

LifeASSURE™



Cartridge Filters for Beverage Service

New FlexN™ Multi-Zone Membrane Design

Combined with the Innovative
MaxMedia™ Pleat Construction



Exceptional protection
of downstream membranes



Extended service life for
lower running costs



Enhanced flexibility in
prefiltration selection



LifeASSURE™ Cartridge Filters

LifeASSURE filter cartridges are CUNO's latest advance in membrane filter technology. Encompassing two leading-edge processes, FlexN membrane manufacture and MaxMedia pleating construction, the LifeASSURE series of filters offers unmatched protection of final membrane filters, as well as exceptionally long service life. Designed with pleated Nylon 66 membrane in an all- polypropylene cartridge construction, LifeASSURE filters are ideally suited for a wide range of pre-filtration and clarification applications in the beverage industry.

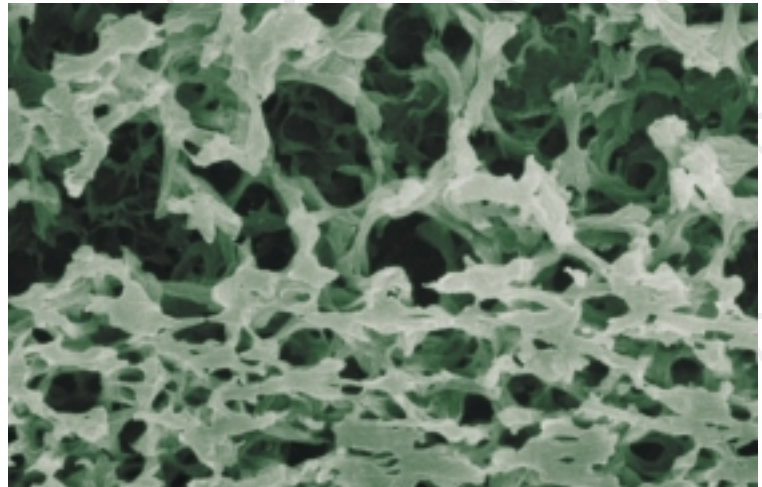
Optimal System Performance

Used as a prefilter, LifeASSURE filters protect and extend the service life of CUNO's BevASSURE™ II and Zetapor® final filters, as well as other membrane filters. LifeASSURE filters will:

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

FlexN™ Membrane Technology

LifeASSURE cartridge filters incorporate CUNO's advanced FlexN 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 at right shows that the **single layer** LifeASSURE 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.



Features	Benefits
■ Multi-zone, FlexN Nylon membrane	■ Increased contaminant capacity ■ Extended service life ■ Maximum membrane protection ■ Lower total filtration costs
■ MaxMedia construction for extremely high surface area	■ Higher throughputs and longer service life ■ Lower total filtration costs
■ 100% Integrity tested in manufacturing and <i>in situ</i>	■ Ensures proper installation and operation
■ True membrane construction	■ Significant reduction of microorganisms
■ Constructed with CFR 21 listed materials	■ Safe for food contact

* US and foreign patents pending.

MaxMedia™ Construction Advantage

LifeASSURE cartridge filters also feature CUNO's innovative MaxMedia construction for extended service life. This design technology maximizes 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 filter provides lower pressure drops, longer service life and lower overall filtration costs.

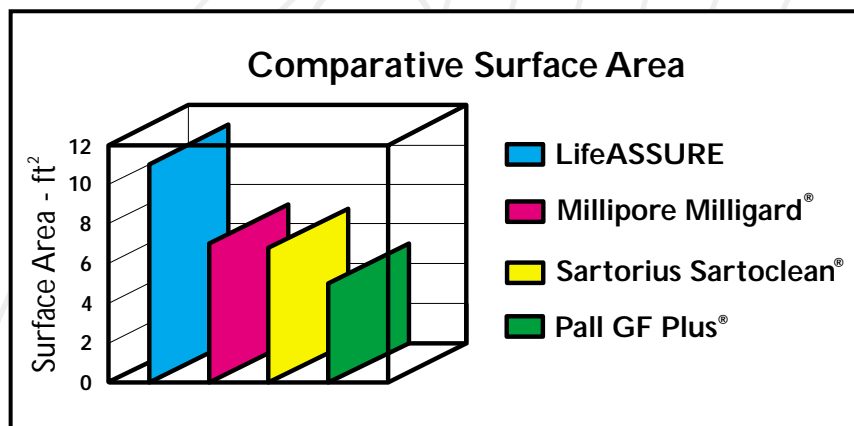


Chart 1 - Surface Area Comparison

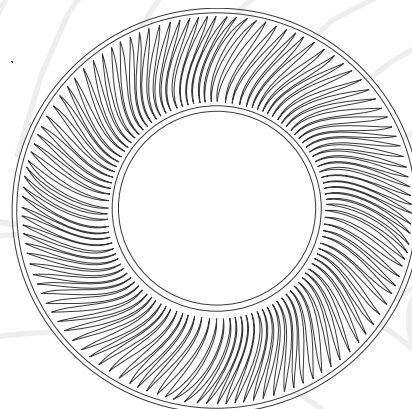


Figure 1 - LifeASSURE's Unique Pleat Configuration

Significant Microorganism Reduction

CUNO LifeASSURE filters consistently exhibit a greater reduction of microorganisms than competitive filters that are either constructed of glass or polypropylene fibers, or filters that are constructed with non-integral membranes. For effective prefiltration and clarification of beverages, microorganism reduction is a critical parameter resulting in economical, reliable filter systems.

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

* Competitive filter surface area data are from the manufacturer's published literature.

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

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

Optimize for Service Life and Effluent Quality

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

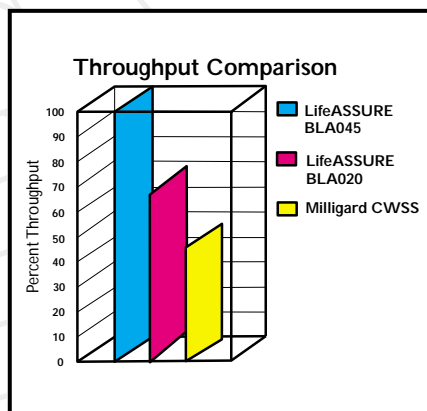


Chart 2 - Throughput comparison of LifeASSURE filters and 0.2 µm nominal filters.

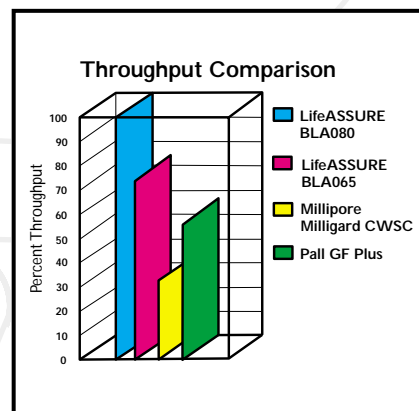


Chart 3 - Throughput comparison of LifeASSURE filters, a 0.5 µm nominal filter, and a 1µm absolute filter.

Prefilter Selection

Since beverages encompass a wide range of fluid conditions, CUNO provides an array of LifeASSURE prefilters to meet the needs filter users.

Pre-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
- the rating of the 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 pre-filter, than specified below. Prefilter selection can be aided by smaller scale pilot tests or flow decay studies using membrane discs. Consult CUNO's Scientific Applications and Support Services (SASS) or CUNO Technical Sales for more information.

Prefilter Selection Chart

Grade	Upstream Zone	Downstream Zone	Fluid Condition	Pre-filter for:
BLA020	0.65µm	0.2µm	Low particulate/colloid content	Zetapor® 020SP, 020ST
BLA045	0.8µm	0.45µm	Low particulate/colloid content	Zetapor® 020SP, 020ST
				Or
				BevASSURE™ BA045
BLA065	1.2µm	0.65µm	High particulate/colloid content	BevASSURE™ BA045
BLA080	2.5µm	0.8µm	High particulate/colloid content	BevASSURE™ BA045
				Or
				BevASSURE™ BA065

CUNO Final Filters

BevASSURE™ II Filters - Typically employed as the final filter in wine and beer filtration, the BevASSURE II 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 costs. Available in both 0.65µm and 0.45µm retention ratings, BevASSURE II cartridges are the filters of choice for discerning brewers and winemakers.

Zetapor® Filters - Typically employed as the final filter in various water applications, Zetapor series filter cartridges are constructed with proprietary charge-modified nylon membrane and polypropylene cartridge components. Zetapor 020SP grade filters provide complete retention (1×10^7 CFU's/cm²) of *B. diminuta* as defined by the FDA. Zetapor 020ST grade filters provide a minimum titer reduction of 1×10^5 CFU's/cm² of *B. diminuta*. Both Zetapor grades are validated products and are supplied with a CUNO Validation Guide.



Benefits of Higher Per-Cartridge Flow Rates

The unique LifeASSURE 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 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 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 give pressure drop will require fewer cartridges, and hence a smaller filter housing, to complete the task.

Installation Integrity Test

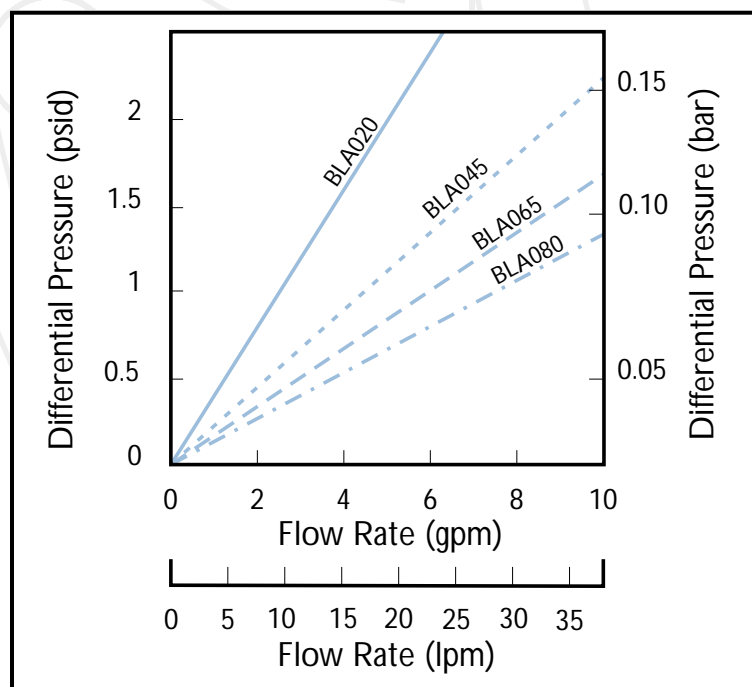
The installation integrity test is a non-destructive measurement of a filter’s ability to function as intended. Conducting an installation integrity test assures the user that the filter is installed and sealed correctly in the filter housing and is ready for service.

Unlike other pre-filters, LifeASSURE filter cartridges are 100% tested for integrity in manufacturing prior to shipment. Additionally, LifeASSURE filter cartridges are integrity testable in situ by the user. For integrity test procedures and values, please consult CUNO document LITTDC03.

Sanitation and Sterilization

The use of hot water (180°F/80°C) sanitation or steam (250°F/121°C) sterilization are common strategies employed in beverage production to maintain clean systems. LifeASSURE filters are constructed with patented (US Patent 5,458,782) Nylon 6,6 membrane optimized for thermal stability to ensure resistance to hot water or steam cycles.

Cartridge Flow Rates



LifeASSURE 10" cartridge water flow rates @ 77° (25°C)

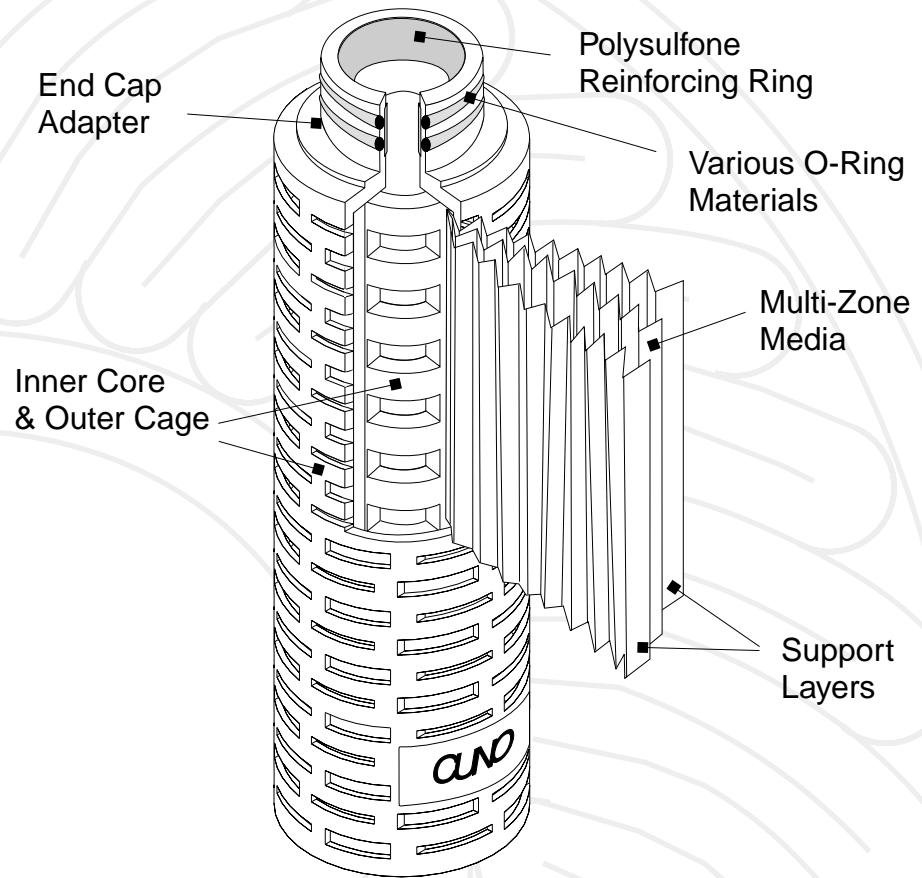
Longer Life with Caustic Cleaning

Cleaning solutions, such as sodium hydroxide, can effectively reduce the impact of beverage colloids in plugging membrane filters. LifeASSURE filters, as with BevASSURE II final filters, 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	140°F/60°C
Flow rate	3 GPM/11 LPM
Duration	30 minutes

LifeASSURE Cartridge Construction

LifeASSURE filter cartridges are constructed of single-layer, patented* Nylon 66 microporous membrane pleated with polypropylene upstream and downstream support materials. The cage, core and end-cap adapters 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. All materials used in manufacturing are traceable and CFR 21 listed for direct food contact. Cartridges are manufactured under an ISO 9001 certified quality system using the most advanced thermoplastic welding techniques to ensure filter integrity. LifeASSURE filters are 100% integrity tested after manufacture to ensure quality.



Cartridge Component	Material of construction
Cage, Core, End-Caps, and Media Support Layers	Polypropylene
Membrane	Nylon 66
Adapter Support Ring	Polysulfone
Cartridge Dimensions	Dimension
Filtration Surface Area	11 ² ft (1m ²)
Outside Diameter	2¾" (7 cm) nominal
Length	Nominal 10, 20, 30, and 40 inches (Nominal 25.4, 50.8, 76.2, and 101.6 cm)
Operating Parameters	Specification
Maximum Operation Temperature	180°F (80°C) for 30 min. sanitation
Maximum Differential Pressure	Forward: 80 psid (5.5 bar) @ 75°F (25°C) 25 psid (1.7 bar) @ 180°F (80°C)
	Reverse: 50 psid (3.4bar) @ 75°F (25°C)
Recommended Filter Change-out Differential Pressure	35 psid (2.4 bar)
Hot Water Sanitation	30 minutes @ 180°F (80°C)
Steam Sterilization	30 minutes @ 250°F (121°C)
Integrity Test Methods	Consult CUNO for appropriate values for the specific filter and housing in use.

* U.S. Patent 5,458,782

Scientific Applications Support Services (SASS)

The cornerstone of CUNO'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. CUNO'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 CUNO's extensive state-of-the-art laboratory facilities. CUNO'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.



CUNO Filter Housings

A specialized 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 filter cartridges are sealed securely, thus eliminating the possibility of fluid bypass. All housings are constructed using 316L stainless steel to maximize corrosion resistance. Internal surfaces of the ZWB & ZWC filter housings are polished to 20 micro-inch Ra to limit microbial adhesion and provide easy cleaning.

Housing Model	ZWC	ZWB	SD
Basic Part Number / Cartridge Capacity	70180 / 4	70192 / 4	5SD / 5
	70189 / 8	70193 / 8	12SD / 12
	70190 / 11	70194 / 11	22SD / 22
	70191 / 21	70195 / 21	--
Housing Style	t-line Sanitary type connection		NTP & Raised Face Flange
Equivalent Cartridge Lengths	10, 20, 30, and 40 inches		
Materials of Construction	316L Stainless Steel		
Pressure & Temperature Ratings	75 psi (5 bar) @ 200°F (90°C)	150 psi (10 bar) @ 200°F (90°C)	150 psi (10 bar) @ 200°F (90°C)
Literature #	LITZRH.106	LITZRH.106	LITHSSD1



Ordering Guide

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 MaxMedia 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 (9 ¾" Length) F - 222 O-ring & Flat Cap (Code 3) J - 226 O-ring & Flat Cap	A - Silicone B - Fluorocarbon C - EPDM D - Nitrile H - Clear Silicone *

* O-Ring Only.

WARRANTY

Seller warrants its equipment against defects in workmanship and material for a period of 12 months from date of shipment from the factory under normal use and service and otherwise when such equipment is used in accordance with instructions furnished by Seller and for purposes disclosed in writing at the time of purchase, if any. Any unauthorized alteration or modification of the equipment by Buyer will void this warranty. Seller's liability under this warranty shall be limited to the replacement or repair, F.O.B., point of manufacture, of any defective equipment or part which, having been returned to the factory, transportation charges prepaid, has been inspected and determined by Seller to be defective.

THIS WARRANTY IS IN LIEU OF ANY OTHER WARRANTY, EITHER EXPRESSED OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE OR USE, OR ANY OTHER MATTER. Under no circumstances shall Seller be liable to Buyer or any third party for any loss of profits or other direct or indirect costs, expenses, losses or consequential damages arising out of or as a result of any defects in or failure of its products or any part or parts thereof or arising out of or as a result of parts or components incorporated in Seller's equipment but not supplied by the Seller.

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