Science.
Applied to Life

3M™ LifeASSURE™ BNA045 and BNA65 Series Filter Cartridges

For Food and Beverage Applications

Technical Support Guide

Introduction

This technical support guide provides information pertinent to 3M™ LifeASSURE™ BNA Series 0.45 and 0.65 micron rated membrane filter cartridges. It contains information that supports the efficacy, performance and safety of 3M LifeASSURE BNA045 and BNA065 Series Filter Cartridges in Food and Beverage applications.

This technical support guide has been prepared specifically for manufacturers requiring product documentation as part of their process qualification. It includes the following test data to support published performance claims:

Product Quality Assurance Information and Product Release Testing

- Materials of Construction
- Dimension Chart (heights and diameters)
- Surface Area Chart
- Part Number Overview
- Maximum Allowable Forward Differential Pressure
- Maximum Allowable Reverse Differential Pressure
- Wetting Procedure
- Integrity Test Values
- Water Flow Rate Chart

Product Performance Test Results

- Non-fiber Shedding Data
- Bacteria Retention
  - Basis of Tests (why we conduct them)
  - Test Methods
  - Results
- Product Robustness Testing
  - Hot Water
  - Steam
  - Oxonia Active®
  - Sodium Hydroxide

Safety and Regulatory Support

- ISO 9001:2015 Certification
- Material Safety Data Sheet
- Food Contact Compliance
- USP Biological Test for Plastics — Class VI and Elution Test Results

Further technical data and product information can be found in “3M LifeASSURE BNA Series Filter Cartridges for Beverage Micobiological Stability”.

Further information may be obtained by contacting: 3M Application Engineering at: (203) 237-5541.

Product Quality Assurance Information and Product Release Testing

A. Lot Number Identification and Traceability — Each 3M™ LifeASSURE™ BNA045 and BNA065 Series Filter Cartridge is engraved with a unique and traceable lot number identification. This lot number allows for easy retrieval of all Quality Control data related to the production of this filter.

B. All 3M LifeASSURE BNA045 and BNA065 Series Filter Cartridges are tested for integrity prior to shipment.

C. Audit tests, including *Water Flow Rate* and *Bacterial Retention* are performed on a routine basis.

Product Specifications

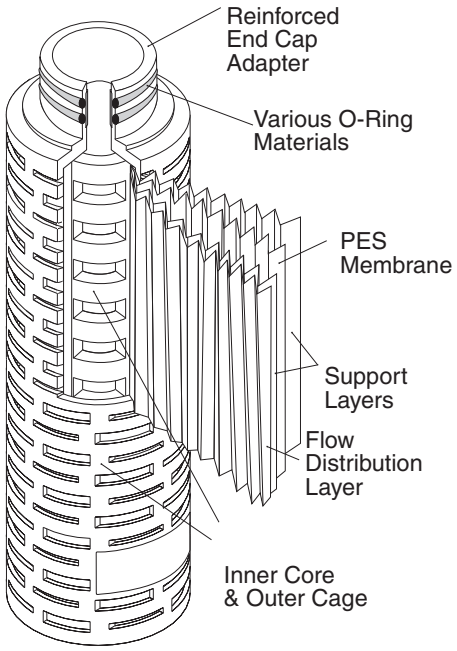
Materials of Construction

3M LifeASSURE BNA Series Filter Cartridges are constructed of single-layer, highly-asymmetric polyethersulfone membrane pleated with polypropylene upstream and downstream support materials. The inner core, outer cage and end cap reinforced adapters are made of polypropylene. No resin or binder compounds are added. Multiple length filter cartridges with industry standard connection styles are produced to fit the most widely used housing designs.

All materials used in manufacturing are traceable. All materials of construction have been tested and passed USP Class VI Biological Tests for Plastics at 121°C.

3M LifeASSURE BNA Series Filter Cartridges are manufactured under an ISO certified quality system using the most advanced thermoplastic welding techniques to ensure filter integrity.

3M LifeASSURE BNA Series Filter Cartridges are 100% integrity tested after manufacture to ensure quality and are supplied with a Certificate of Quality. The filter cartridge grade, lot number and serial number are thermally etched into the cage assembly of the filter cartridge.



Materials of Construction	
Membrane	Polyethersulfone
Support Layers	Polypropylene
Inner Core, Outer Cage, End Caps	Polypropylene
Reinforced Adapters	Polypropylene with Polysulfone Reinforcing Ring
O-rings	Various

Nominal Filter Cartridge Dimensions				
Filter Cartridge Diameter	2.75" (70 mm)	2.75" (70 mm)	2.75" (70 mm)	2.75" (70 mm)
Filter Cartridge Lengths	10" (254 mm)	20" (508 mm)	30" (762 mm)	40" (1016 mm)
Nominal Effective Filtration Area (EFA)	8.5 ft.^{2} (0.79 m^2)	17 ft.^{2} (1.58 m^2)	25.5 ft.^{2} (2.37m^2)	34 ft.^{2} (3.16m^2)

3M™ LifeASSURE™ BNA Series Filter Cartridge Part Number Description

Cartridge	Rating (µm)	Configuration	Length (Inches)	End-modification	O-Ring/Gasket Material
3M™ LifeASSURE™ BNA Series	**045** – 0.45 **065** – 0.65	**F** – APT Pleat	**01** – 10 **02** – 20 **03** – 30 **04** – 40	**B** – 226 O-rings, Bayonet Lock & Spear **C** – 222 O-ring & Spear **F** – 222 O-ring & Flat Cap **J** – 226 O-rings, Bayonet Lock & Flat Cap **T** – 222 with Spear (Sartorius code 28, not available with support ring)	**A** – Silicone **B** – Fluorocarbon **C** – EPR **D** – Nitrile

Operating Parameters	
Recommended Flow Rate (10" Element)	**Beer:** 1–2 gpm (3.8–7.6 lpm) **Wine:** 2–3 gpm (7.6–11.4 lpm) **Maximum:** 9 gpm per psid (34 lpm per 68.9 mbar)
Max. Differential Pressure (Forward)	80 psid @ 77°F (5.5 bar @ 25°C)
Max. Differential Pressure (Reverse)	35 psid @ 194°F (2.4 bar @ 90°C)
Max. Hot Water Sanitation Temperature	50 psid @ 77°F (3.44 bar @ 25°C)
Max. Steam Sterilization Temperature	194°F (90°C) – 150, 30-minute cycles
NaOH Cleaning Duration (Conc. 1M @ 65°C)	100 hours
Peracetic Acid Sanitation (Conc. 1% @ 21°C)	100 hours

Wetting Procedures for Filter Cartridge Integrity Testing

Any of the following three methods may be used to wet the filter cartridges for the integrity test:

1. With the housing vent valve open and the downstream valve slightly opened or completely closed, fill the housing with water. When water begins to exit through the housing vent valve, close the vent valve, close the downstream valve and stop the flow of water into the housing. Allow the water to remain in the housing for approximately 5 minutes to statically wet the filter cartridges. Open the vent valve and the housing drain valve or the downstream valve and drain the housing. Perform the required integrity test.

2. With the housing vent valve open and the downstream valve slightly opened or completely closed, fill the housing with water. When water begins to exit through the housing vent valve, close the vent valve and open the downstream valve. Flow water through the housing for approximately 5 minutes at 3 gpm per 10 inch filter cartridge with no downstream back pressure.

3. With the housing vent valve open and the downstream valve completely closed, fill the housing with water. When water begins to exit through the housing vent valve, close the vent valve. Initiate water flow into the housing at minimum of 50 psi supply pressure. Let the water continue to flow into the housing and leave the housing under these pressure conditions for 5 minutes. After 5 minutes, slowly open the downstream valve and allow water to flow through the housing for approximately 2 minutes at a minimum water flow rate of 0.5 lpm per 10 inch filter cartridge.

Integrity Test Values

3M™ LifeASSURE™ BNA Series Filter Cartridges can be integrity tested by the user by one of three methods: the Forward Flow Integrity Test (FFIT), the Bubble Point Test (BPT), or the Pressure Hold Test (PHT).

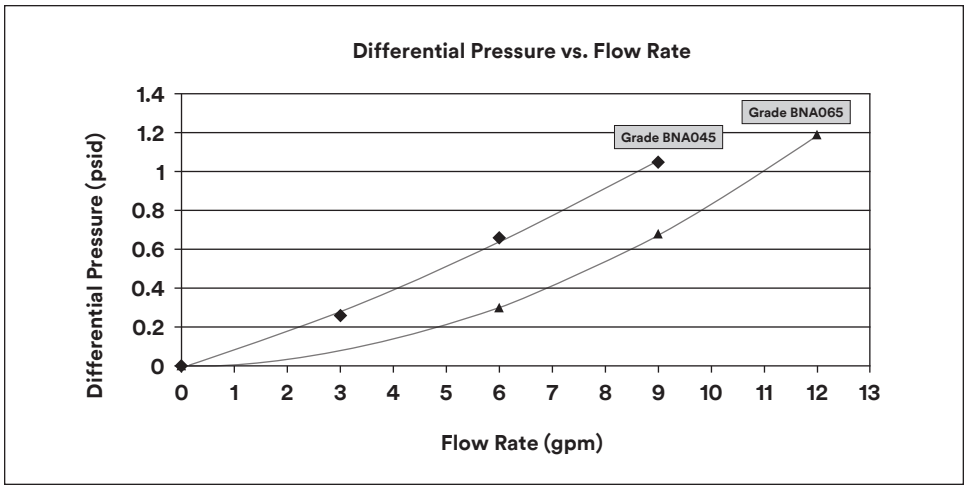
Grade ID	FFIT Pressure	FFIT Limits	Minimum Bubble Point	Pressure Hold Limits
3M™ LifeASSURE™ BNA045	22 psi / 1.5 bar	<35 cc/min @ 25°C	>24 psi / 1.76 bar	Consult 3M Purification Inc.
3M™ LifeASSURE™ BNA065	15 psi / 1.0 bar	<25 cc/min @ 25°C	>17 psi / 1.2 bar	Consult 3M Purification Inc.

Please consult with 3M for detailed instructions on performing the integrity tests.

The Pressure Hold Test requires calculation of the housing and system volume upstream of the filter cartridge assembly. Consult with 3M for assistance in calculating this volume and the correct Pressure Hold Test values for your system.

Water Flow Rate vs. Differential Pressure

3M™ LifeASSURE™ BNA045 and BNA065 Series Filter Cartridges



Product Performance Test Results

Non-fiber Shedding Data

Particulate matter in effluent samples from 10 inch filter cartridges was evaluated. Sample filter cartridges from three (3) lots were flushed with 0.2 micron filtered water. Effluent water samples were collected and evaluated for total particulate matter by vacuum filtration through a 47-mm gridded analysis membrane. Each analysis membrane was examined microscopically at 125X magnification. A total of 25 out of 160 grids were examined and total particles and fibers were counted. Results are reported in particles >10 micron and >25 micron per mL of effluent water sample.

3M™ LifeASSURE™ BNA045 and BNA065 Series Filter Cartridges — Non-fiber Shedding Data

Cartridge #	Particles/mL >10 micron	Particles/mL >25 micron
05N033-0046	<1	<1
05N033-0047	<1	<1
05N037-0043	<1	<1
05N037-0051	<1	<1

Results: The results for the analysis of effluent samples for the level of particulate matter are consistent with a non-fiber releasing filter cartridge. The results indicate that the level of particulate matter found in the effluent samples were less than the USP specification for LVP acceptable particulate matter of <12 particles/fibers per mL for particles/fibers >10 micron and <2 particles/fibers per mL for particles/fibers >25 micron.

For a filter cartridge to be considered as “Non-Fiber Shedding” it must meet the requirements of 21 CFR 211.72 and 210.3 (b) (6).

Bacteria Retention

Basis of Tests

The primary purpose of a membrane filter installed in a food or beverage process is to effectively control spoilage microorganisms. Microorganisms specific to the food and beverage industry were selected to demonstrate the retention capabilities of 3M™ LifeASSURE™ BNA Series Filter Cartridges.

Oenococcus oeni Retention

3M™ LifeASSURE™ BNA Series 10 inch filter cartridges rated 0.45 µm from three different production lots were flushed with water at 3 gpm for 5 minutes with a 5 psi backpressure and forward flow integrity tested. The filter cartridges were then challenged with a suspension of *Oenococcus oeni* in white wine at a concentration of 1×10^7 CFU/mL. The filtrate from each filter cartridge was assayed to determine the log reduction ratio value (LRV) for each filter cartridge. Postchallenge, the filter cartridges were flushed with deionized water and forward flow integrity tested to confirm they were still integral after the bacteria challenge.

3M™ LifeASSURE™ BNA045 Series Filter Cartridges — *Oenococcus oeni* Retention

Cartridge #	Forward Flow Integrity @ 22 psi	LRV
05N020-0005	Pass	10.4
05N020-0009	Pass	9.0
05N020-0033	Pass	>11.9
05N024-0003	Pass	6.7
05N024-0016	Pass	7.9
05N024-0044	Pass	7.9
05N033-0013	Pass	9.5
05N033-0019	Pass	10.2
05N033-0024	Pass	9.3

Results: The tested 3M LifeASSURE BNA045 Series 0.45 micron rated filter cartridges retained *Oenococcus oeni* at an average LRV of 9 when challenged with an average challenge level of 7.2×10^7 CFU/cm^2.

Serratia marcesens Retention

3M LifeASSURE BNA Series 10 inch filter cartridges rated 0.45 µm from three different production lots were flushed with water at 3 gpm for 3 minutes and forward flow integrity tested. The filter cartridges were then challenged with a suspension of *Serratia marcescens* in sterile deionized water at a concentration of 1×10^7 CFU/mL. The filtrate from each filter cartridge was assayed to determine the log reduction ratio value (LRV) for each filter cartridge. Post-challenge, the filter cartridges were flushed with deionized water and forward flow integrity tested to confirm they were still integral after the bacteria challenge.

3M™ LifeASSURE™ BNA045 Series Filter Cartridges — *Serratia marcesens* Retention

Cartridge #	Forward Flow Integrity @ 22 psi	LRV
05N020-0019	Pass	8.4
05N020-0021	Pass	7.0
05N020-0030	Pass	8.9
05N024-0006	Pass	8.9
05N024-0010	Pass	8.3
05N024-0050	Pass	8.7
05N033-0006	Pass	>10.9
05N033-0015	Pass	>10.9
05N033-0020	Pass	>10.8

Results: The LifeASSURE BNA045 Series 0.45 micron rated filter cartridges retained *Serratia marcescens* at an average LRV of 8 when challenged with an average challenge level of 7.5×10^6 CFU/cm^2.

Lactobacillus brevis Retention

3M™ LifeASSURE™ BNA Series 10 inch filter cartridges rated 0.45 micron and 0.65 micron from three different production lots were flushed with water at 3 gpm for 3 minutes with a 5 psi backpressure and forward flow integrity tested. The filter cartridges were then challenged with a suspension of *Lactobacillus brevis* in degassed beer at a concentration of 1×10^7 CFU/mL. The filtrate from each filter cartridge was assayed to determine the log reduction ratio value (LRV) for each filter cartridge. Post-challenge, the filter cartridges were flushed with deionized water and forward flow integrity tested to confirm they were still integral after the bacteria challenge.

3M™ LifeASSURE™ BNA045 Series Filter Cartridges — *Lactobacillus brevis* Retention

Cartridge #	Forward Flow Integrity @ 22 psi	LRV
05N020-0001	Pass	10.4
05N020-0014	Pass	10.0
05N020-0027	Pass	8.1
05N024-0001	Pass	10.2
05N024-0008	Pass	10.4
05N024-0024	Pass	8.0
05N033-0005	Pass	>11
05N033-0018	Pass	>11.2
05N033-0023	Pass	>11.1

Results: The tested 3M LifeASSURE BNA045 Series 0.45 micon rated filter cartridges retained Lactobacillus brevis at an average LRV of 10 when challenged with an average challenge level of 4.9×10^6 CFU/cm^2.

3M™ LifeASSURE™ BNA065 Series Filter Cartridges — *Lactobacillus brevis* Retention

Cartridge #	Forward Flow Integrity @ 15 psi	LRV
05N016-0011	Pass	8.6
05N016-0014	Pass	10.4
05N016-0019	Pass	7.5
05N023-0002	Pass	7.6
05N023-0009	Pass	7.8
05N023-0022	Pass	8.1
05N037-0013	Pass	>11.1
05N037-0017	Pass	>10.7
05N037-0044	Pass	>11

Results: The tested 3M LifeASSURE BNA065 Series 0.65 micron rated filter cartridges retained Lactobacillus brevis at an average LRV of 7 when challenged with an average challenge level of 3.9×10^6 CFU/cm^2.

Dekkera intermedia Retention

3M™ LifeASSURE™ BNA Series 10 inch filter cartridges rated 0.45 micron and 0.65 micron from three different production lots were flushed with water at 3 gpm for 5 minutes and forward flow integrity tested. The filter cartridges were then challenged with a suspension of *Dekkera intermedia* in dilute acetic acid solution at pH 4.0 at a concentration of 1×10^6 CFU/mL. The filtrate from each filter cartridge was assayed to determine the log reduction ratio value (LRV) for each filter cartridge. Post-challenge, the filter cartridges were flushed with deionized water and forward flow integrity tested to confirm they were still integral after the bacteria challenge.

3M™ LifeASSURE™ BNA045 Series Filter Cartridges — *Dekkera intermedia* Retention

Cartridge #	Forward Flow Integrity @ 22 psi	LRV
05N020-0003	Pass	>10.2
05N020-0017	Pass	>10.5
05N020-0032	Pass	>10.4
05N024-0020	Pass	>9.8
05N024-0042	Pass	7.0
05N024-0051	Pass	10.1
05N033-0012	Pass	9.0
05N033-0021	Pass	>10.1
05N033-0045	Pass	9.4

Results: The tested 3M LifeASSURE BNA045 Series 0.45 micron rated filter cartridges retained *Dekkera intermedia* at an average LRV of 9 when challenged with an average challenge level of 1.5×10^6 CFU/cm^2.

3M™ LifeASSURE™ BNA065 Series Filter Cartridges — *Dekkera intermedia* Retention

Cartridge #	Forward Flow Integrity @ 15 psi	LRV
05N016-0025	Pass	8.4
05N016-0031	Pass	10.0
05N016-0038	Pass	N/A
05N023-0006	Pass	>10.0
05N023-0015	Pass	9.2
05N023-0019	Pass	8.9
05N037-0020	Pass	>10.1
05N037-0025	Pass	>10.1
05N037-0027	Pass	>10.1

Results: The tested 3M LifeASSURE BNA065 Series 0.65 micron rated filter cartridges retained *Dekkera intermedia* at an average LRV of 9 when challenged with an average challenge level of 1.0×10^6 CFU/cm^2.

Product Robustness Testing

Exposure to Hot Water and Steam

In order to evaluate the effects of thermal stress, 3M™ LifeASSURE™ BNA Series 10 inch filter cartridges from different production lots and were subjected to repetitive Hot Water (90°C) and *in-situ* steam cycles at 131°C. The hot water and *in-situ* steam cycles were 30 minutes each with cooling between cycles. Test filter cartridges were evaluated for integrity by Forward Flow Integrity Testing (FFIT) at a test pressure of 22 psi or 15 psi for 0.45 micron rated and 0.65 micron rated, respectively, initially and at various intervals following the thermal cycles.

Hot Water (90°C) Sanitation Cycles

3M™ LifeASSURE™ BNA045 Series Filter Cartridges

Cartridge #	Cycle 50	Cycle 100	Cycle 150
05N020-0007	Pass	Pass	Pass
05N020-0020	Pass	Pass	Pass
05N020-0029	Pass	Pass	Pass
05N024-0005	Pass	Pass	Pass
05N024-0012	Pass	Pass	Pass
05N024-0019	Pass	Pass	Pass
05N033-0001	Pass	Pass	Pass
05N033-0009	Pass	Pass	Pass
05N033-0027	Pass	Pass	Pass

Results: The results show that the 3M LifeASSURE BNA045 Series Filter Cartridges tested withstood up to 150, 30 minute hot water (90 °C) cycles.

3M™ LifeASSURE™ BNA065 Series Filter Cartridges (FFIT values at a test pressure of 40 psig at 25°C)

Cartridge #	Cycle 50	Cycle 100	Cycle 150
05N016-0004	Pass	Pass	Pass
05N016-0015	Pass	Pass	Pass
05N016-0041	Pass	Pass	Pass
05N023-0004	Pass	Pass	Pass
05N023-0013	Pass	Pass	Pass
05N023-0020	Pass	Pass	Pass
05N037-0006	Pass	Pass	Pass
05N037-0019	Pass	Pass	Pass
05N037-0034	Pass	Pass	Pass

Results: The results show that the 3M LifeASSURE BNA065 Series Filter Cartridges tested withstood up to 150, 30 minute hot water (90 °C) cycles.

In-situ Steam Sterilization Cycles

3M™ LifeASSURE™ BNA045 Series Filter Cartridges

Cartridge #	Cycle 75	Cycle 100	Cycle 150
05N020-0002	Pass	Fail	N/A
05N020-0015	Pass	Pass	Pass
05N020-0025	Pass	Pass	Pass
05N024-0021	Pass	Pass	Pass
05N024-0025	Pass	Pass	Pass
05N024-0045	Pass	Pass	Pass
05N033-0003	Pass	Pass	Pass
05N033-0017	Pass	Pass	Pass
05N033-0025	Pass	Pass	Pass

Results: The results indicate that the tested 3M™ LifeASSURE™ BNA045 Series Filter Cartridges tested withstood up to 75, 30 minute *in-situ* steam sterilization cycles at 135°C.

3M™ LifeASSURE™ BNA065 Series Filter Cartridges

Cartridge#	Cycle 75	Cycle 100	Cycle 150
05N016-0001	Pass	Pass	Pass
05N016-0008	Pass	Pass	Pass
05N016-0034	Pass	Pass	Pass
05N023-0003	Pass	Pass	Pass
05N023-0012	Pass	Pass	Pass
05N023-0018	Pass	Pass	Pass
05N037-0011	Pass	Pass	Pass
05N037-0029	Pass	Pass	Pass
05N037-0050	Pass	Pass	Pass

Results: The results indicate that the tested 3M LifeASSURE BNA065 Series Filter Cartridges tested withstood up to 75, 30 minute *in-situ* steam sterilization cycles at 135°C.

Sanitation Agent Compatibility — Oxonia Active®

In order to evaluate the compatibility of 3M™ LifeASSURE™ BNA Series Filter Cartridges with peracetic acid/hydrogen peroxide sanitation agents typically used in the Food and Beverage industry, 3M LifeASSURE BNA Series 10 inch filter cartridges from different production lots and were subjected to repetitive exposures to a 1% aqueous solution of Oxonia Active® at ambient temperature. Initially, and prior to each exposure interval, the filter cartridges were Forward Flow Integrity Tested at a test pressure of 22 psi or 16 psi for 0.45 micron rated and 0.65 micron rated, respectively. After each exposure interval, the filter cartridges were Forward Flow Integrity tested to confirm the filter cartridges remained integral after exposure to the Oxonia Active® solution. Following the Forward Flow Integrity Test, each filter cartridge was forward flow bubble point tested to release as much water as possible from the pores of the membrane and then exposed to a fresh 1% aqueous Oxonia Active solution for the next exposure interval.

3M™ LifeASSURE™ BNA045 Series Filter Cartridges — Cumulative Exposure to Oxonia Active® Solution

Cartridge #	Cycle 50	Cycle 100	Cycle 150
05N024-0004	Pass	Pass	Pass
05N024-0023	Pass	Pass	Pass
05N033-0016	Pass	Pass	Pass
05N033-0022	Pass	Pass	Pass

Results: The results indicate that the 3M LifeASSURE BNA045 Series Filter Cartridges exposed were compatible with 1% Oxonia Active® up to a total of 150 cumulative hours.

3M™ LifeASSURE™ BNA065 Series Filter Cartridges — Cumulative Exposure to Oxonia Active® Solution

Cartridge #	Cycle 50	Cycle 100	Cycle 150
05N023-0023	Pass	Pass	Pass
05N023-0026	Pass	Pass	Pass
05N037-0007	Pass	Pass	Pass
05N037-0021	Pass	Pass	Pass

Results: The results indicate that the 3M LifeASSURE BNA065 Series Filter Cartridges exposed were compatible with 1% Oxonia Active® up to a total of 150 cumulative hours.

Cleaning Agent Compatibility — Sodium Hydroxide

In order to evaluate the compatibility of 3M™ LifeASSURE™ BNA Series Filter Cartridges with caustic cleaning solutions, 3M LifeASSURE BNA Series 10 inch filter cartridges from different production lots and were subjected to repetitive exposures to 1 M aqueous sodium hydroxide (NaOH)solution at 65°C. Initially, and prior to each exposure interval, the filter cartridges were Forward Flow Integrity Tested at a test pressure of 22 psi or 15 psi for 0.45 micron rated and 0.65 micron rated, respectively. After each exposure interval, the filter cartridges were Forward Flow Integrity tested to confirm the filter cartridges remained integral after exposure to the 1 M NaOH solution. Following the Forward Flow Integrity Test, each filter cartridge was forward flow bubble point tested to release as much water as possible from the pores of the membrane and then exposed to a fresh 1 M NaOH solution for the next exposure interval.

3M™ LifeASSURE™ BNA045 Series Filter Cartridges — Cumulative Exposure to 1 M NaOH at 65°C

Cartridge #	Cycle 50	Cycle 100	Cycle 150
05N020-0012	Pass	Pass	Pass
05N020-0023	Pass	Pass	Pass
05N020-0028	Pass	Pass	Fail
05N024-0002	Pass	Pass	Pass
05N024-0009	Pass	Pass	Pass
05N024-0049	Pass	Pass	Pass
05N033-0002	Pass	Pass	Pass
05N033-0010	Pass	Pass	Pass
05N033-0026	Pass	Pass	Pass

Results: The results indicate that the 3M LifeASSURE BNA045 series filter cartridges exposed were compatible 1 M NaOH up to a total of 100 cumulative hours.

3M™ LifeASSURE™ BNA065 Series Filter Cartridges — Cumulative Exposure to 1 M NaOH at 65°C

Cartridge #	Cycle 50	Cycle 100	Cycle 150
05N016-0005	Pass	Pass	Pass
05N016-0033	Pass	Pass	Pass
05N016-0043	Pass	Pass	Fail
05N023-0007	Pass	Pass	Pass
05N023-0016	Pass	Pass	Pass
05N023-0024	Pass	Pass	Pass
05N037-0005	Pass	Pass	Pass
05N037-0023	Pass	Pass	Pass
05N037-0041	Pass	Pass	Pass

Results: The results indicate that the 3M LifeASSURE BNA065 series filter cartridges exposed were compatible 1 M NaOH up to a total of 100 cumulative hours.

Safety and Regulatory Support

In addition to product performance test results, the following safety and regulatory support information is provided:

- ISO 9001:2015 Certification
- Material Safety Data Sheet
- Food Contact Compliance Information
- USP Biological Test for Plastics — Class VI and Elution Test Results

CERTIFICATE

TÜVRheinland®

TUV Rheinland of North America, Inc.

295 Foster Street, Suite 100, Littleton, MA 01460

Hereby certifies that

3M Purification, Inc.

400 Research Parkway Meriden, CT	32 River Road Stafford Springs, CT	3M Separation and Purification Sciences Division, 3M Center St Paul, MN

Sales, Human Resources, Customer Service, Quality, Laboratory, Manufacturing, Maintenance, Shipping & Receiving, Purchasing, Warehouse

has established and maintains a quality management system for the

Design, Development and Manufacture of Products for Filtration, Ultrafiltration and Other Media Platforms for the Potable Water, Industrial Processing, and Food and Beverage Applications

An audit was performed and documented in Report No 9519.
Proof has been furnished that the requirements according to

ISO 9001:2015

are fulfilled.
Further clarification regarding the scope of this certificate and the applicability of ISO 9001:2015 requirements may be obtained by contacting TRNA.

Certificate Registration No.

74 300 9519

Certificate Issue Date
August 10, 2017

Reissue Date: 8/15/2018

ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

Certificate Expiration Date
August 09, 2020

Certification of Management Systems

Material Safety Data Sheet

This material safety data sheet (MSDS) is provided as a courtesy in response to a customer request. This product is not regulated under, and a MSDS is not required for this product by the OSHA Hazard Communication Standard (29 CFR 1910.1200) because, when used as recommended or under ordinary conditions, it should not present a health and safety hazard. However, use or processing of the product not in accordance with the product's recommendations or not under ordinary conditions may affect the performance of the product and may present potential health and safety hazards.

Section 1: Chemical Product and Company Identification

Product Name: 3M™ LifeASSURE™ Series Filter Cartridges

Date: April 2011

Company: 3M Purification Inc.

Address: 400 Research Parkway, Meriden, CT 06450-1018, USA

Product Specific Use: *For chemical emergency, spill, leak, fire, exposure or accident.*

Emergency Phone: 1-800-364-3577 or (651) 737-6501 (24 hours)

For non-emergency information, call (203)-238-8965

Section 2: Composition/Information on Ingredients

Ingredient: CAS No., % by Wt.

Section 3: Hazards Identification

Odor, Color, Grade: Refer to Section 9

General Physical Form: Solid

Immediate health, physical, and environmental hazards: This product, when used under reasonable conditions and in accordance with the 3M Purification directions for use, should not present a health hazard. However, use or processing of the product in a manner not in accordance with the product's directions for use may affect the performance of the product and may present potential health and safety hazards.

Potential Health Effects

Eye Contact: No health effects are expected

Skin Contact: No health effects are expected

Inhalation: No health effects are expected

Ingestion: No health effects are expected

Section 4: First Aid Measures

Potential Environmental Effects

Eye Contact: No need for first aid is anticipated

Skin Contact: No need for first aid is anticipated

Inhalation: No need for first aid is anticipated

If Swallowed: No need for first aid is anticipated

Section 5: Fire-Fighting Measures

Flash Point: N/A

Extinguishing Media: Use fire extinguishers with class B extinguishing agents (e.g., dry chemical, carbon dioxide)

Unusual Fire and Explosion Hazards: No unusual fire or explosion hazards are anticipated

Fire Fighting Equipment: Wear full protective equipment (Bunker Gear) and a Self-Contained Breathing Apparatus (SCBA)

Section 6: Accidental Release Measures

Not applicable.

Section 7: Handling and Storage

Handling: Keep out of the reach of children. This product is considered to be an article which does not release or otherwise result in exposure to a hazardous chemical under normal use conditions. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below Occupational Exposure Limits. If ventilation is not adequate, use respiratory protection equipment.

Storage: Not applicable

Section 8: Exposure Controls/Personal Protection

Eye Protection: Not applicable

Skin Protection: Not applicable

Respiratory Protection: Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection

Prevention of Swallowing: Not applicable

Section 9: Physical and Chemical Properties

Odor, Color, Grade: Appearance and Odor: Filter cartridges are cylindrical, white and solid. Filter housings are also white and constructed with high impact plastic. These products are odorless.

General Physical Form: Solid

Autoignition Temperature: Not Applicable

Flash Point: Not Applicable

Flammable Limits (LEL): Not Applicable

Flammable Limits (UEL): Not Applicable

Boiling Point: Not Applicable

Density: Not Applicable

Vapor Density: Not Applicable

Vapor Pressure: Not Applicable

Specific Gravity: Not Applicable

pH: Not Applicable

Melting Point: Not Applicable

Solubility In Water: Nil

Evaporation Rate: Not Applicable

Percent Volatile: Not Applicable

Viscosity: Not Applicable

Section 10: Stability and Reactivity

Stability:

Materials to Avoid:

Hazardous Decomposition Products:

Hazardous Polymerization: Will not occur

Hazardous Decomposition or By-products:

Hazardous Decomposition: Under recommended usage conditions, hazardous decomposition products are not expected. Hazardous decomposition products may occur as a result of oxidation, heating, or reaction with another material.

Section 11: Toxicological Information

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

Ecotoxicological Information: Not applicable

Chemical Fate Information: Not applicable

Section 12: Ecological Information

Ecotoxicological Information: Not determined

Chemical Fate Information: Not determined

Section 13: Disposal Considerations

Dispose of waste product in a sanitary landfill. As a disposal alternative, incinerate in an industrial or commercial facility in the presence of a combustible material. **WARNING:** To reduce the risks associated with improper disposal and/or handling of contaminates in used filters: Take appropriate steps to access the disposal required for any altered product or materials added to the product. (Alteration of the product or addition of other materials to the product may require different disposal methods.)

Section 14: Transport Information

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

Section 15: Regulatory Information

Chemical Inventories

This product is an article as defined by TSCA regulations, and is exempt from TSCA Inventory listing requirements. Contact 3M Purification for more information.

311/312 Hazard Categories

Fire Hazard: No

Pressure Hazard: No

Reactivity Hazard: No

Immediate Hazard: No

Delayed Hazard: No

U.S. Federal Regulations

Contact 3M for more information.

State Regulations

Contact 3M for more information.

International Regulations

Contact 3M for more information.

Section 16: Other Information

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Food Contact Compliance

Designated filtration products comply with applicable U.S. regulations for food and beverage use.

The product is compliant with the requirements of Regulation (EC) 1935/2004 for food contact for use in aqueous, acidic, alcoholic and dairy products.

Consult 3M for detailed regulatory compliance information.

USP Biological Test for Plastics

3M™ LifeASSURE™ BNA Series Filter Cartridge materials of construction meet the USP Biological Reactivity for Class VI Plastics test.

Technical Information
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