical. Recommended applications include:

- Parenterals (SVP and LVP), Membrane Protection, Ophthalmics, Orals, Topicals, Vaccines and Serum
- Tissue Culture Media, Fermentation Feeds and Intermediates
- Rinse Fluids and Pharmaceutical Fine Chemicals
- Blood Plasma Fractionation
- Reagents and Buffers, High Purity Water Systems, Air & Gas Pre- and Final filtration
- Diagnostics
- Cosmetics Manufacturing

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 PPG Series Filter Cartridge Ordering Guide

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

* PTG020 not available with D & E end modifications.

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

Note: Betafine PPG Series is new name for PolyPro XL PB.

Important Notice

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Data may be subject to change without further notice.

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The below 3M Cuno Bettafine PEG-series cartridge filters are all the models that are potentially possible in all variations. Please note that not all models are actually produced or on stock and some model numbers and names have become obsolete. Nevertheless this should help as cross reference table chart for Cuno filters nomenclature.

Betafine PPG series

PPG 020 B 01
PPG 020 B 02
PPG 020 B 03
PPG 020 B 04
PPG 060 B 01
PPG 060 B 02
PPG 060 B 03
PPG 060 B 04
PPG 120 B 01
PPG 120 B 02
PPG 120 B 03
PPG 120 B 04
PPG 250 B 01
PPG 250 B 02
PPG 250 B 03
PPG 250 B 04
PPG 500 B 01
PPG 500 B 02
PPG 500 B 03
PPG 500 B 04
PPG 10C B 01
PPG 10C B 02
PPG 10C B 03
PPG 10C B 04