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LifeASSURE™ BNA020 Series

Log-Reduction Grade Membrane Filters

0.2 µm rated filters for bottled water & beverage microbiological stability

3M Purification's LifeASSURE BNA020 Series filter, formerly known as BevASSURE PES, features a asymmetrical polyethersulfone (PES) membrane with an Advanced Pleat Technology (APT) construction. This design results in a robust filter that is optimised for both long service life and fast flowing applications, while providing 0.2 µm rated filtration for superior removal of microorganisms.

The LifeASSURE BNA020 Series filter helps bottled water and other beverage processors meet the high standards for microorganism control. Combined with 3M Purification's range of particle control and prefiltration filter cartridges, LifeASSURE BNA020 final filters offer bottlers a complete solution for rigorous contaminant control while maintaining long service life and low operating costs.

Durable Design

The LifeASSURE BNA020 Series filter membrane and cartridge design innovations result in a highly durable filter cartridge, capable of secure operation through numerous cycles of hot water sanitation and chemical based cleaning and sanitation protocols.

Advanced Technologies

Highly Asymmetric BNA020 Membrane

LifeASSURE BNA020 Series filters incorporate a dual-zone PES membrane with a high degree of asymmetry (Figure 1). When viewed in cross-section, the membrane contains larger pores on the upstream surface that gradually taper to smaller pores towards the downstream surface.

Compared to conventional membranes with a symmetric pore structure, this structure provides greater contaminant capacity, since it presents greater open spaces (void volume) in which to retain these contaminants. This increase in capacity leads directly to longer service life. In addition, the asymmetric structure provides less resistance to flow, resulting in a lower pressure drop when compared at a constant flow rate to competitive filters, allowing a user to employ fewer LifeASSURE BNA020 filters for any given flow rate.



Features and benefits

0.2 µm rated membrane

- Reliable, high LRV microorganism control

Asymmetric polyethersulfone (PES) membrane

- Exceptionally high capacity and service life resulting in maximum economy

Advanced Pleat Technology construction

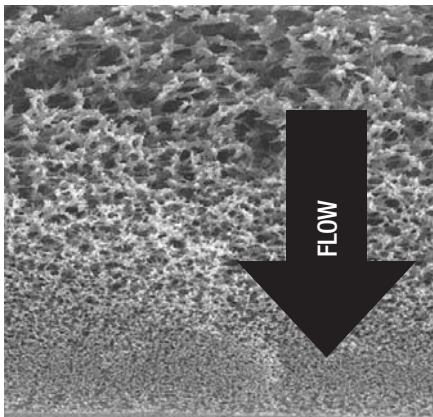
- Allows superior fluid and contaminant access to filter surface area for greatest service life and flow rates

21 CFR compliant materials of construction, EEC Directive 2002/72EC tested, USP Biological Reactivity for Class VI Plastics Test, Technical Support Guide

- Eases regulatory concerns

The 3M logo, consisting of the letters '3M' in a bold, red, sans-serif font.

Figure 1: SEM Photograph Showing LifeASSURE BNA020 - Membrane Cross-Section



Advanced Pleat Technology Design

LifeASSURE BNA020 Series filters feature the Advanced Pleat Technology (APT) design for extended service life. This design technology maximises the useful surface area of the filter while maintaining open flow paths between the media pleats (refer to Figure 2). By employing the APT design, the LifeASSURE BNA020 Series filter provides lower pressure drops, longer service life and lower overall operational costs.

Media Support Design

LifeASSURE BNA020 Series filters employ a design that results in higher beverage flow versus pressure drop compared to competitive filters. This unique 3M Purification development combines the high flowing PES membrane with special support layers upstream and downstream of the membrane. When combined with the previously mentioned Advanced Pleat Technology, this feature greatly increases flow per cartridge, and results in lower overall operational costs.

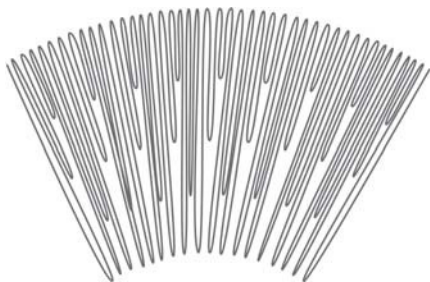
Advanced Performance

Extended Service Life

In the majority of beverage applications, the final membrane filter is used in a continuous (as opposed to a batch) operation. Its service life is measured either by the volume filtered, or the number of days in service, before becoming permanently blocked. Filters that provide longer service life not only reduce direct operational costs, but also reduce indirect filter costs as well (filter change-out/installation labour, downtime between change-outs, filter flushing, etc.). The LifeASSURE BNA020 Series filter’s unique combination of highly asymmetric PES membrane, Advanced Pleat Technology design, and upstream/downstream supports all work together to maximise the volume of beverage that can be processed.

LifeASSURE BNA020	Microorganism	Retention Level
BNA020	<i>Brevundimonas diminuta</i>	LRV > 7
BNA020	<i>Pseudomonas aeruginosa</i>	LRV > 7

Figure 2: Advanced Pleat Technology Design



Advanced Microbiological Control

The primary purpose of a membrane filter cartridge in bottled water and beverage processing is to effectively control even the smallest microorganisms. LifeASSURE BNA020 Series 0.2 micron rated filters provide superior retention of common spoilage microorganisms, even at challenge concentrations that far exceed those experienced by most beverage producers. LifeASSURE BNA020 Series membrane has been shown to provide Log Reduction Values (LRV) in excess of 7 with *Brevundimonas diminuta* (ATCC 19146) and *Pseudomonas aeruginosa* at a concentration of 10⁷ CFU/cm² or greater.

Fast Flow Rates at Low Pressure Drops

3M Purification has combined three key technological advances to provide the fastest flow rate per unit of pressure drop. These three technologies, Advanced Pleat Technology (APT) design, an upstream and downstream support design and a unique, highly asymmetric microporous membrane, afford users with faster process flow rates using fewer filters as compared to alternative filters.

Initial Clean Pressure Drop (water) for a 30" Filter Flowing at 76 l/min	
LifeASSURE BNA020	152 mbar
Competitor A	200 mbar
Competitor B	400 mbar
Competitor C	310 mbar

As the example on the previous page illustrates, the pressure drop at a given flow rate for LifeASSURE BNA020 Series filters can be a significantly lower compared to competitive filters. Since filter change-out is usually tied to a terminal differential pressure drop (typically between 1.4 and 2.4 bar), employing filters that exhibit a lower initial pressure drop can result in longer filter service life.

Alternatively, in a new system when determining the number of filters needed to provide a desired flow rate at a given pressure drop, faster flowing filters will result in smaller, more economical systems. Consider the example on the left. As the example illustrates, the nearest competitor requires significantly more 30” filters to provide the same flow rate and pressure drop.

The Number of 30” filters needed to provide a 170 l/min flow with a clean pressure drop of 69 mbar	
LifeASSURE BNA020	5 filters
Competitor A	8 filters
Competitor B	14 filters
Competitor C	8 filters

Materials of Construction	
Membrane	Polyethersulfone (PES)
Support layers	Polypropylene
Core, Cage, End Caps, Adapters	Polypropylene
Encapsulated Adapter Reinforcing Ring	Polysulfone
O-rings	Various polymers available
Nominal Filter Dimensions	
Effective Filtration Area (EFA)	0.79 m ²
Filter Diameter	70 mm
Filter lengths	10” (254 mm), 20” (508 mm), 30” (762 mm), 40” (1016 mm)
Operating Parameters	
Typical Water Flow Rate at 25 °C	17 litre per min/100 mbar
Maximum Differential Pressure (forward)	5.5 bar at 25 °C - 1.7 bar at 80 °C
Maximum Differential Pressure (reverse)	0.69 bar at 25 °C
Maximum Forward Flow Diffusion at 25 °C per 10” filter	51 cc/min at 2.4 bar
Maximum hot water sanitation temperature	85 °C
Maximum steam temperature	126 °C
Maximum peracetic acid exposure	1% (10,000 ppm)



Automated Integrity Testing - MicroCheck 2

A full range of non-destructive integrity tests can be easily and automatically performed with the MicroCheck 2 integrity test instrument. The MicroCheck 2 and MiniCheck integrity test instruments provide fast, reliable and accurate automated integrity testing of LifeASSURE™ BNA020 Series cartridges.

LifeASSURE BNA020 Cartridge Construction - Prefiltration Selections

Many bottling applications employ a prefilter and final filter in series to achieve maximum performance and economy. Prefilters are used to help protect and extend the life of more expensive final filters. 3M Purification offers a number of premium prefilter choices: Betafine™ XL pleated filter cartridges, Betapure™ NT depth filter cartridges and LifeASSURE™ BLA membrane filter cartridges. Betafine™ XL filter cartridges feature 3M Purification’s Advanced Pleat Technology maximising the accessible filter area and supplying exceptionally high flow rates. Those preferring depth-style filters can select from 3M Purification’s Betapure™ NT prefilter family which employs an advanced media design that enhances flow while extending service life. For additional bioburden control, 3M Purification’s LifeASSURE™ BLA filter cartridges, featuring dual-zone membrane, are designed to deliver the ultimate in final membrane protection and bioburden reduction.

Filter Housings

A specialised range of filter housings is available to meet the needs of the food & beverage industry. They provide easy access for filter change-out and they ensure that LifeASSURE™ BNA020 filter cartridges are sealed securely to eliminate the possibility of fluid bypass. All housings are constructed using 316L stainless steel to maximise corrosion resistance. Internal surfaces of the housings are polished to 20 micro-inch Ra to limit microbial adhesion and provide easy cleaning. 3M Purification also offers custom-design, fully automated filtration skids and mobile units. These units can incorporate membrane housings, prefilter housings, SIP and CIP systems along with all necessary piping, valves, monitoring devices and computer controls for reliable, hands-free operation.

LifeASSURE BNA020 Series Filter Ordering Guide

Cartridge Grade	Configuration	Length Inches	End-modification	O-ring Material
BNA020 LifeASSURE BNA020 0.2 µm	F - APT Pleat	01 - 10" 02 - 20" 03 - 30" 04 - 40"	B - 226 O-ring & Spear (Code 7) C - 222 O-ring & Spear (Code 8) F - 222 O-ring & Flat Cap (Code 3) J - 226 O-ring & Flat Cap	A – Silicone B – Fluorocarbon C – EPR D - Nitrile

Note: LifeASSURE BNA020 new name for BevASSURE PES 0.2 µm

Example: The part number for a 30" LifeASSURE BNA020 Filter, 0.2 micron retention rating, 226 silicone O-ring connector with locating spear, would be: BNA020F03BA.

LifeASSURE BNA020 Series Filter Disc Ordering Guide

Part Number	Size / Packaging
NM04708 BNA020	47 mm disc / 40 box

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3M Purification MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Since a variety of factors can affect the use and performance of a 3M Purification product in a particular application, some of which are uniquely within the user's knowledge and control, user is responsible for determining whether or not the 3M Purification product is fit for a particular purpose and suitable for user's method of application.

Limited Warranty

3M Purification warrants this product to be free from defects in material and workmanship during normal use for a period of one (1) year from the date of shipment from the factory. If the Product(s) is (are) defective within this warranty period, your exclusive remedy and 3M Purification's sole obligations shall be, at 3M Purification's option, to replace or repair the Product(s) or refund the original purchase price of the Product(s). This warranty does not apply to failures that result from abuse, misuse, alteration or damage not caused by 3M Purification or failure to properly follow installation and use instructions.

Limitation of Liability: 3M Purification will not be liable for any loss or damage arising from the use of the Product(s), whether direct, indirect, special, incidental, or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you.

This warranty gives you specific legal rights and you may have other rights which vary from state to state, or country to country.

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BNA020 F 01 B B	BNA020 F 03 B B
BNA020 F 01 B C	BNA020 F 03 B C
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