

3M Purification

Food and beverage markets

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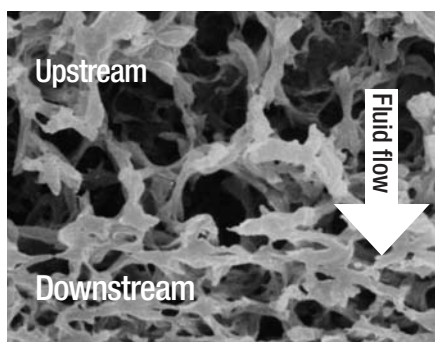
LifeASSURE™ BLA

Series cartridge filters

Robust Nylon 6,6 pleated prefilters for beverage filtration

- ☑ New name for CUNO LifeASSURE FB cartridges
- ☑ Multi-zone microporous membrane design and Advanced Pleat Technology construction
- ☑ Exceptional protection of downstream membranes
- ☑ Extended service life for lower running costs and enhanced flexibility in filtration selection

3M



LifeASSURE BLA Series filters

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

Optimal system performance

LifeASSURE BLA filters can be used as either final filters for spoilage organism removal or as a prefilter. LifeASSURE BLA filters protect and extend the service life of 3M Purification's LifeASSURE BA, BNA and BDA final filters, as well as other membrane filters.

LifeASSURE BLA filters will:

- increase final filter life substantially, often by 10 times or more,
- decrease filter change-outs, greatly reducing filter costs,
- significantly reduce effluent microorganism content.

Multi-zone microporous membrane technology

LifeASSURE BLA filters incorporate 3M Purification's 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 a high retention efficiency. The SEM photograph on the left 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 prefilter 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.

Features and benefits

Multi-zone microporous nylon membrane

- Increased contaminant capacity
- Extended service life
- Maximum membrane protection
- Lower total filtration costs

Advanced Pleat Technology (APT) construction for extremely high surface area

- Higher throughputs and longer service life
- Lower total filtration costs

100% Integrity tested in manufacturing

- Ensures proper installation and operation

True membrane construction

- Significant reduction of microorganisms

Approved for food contact use

-  Complies with European and US regulations

Robust construction

- Stable long service life in harsh beverage filtration environment

APT construction advantage

LifeASSURE BLA filters also feature 3M Purification's Advanced Pleat Technology (APT) construction for extended service life. This design technology maximises the useful surface area of the filter 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 filter provides lower pressure drops, longer service life and lower overall filtration costs.

Significant micro-organism reduction

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

In tests with *Brevundimonas diminuta* (considered one of the smallest bacteria) LifeASSURE BLA 020 grade filters exhibited an average log reduction value (LRV)* of 7.3 and the LifeASSURE BLA 045 grade filters exhibited an average LRV of 3.5.

Optimised for service life and effluent quality

As the data in charts 2 and 3 demonstrate, LifeASSURE BLA cartridges are designed to provide both enhanced service life and performance. When compared to competitive products, the available grades of LifeASSURE BLA filters 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 filters allow significantly more throughput than the competitive filters and provide up to double the service life.

Figure 1: LifeASSURE™ BLA's Advanced Pleat Technology (APT) configuration

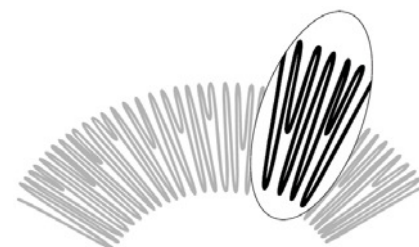


Table 1: Comparative log reduction values

Product	LRV
LifeASSURE™ BLA 020	7,3
Cartridge AS	4,5
LifeASSURE™ BLA 045	3,5
Cartridge AC	2,6

Chart 1: Comparative surface area

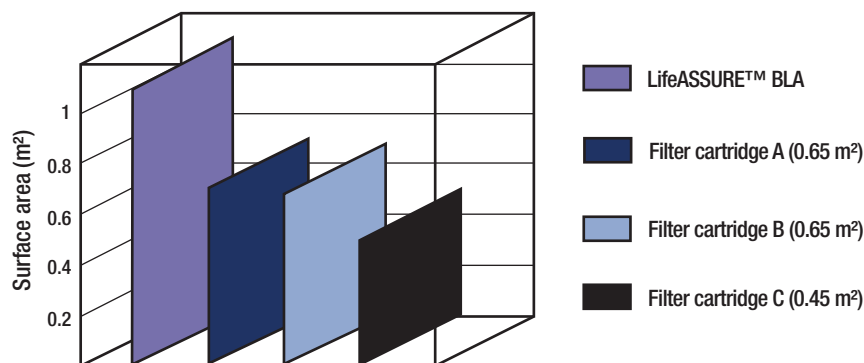


Chart 2: Throughput comparison of LifeASSURE™ BLA filters and 0.2 µm nominal filters

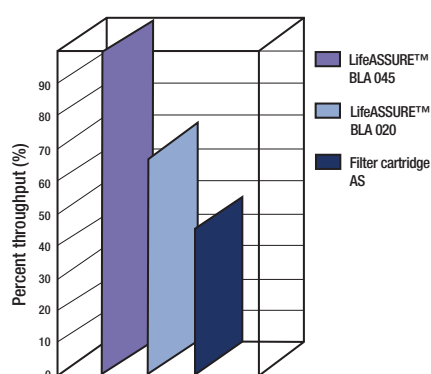
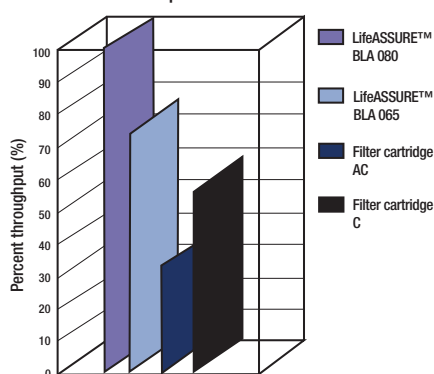


Chart 3: Throughput comparison of LifeASSURE™ BLA filters, 0.5 µm nominal and 1 µm absolute filter



* LRV = $\log_{10}$ (number of organisms in/number of organisms out).



Filter selection

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

Filtration selection is highly dependent on:

- **the nature of the fluid,**
- **the particulate/colloid content of the fluid,**
- **the amount of pretreatment or clarification of the fluid and**
- **if present, the rating of any downstream membrane filter being protected**

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

Prefilter selection chart

Grade	Upstream zone	Downstream zone	Fluid condition	Prefilter for:
BLA 020	0.65 µm	0.2 µm	Low particulate/colloid content	LifeASSURE™ BNA020 LifeASSURE™ BDA020 LifeASSURE™ PSA 0.20 mm
BLA 045	0.8 µm	0.45 µm	Low particulate/colloid content	LifeASSURE™ BNA020 LifeASSURE™ BDA020 LifeASSURE™ BNA045 LifeASSURE™ BA 045
BLA 065	1.2 µm	0.65 µm	High particulate/colloid content	LifeASSURE™ BA 045 LifeASSURE™ BNA045
BLA 080	2.5 µm	0.8 µm	High particulate/colloid content	LifeASSURE™ BNA 065 LifeASSURE™ BA 065

Final filters

LifeASSURE BA and BNA filters

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

LifeASSURE BDA020 and BNA020 filters

These filters are typically employed as the final filter in various water applications. They are constructed with a PES membrane and polypropylene components. LifeASSURE BDA020 grade filters provide complete retention (1×10^7 CFU's/cm²) of *Brevundimonas diminuta* as defined by the FDA. LifeASSURE BNA020 grade filters provide a minimum titer reduction of 1×10^5 CFU's/cm² of *Brevundimonas diminuta*.

Benefits of higher per-cartridge flow rates

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

Change-out filters 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 filter cartridges provide longer service life and require fewer cartridge change-outs.

Reduce filter housing costs

For new applications (where filter 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 cartridges and hence a smaller filter housing to complete the task.

Installation integrity test

The installation integrity test is a non-destructive measurement of the filter’s ability to function as intended. Conducting an installation integrity test assures the user that the filter is installed and sealed correctly in the filter housing and is ready for service. Unlike other filters, LifeASSURE BLA filter cartridges are 100% tested for integrity in manufacturing prior to shipment. Additionally, LifeASSURE BLA filter cartridges are integrity testable *in situ* by the user. For integrity test procedures and values, please consult 3M Purification.

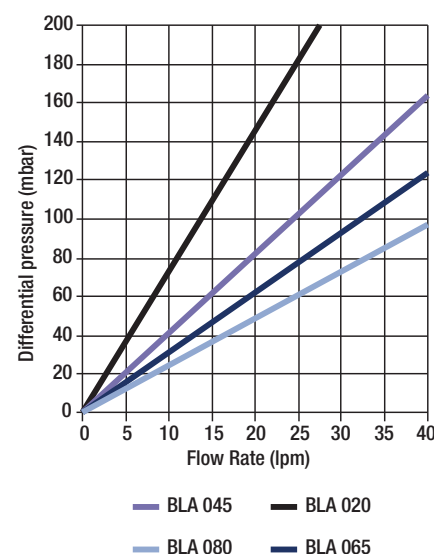
Sanitation and sterilisation

The use of hot water (80 to 90 °C) sanitation or steam (121 °C) sterilisation are common strategies employed in beverage production to maintain clean systems. LifeASSURE BLA filters are constructed with Nylon 6,6 membranes optimised for thermal stability to ensure resistance to hot water or steam cycles.

Longer life with caustic cleaning

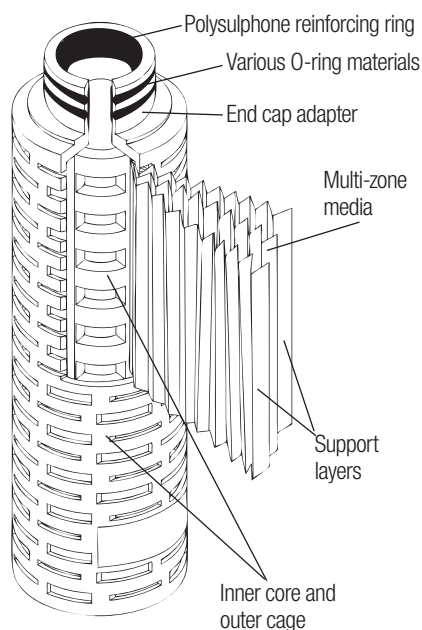
Cleaning solutions, such as sodium hydroxide, can effectively reduce the impact of beverage colloids in plugging membrane filters. LifeASSURE BLA filters, as with LifeASSURE BA filters, can be cleaned with a dilute caustic flush, reducing differential pressure build up and extending service life.

Chart 4: LifeASSURE™ BLA 10” cartridge water flow rates at 25 °C



Recommended cleaning parameters	
NaOH concentration	2 % by weight
Maximum temperature	60 °C
Flow rate	11 lpm
Duration	30 minutes

Standard Cartridge



LifeASSURE BLA Series cartridge specifications

LifeASSURE BLA filter cartridges are constructed of a single-layer, Nylon 6,6 microporous membrane pleated with polypropylene upstream and downstream support materials. The cage, core and end cap adapter are made of polypropylene. Multiple length 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. Cartridges are manufactured under an ISO certified quality system using the most advanced thermoplastic welding techniques to ensure filter integrity. LifeASSURE BLA filters are 100% integrity tested after manufacture to ensure quality.

Materials of construction	
Cage, core, end caps and media support layers	polypropylene
Membrane	Nylon 6,6
Adapter support ring	polysulphone
Cartridge dimensions	
Filter surface area	1 m ²
Outside diameter	2 ¾" (7 cm) nominal
Length	nominal 10, 20, 30 and 40 inches (nominal 25.4, 50.8, 76.2 and 101.6 cm)
Operating parameters	
Short term maximum operating temperature	80 °C for 30 min. sanitation
Maximum differential pressure	Forward: 5.5 bar at 25 °C 1.7 bar at 80 °C Reverse: 3.4 bar at 25 °C
Recommended filter change-out differential pressure	2.4 bar
Hot water sanitation	30 minutes at 80 °C
Steam sterilisation	30 minutes at 121 °C
Integrity test parameters	Consult 3M Purification for appropriate values for the specific filter and housing in use.
Regulatory compliance	
LifeASSURE™ BLA Series filter cartridges comply with the requirements of Regulation (EC) 1935/2004 for their intended food contact applications. All materials of construction are listed in the FDA CFR Title 21. Contact 3M Purification for further information.	

Scientific Applications Support Services (SASS)

The cornerstone of 3M Purification's philosophy is service to customers, not only in product quality and prompt service, but also in problem solving, application support and in the sharing of scientific information.

3M Purification's Scientific Applications Support Services group is a market-oriented group of scientists and engineers who work closely with customers to solve difficult separations problems and aid in the selection of the most effective and economical filtration systems.

SASS specialists are skilled in performing on-site Vmax testing (a predictive method for filter throughput) and are able to relate field test results to full manufacturing scale operations. SASS projects can also be performed in 3M Purification's extensive state-of-the-art laboratory facilities.

3M Purification's vast experience with countless beverage installations provides the knowledge and insight to resolve problems promptly and efficiently in a cost-effective and confidential manner.

Filter housings

A specialised range of filter housings are available to meet the needs of the beverage industry. They provide easy access for filter change-out and the greatest assurance that LifeASSURE BLA filter cartridges are sealed securely, thus eliminating the possibility of fluid bypass. All housings are constructed using 316L stainless steel to maximise corrosion resistance. Internal surfaces of the IW filter housings are polished at least 0.8 µm Ra to limit microbial adhesion and provide easy cleaning.



Housing IW specifications	01 IWN / 03 IWN / 05 IWN / 08 IWN	12 IWN	18 IWN / 24 IWN
Design code	AD Merkblätter 95		
Housing material (in contact)	316L (1.4404) stainless steel		
Surface finish	Mechanical polish < 0.8 micron Ra		
Closure	Clamped	Bolted	Bolted
Number of cartridges	1 - 3 - 5 - 8	12	18 -24
Standard gasket material	Silicone (others on request)		
Cartridge height	1, 2, 3 and 4 high		3 and 4 high
Connection sizes	• Threaded male DIN 11851 • Triclover • DIN 2633 flanges • MACON		
Vent connections	½" TC		
Max. operating pressure	10 bar g	9 bar g	8 bar g
Max. operating temperature	150 °C		
PED 97/23/CE	Category I		Category I (18 IWN) Category II (24 IWN)
ATEX 94/9/CE	II-2-G/D-T5		
This table is intended as a guide. Grade selection and performance should be confirmed with small-scale pilot trial.			

LifeASSURE™ BLA Series filter cartridges - Ordering guide

Cartridge grade	Removal rating (µm)	Configuration	Length (inches)	End modifications	Gasket/O-ring material
BLA	020 – 0.20 045 – 0.45 065 – 0.65 080 – 0.80	B – Pleated APT material	01 – 10" 02 – 20" 03 – 30" 04 – 40"	B – 226 O-ring and spear (Code 7) C – 222 O-ring and spear (Code 8) D – Double open end (10" length) E – Double open end (9¾" length) F – 222 O-ring and flat cap (Code 3) J – 226 O-ring and flat cap	A – silicone (MVQ)** B – fluorocarbon (FPM)** C – EPDM (EPDM)** D – nitrile (NBR)** H – clear silicone*

* O-ring

** ISO designation

Note: LifeASSURE BLA is new name for CUNO LifeASSURE FB.

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.

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