

3M Purification

LifeASSURE™ BLA Series Filter Cartridges for Beverage Service



LifeASSURE™ BLA Series Filters

LifeASSURE™ BLA Series filters are 3M Purification's latest advance in membrane filter cartridge technology. Encompassing two leading-edge processes, multi-zone microporous membrane technology and Advanced Pleat Technology (APT) construction, the LifeASSURE BLA series of filter cartridges offers unmatched protection of final membrane filter cartridges, as well as exceptionally long service life. Designed with pleated Nylon 6,6 membrane in an all-polypropylene cartridge construction, LifeASSURE BLA series filter cartridges are ideally suited for a wide range of pre-filtration and clarification applications in the beverage industry

Optimal System Performance

Used as a pre-filter, LifeASSURE BLA series filter cartridges help protect and extend the service life of 3M Purification's LifeASSURE™ BA series and LifeASSURE™ BNA series final filter cartridges, as well as other membrane filter cartridges. LifeASSURE BLA series filter cartridges will:

- Increase final filter cartridge life substantially, often by 10 times.
- Decrease filter cartridge change-outs, greatly reducing filter cartridge costs.
- Significantly reduce effluent microorganism content.

Applications

LifeASSURE™ BLA series filters are optimized for prefiltration and clarification service in food and beverage applications.

- Wine
- Beer
- Bottled Water
- Soft Drinks
- Syrups
- Food grade dyes and flavors
- Preservative solutions
- Blending & wash water
- Distilled Spirits

Multi-zone Microporous Membrane Technology

LifeASSURE BLA series filter cartridges incorporate 3M Purification's advanced Multi-zone microporous membrane technology. It allows unmatched flexibility in creating a multi-zone membrane that offers the maximum in contaminant holding capacity while maintaining high retention efficiency. The SEM photograph on page two shows that the single layer LifeASSURE BLA membrane consists of an "open" zone on the upstream side of the membrane and a "tighter" zone on the downstream side. In effect, the open zone acts as a pre-filter by capturing larger particles and colloids while the tighter zone provides the retention of smaller contaminants. This multi-zone structure eliminates dual-layer membrane construction to provide a larger surface area, significantly increased contaminant holding capacity, and longer service life than competitive filter cartridges.

Features & Benefits

Multi-zone microporous membrane

- Increased contaminant capacity
- Extended service life
- Maximum membrane protection
- Lower total filtration costs than competitive filter cartridges

Advanced Pleat Technology construction for extremely high surface area

- Higher throughputs and longer service life than competitive filter cartridges
- Lower total filtration costs than competitive filter cartridges

100% Integrity tested in manufacturing and *in situ*

- Ensures proper installation and operation

True membrane construction

- Significant reduction of microorganisms

Constructed with CFR 21 listed materials

- Complies with requirements of the Pure Food, Drug and Cosmetic Act.



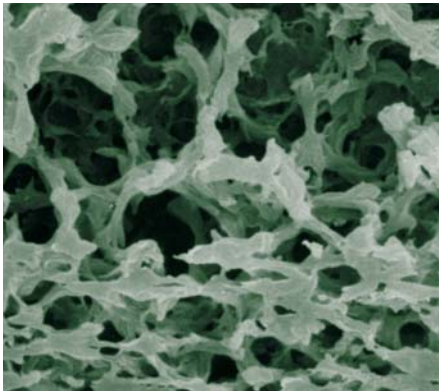


Figure 1 - SEM of Multi-zone microporous Membrane

Products	LRV
LifeASSURE™ BLA020	7.3
Millipore Milligard® CWSS	4.5
LifeASSURE™ BLA045	3.5
Millipore Milligard® CWSC	2.6

Table 1 - Comparative Log Reduction Values

Advanced Pleat Technology Construction

LifeASSURE™ BLA series filters also feature 3M Purification's innovative Advanced Pleat Technology (APT) construction for extended service life. This design construct maximizes the useful surface area of the filter cartridge while maintaining proper flow paths between media pleats. By employing as much as 50% more effective surface area* than competitive filters (see chart 1), the LifeASSURE BLA series filter cartridge provides lower pressure drops, longer service life, and lower overall filtration costs.

Comparative Surface Area

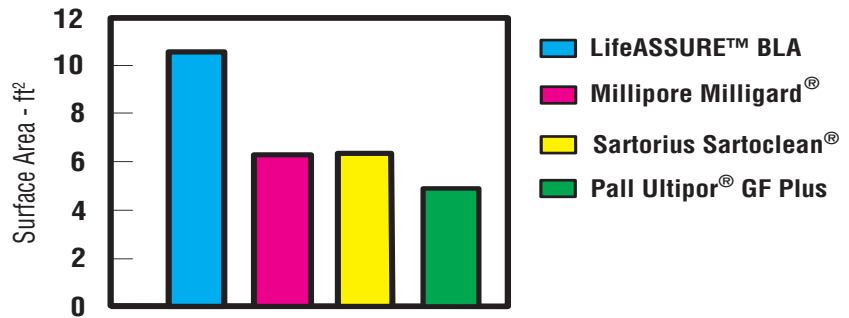


Chart 1 - Surface Area Comparison

Significant Microorganism Reduction

3M Purification LifeASSURE BLA series filter cartridges consistently exhibit a greater reduction of micro-organisms than competitive filters that are either constructed of glass or polypropylene fibers, or filters that are constructed with non-integral membranes. For effective pre-filtration and clarification of beverages, microorganism reduction is a critical parameter resulting in economical, reliable filter cartridge systems.

In tests with *Brevundimonas diminuta*, (considered one of the smallest bacteria) LifeASSURE BLA020 series grade filter cartridges exhibited an average log reduction value** (LRV) of 7.3 and the LifeASSURE BLA045 series grade filter cartridges exhibited an average LRV of 3.5.

Optimize for Service Life and Effluent Quality

As the data in Charts 2 & 3 demonstrate, LifeASSURE BLA filter cartridges are designed to provide both enhanced service life and performance. When compared to competitive products, the available grades of LifeASSURE BLA series filter cartridges allow the user to select equivalent effluent quality with vastly superior life, or improve the effluent quality with reduced, yet competitively superior, service life. Either way, the result is the same, LifeASSURE BLA series filter cartridges allow significantly more throughput than the competitive filter cartridges and provide up to double the service life.

Pre-filter Selection

Since beverages encompass a wide range of fluid conditions, 3M Purification provides an array of LifeASSURE™ BLA series pre-filters to meet the needs of filter users.

- Pre-filtration selection is highly dependent on:
- The nature of the fluid
- The particulate/colloid content of the fluid
- The amount of pre-treatment or clarification of the fluid
- The rating of the membrane filter being protected

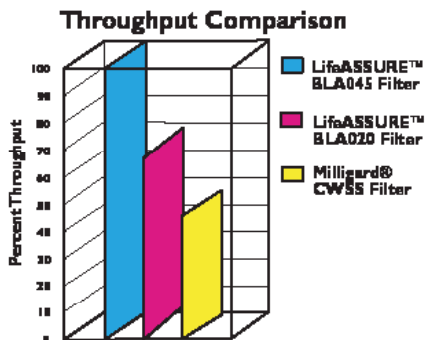


Chart 2. - Throughput comparison of LifeASSURE™ BLA Series filter cartridge and 0.2 µm nominal filter cartridges.

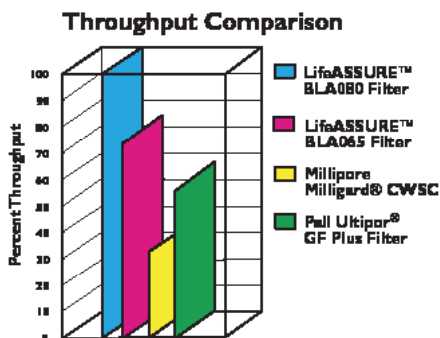


Chart 3. - Throughput comparison of LifeASSURE™ BLA Series filter cartridges and 0.2 µm nominal filter cartridges.

* Competitive filter surface area data is from the respective manufacturers' published literature.

** LRV = log10 number of organisms in/number of organisms out.

The table below is provided as a guide to pre-filter selection, although actual process conditions may dictate the use of a more open or closed pre-filter, than specified below. Pre-filter selection can be aided by smaller scale pilot tests or flow decay studies using membrane discs. Consult 3M Purification's Scientific Applications Support Services (SASS) or 3M Purification Technical Sales for more information.

Pre-Filter Chart

Grade	Upstream Zone	Downstream Zone	Fluid Condition	Pre-filter for:
BLA020	0.65µm	0.2µm	Low particulate/colloid content	LifeASSURE™ BNA020 / BDA020 Series
BLA045	0.8µm	0.45µm	Low particulate/colloid content	LifeASSURE™ BNA020 / BDA020 Series
				Or
				LifeASSURE™ BA045 / BNA045 Series
BLA065	1.2µm	0.65µm	High particulate/colloid content	LifeASSURE™ BA045 / BNA045 series
BLA080	2.5µm	0.8µm	High particulate/colloid content	LifeASSURE™ BA045 / BNA045 Series
				Or
				LifeASSURE™ BA065 / BNA065 Series

3M Purification Final series filters

LifeASSURE™ BA series filter cartridges - Typically employed as the final filter cartridge in wine and beer filtration, the LifeASSURE BA series filter cartridge has up to 40% more surface area than competitive filter cartridges, is resistant to repetitive hot water sanitation, and provides excellent throughputs for low running costs. Available in both 0.65µm and 0.45µm retention ratings, LifeASSURE BA series are the filter cartridges of choice for discerning brewers and winemakers.

LifeASSURE™ BDA020 series filter cartridges – typically employed as final series filter cartridges in applications requiring absolute retention of microorganisms at 0.2 µm. BNA020 series filters are qualified for absolute retention of *B. diminuta* (ATCC 19146) following American Society of Testing and Materials (ASTM) methodology at a minimum challenge level of 107 CFU/cm² of filter cartridge area.

Benefits of Higher Per-Filter Cartridge Flow Rates

The LifeASSURE™ BLA series filter cartridge construction results in a higher per-filter cartridge flow rate at the same pressure drop when compared to competitive filter cartridges. This can reduce filter cartridge costs two ways:

Change-out filter cartridges less frequently - For existing applications at a given flow rate, filter cartridges with more surface area per-cartridge have a lower flux (flow per unit surface area) than those filter cartridges with less surface area. Since service life is inversely proportional to flux (lower flux = longer service life) in most applications, LifeASSURE BLA series filter cartridges provide longer service life and require fewer filter cartridge change-outs than competitor cartridges.

Reduce filter cartridge housing costs - For new applications (where filter cartridge housing size is selected based on a desired “clean” initial pressure drop), filter cartridges that provide a higher flow rate per-cartridge at a given pressure drop will require fewer filter cartridges, and hence a smaller filter cartridge housing, to complete the task.

Installation Integrity Test

The installation integrity test is a non-destructive measurement of a filter cartridge's ability to function as intended. Conducting an installation integrity test assures the user that the filter cartridge is installed and sealed correctly in the filter cartridge housing and is ready for service.

Unlike other pre-filter cartridges, LifeASSURE BLA series filter cartridges are 100% tested for integrity in manufacturing prior to shipment. Additionally, LifeASSURE BLA series filter cartridges are integrity testable in situ by the user. For integrity test procedures and values, please consult your 3M Purification representative.

Sanitation and Sterilization

The use of hot water (80 °C) sanitation or steam (121 °C) sterilization are common strategies employed in beverage production to maintain clean systems. LifeASSURE BLA series filter cartridges are constructed with Nylon 6,6 membrane optimized for thermal stability to ensure resistance to hot water or steam cycles.



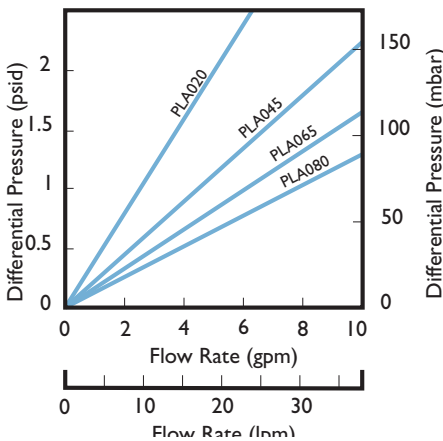
Longer Life with Caustic Cleaning

Cleaning solutions, such as sodium hydroxide, can effectively reduce the impact of beverage colloids in plugging membrane filter cartridges. LifeASSURE™ BLA series filter cartridges, as with LifeASSURE BA series filter cartridges, can be cleaned with a dilute caustic flush, reducing differential pressure build up and extending service life.

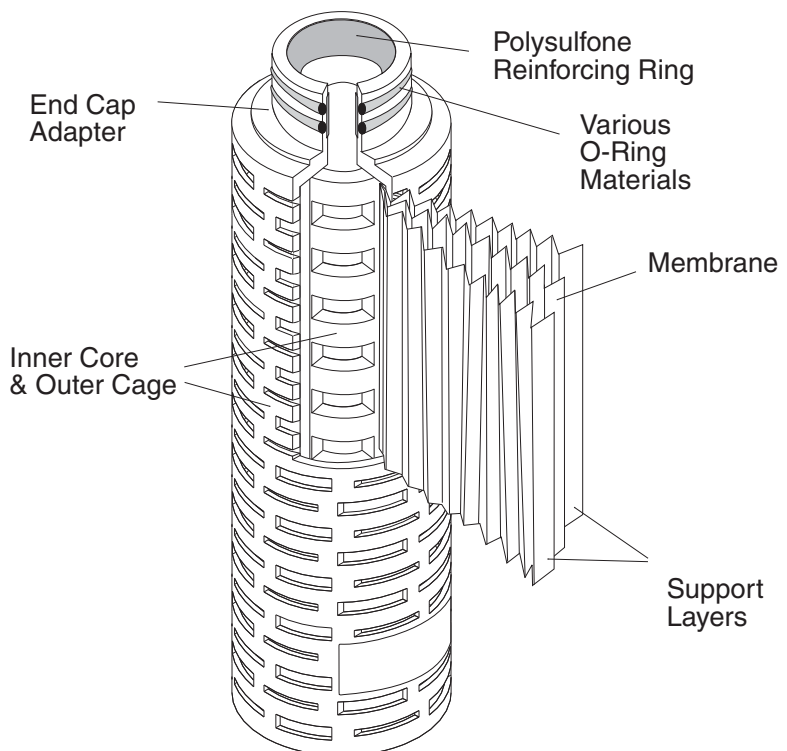
Recommended Cleaning Parameters	
NaOH concentration	2% by weight
Maximum Temperature	60 °C
Flow rate	11 LPM
Duration	30 minutes

LifeASSURE™ BLA series Filter Cartridges Construction

LifeASSURE BLA series filter cartridges are constructed of single-layer, Nylon 6,6 microporous membrane pleated with polypropylene upstream and downstream support materials. The inner core, outer cage and end-cap adapters are made of polypropylene. Multiple length filter cartridges with industry standard connection styles are produced to fit the most widely used housing designs and system sizes. No resin or binder compounds are added. All materials used in manufacturing are traceable and meet requirements and are approved for direct food contact, thereby complying with requirements of the Pure Food, Drug and Cosmetic Act. Filter cartridges are manufactured under an ISO 9001:2008 Quality Management System (QMS) using the most advanced thermoplastic welding techniques to ensure filter cartridge integrity. LifeASSURE BLA series filter cartridges are 100% integrity tested after manufacture to ensure quality.



LifeASSURE™ BLA Series 10" filter cartridge water flow rates @ 25 °C



Filter Cartridge Component	Material of construction
Outer Cage, Inner Core, End-Cap Adapters, and Media Support Layers	Polypropylene
Membrane	Nylon 6,6
Adapter Support Ring	Polysulfone
Filter Cartridge Dimensions	
Filtration Surface Area	1 m ²
Outside Diameter	2¾" (7 cm) nominal
Length	Nominal 10, 20, 30, and 40" (Nominal 25.4, 50.8, 76.2, and 101.6 cm)
Operating Parameters	Specification
Maximum Operation Temperature	80°C for 30 min. sanitation
Maximum Differential Pressure	Forward: 5.5 bar @ 25 °C 1.7 bar @ 80 °C
	Reverse: 3.4 bar @ 25 °C
Recommended Filter Cartridge Change-out Differential Pressure	2.4 bar
Hot Water Sanitation	30 minutes @ 80 °C
Steam Sterilization	30 minutes @ 121°C
Integrity Test Methods	Consult 3M Purification for appropriate values for the specific filter cartridge and housing in use.

LifeASSURE™ BLA Series Filter Cartridge Ordering Guide

Filter Cartridge Grade	Removal Rating	Configuration	Length Inches	End-modification	Gasket/O-ring Material
BLA	020 - 0.20 micron 045 - 0.45 micron 065 - 0.65 micron 080 - 0.80 micron	B - Pleated APT Configuration	01 - 10" 02 - 20" 03 - 30" 04 - 40"	B - 226 O-ring & Spear (Code 7) C - 222 O-ring & Spear (Code 8) D - Double open end (10" Length) E - Double open end (9¾" Length) F - 222 O-ring & Flat Cap (Code 3) J - 226 O-ring & Flat Cap	A - Silicone B - Fluorocarbon C - EPR D - Nitrile H - Clear Silicone *

* O-Ring Only.

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.

It is your responsibility to determine if additional testing or information is required and if this product is fit for a particular purpose and suitable in your specific application.

Limitation of Liability

3M Purification Pty Limited will not be liable, to the extent permitted by law, for any loss or damage from the use of the Product(s), whether direct, indirect, special, or consequential, regardless of the legal theory asserted, included warranty, contract, negligence or strict liability.

**3M Purification Pty Limited**

140 Sunnyholt Road
Blacktown NSW 2148
AUSTRALIA

Tel. 1300 367 362
Fax. 1800 671 599

www.3mpurification.com.au

New Zealand

PO BOX 33-246
North Shore 0740
Auckland, NEW ZEALAND

Tel. 0800 362 886
Fax. 0800 362 880

www.3m.com/nz